



**association to protect
AMHERST ISLAND**

Without prejudice to all our rights

**Windlectric's REA Application for the Proposed Amherst Island
Wind Energy Project**

New Information and Evidence

Re:

EB-2014-0300

**Submitted by: Dr. John Harrison on behalf of the Association to Protect
Amherst Island (APAI)
July 19, 2015**

I am providing new information on Windlectric's REA application for the proposed Amherst Island Wind Energy Project. This includes updates to APAI Reviews of Noise Assessment, Ice Throw, Shadow Flicker, and Viability of the Windlectric Project.

Noise Assessment

The Windlectric project is notable for the large number of homes with a predicted sound pressure level within 1.5 A-weighted decibels of the Ontario noise limit defined by the 2008 Guidelines. These predictions do not include the uncertainty in the prediction and do not take account of the additional noise that results from certain atmospheric conditions. It has recently come to light that the turbine manufacturers are aware of this: To cover themselves for the Falmouth MA project, Vestas wrote to the project manager to declare that its turbine can generate a sound pressure level 8 decibels above its warranted sound power under certain atmospheric conditions. This new information has been sent to MOECC¹. The conditions of approval, if granted, will surely have to deal with this

¹ See Attachment 1: Letter to Ms. Agatha Garcia-Wright – Jan. 6th, 2015

Ice Throw

Several months ago, APAI expressed concern about ice throw during icing conditions. Windlectric had expressed confidence that ice monitors would detect icing and shut down the turbines. A recent Wind Energy Update article² and a conference³ in Toronto cast serious doubt on this confidence. A safe ice-throw setback is 300 metres. There are 6 turbines within 300 metres of travelled roadways and 27 turbines within 300 metres of neighbouring lot lines. Again, APAI expects that this will require changes to the site plan.

Shadow-Flicker

By Windlectric's own admission 45 homes will be subject to more shadow flicker, from the sun passing behind the wind turbines, on the island than would be permitted in Europe. This can be dealt with by periodic shut-downs of the turbines and MOECC have been made aware of this. This protocol has proven successful in the UK. However, as yet, we have seen no response to this by Windlectric.⁴

Viability of the Windlectric Project⁵

The Windlectric wind energy proposal has never made sense, neither for the consumer, for the investors in Algonquin Power and Utilities Corporation nor for the Province of Ontario.

APAI maintains that Algonquin Power, the corporation behind the shell company Windlectric, has misled its investors and the Ontario Power Authority in its prediction for the potential wind resource for a 75 MW wind energy development on Amherst Island. In its announcement of the project in February 2011 Algonquin Power (APCo) announced an energy output of 247 GWh/annum. As is easily demonstrated, this is equivalent to a capacity factor of 38%. Using hourly IESO wind generation data for all listed wind projects in Ontario APAI has calculated the annual capacity factor for the projects dating back to 2006. A summary is shown below in Table 1.

² See Attachment 2: Submission to the MOECC Technical Review Committee – Sept. 2014

³ See Attachment 3: Submission to the MOECC Technical Review Committee – Oct. 24th 2014

⁴ See Attachment 4: Response to EBR 012-0774 – Feb. 2014

⁵ This information was made available in a comment to EB 2014-0300 dated Dec. 12th, 2014. It is repeated here as evidence that approval to construct a transmission line is premature.

There has never been a capacity factor of 38%, not even with the modern turbines sited along the high wind resource north shore of Lake Erie. Amherst Island lies in the lee of Prince Edward County and has significantly less wind than neighbouring Wolfe Island which is un-protected from the prevailing winds off Lake Ontario⁶.

APCo has made no effort to justify its proposed high capacity factor. This is a common failing of wind energy companies, as revealed in an analysis by Fitch, the ratings agency.⁷

Furthermore, the capacity factor for the Ontario system of wind energy generating systems appears to be decreasing by 1%/annum, in keeping with the decline observed elsewhere. This is demonstrated in Figure 1 below. The figure shows the normalized capacity factor for those Ontario systems that have been in operation for 4 years or more as of June 2013. The capacity factors were normalized to remove the variation in the annual average wind speed.

