

MORATORIUM, RESEARCH AND NATIONAL REGULATIONS NEEDED FOR THE SITE PLACEMENT OF INDUSTRIAL WIND TURBINE DEVELOPMENTS

Proposed by CFUW Kincardine

RESOLVED, That the Canadian Federation of University Women (CFUW), Kincardine chapter, strongly urges all levels of government to institute a *moratorium* on the construction of industrial wind turbine developments until such time that evidence-based, impartial, *scientific research* has identified issues relating to site placement, human health, the environment and economic efficiencies, resulting in the development of national, uniform *standards and regulations*.

BACKGROUND

As residents of a thriving agricultural community located along the shoreline of the Great Lakes ecosystems, we are concerned about the rapid and uncontrolled growth of the industrial wind turbine developments. The locations of the industrial wind turbine industry in prime farmland and fresh water lakes have raised concerns about health, environmental and economic consequences. These issues have implications throughout Canada and the world.

Industrial Wind Turbines and Human Health

Numerous side effects have been reported after the development of industrial wind turbines with setbacks that are too close to residences. The term “setback” is defined as the plan distance separating the center of a dwelling (receptor) and the base of the closest wind turbine (Environmental Protection Act Ontario 2009, p.1, 2). The provincial government has determined that minimum setbacks are 550 metres. In her report (May, 2010, p.10) Dr. Arlene King, Chief Medical Officer of Health of Ontario, identifies that “sound measurements at residential areas around wind turbines...is a key gap that could be addressed.” Presently there is a dearth of scientific research regarding health impacts of people living close to industrial wind turbine projects.

Dr. Robert McMurtry (former assistant deputy minister of Population and Public Health Branch of Health Canada) believes that wind energy may offer a cleaner way to generate electricity, but some people who live near the giant wind turbines are suffering through serious health problems such as headaches, heart palpitations, hearing problems, stress, anxiety, depression, acute hypertensive episodes and atrial fibrillation (abnormal heart rhythm). He informed a government committee that until rigorous epidemiological studies of the health effects of wind turbines, Ontario should not go ahead with any further construction of wind turbines. (McMurtry, 2010). In addition, there are no health studies on the effects of low frequency noise and stray voltage on infants, babies, pregnant women and livestock living in proximity to industrial wind turbines.

The Grey-Bruce Medical Officer of Health, Dr. Hazel Lynn, believes the setbacks for wind turbines should be longer and that within buildings, Low Frequency Noise (LFN) which comes from wind turbines, could cause health effects. She contends the effects would be less if the setbacks were longer than the provincial setback of 550 metres. Dr. Lynn adds that symptoms are the same around the world but the problem is that little is known about wind turbines. European research is ahead of that being done in Canada and minimum setbacks there are between 1.2 and 1.5 km. (Jankowski *et al*, 2010).

Responding to public concerns about health effects caused by industrial wind turbines, The Board of Health for the Grey-Bruce Health Unit (2010, p.1), passed a resolution “that the Medical Officer of Health investigate initiating a study to examine the effects the installation of Industrial Wind Turbines in close proximity to residential homes, or residential areas, has had on residents in Grey-Bruce Counties.”

In her report (Jan. 21, 2011, p. 2, 3) Dr. Hazel Lynn, stated that “to dismiss all these people as eccentric, unusual or as hyper-sensitive social outliers, does a disservice to constructive public discourse... We cannot pretend this affected minority does not exist.”

As industrial wind turbines become taller and larger, the old setbacks of 550 metres from a receptor are not appropriate. Larger turbines require longer setbacks. The Ontario Ministry of the Environment has determined that there is no single setback that can accommodate all the variables of a wind turbine project design as well as the compliance with noise limits. (Environmental Protection Act, 2009, Section 47.3 (1) p.2). Scientific research is needed to determine more appropriate setbacks and geographic locations for industrial wind turbine developments in Ontario and across Canada.

Due to public concerns about health related issues from industrial wind turbines forcing people to leave their homes because of stray electrical voltage and low frequency noise, Mayor Twolan and the municipal government in Huron-Kinloss, Ontario have taken the lead to request the local health unit to initiate a study and make recommendations (Huron-Kinloss, Resolution 318, 2010).

Dr. Nina Pierpont, MD, PhD, New York has been studying Wind Turbine Syndrome (WTS) for the past five years and has discovered a list of symptoms experienced by many people living near industrial wind turbines: sleep disturbance, headache, tinnitus, ear pressure, dizziness, fainting sensation, vertigo (sensation of spinning or room moving), nausea, visual blurring, rapid heart rate, irritability, problems with memory or concentration and panic episodes (Martin, 2010).

