ONTARIO ENERGY BOARD

EB-2017-0150

IN THE MATTER OF the *Ontario Energy Board Act*, 1998, S. O. 1998, c. 15, Schedule B;

AND IN THE MATTER OF an application by the Independent Electricity System Operator (IESO) pursuant to section 25 of the *Electricity Act, 1998* for approval of its 2017 revenue requirement, expenditures and fees.

MOTION RECORD

(**Environmental Defence Motion for Full and Adequate Interrogatory Responses, Technical Conference, and Extension of Time re Evidence)**

Date: October 16, 2017

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ONTARIO ENERGY BOARD

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IN THE MATTER OF the *Ontario Energy Board Act*, 1998, S. O. 1998, c. 15, Schedule B;

AND IN THE MATTER OF an application by the Independent Electricity System Operator (IESO) pursuant to section 25 of the *Electricity Act*, *1998* for approval of its 2017 revenue requirement, expenditures and fees.

NOTICE OF MOTION AND WRITTEN SUBMISSIONS

Environmental Defence will make a motion to the Ontario Energy Board ("Board") on a date fixed by the Board, at the offices of the Board, 2300 Yonge Street, 25th Floor, Toronto, Ontario.

PROPOSED METHOD OF HEARING: This motion is to be heard in writing or through any other method as directed by the Board.

THE MOTION IS FOR:

1. An order that:

    a. The IESO provide full and adequate responses to Environmental Defence interrogatories 1 to 6, 9 to 11, and 13 to 14;

    b. Granting an extension of the August 25, 2017 deadline to inform the board that an intervenor wishes to submit evidence in this proceeding to two weeks from the date of any order on this motion; and

    c. A technical conference shall be held in this matter;

THE GROUNDS FOR THE MOTION ARE:

Issue and Overview

2. Environmental Defence believes the IESO should doing far more to report on the efforts it takes to cost-effectively reduce transmission losses and to report on the results of those efforts. This should be accomplished by preparing transmission loss reduction plans and by including a metric regarding transmission losses in its regulatory scorecard. The IESO disagrees that this is even a relevant area to explore and consider in this proceeding at all whatsoever, arguing that this entire area of inquiry is outside of the Board's purview in this hearing.[1]

Relevance of Transmission Losses Generally

3. Contrary to the IESO's assertions, the Board has the jurisdiction and mandate to require the IESO to report on its efforts to manage transmission losses (e.g. via annual plans) and to report on the results of those efforts (e.g. in a regulatory scorecard). Indeed, this issue is central to the Board's consumer-protection mandate. Transmission losses cost Ontario energy consumers hundreds of millions dollars every year (i.e. $390 million based on a ballpark figure for 2015).[2] Ensuring that losses are reduced to an optimal level (i.e. to the level that is most cost-effective) is incredibly important for consumers, and fits squarely within the statutory objective of this Board to "protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service."[3]

4. Transmission losses are relevant to the IESO's regulatory scorecard as well. The proposed scorecard includes metrics regarding cost control but no metrics to measure its efforts to cost-effectively reduce transmission losses. Without a transmission losses metric in the scorecard, the IESO could have a misaligned incentive to "cut corners" in its management of transmission losses in its efforts to keep costs down. These misaligned incentives could result in higher energy bills if cost-effective methods to reduce transmission losses are missed.

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[1] Response to ED interrogatory #1.
[2] EB-2016-0160, Exhibit 5.4, tab 1, p. 1; EB-2016-0160, Transcript vol 12, p. 99, ln 22 to p. 100, ln. 15.
[3] *Ontario Energy Board Act, 1998*, s. 1(1)1.

5. Transmission losses are also relevant to the rate-setting process more generally. The IESO files information regarding its operating costs but does not file information on how it is (or is not) properly optimizing transmission losses, again creating a misaligned incentive to reduce operating costs even if doing so results in missed opportunities to save consumers money by cost-effectively reducing transmission losses.

6. The IESO's position that transmission losses are irrelevant to its performance conflicts with the expert report it filed regarding scorecard best practices.[4] The IESO's expert, John Todd (President of Elenchus Research Associates Inc.), found that a transmission losses metric "would be a useful indicator of the performance of the industry with respect to optimizing the various types of investment and grid management opportunities that impact on transmission system losses."[5] The report discussed the possibility of including a transmission loss metric into the IESO scorecard in the future after further research in this area.[6]

7. The IESO's position is also inconsistent with the Board's recent decision in Hydro One's rates case (EB-2016-0160). In that case the Board ordered Hydro One to "work jointly with the IESO to explore cost effective opportunities for line loss reduction, explore opportunities for economically reducing line losses and report on these initiatives as part of its next rate application."[7] Transmission losses are relevant to the IESO rates case for the same reasons that the Board not only found them relevant to Hydro One's case, but found them important enough to be the subject of a specific order.