Table 1: Annual Average Capacity Factor (Efficiency) Given as a Percentage.⁸

July to June	Power (MW)	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Amaranth 1	67.5	30	29					
Amaranth 1 & 2	200				24	28	27	27
Dillon	78						36	36
Gosfield	50						33	33
Kingsbridge	40	33	35	33	28	32	30	31
Port Alma 1	101				34	35	34	34
Port Alma 2	101						36	36
Port Burwell	99	29	27	28	25	28	28	28

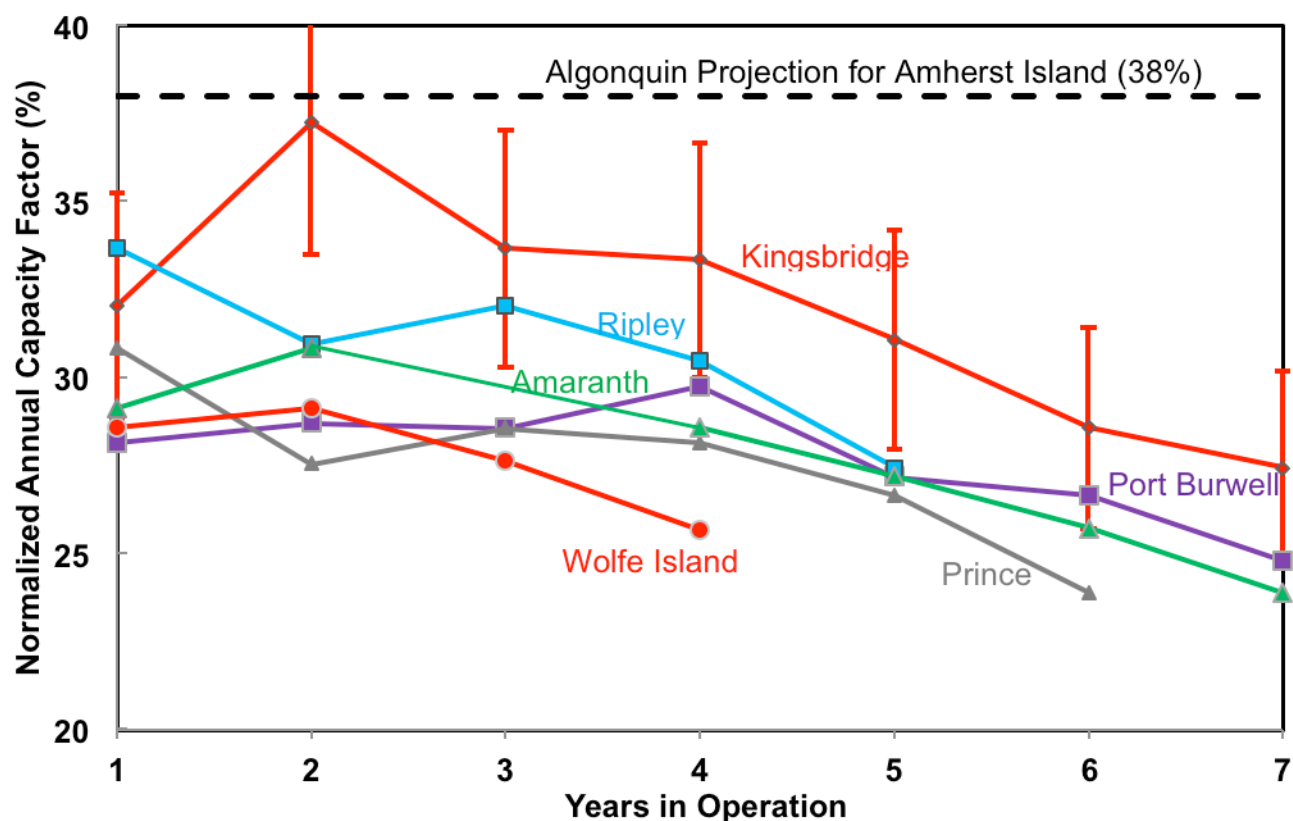
⁶ Despite its unjustified significantly over-optimistic annual energy prediction APCo does appreciate that the wind resource is mediocre and is trying to compensate by proposing to use large blade diameter turbines.

⁷ See Appendix 1.

⁸ See: Appendix A of <http://www.protectamherstisland.ca/wp-content/uploads/2013/08/Report-to-Renewable-Energy-Analysts-September-2013.pdf> Going forward from June 2013 would be meaningless with the policy of paying not to produce.

