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Ontario's Offshore Wind Industry Policy Issues

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1. INTRODUCTION

One of the main demands in the developing world is for *ENERGY*. This subject places enormous stress on the world by many factors like high cost of energy, inadequate infrastructures and the most important, the serious impacts on the environment.

Fossil fuel combustion causes significant health problems, contributes to global climate warming and emits 70% of the world's greenhouse gases. Designing low-cost energy technologies and developing strategies for this is one of the world's main challenges at present. Oil may getting more expensive in the future due to the limited fossil fuel reserves. And life will become more difficult in the industrialized countries. So the needs for energy alternatives like renewable energies is felt more and more every day. It worth noting that although transition from traditional sources of energies to clean and renewable energies is not simple and is both time and money consuming, but it is a must and not only necessary but also because of the fundamental problem off the world's population growth, this shift should be done as soon as possible.

Renewable green energy sources like wind, solar and water can help reduce dependence on petroleum products and also reduce pollution. But the problem is that these energy sources provide a very small part of the world's energy needs at the moment.

According to the Energy Information Agency, by the year 2020, world energy consumption is projected to increase by 50%.

No one knows when that last drop of oil or portion of natural gas will be extracted from the ground. But wind, sun and even water resources never end and the world can rely on them to produce energy for ever. Also they are very simple and less expensive than the other non-renewable energy sources.

In this essay we have focused on wind energy and particularly on the *offshore wind energy in Ontario, Canada*. While offshore wind farms are a major source of producing energy in Europe – more than 91% of the world's offshore wind power is currently installed off Northern Europe [1]- Canada so far has no offshore wind power.

One main reason can be the relatively low prices for electricity in Canada, which makes the competition harder for offshore wind power however, the situation for onshore wind power is better as installation is cheaper for this type of wind power.

To find a reasonable position in the global clean energy economy, Canada must execute permitting and review processes in an efficient and effective manner that protects the health and safety of the Canadian community while supporting vital economic growth.

The Great Lakes have a high potential for offshore wind farms and are a vital environmental and economic asset for eight states and two provinces of the Great Lakes region. They have fresh water which avoid the extra expenses forced by corrosive effects of salt water exposure. The Great Lakes are ideal for wind development because of high wind speed and shallow waters.

This is particularly true at the Canadian side of the lake, as the winds often blow in a prevailing north-easterly direction, that is from South-West.[2]

Deployment of offshore wind in the Great Lakes region would stimulate economic revitalization in key sectors for aims of the economy, diversify the nation's energy supply and enhance our national security by accelerating energy independence efforts, and reduce air pollution and greenhouse gas emission.[3]

2. PROBLEMS WITH WIND POWER

According to the windontario.ca website, Ontario has the most expensive electricity in North America. So it seems that wind power can be a solution to reduce the electricity price in this province. We can find the most numbers of wind turbines in the rural parts of Ontario. So the major impacts of wind farms are on these regions. The main concerns for the people in these area are:

- Sleep disorders
- High blood pressure
- Tinnitus
- Migraines
- Elevated stress and anxiety
- Lower property values

Other worries of the opponents of wind energy are birds and bats. Experts warn wind turbine developments may hurt birds of prey.[4]

John Campbell has worked with some species for decades and believes that the birds aren't dying from turbine strikes, they are abandoning high-quality nests because of

the pressure of turbine and other industrial developments. Wind turbines mess up the bird's lives. They move to lower quality sites.[5]

The property tax assessors, the Municipal Property Assessment Corporation (MPAC), said in 2012, " there is NO statistically significant impact on sale price of residential properties in these market areas resulting from proximity to an industrial wind turbines."[4]

A recent Health Canada study into wind turbine's noise did not find a consistent relationship between wind turbines and health effects.[6]

In recent years, most large wind turbine developments have been appealed to the provincial Environmental Review Tribunal (ERT), which has cited a lack of scientific evidence to back up health complaints.

