

September 8, 2016

**BY COURIER (2 COPIES) AND RESS**

**Ms. Kirsten Walli**

Board Secretary

Ontario Energy Board

2300 Yonge Street, Suite 2700, P.O. Box 2319

Toronto, Ontario M4P 1E4

Dear Ms. Walli:

**Re: EB-2016-0160 – Hydro One – Cost of Service**

I am writing to provide comments regarding the Board's pending decision on whether to hold a technical conference in this matter.

If a technical conference were to be held, Environmental Defence would have questions for Hydro One. Environmental Defence did not receive full and complete responses to a number of interrogatories. Environmental Defence would ask questions relating to those interrogatories during a technical conference.

Environmental Defence has also followed up with Hydro One and the Independent Electricity System Operator to request better responses in writing. We hope that those answers may negate the need for us to ask at least some of the questions we would have for a technical conference. Those letters are attached.

Yours truly,



Kent Elson

Encl.

cc: Participants in EB-2016-0160

September 8, 2016

**BY EMAIL**

**Nancy Marconi**

Manager

Independent Electricity System Operator

1600 - 120 Adelaide Street West

Toronto, Ontario M5H 1T1

nancy.marconi@ieso.ca

Dear Ms. Marconi:

**Re: EB-2016-0160 – Hydro One – Cost of Service**

I am writing on behalf of Environmental Defence to request that the Independent Electricity System Operator (“IESO”) provide certain relevant information to assist with the above hearing.

Environmental Defence made a number of interrogatory requests relating to transmission losses. Hydro One did not provide complete responses on the basis that information on transmission system losses resides with the IESO. We therefore ask that the IESO either answer the following interrogatories and file them with the Board or provide the relevant information to Hydro One so that it can provide further and better interrogatory responses. Note that the numbering below matches the numbering from Environmental Defence’s original interrogatories to Hydro One.

2. Reference: Ex. B2, Tab 1, Sch. 1
  - a) Please provide, for each of the last 10 years, Hydro One’s annual transmission energy losses as a percent of its total annual transmission throughput volumes; and
  - b) Please provide, for each of the last 10 years, Hydro One’s transmission energy losses during the annual peak demand hour as a percent of the total demand of its customers during the peak hour.
3. Reference: Ex. B2, Tab 1, Sch. 1
  - a) Has Hydro One undertaken benchmarking studies which compare its annual transmission energy losses as a percent of its total annual transmission throughput volumes to those of other electricity transmission companies? If yes, please provide these studies; [Please answer this from the perspective of any benchmarking done by the IESO]
  - b) Has Hydro One undertaken benchmarking studies which compare its transmission energy losses during the annual peak demand hour as a percent of the total demand of its customers during the peak hour to those of other electricity transmission companies? If

yes, please provide these studies; [Please answer this from the perspective of any benchmarking done by the IESO] and

- c) What are the average transmission energy losses for transmission companies in (i) the United States and (ii) Canada? To the extent that they are available, please provide the figures for both the annual transmission energy losses as a percent of total annual transmission throughput volumes and the transmission energy losses during the annual peak demand hour as a percent of the total demand of its customers during the peak hour.
4. Reference: Ex. B2, Tab 1, Sch. 1
- a) Please provide a detailed description of the various sources of Hydro One's transmission energy losses. Please include a percentage breakdown by geographic region and type (e.g. line losses versus losses from equipment such as transformers). Please also attach any internal documents, reports, presentations, etc. on this issue.
  - b) Please provide a detailed description of Hydro One's plans to reduce its transmission energy losses from the various sources of those losses. Please also attach any internal documents, reports, presentation, etc. on this issue. [Please provide the IESO's planning in this regard as it relates to Hydro One's network]
  - c) Please describe and list all of the actions that Hydro One could take but will not be taking to reduce its transmission energy losses (e.g. due to cost, viability, priorities, etc.).
5. Reference: Ex. B2, Tab 1, Sch. 1
- a) Please make best efforts to estimate the gross cost of the energy lost in each of the last 10 years via transmission energy losses. Please make and state assumptions as necessary.
  - b) To the extent that the figure would be different than the one provided in response to (a) above, please estimate the cost of the transmission energy losses to Hydro One's customers.
  - c) Please estimate the cost of transmission energy losses to Hydro One itself.

Please do not hesitate to contact me if you wish to discuss this matter.

Yours truly,



Kent Elson

cc: Participants in EB-2016-0160

September 8, 2016

**BY EMAIL**

**Gordon Nettleton**  
McCarthy Tetrault LLP  
Toronto Dominion Bank Tower  
66 Wellington Street W.  
Suite 5300  
Toronto Ontario M5K 1E6  
gnettleton@mccarthy.ca

Dear Mr. Nettleton:

**Re: EB-2016-0160 – Hydro One – Cost of Service**

I am writing on behalf of Environmental Defence to request further and better responses to Environmental Defence's interrogatories.

Interrogatory #1 asked about the import and export capacity of Hydro One's interconnections with adjoining jurisdictions (Manitoba, Quebec, Minnesota, Michigan and New York). Hydro One noted that import and export capability is based on a number of factors but did not provide the relevant figures. It is clearly possible to calculate import and export capacity (see attached IESO document that does so for Quebec).