Relevance of Specific Interrogatories

8. Environmental Defence requested information on the annual magnitude and cost of transmission losses, the measures available to the IESO to reduce losses, and the pros and cons of specific transmission loss metrics. The requested information is relevant and would assist the Board in assessing whether the IESO should be required to

[4] Exhibit C-1-1, Attachment 1, Page 5.
[5] Exhibit C-1-1, Attachment 1, Page 36.
[6] *Ibid*.
[7] Decision in EB-2016-0160, p. 116.

produce regular plans exploring cost-effective transmission loss reduction opportunities and/or include a transmission losses metric in its scorecard.

9. Interrogatories 1 to 6 asked for the IESO's estimates of the annual magnitude (TWh) and cost ($) of transmission losses for the past ten years.[8] These figures are relevant to the *importance* of transmission losses. The higher the cost of losses, the more important it is that the IESO transparently report to the Board on its efforts to reduce transmission losses as well as the results of those efforts.

10. Interrogatories 9 to 11 asked the IESO to list and describe the measures it can take to optimize the level of transmission losses, provide existing IESO documentation regarding those measures, and describe its role with respect to measures that Hydro One and other entities can take to reduce losses. The IESO declined to provide *any* of the requested information. In other words, the IESO simply refused to say, when asked, what it is and is not doing to optimize the level of transmission losses and what its role is vis-à-vis the measures that Hydro One and other entities can take.

11. The information requested in those three interrogatories is directly linked to central issue of whether the IESO has sufficient *control* over transmission losses. The IESO claims that it does not have sufficient control over losses for any transmission losses metric to be a useful performance measure, and yet it has refused to provide *any* information or existing documentation on the mechanisms its disposal to manage losses.

12. These three interrogatories also highlight another reason why the IESO should be required to report on its efforts to reduce losses and the results of those efforts. Some measures to reduce losses straddle the responsibility of multiple entities (e.g. the IESO and Hydro One). Without greater efforts and transparent reporting, it is likely that certain measures will "fall through the cracks" and opportunities to reduce costs will be missed. By failing to describe its role in the management of transmission losses vis-à-vis other entities like Hydro One, the IESO has attempted to sidestep this important issue.

[8] The interrogatories also requested this information as a percent of throughput (to control for throughput in measuring the magnitude of losses) and for this information based on the peak hour (when losses are the highest and the most expensive).

13. Interrogatories 13 and 14 ask the IESO to comment on the relative pros and cons of specific transmission loss metrics. For example, would the IESO believe it would be better (or worse) to track the gross annual amount of losses (TWh), the losses as a percent of throughput, or the annual cost of losses? Again, the IESO declined to provide any comment, arguing again that the examination of losses is irrelevant.

14. The specific information requested in the interrogatories at issue is relevant and the IESO did not have valid grounds to decline to provide it.

Additional Evidence

15. In light of the IESO's lack of responses to interrogatories and the decision not to hold an oral hearing, Environmental Defence requests an extension of the August 25, 2017 deadline to inform the board that it wishes to submit evidence in this proceeding. Environmental Defence wishes to file evidence on transmission losses, including the degree of control that the IESO has over transmission losses and potential regulatory approaches to oversee a system operator's management of losses. If granted an extension of time, Environmental Defence would provide estimated costs and other proposed details within two weeks (or any other timeline as set by the Board).

16. Environmental Defence initially decided against filing evidence in this hearing on the assumption that the necessary information regarding transmission losses was in the possession of the IESO and could be obtained from the IESO through the Board's processes. It was also believed that using the Board's processes to obtain this information from the IESO would be more efficient and cost effective than commissioning additional evidence. However, circumstances have now changed with the conclusion of a partial settlement agreement, the IESO declining to provide further and better interrogatory responses, and the decision to hold a written hearing.

17. As a result, unless the board makes all or some of the orders requested in this motion, there could be no evidence on the record regarding key issues such as the extent of the IESO's role in managing transmission losses. Those changed circumstances justify providing an extension of time to inform the board that Environmental Defence wishes to submit evidence and to provide the estimated costs.