However, the government is now on more solid footing for future wind projects. It may authorize the wind projects in Ontario under the new FIT policy.[4]

3. ONTARIO MORATORIUM

A thousand people who overflowed the auditorium of Sir Wilfrid Laurie Collegiate on Guildwood Pkwy, on November 25, 2008, debated over the pros and cons of Toronto Hydro's proposed offshore windfarm.

Toronto Hydro planned to install about sixty turbines in the lake over an area twenty five kilometers long, extending as far east as Ajax and as far west as the waters off the Leslie street spit.

People were arguing the project affects everyone in Toronto and beyond. On the other hand, the supporters believed that Canada is falling behind much of the world in renewable energy and many university graduates have to leave Canada to find work in the renewable energy sector.

The proponent of the wind farm was Toronto Hydro Energy Services, an unregulated unit of Toronto Hydro Crop., which is owned by the City of Toronto.

Supporters of the wind turbines were taken aback at local opposition to the proposed turbines; some residents fear the lake view will be spoiled, their property values will suffer and migratory birds will be killed or disrupted.[7]

4. MORATORIUM AND SMAL LOCAL BUSINESSES

Toronto's eastern shoreline is considered a good prospect for wind turbines because of a relatively shallow underwater reef two or four kilometer-offshore, where the turbines can sit. But developers are uncertain of what might happen. For example, the chief executive of Trillium Power was an hour away from signing a financing agreement for a wind development of 500 MW or more in Lake Ontario off Kingston when the moratorium was announced. Trillium launched a $2.25 billion lawsuit against the province.[8]

In another lawsuit over the moratorium The SouthPoint Wind suit filed in Ontario Superior Court, names the province, three provincial ministries, Environment Canada, Hydro One and the Ontario Power Authority. It was claiming $1 billion in damages for confiscation of its property and assets, $100 million for failure to negotiate in good faith, and other $100 million for punitive, aggravated and exemplary damages.[9]

5. ONTARIO'S MORATORIUM IMPACTS ON WIND INDUSTRY

After the moratorium, Ontario's reputation as a leader in the green energy economy is being threatened by an inconsistent ad-hoc policy on wind development, renewable advocates say, threatening several projects and the prospect of future manufacturing jobs. Exploiting this resource of energy could go a long way towards the Ontario government's goal of increasing renewable generation by 2020.

The current moratorium has cast an ominous shadow over the offshore wind power industry in Ontario. The only accomplishment for Ontario is that it is going to chase serious investors out of the province. No one will put any money for offshore industry with this back and forth.

The inconsistent policy will jeopardize long-term economic development as turbine manufacturers decide to settle elsewhere.

Some think that the moratorium put an end to the offshore wind turbines industry without saying so. But some believe that the offshore wind farms have just put in the background due to the extent of work on onshore wind farm approvals.[10]

6. ONTARIO AND THE FIT PROGRAM

As offshore wind energy developments get underway in Quebec, Nova Scotia, New Brunswick, British Columbia, Newfoundland and Labrador, New York, Pennsylvania, Ohio, Michigan, Minnesota, Indiana and virtually all other coastal jurisdictions in Canada and the United States, Ontario has ceded an early lead in this particular renewable energy arena.

The Feed-In Tariff (FIT) program (table 1), was made to develop and encourage use of renewable energy. It was open to projects with generating capacity greater than 10 KW and generally up to 500 KW. It helped Ontario to reduce its dependency to the coal-fired electricity generation, creating jobs, new industries and technologies. The FIT program did give Ontario an excellent head start in the wind energy sector. But unfortunately, they had removed offshore wind farm support from the Ontario FIT program. This decision has caused many problems for the offshore industry and now the out-of-country investors are worried and may ask "where else in Canada can we invest our renewable energy dollars to mitigate the political and policy risk in Ontario?!"