Professor Mariana Alves-Pereira, Dept. of Environmental Sciences and Engineering, New University of Lisbon, Caparica, Portugal has been studying the pathophysiology of low-frequency noise and infrasound to conclude that whole-body vibroacoustic disease (VAD) can occur over years of exposure to low frequency (LF) noise resulting in stroke, epilepsy, suicide and rage reactions (Alves-Pereira, 1999). Wind farm noise emission criteria or standards are not consistent and may vary even within a particular country (Kamperman *et al*, 2009). The National Academy of Medicine in France has recommended halting wind turbine construction closer than 1.5 km. from residences due to harmful effects on human health (Gueniot, 2006). The problem is that noise affects the whole body and not just the auditory system. Unbiased scientific research is needed to determine appropriate setbacks.

Dr. Sarah Laurie MD, medical Director of the Waubra Foundation, Australia believes that there is mounting evidence across the world that wind turbines cause major health problems forcing some people to leave their homes, farms and livelihoods as they can no longer work their land. Others are unable to leave, as their main asset, their house and land becomes unsaleable (Wind-Watch, 2010).

In the beginning, asbestos products, cigarettes, second hand smoke and lead paint were considered to be safe however, through scientific research and human illness, they were proven detrimental.

Lessons Learned About the Economic Realities of Wind Turbines

Information about the high cost of wind turbine generated power was initially brought to public attention by special interest groups and the media. However, concerns about the costs associated with the operation of industrial wind turbines are gradually becoming validated by scientific studies (Fox and Gallant, 2011; Vandenberg, 2011). Although much of the information about power costs relates to the current situation in Ontario, it is important to note that similar issues have been identified in Europe. For example, in Holland, the government recently announced that it cannot afford to continue producing wind powered electricity (Sekularac, 2011).

The building and operation of wind turbines create immense financial liabilities for consumers and these are reflected in significantly higher electricity bills (Gallant, 2010; Corcoran, 2011) and debt retirement charges (Trebilcock, 2010). It is estimated that the cost of electricity in Ontario has risen 65% since 1999 and it is expected to rise another 46% by 2015 (Corcoran, 2011). Jim McCarter, the Auditor General of Ontario, in his Annual Report (December 2011), indicated that “green electricity” (including wind turbines) would add \$220 million to hydro bills. The cost of building additional transmission lines to transport electricity from rural wind turbines to urban areas is expected to be in excess of \$5 billion (Stelling, 2010). Further scientific research would result in uniform and standard policies for electricity production and more effective use of tax dollars.

Wind power is more expensive to produce than other forms of power. Based on present 10-20 year contracts, the wind power producers are guaranteed fixed rates of payment between 13-19 cents per kilowatt hour, whether the power is needed or not. Since excess power cannot be stored, it is sold to other areas (usually the United States) at discounted rates, meaning consumers are actually subsidizing power that is sold elsewhere (Gallant, 2010; Trebilcock, 2010). Alternatively, nuclear energy costs the consumers 5-6 cents per kilowatt hour and hydro generated power costs 4.5 cents per kilowatt hour (Trebilcock, 2010).

The disposal of wind turbines can be problematic when the contracts end. The extrication and disposal of wind turbines is expensive and creates significant waste in landfill sites. In Denmark, wind turbines that were expected to last 20 years are only lasting 10 years, meaning that each tower is dismantled, scrapped, replaced and re-subsidized sooner than anticipated. In comparison, conventional power plants have working lives of 40-60 years (Stelling, 2010).

The operating efficiency of wind turbines is seldom above 30% and more often is closer to 20% of capacity (Wakefield, 2010). Industrial wind turbines are particularly inefficient during hot summer weather when power is needed for air conditioning. Conversely in cold climates, ice build up accelerates deterioration.

Some emerging evidence indicates that the location of wind turbines adjacent to residential or agricultural property significantly depresses property values. Research would further identify issues relating to property values and site placement of industrial wind turbines.

Michael Trebilcock LLB, LL.M a law and economics professor at the University of Toronto, summed up the problem in the Financial Post on March 6, 2010, p.5 "Before mortgaging its long-term future by awarding hundreds more 20 year fixed price contracts to wind developers, the province of Ontario urgently needs an independent, objective, expert investigation...regarding the prospective economic, environmental and employment effects of wind power and other renewable energy policies."

Impacts of Industrial Wind Turbines on the Environment: Land and Fresh Water Locations

Many scientists have expressed the need for further investigation into the effects of industrial wind turbines on wildlife, farm animals and the ecosystems. In Ontario, the Ministry of the Environment (MOE) regulates a setback of only 5 km from the shoreline. The low frequency vibration produced by industrial wind turbines travels for dozens of km over water because of the close proximity of vapour molecules. The MOE has also restricted the increase of cyclical sound to 5 decibel. The turbulence of the lake water adds significantly to the decibel levels created by the wind turbines, thereby exceeding the 5 decibel increase in sound reaching the shoreline. To protect humans living near the shoreline from the effects of low frequency vibrations, a 60 turbine project must be located beyond 20 km from the shore (Boue, 2010). Sound pollution created by wind turbines interferes with communication within wildlife species, and for those that rely on echo-location such as bats (Dr. Scott Petrie, May 2010).