Technical Conference

18. For the same reasons detailed above regarding the importance of transmission losses, Environmental Defence requests that a technical conference be held. This would allow the parties the opportunity to gain information from the Applicant while still avoiding the need for an oral hearing before the Board.

Procedural Fairness

19. This motion engages procedural fairness as it relates to important information that Environmental Defence would use to make its case. The IESO holds the key information relating to transmission losses in Ontario, creating a large asymmetry of information. Much of the relevant information can only be obtained via the IESO itself, especially in relation to the measures that the IESO is and is not taking in order to manage transmission losses. If no orders are made as a result of this motion, Environmental Defence may be denied an opportunity to properly make its case.

Conclusion

20. Therefore, Environmental Defence requests the orders listed above.

THE FOLLOWING DOCUMENTARY EVIDENCE will be used for this motion:

a. The materials enclosed with this Notice of Motion and any other materials as counsel may request and the Board may admit.

Date: October 16, 2017

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TO: The Applicant and Parties

ED INTERROGATORY 1

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

1. Please provide the annual transmission losses (TWh) of the IESO-controlled Ontario electricity transmission system for each of the last ten years.

RESPONSE

1. The IESO believes that the requested information is not relevant to the current proceeding. As stated in the Board-approved settlement agreement in the IESO's 2016 revenue requirement submission (EB-2015-0275), the scorecard is intended to "be a tool for the Board and intervenors to use in evaluating the IESO's proposed expenditure and revenue requirement". As described in Exhibit C-1-1, the IESO is of the view that transmission losses are not indicators of the cost effectiveness of IESO activities but rather of the overall attributes and characteristics of the electricity system in Ontario.

   To provide further context, transmission losses are one of many complex and sometimes competing priorities that the IESO must constantly balance in fulfilling its objects across its diverse functions. "Optimizing" transmission line losses over other priorities would entail economic, social and environmental policy trade-offs that could come at an ultimate cost to ratepayers. For example, a 500 kV versus a 230 kV transmission line would mean lower losses but would be a significantly greater capital expenditure and limit the amount and type of resources that could be connected to it due to reliability concerns. Similarly, the overall cost of one generator's supply may be lower than another's even if dispatching the supply would lead to higher transmission losses. All of these factors and system attributes must be considered in the overall balancing of the electricity system and are influenced by, amongst other things, reliability requirements, policy initiatives, and stakeholder priorities.

ED INTERROGATORY 2

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

2. Please state the annual transmission losses of the IESO-controlled Ontario electricity transmission system as a percentage of its annual throughput volumes for each of the last ten years.

RESPONSE

2. Please refer to the response to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01.

ED INTERROGATORY 3

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

3. Please state the financial cost to Ontario electricity consumers of Ontario's annual transmission losses for each of the last ten years. Please show your assumptions and calculations. If the IESO calculates the financial cost to consumers based only on the HOEP, please also provide a calculation of the financial cost that includes all costs included in the Global Adjustment Charge.

RESPONSE

3. Please refer to the response to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01.

   As described in Exhibit C-1-1, the IESO is of the view that transmission losses are not indicators of the cost effectiveness of IESO activities. As a result, the costs associated with these transmission losses are also not indicators of the cost effectiveness of IESO activities.

   For further clarification, costs associated with system-wide transmission line losses are a component of the Net Energy Market Settlement Uplift (charge code 150). The charge covers differences between the amount paid to suppliers for the commodity and the amount paid by buyers in a given hour. The Net Energy Market Settlement Uplift is the only settlement mechanism in Ontario's wholesale electricity market through which market participants are charged for costs attributed to system-wide transmission losses and is recovered through the wholesale market service charge. In the Board's August 4 Decision on the issues list for this proceeding, the Board determined that it will not review the wholesale market service charge in this proceeding[1].

   The IESO believes that review of the settlement of costs attributed to transmission losses is therefore out of scope of the current proceeding. In an effort to be of assistance to parties, the IESO provides the following additional context.

   The settlement methodology for transmission losses was recommended by the government-appointed Market Design Committee and accepted by the IESO's Technical Panel prior to the opening of Ontario's wholesale competitive electricity market in May

[1] Page 7 of the OEB's August 4, 2017 Decision (EB-2017-0150) on Issues List

2002. A change to the methodology should be subject to comprehensive review and input from stakeholders through the appropriate forums, including the IESO Technical Panel.