Traditionally, Ontario should manage to respect its commitments to energy project developers. As the FIT program continues to evolve, we expect that the province will again endeavour to honour its commitments.[11]

Renewable Fuel	Project Size Tranche*	Price (¢/kWh)	Escalation Percentage**
Solar (PV) (Rooftop)	≤ 10 kW	38.4	0%
	> 10 kW ≤ 100 kW	34.3	0%
	> 100 kW ≤ 500 kW	31.6	0%
Solar (PV) (Non-Rooftop)	≤ 10 kW	28.9	0%
	> 10 kW ≤ 500 kW	27.5	0%
On-Shore Wind	≤ 500 kW	12.8	20%
Waterpower	≤ 500 kW	24.6	20%
Renewable Biomass	≤ 500 kW	17.5	50%
On-Farm Biogas	≤ 100 kW	26.3	50%
	> 100 kW ≤ 250 kW	20.4	50%
Biogas	≤ 500 kW	16.8	50%
Landfill Gas	≤ 500 kW	17.1	50%

* The FIT Program (2014) is available to Projects generally ≤ 500 kW.

**Escalation Percentage based on the Consumer Price Index will be applied to eligible Renewable Fuels as calculated in the FIT Contract. The Base Date is January 1 of the year in which the Project achieves Commercial Operation, unless the Project achieves Commercial Operation in October, November, or December, in which case the Base Date is January 1 of the following year.

FIT PRICE ADDERS

	Aboriginal Participation		Community Participation		Municipal or Public Sector	
Participation Level (Equity)	> 50%	≥ 15% ≤ 50%	> 50%	≥ 15% ≤ 50%	> 50%	≥ 15% ≤ 50%
Price Adder (¢/kWh)	1.5	0.75	1.0	0.5	1.0	0.5

Table1. FIT/microFIT PRICE SCHEDULE (Effective September 30, 2014 for FIT and January 1, 2015 for microFIT)

Note: The above table applies to all FIT Project sizes and all Renewable Fuels except Solar (PV) (Rooftop).

7. POLICY AND SCIENCE

The Ontario Ministry of Natural Resource and Forestry conducts and supports scientific research to better understand renewable energy project's effects and benefits.[12]

These research projects focus on :

- Species at risk
- Coastal engineering
- Birds and bat migration
- Bat habitants
- Fish and fish habitant
- Development of a bird and bat monitoring database (appendix A)

The ministry works collaboratively with science partners from Ontario, other provinces, the federal government and the United States. The goal is to increase knowledge to better inform the development of renewable energy projects in Ontario.

Also after four years, the Ontario government has issued a call for further study and posted a notice requesting for a "technical evaluation of sound propagation modelling methodologies" to predict offshore wind farm noise impacts in Ontario.

The proposal asks bidders to do a review of existing studies but they are not allowed to do actual field measurements and testing. The moratorium was put on standby to push the issue past the provincial election that was due later that year, but has remained in place ever since.

There are three reports published by Ontario's Ministry of Natural Resources on the impacts of offshore wind farms since the moratorium began. One is on the "physical features" and the two others looked at the "impact on fish". But they are not conclusive.

The physical feature report outlines further research might be needed and the fish impact report proposed warning and caution due to the lack of experience with offshore wind works. So, the ministry says they still need to gather more information on the potential effects of offshore wind developments. It also added that these three reports are not government policy.

Kate Jordan, spokesperson of Ontario's environment ministry said the new study is "in keeping with the science-based approach used to establish the standards for onshore wind projects."

Apart from the last three studies on offshore wind turbines, there is a new study which started in late 2014 and was expected to be finished in six to nine months. The ministry wants more study on the impact on local ecology, including birds and fish as well as how noise from wind turbines travels over water.

John Yakabuski (of the Ontario Conservatives) said it could be a friendly gesture towards the wind industry, keeping the possibility of offshore wind projects alive. He said asking for the study is a mistake, since no one wants turbines in the Great Lakes.