Hydro One noted that import/export capability is not computed with respect to each of its 26 interconnections. Although Environmental Defence does not require a figure for each interconnection, it does request that the import and export capability be calculated for each of the adjoining jurisdictions. I have therefore revised the interrogatory to be less granular by asking for the information on a jurisdiction-wide basis rather than for each interconnection, which should be easier for Hydro One to respond to. Therefore, Environmental Defence requests the following information:

- a) Please provide Ontario's theoretical maximum import and export capacity (MW) through Hydro One's system with adjoining jurisdictions (Manitoba, Quebec, Minnesota, Michigan and New York);
- b) Please provide Hydro One's best estimate of the actual maximum amount of electricity (MWhs) that can be imported per year via each of these jurisdictions;

- c) Please provide Hydro One's best estimate of the actual maximum amount of electricity (MWhs) that can be exported per year via each of these jurisdictions;
- d) Please describe all the actions that Hydro One is taking to increase the amount of electricity (MWhs) that can be imported and/or exported via each of these jurisdictions. In each case where actions are being taken, please state the expected increase in annual imports and/or exports (MWhs) that these actions will allow.

Interrogatories 2, 3, 4, and 5 requested information relating to transmission losses. Hydro One stated that this information resides with the Independent Electricity System Operator ("IESO") and therefore provided either incomplete responses or no response at all to these interrogatories. Environmental Defence requests that Hydro One, as the applicant, obtain the necessary information from the IESO so as to provide a response to the interrogatory.

Please do not hesitate to contact me if you wish to discuss this matter.

Yours truly,

A handwritten signature in blue ink, appearing to read 'K. Elson', is written over a light blue horizontal line.

Kent Elson

Encl.

cc: Participants in EB-2016-0160

**1. How much energy (TWh) can Ontario currently import per year from Quebec using the existing interties and transmission system?**

Ontario cannot rely on the energy from Quebec to meet the IESO’s adequacy requirements without the enhancements to the transmission system that are described in the *Review of Ontario Interties* report. Without those enhancements Ontario would not be able to import the energy when it needs it the most (i.e. under low water conditions and peak load levels in Ontario). To plan the system in a manner capable of reliably delivering power to consumers, firm imports must meet adequacy planning criteria as set out by the North American Electric Reliability Corporation (NERC), the Northeast Power Coordinating Council (NPCC) and the IESO. These take into account variables such as operating characteristics, weather and extreme weather patterns, generator and transmission outages, transmission transfer capabilities, and availability of fuel. All of these variables factor into the analysis to determine the amount of *firm* energy that can be relied upon to serve Ontario consumers. Ontario’s ability to import firm energy from Quebec is limited by transmission constraints in the Ottawa area, as noted in the *Review of Ontario Interties*.

Unlike Ontario’s interties with other neighbours (e.g. New York); most of the interties with Quebec are radial interconnections that can only be used to deliver power from very specific generators in Quebec. Ontario has one non-radial intertie with Quebec (the “HVdc intertie”), which can be used to deliver power from any generator in Quebec. The IESO estimates that the non-radial HVdc intertie has the hypothetical capability of delivering between 8.7 and 9.8 TWh of energy from Quebec in 2015. Additionally if the radial interties with Quebec are considered, then this hypothetical range becomes 16.5 TWh to 18.5 TWh. Quebec’s ability to export this hypothetical amount of energy is dependent on the availability of the specific generators in Quebec that could connect to the radial interties.

Although Ontario is able to hypothetically import between 16.5 and 18.5 TWh in a year from Quebec, Ontario typically imports 3 TWh of energy and exports 1.6 TWh of energy. This indicates that either energy is not available in Quebec to export to Ontario or it is not economical to export this energy to Ontario.

**2. What is the breakdown of the \$500 million transmission upgrade cost estimate for each of the three measures listed in Appendix F of *Review of Ontario Interties*?**

Item	Cost
New 230 kV double circuit line between Cornwall and Ottawa	\$300 M

New 230 kV circuit, approximately 8 km in length, to connect existing circuits in the west of Ottawa	\$75 M
Additional voltage control equipment in the Ottawa area	\$75 M
Other enhancements (e.g. converting circuit H9A to 230 kV operation)	\$50 M

**3. What is the breakdown of the \$1.4 billion transmission cost estimate for each of the measures listed in Appendix F and on Page 25 of the Review of Ontario Interties report?**

Item	Cost
New HVdc Interconnection	\$1.1 B
New 500 kV double circuit line from Bowmanville to Cherrywood	\$225 M
Replacement of existing phase-angle regulating transformers	\$40 M

**4. What is the IESO’s estimate of how many MW Ontario’s firm import capability from Quebec will be increased for every 1 MW of incremental conservation and demand management (CDM) and/or distributed generation (DG) in the west end of Ottawa?**

Reducing the demand in the west end of Ottawa, either through CDM or DG, would increase Ontario capability to source firm capacity from Quebec. However, the precise ratio would depend on a number of variables that would require further clarification, including:

- future transmission system enhancements
- where the CDM and/or DG is located in the Ottawa area (on the 230 kV network or the 115 kV network)
- type of CDM and/or DG

These types of considerations would be part of the work conducted through an Integrated Regional Resource Plan process. For more information please visit:

<http://www.powerauthority.on.ca/power-planning/regional-planning/greater-ottawa/ottawa>.

5. **If the IESO were to assume that imports from Quebec were used to replace the output of Bruce B, would that change the conclusions of the Review with respect to the transmission upgrades needed to accommodate firm water power imports from Quebec?**

The upgrades identified in the *Review of Ontario Interties* would remain as described in the report. However, the loss of the Bruce B facilities and accompanying energy would necessitate further analysis and likely require transmission system changes to accommodate such a significant change to the overall Ontario electricity system.