Prince	189		29	27	24	29	28	27
Ripley	76			33	26	33	32	31
Talbot	99						33	33
Underwood	182				26	32	31	31
Wolfe Island	198				24	30	29	29

Figure 1: Normalized Capacity Factor for Ontario Wind Energy Generating Systems as a Function of Years of Service



In the latest APCo quarterly report⁹ and in a follow-up report from the TD Bank analyst Sean Steuart¹⁰, APCo makes clear that the Windlectric project is high cost in

⁹

<http://investors.algonquinpower.com/Cache/1001192128.PDF?Y=&O=PDF&D=&fid=1001192128&T=&iid=4142273>

¹⁰ For the full report on Algonquin Power see pages 2 to 6 of:
<http://www.investorvillage.com/uploads/51871/files/tdw26.pdf>

comparison to other wind energy projects. This is summarized in the following Table 2:

Table 2: Relative Expense of Algonquin's Wind Projects

Wind Project	Timing	Total Cost (\$mm)	Power (MW)	\$mm/MW
Morse (Sask.)	Q1/15	81	25	3.3
St. Damase (QC)	Q4/14	49	24	2.0
Val Eo (QC)	Q4/15	52	24	2.2
Odell (MN)	Q4/15	347 (US)	200	1.7
Amherst Island	H2/16	260	75	3.5
Chaplin (Sask.)	Q4/16	340	177	1.9

\$mm is \$million; Power (MW) is nameplate power. Note that Morse and Chaplin are in the high wind northern extension of the Great Plains.

The Amherst Island project at \$3.5mm/MW is significantly higher in cost than the weighted average \$1.8mm/MW for the other projects on its books. Building on an island is an expensive proposition, as was discovered by TransAlta with the cost over-runs for the Wolfe Island project. Already the capex for the Windlectric project has increased from \$230mm to \$260mm. APAI's best estimate for the initial capacity factor is 26% and, before the recent increase, its best estimate for the IRR for the project was -4.5%.

At some point, the Directors and Investors of Algonquin Power will realize that the project is not viable and will abandon it. For this reason, consideration of a 115 kV connection from a hypothetical substation to the grid is premature.

Dr. John Harrison PhD
Vice President
Association to Protect Amherst Island

Appendix 1: US Wind Power Production Underperformance May Continue

Fitch Ratings-New York/Chicago-14 November 2014: Wind power production forecast inaccuracies have dogged the industry and improvements to more recent forecasts remain to be seen, Fitch Ratings says. We believe these issues have taken on more importance in light of a deal to limit greenhouse gases announced Wednesday by Chinese leader Xi Jinping and President Obama, which would accelerate the U.S.'s shift to alternative energy, including wind power.

The majority of 19 operating wind projects we analyzed in a recent report suffered chronic production shortfalls. Actual production only occasionally exceeded base case levels and generally fell between base and rating case levels. On average, actual production was 7.8% below Fitch's base case projections and 6.1% above Fitch's rating case. Going forward volatility is likely. The difference between minimum and maximum annual production in the rated projects is 14% on average and can be higher even in those projects performing relatively well.

In our view, this underperformance is mainly attributable to an overestimation of average wind conditions and underestimating the wake effects between turbines for studies completed prior to construction. Three out of the four Fitch-rated wind projects that used forecasts incorporating actual operating data performed close to base case expectations.

Wind resource consultants continue to hone their methodologies and report that more recently completed studies have improved accuracy. Fitch-monitored projects with forecasts prepared in 2003-2006 performed on average only slightly worse than projects with forecasts prepared in 2007-2010. As production data from newer projects becomes available, Fitch will be better able to validate the claims of improved accuracy.

In addition to production shortfalls, wind projects must contend with grid curtailment, technical issues and excess operating costs. Operations and maintenance (O&M) expenses (which include labor, services and replacement parts) can also be significant for some projects. O&M services are often provided by the equipment manufacturers, reducing expense volatility even after original warranties expire. However, the cost of replacement parts and frequency of replacement can increase significantly for projects without service contracts. The impact is deeper when parts availability is strained for weaker manufacturers.

Contact: Greg Remec
Senior Director
Global Infrastructure & Project Finance Group
+1 312 606-2339
70 West Madison Street
Chicago, IL

Rob Rowan
Senior Director
Fitch Wire
+1 212 908-9159