Jane Wilson, president of Wind Concerns Ontario, which is critical of wind power, was also uncertain how to interpret the request. She noted that it's not specifically a research on low-frequency sound, which is below the range of human hearing but may still have physical effects on health.[14]

8. ONTARIO'S POLICY CONSTRAINTS

At the moment, there are several policy and commercial constraints facing offshore wind development in Ontario:

- Offshore wind development moratorium is still in place
- No offshore wind specific procurement process or FIT rate exists (table 1)
- High construction costs for marine projects (relative to onshore wind)
- Relatively low energy commodity price in the Ontario market (surplus capacity)
- Some people think even if turbines are far from land, their noise will carry long distances over the water to shoreline communities
- In 2013, the province removed over 500 KW wind projects from its FIT policy, but contracts signed prior to that are still working their way through the government's reviews. The government's energy regulator, the Independent Electricity System Operator (IESO), needs to have a different policy for new wind projects in future.[4]

9. POLICY ALTERNATIVES

In particular, the excellent offshore wind resource in the Great Lakes region presents a significant opportunity to stimulate economic revitalization. So Ontario has to support the efficient, expeditious, orderly and responsible review of proposed offshore wind energy projects in the Great Lakes.

Offshore wind proposals must be evaluated for potential social, environmental, cultural, safety and security impacts by the appropriate provincial agencies. [3]

Canada needs a consortium to enhance coordination among participating provincial agencies, working toward the shared goal of coordinating reviews and data collection and dissemination needs to the extent practicable. Also, the consortium can embody a fundamental principle of the national marine policy to support sustainable, safe, secure and productive access to, and uses of the Great Lakes.

Policy alternatives include changes to streamline or restrict site and project approvals, feed-in-tariffs and incentives, capital support program, and permitting and regulation related to safe projects, installation and operation of wind power facilities. Particularly the construction of offshore wind facilities would require significant government support and therefore sufficient political will to bear the cost. Development of new technologies can reduce costs which are the greatest impediments. Also, government commitments encourage new projects and balance public interests. However, overcoming local stakeholder opposition to specific projects and maintaining public support for subsidies of clean electricity projects in the face of rising electricity prices may in the long term prove more problematic.[15]

10. THE FUTURE OF THE OFFSHORE WIND ENERGY

It is estimated that within five years from now the amount of electricity generated from offshore windfarms will quintuple. However, if conditions stay the same for Canada, Canada will get a low portion of it.

A report from British-based research firm GlobalData says offshore wind will expand dramatically during this decade. The reports note that the ocean-located turbines capacity grew from less than 1 GW in 2006 to 7.1 GW in 2013 and predict that it will rise to almost 40 GW by 2020.

Canada’s total wind power capacity currently stands about 9 GW, but all of that is from land-based wind farms, in the absence of offshore wind projects.

The main reasons, according to the Canadian Wind Energy Association (CANWEA) is that electricity prices are lower in Canada – making it harder for offshore wind farms to compete – and that there are still lots of opportunities for cheaper onshore installations. A reasons for the latter factor is that Canada is physically a big country so the necessity for offshore wind farms is less felt. However, over the long term there will eventually be offshore wind farms built in Canada as it provides tremendous opportunity and resource.

Apart from plans by several Ontario developers which are on hold due to the moratorium, there are two main offshore wind farms in the planning stages in Canada, but both area long way from fruition.

St. John's-based Beothuk Energy Inc. has plans for an $400-million, 180 MW wind farm in the Gulf of St. Lawrence, off the west coast of Newfoundland. And Naikun Wind Energy Group Inc. of Vancouver has been planning a 400 MW offshore wind project in Hecate Strait, between Haida Gwaii and Prince Rupert off the northwest coast of British Columbia. Naikun has received environmental approvals, but the project is on hold because the company has not yet got a power purchase contract from the provincial government.

There are no offshore wind farms in the United States yet either. The most advanced project in the Cape wind farm has received environmental approvals and has financing arranged, but due to some political fight, with stiff opposition from some local residents, this is on hold.