The Great Lakes make up the world's largest freshwater lake system providing 18% of the planet's supply of water. With over 36 million people living in the Great Lakes Basin, it is the most densely populated coastal area on the continent. Many people obtain drinking water from the Great Lakes which are also important for recreational and aesthetic purposes. Vibrations caused by the construction and operation of wind turbines could disturb toxic sediments (PCBs, dioxin, mercury) and contaminate the drinking water (Lombardi, 2009). This vast ecosystem also supports a varied and important population of wildlife. Lake Erie has the greatest diversity of migratory bird species in the Great Lakes, with 50,000 pairs of waterfowl breeding in the region. Lake Huron has one of the largest populations of indigenous waterfowl. Bruce Peninsula and southern shores of the lake provide important staging areas (where they stop to rest and forage) for migratory waterfowl, shorebirds, eagles and songbirds. Industrial wind turbines located in the vicinity of historical migration routes, present mortal hazards to migrating birds (Stelling, 2008).

The Lake Huron Centre for Coastal Conservation encourages all levels of government in Canada to conduct independent studies to ensure that any offshore wind projects do not compromise the nation's natural heritage assets of water and biodiversity (Peach, G., Pearson, M., 2010). The Species at Risk Act, (SARA) is a Canadian federal law which requires that critical habitat on federal lands or aquatic species anywhere, be legally protected. There are at present, 26 birds, native to the Great Lakes region listed on the Species at Risk Registry (SAR) as being threatened, endangered or of special concern. There are also numerous reptiles, butterflies and mollusks which are identified as at risk by SAR (SARK: Government of Canada, 2004). We have a legal and moral obligation to protect these species and their habitats.

Ducks Unlimited Canada, has asked the Ontario Government to establish a moratorium on wind turbines in areas of wildlife habitat and migratory routes until scientific monitoring and the approval process have been researched. Worldwide plans for the installation of 3.5 million wind turbines will cause the extinction of many bird species. Mark Duchamp, president of Save the Eagles International (STEI), believes that while other threats cannot be easily stopped, poorly-sited wind turbine projects can. The Spanish Ornithological Society recommends that wind turbines no longer be built in natural areas, but in urban and industrial areas instead. Duchamp revealed that bird mortality caused by wind turbines was much higher than previously thought. For the Spanish region of Castilla La Mancha, STEI estimates 1.3 million birds are killed by wind turbines a year. Many birds, such as the Imperial Eagle, the Bonelli's Eagle or the Lesser Kestrel, are in danger of extinction. STEI concludes that this considerable number proves that wind turbines have a great capacity for killing. To save birds from this new threat, it is urgent to impose a moratorium on wind turbine construction and to call for a totally independent commission to investigate the effectiveness of this intermittent, unreliable and destructive form of energy (Duchamp, 2011).

The Great Lakes are a closed system with a very slow retention time (the time required for a substance added to the system to flow out). The average retention time for Lake Huron is 22 years, which makes it especially vulnerable to pollution and subject to major, potentially long-lasting damage (Great Lakes Information Network, 2005). The construction and operation of wind turbines in the Great Lakes, creates the possibility of introducing contaminants such as oil and other lubricants into the delicate ecosystem. Each turbine contains hundreds of litres of lubricating fluids which could leak into the ecosystem over decades. There are many opportunities for mishaps to occur during the construction, operation and decommissioning of the turbines.

The braking system of a wind turbine is designed to prevent the vanes from turning too fast in excessively strong winds. However there are examples of the braking system failing, causing the wind turbines to blow apart and scatter rotating metal, hundreds of meters (Nordtank, 2001). In Europe, the underwater foundations of turbines were found to have a design fault that caused the towers to slide on their bases. There are also numerous examples of lightning strikes, turbine fires and ice buildup causing the collapse of wind turbines. The construction of underwater transmission cables destroys the habitat and leads to displacement of flora and fauna of the lake-bed which has detrimental effects on the food chain. A malfunction of the high voltage underwater cables could result in dangerous levels of electricity in the water, harming wildlife and humans. Industrial wind turbines leave massive environmental effects on fragile ecosystems on land and in freshwater locations.

Recently, Bob Runciman, Canadian Senator, presented a motion that was unanimously endorsed by the Senate, to declare a moratorium on wind energy projects due to environmental concerns (Hendra, 2011).

It is evident that there is a need for independent research to determine placement of industrial wind turbines in locations that will be safe for wildlife and their habitats, farm animals as well as for humans.

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