The global adjustment (GA) framework and equation, which does not include a factor for transmission line losses, are set out in government regulation. The GA is intended to cover the cost for providing both adequate future generating capacity and conservation programs for Ontario. As such, the associated GA costs cannot be directly attributed to volumes of electricity flowing across Ontario's transmission lines and the associated losses.

ED INTERROGATORY 4

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

4. Please provide the annual peak hour transmission losses of the IESO-controlled Ontario electricity transmission system for each of the last ten years.

RESPONSE

4. Please refer to the response to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01

ED INTERROGATORY 5

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

5. Please state the annual peak hour transmission losses of the IESO-controlled Ontario electricity transmission system as a percentage of its annual peak hour demands for each of the last ten years.

RESPONSE

5. Please refer to the response to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01.

ED INTERROGATORY 6

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

6. Please state the financial cost to Ontario's electricity consumers of Ontario's annual peak hour transmission losses for each of the last ten years. Please show your assumptions and calculations. If the IESO calculates the financial cost to consumers based only on the HOEP, please also provide a calculation of the financial cost that includes all costs included in the Global Adjustment Charge.

RESPONSE

6. Please refer to the response to ED Interrogatory 3 at Exhibit I, Tab 5.1, Schedule 4.03.

ED INTERROGATORY 9

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

9. Please list and describe all of the actions and processes by which the IESO optimizes or could optimize the level of transmission losses (e.g. generation siting, generation dispatch, voltage control, identification of incremental line or equipment investments, expansion of demand response, etc.). Please provide a full and comprehensive response.

RESPONSE

9. Please refer to the response to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01.

ED INTERROGATORY 10

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

10. Please list and describe all of the actions and processes for optimizing transmission losses that are the responsibility of entities other than the IESO. For each action and process, please describe any role that the IESO plays with respect to those actions and processes or, where appropriate, please indicate that the IESO plays no role at all whatsoever.

RESPONSE

10. Please refer to the responses to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01, and ED Interrogatory 9 at Exhibit I, Tab 5.1, Schedule 4.09. The IESO is of the view that the actions and processes that are the responsibility of other entities are also not relevant to the current proceeding.

ED INTERROGATORY 11

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

11. Please provide all IESO reports, policies, procedures, standards, or other similar such documents that describe what the IESO does to optimize transmission losses.

RESPONSE

11. Please refer to the response to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01. In an effort to be of assistance to parties, the IESO also provides the following context.

    In regards to our planning activities, the IESO follows good utility practice in considering transmission losses as one of many complex and sometimes competing priorities that the IESO must balance. It conducts assessments of the economic impact of power system losses when such losses could reasonably be consequential to the selection of a least cost plan. Example of such analysis can be found in the IESO's Feasibility Study for the East-West Tie and in the Appendix to the Pickering-Ajax-Whitby Integrated Regional Resource Plan.

    When operating the power system, the IESO is required to consider losses when scheduling resources as stipulated in the IESO's Market Rules and associated manuals.

ED INTERROGATORY 13

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

13. If the Board were to direct the IESO to measure and monitor the effectiveness of its efforts to optimize the level of transmission losses, please compare, rank, and discuss the appropriateness of the following metrics:
    a. Annual transmission losses (TWh);
    b. Annual transmission losses (TWh) as a percent of total annual transmission throughput volumes (TWh);
    c. Total annual cost of transmission losses to consumers; and
    d. Total annual cost of transmission losses to consumers per TWh of total annual transmission throughput volumes.

RESPONSE

13. Please refer to the responses to ED Interrogatory 1 at Exhibit I, Tab 5.1, Schedule 4.01, and ED Interrogatory 3 at Exhibit I, Tab 5.1, Schedule 4.03.

ED INTERROGATORY 14

Issue 5.1 Is the IESO's proposed Regulatory Scorecard appropriate?

INTERROGATORY

Reference for the following interrogatories: Ex. C-1-1, p. 4 and Ex.C-1-1, Attachment 1, p. 36

14. If the IESO wished to measure and monitor the effectiveness of its efforts to optimize the level of transmission losses or the Board were to direct it to do so, what metric(s) would it use? Please explain.

