

**From:** Peter Large

**Sent:** Monday, August 19, 2013 11:18 AM

**To:** Ian Robertson Algonquin

**Cc:** Pam Barnard; Jim Bradley MOE; Bob Chiarelli Lib; David Oraziotti Lib; randy.hillier@pc.ola.org; egillespie@gillespielaw.ca; Peter Hendra Whig; protectai@kos.net; kenneth.moore@algonquinpower.com; christopher.ball@algonquinpower.com; george.steeves@algonquinpower.com; christopher.huskilson@algonquinpower.com; christopher.jarratt@algonquinpower.com

**Subject:** Decommissioning the proposed Algonquin-built wind-turbine project on Amherst Island

Association to Protect Amherst Island  
PO Box 4, 5695 Front Road  
Stella, ON K0H2S0

August 18, 2013

Mr. Ian E. Robertson, CEO  
Algonquin Power and Utilities Corp  
2845 Bristol Circle  
Oakville ON, L6H7H7

Please find enclosed two attachments:

- Letter to Mr. Ian Robertson
- Document: Scrap Value of Decommissioned Wind Turbines for Windlectric Amherst Island Project (Dr. John Harrison)

Peter G.S. Large, P. Eng  
President, APAI



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AMHERST ISLAND**

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Subject: Decommissioning the proposed Algonquin-built wind-turbine project on Amherst Island

Dear Mr. Robertson:

On July 26, 2013, APAI (The Association to Protect Amherst Island) wrote, describing the various contradictions in Algonquin's report regarding 'Decommissioning' (an REA requirement) of the wind turbine project that Algonquin proposes for Amherst Island. Those contradictions include:

- i. Algonquin provided no funding for 'decommissioning' in STANTEC's December 2012 REA report.
- ii. In that report, STANTEC, in the 'Mode of Disposal' of turbine components, mentions placing turbine sections in 'regulated landfills', 'recycling', (and in a minor reference, 'Salvage') even though there appears to be no regulated landfill sites or recycling depots in Ontario capable of handling turbine parts.
- iii. Sean Fairfield's letter of April 8, 2013, says 'Windlelectric Inc...is responsible...for all financial issues including...decommissioning'.
- iv. Algonquin's recent reply to questions on 'decommissioning' in the Municipal Consultation Form mentions none of the above, now saying, 'Algonquin will cover the cost of decommissioning by selling the parts for salvage'. It is this point I wish to address.

STANTEC in its report on 'Decommissioning' says that the decommissioning component of the proposed wind-turbine project will be similar in nature to the construction, i.e.:

'Many activities during decommissioning would be comparable to the construction phase, including the use of heavy equipment on site, restoring constructible areas around all Project infrastructure and preparing staging areas.'

Considered a mirror image of construction, the decommissioning cost has been estimated at \$100 million.

Dr. John Harrison, physicist and APAI Vice-President, has estimated the scrap value of the turbines proposed by Algonquin. Dr. Harrison's calculation sheet is attached, based upon three major components of a turbine, and assuming 33 turbines in the project (all at to-day's prices):

— The scrap value of steel:	\$3.0 million
— The scrap value of copper:	\$ 2.7 million
— The scrap value of rare earth in a turbine magnet	\$0.6 million
Total:	\$6.3 million

Conclusion: The scrap value of the Windlectric project would be FAR below the cost of decommissioning, which reinforces the conclusion that this project would be a bad business deal. The immediate risk factors before approval include the nationally and internationally recognized stature of the Island's cultural and natural heritage (about which we have written extensively). If approved, the cost and difficulty of construction on an Island, the very high community opposition to the project, the significantly lower energy output than Algonquin claims, and the high cost of decommissioning will result in a negative return on investment for Algonquin Power's shareholders. If constructed, the project will be out-of-compliance with the MOE noise standard. Yet again, we see that Amherst Island is the wrong place for wind turbines and that this project makes no sense from engineering, financial and moral perspectives.

Peter G.S. Large, P. Eng  
President, APAI

cc:

- Loyalist Township Council
- Chairman and Board of Directors, Algonquin Power
- Hon. James Bradley, Minister of the Environment
- Hon. Bob Chiarelli, Minister of Energy
- Hon. David Oraziotti, Minister of Natural Resources
- Mr. Randy Hillier, PC, MPP
- Mr. Eric Gillespie, LLB
- Mr. Peter Hendra, The Kingston Whig Standard
- protectai@kos.net

## Scrap Value of Decommissioned Wind Turbines for Windlectric Amherst Island Project

Scrap values<sup>1</sup> as of July 22<sup>nd</sup>, 2013:

Steel: \$264/tonne (1000 kg)

Copper: \$6.28/ kg

### Steel

Weight of steel tower<sup>2</sup>: 300 tonnes;

Weight of steel component of the nacelle: 50 tonnes (estimate);

Total steel: 350 tonnes.

**Scrap value of steel: \$0.09M/turbine or \$3.0M total**

### Copper

Weight of copper in a turbine: 5.6 tonnes/MW<sup>3</sup> (includes cabling).

Weight of copper in Siemens 2.3 MW turbine including cabling: 13 tonnes (estimate).

**Scrap value of Copper: \$0.08M/turbine or \$2.7M total**

### Neodymium

Weight of neodymium iron boride magnet in a turbine: 2 tonnes (estimate).

Weight of neodymium: 0.5 tonnes (estimate)

Cost of neodymium: \$75/kg<sup>4</sup>

Cost of neodymium: \$0.04M/turbine or \$1.2M total

The problem: "The neodymium-iron-boron material decomposes peritectically — it changes composition — when heated to its melting point," says Chumbley, lead researcher on the project. "So it can't just be melted down and reused. But it's too valuable to throw away, so there are literally warehouses full of 55-gallon drums of the stuff waiting to be recycled."<sup>5</sup>

The future: The DOE Ames Lab is working on the problem: "Scientists at the U.S. Department of Energy's (DOE) Ames Laboratory are working to more effectively remove the neodymium, a rare earth element, from the mix of other materials in a magnet. Initial results show recycled materials maintain the properties that make rare-earth magnets useful."<sup>6</sup>

**Assume that the problem will be resolved and allow a total scrap value of \$0.6M**

**Conclusion: The scrap value of the Windlectric project is estimated to be \$6.3M**

This is in 2013 dollars.

<sup>1</sup> Darin Horner – Lighting Dimension (Toronto)

<sup>2</sup> Draft Road Use Report (Hatch, Oct. 24<sup>th</sup>, 2012)

<sup>3</sup> Ian Falconer, M.Sc. thesis, University of Exeter, 2009.

<sup>4</sup> As of July 2013 (<http://www.metal-pages.com/metalprices/neodymium/>)

<sup>5</sup> US Department of Energy news release (<http://www.eurekalert.org/features/doe/2001-07/di-nf060502.php>)

<sup>6</sup> News release Oct. 2012 (<https://www.ameslab.gov/news/news-releases/reclaiming-rare-earths>)