It worth noting that power generating by offshore wind turbines benefit from stronger wind speed over the ocean and larger turbines that will help decrease the cost per MWh/yr of power generated.

On the other hand, development and operations of offshore wind in Ontario would create many employment opportunities and lift real gross domestic product by a cumulative total of up to $5.6 billion over 2013-2026.

Offshore wind farms in the Great Lakes can be considered as an asset and there are many potential benefits for both the shoreline communities and the power industry.[16]

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APPENDIX

Appendix A

WIND ENERGY BIRD AND BAT MONITORING DATABASE

The database is an initiative between the Ministry of Natural Resources and Forestry, Birds Studies Canada, Environment Canada and the Canadian Wind Energy Association. The database stores birds and bat monitoring data from operating wind power projects located in Ontario across Canada.

The information can be used to study bird and bat mortality patterns associated with wind power projects. This helps to inform guidelines and policy, support an adaptive management approach and provide public information.[13]

Appendix B

MEETING WITH JACK SIMPSON

In our meeting with Jack Simpson – director (Vice president) of generation and capacity planning at Toronto Hydro – he cited that Toronto Hydro had proposed a 200 MW- offshore wind farm to be located approximately four kilometers offshore from Toronto, in the vicinity of the Scarborough Bluffs where the water depth is suitable. Development work included wind resource assessment, marine mapping and geotechnical work, preliminary structure/foundation designs and electrical interconnection work. An environmental assessment was completed for a LIDAR platform approximately one kilometer offshore and a two-year wind study was completed after this platform was constructed. The commercial approach was to submit this project under OPA's FIT program and secure a twenty-year off-take contract, which faced considerable public opposition to wind development and an offshore wind in 2008. A moratorium was put in place, pending further study. Toronto Hydro has put development on hold and was requested to remove the LIDAR platform. It is focusing on aging infrastructure (stations, wires, etc.) for at least the next decade and doesn't anticipate funding major generation projects.

Appendix C

OPPOSITION AGAINST WAINFLEET WIND ENERGY INC.

To be successful in appealing a Renewable Energy Approval (REA), the Environment Protect Act (EPA) requires appellants to demonstrate that operating the project in accordance with the REA will cause serious harm to human health and/or serious and irreversible harm to plant life, animal life or the natural environment.

On July 29,2014 Mike Pitt and Skydive Burnaby Ltd., set a file against Wainfleet wind energy Inc. the appellants argued that the REA would cause serious harm to human health. Specifically, they argued that two of the five wind turbines posed a threat to parachutists associated with the appellant's skydiving business, located on a nearby property. All parties agreed that a collision between a parachutist and a turbine, would cause harm to human health. Furthermore, the parties agreed that if the turbines were to prevent airplanes from taking off or landing safely, that this would cause harm to human health.

The following are the appeal outlines:

1) Industrial turbines cause a range of serious health effects in approximately five to thirty percent of the population. These health effects are sleep disturbance, tinnitus, headache, ear pressure, dizziness, vertigo, nausea, visual blurring, techy cardia, irritability, problem with concentration, memory and panic episodes associated with sensations of internal pulsation or quivering when awake or asleep, excessive tiredness and loss of quality of life. All which can lead to increased morbidity significant chronic disease and health effects.
2) These health effects are likely caused by exposure to infrasound, low-frequency noise, audible noise, visual impact, shadow flicker, stray voltage and/or electromagnetic fields. The tonality and lack of night-time abatement are factors which also contribute to negative health impacts.
3) These health effects occur at sound level starting at approximately 30 dba, which is lower than the levels permitted by REA for this project.
4) The project is located too close to the ongoing operation of Skydive Burnaby Ltd. The project will expose pilots to unsafe conditions.

DECISION

An REA has been issued to Wainfleet Wind Energy Inc. to engage in a renewable energy project in respect of a class four wind facility consisting of the construction, installation, operation, use and retiring of five turbines with a total name plate capacity of 9 MW. The wind facility will be connected to Hydro One's distribution system.[17]