RESPONSE

14. Please refer to the responses to ED Interrogatory 9 at Exhibit I, Tab 5.1, Schedule 4.09, and ED Interrogatory 13 at Exhibit I, Tab 5.1, Schedule 4.13.

    The IESO is not in a position to comment on what metric the OEB would determine as most appropriate to measure and monitor the effectiveness of efforts to optimize the level of transmission losses, particularly given the IESO’s limited control of electricity system characteristics that influence losses.

Ontario

Ontario Energy Board
Commission de l'énergie de l'Ontario

DECISION AND ORDER

EB-2016-0160

HYDRO ONE NETWORKS INC.

Application for electricity transmission revenue requirement and related changes to the Uniform Transmission Rates beginning January 1, 2017 and January 1, 2018

BEFORE: Ken Quesnelle
Vice Chair and Presiding Member

Emad Elsayed
Member

Peter C. P. Thompson, Q.C.
Member

September 28, 2017

The OEB realizes that such a report is not explicitly required as part of OEB's Filing Requirements for Electricity Transmission Applications. The OEB also realizes that investment priorities are not static. For example, as mentioned in Section 5.0, circumstances could arise which render some of the planned projects uneconomical. However, the OEB needs to be assured that Hydro One's planning process is robust and that Hydro One ensures that it has the capability to successfully execute what has been planned. Given the process gaps that have been identified in this proceeding, as well as the significant variances between planned and actual capital expenditures and between planned and actual in-service additions over a number of years, the OEB needs to have confidence in Hydro One's processes. Such a report would be a step towards that objective.

4.5 LINE LOSSES

Environmental Defence (ED) filed evidence regarding the loss minimization practices of utilities in other jurisdictions.[43] This evidence advocates for measuring and reporting losses, benchmarking transmission losses, considering transmission losses in operational and investment decisions, and encouraging reduction of losses through explicit incentives. ED proposed that Hydro One develop a transmission loss reduction plan to identify all cost effective projects that could economically reduce losses on Hydro One's transmission system.

In the oral hearing, Hydro One's direct examination addressed these points. Hydro One stated that many of the practices advocated by ED, which are part of transmission ownership and operation in other jurisdictions, are part of the role of the Independent Electricity System Operator (IESO), in Ontario. Accordingly, Hydro One submitted that the IESO is better placed to measure and report on losses, benchmark transmission losses and encourage loss reduction through explicit incentives as part of its regional planning efforts.

Findings

There was considerable discussion during this proceeding about how Hydro One deals with transmission line losses. There was no disagreement among the parties about the fact that the cost of transmission line losses is very large. The debate was about how much of this cost can be avoided or reduced. It was also clear that the responsibility for managing line losses lies with the IESO in some areas (e.g. regional planning) and with Hydro One in some cases (e.g. asset refurbishment or replacement). ED submitted

[43] Exhibit K 12.4

evidence regarding the loss minimization practices of utilities in other jurisdictions. Some of these practices may not be applicable to Hydro One as the IESO is responsible for the operation of the Ontario transmission grid as a whole.

In its Reply Argument, Hydro One stated that when new investments are proposed and where selection of new equipment is evaluated for procurement purposes, losses are taken into account where it is appropriate to do so. However, during the oral hearing, Hydro One's witnesses were not able to point to any internal documents that describe its approach to evaluating line losses as part of its investment planning process. Hydro One's witnesses also could not recall any reference to transmission line losses in business cases associated with relevant capital investments. Hydro One also acknowledged that many of its planning decisions (e.g. choice of conductor and station configurations) are made without any input from the IESO.[44]

Hydro One's main argument is that the benefit of taking measures to reduce line losses would not justify the associated cost. The example provided by Hydro One during the hearing was disputed because it used the total project cost as opposed to the incremental cost of loss reduction measures to compare to annual savings resulting from line loss reduction.

In summary, Hydro One has not provided any evidence of specific initiatives that it has undertaken or is planning to undertake to reduce line losses.

The OEB finds that, given the magnitude of line losses, Hydro One should work jointly with the IESO to explore cost effective opportunities for line loss reduction. Hydro One should also explore, as part of its investment decision process, opportunities for economically reducing line losses. The OEB requires Hydro One to report on these initiatives as part of its next rate application.

4.6 BENCHMARKING

In the Hydro One Networks Inc. Transmission Rate Application Settlement Agreement for the 2015 and 2016 rate years,[45] Hydro One agreed to complete an independent Transmission Cost Benchmarking study to be filed with Hydro One's next transmission rates application. Hydro One commissioned Navigant Consulting and First Quartile Consulting to perform the study which was submitted with the application.[46]

[44] Hydro One Reply Argument, p. 52
[45] EB-2014-0140
[46] Exhibit B2/Tab 2/Schedule 1/Attachment 1

19.0 CONCLUSION

The following list is a summary of directions for filing and other matters contained in this Decision. Where any discrepancies exist between this list and the text of the Decision, the text in the Decision governs.

Hydro One must:

- Continue to make improvements to its planning process addressing the issues that have been identified in this proceeding as well those identified in Hydro One's internal audit, and to report on the progress made in this area in its next transmission rates application (p. 18)

- Complete an independent third-party assessment of its TSP and to file this assessment with its next rate application (p. 18)

- Begin the customer engagement process sufficiently in advance of filing the application, include LDCs (to determine practical ways to seek some input from their end users), incorporate timely and meaningful input from First Nations representatives, and ensure that information presented to customers is unambiguous and easy to understand (p. 24)

- Provide a report detailing its overall performance in the execution of the capital program relative to plan showing the performance at the program level in terms of overall expenditures and in-service additions compared to the approved plan. In addition, for major projects or programs with total budgeted cost greater than $3 million which are planned to be completed during the test years, the report should show the status of each project and an explanation of any variances regarding scope, cost or schedule (p. 30)

- Work jointly with the IESO to explore cost effective opportunities for line loss reduction, explore opportunities for economically reducing line losses and report on these initiatives as part of its next rate application (p. 32)

- Report on its implementation of the recommendations from the benchmarking study in future proceedings and consider the shortcomings identified in this proceeding in undertaking future benchmarking studies (p. 34)

- Establish firm short and long term targets for productivity improvements and associated reduction in revenue requirements as a means to drive continuous improvement and improve its internal and external benchmarking standings. Put more emphasis on including performance metrics in the scorecard that provide objective year-over-year unit cost measures of productivity, safety, reliability and quality of service improvements. Consider the merits of implementing measures that reflect outcomes of its overall business such as gross fixed assets/unit of

2015 Transmission Loss Volumes and Cost Estimates

Ln	Item	Value
1	2015 Average Transmission Losses (%)	2.5%
2	2015 Generator Output	153.7 TWh
3	Transmission Loss Volume (MWh)	3,842,500 MWh
4	2015 Wholesale Market Generation Cost (HOEP & GA)	$101.38/MWh
5	Estimated Total Cost	**$389,552,650**

Note: The above cost estimate uses the 2015 weighted price average and therefore does not account for the fact that losses are highest at the peak when generation is the most expensive. Therefore, the figure likely underestimates the true cost of losses.

Sources and Calculations:

1. 2015 Average Transmission Losses (%): IESO, *Conservation & Demand Management Energy Efficiency Cost Effectiveness Guide*, March 2015, Appendix A[1]
2. 2015 Generator Output: IESO News Release, January 12, 2016[2]
3. Losses (MWh): Generator output multiplied by average transmission losses
4. 2015 Wholesale Market Electricity Price: IESO, Monthly Market Report, December 2015, p. 22[3]
5. Estimated Total Cost: Losses (MWh) multiplied by wholesale market commodity price.

[1] http://www.ieso.ca/Documents/conservation/LDC-Toolkit/Guidelines-and-Tools/CDM-EE-Cost-Effectiveness-Test-Guide-v2-20150326.pdf.
[2] http://www.newswire.ca/news-releases/ieso-releases-2015-ontario-electricity-data-sector-wide-changes-continue-to-impact-supply-demand-price-564992261.html.
[3] http://www.ieso.ca/imoweb/pubs/marketReports/monthly/2015dec.pdf.

ONTARIO ENERGY BOARD

FILE NO.:	**EB-2016-0160**	**Hydro One Networks Inc. Transmission**

VOLUME:	**12**	
DATE:	**December 14, 2016**	
BEFORE:	**Ken Quesnelle**	**Presiding Member**
	Emad Elsayed	**Member**
	Peter C.P. Thompson, Q.C.	**Member**

earlier stage if it's determined there is no value for transmission loss reductions as part of the whole life value framework.

MR. ELSON: So Hydro One acknowledged that it didn't have a figure for the avoided cost of transmission losses, and can you comment on that and what it says about at least potentially how Hydro One is doing things differently from National Grid?

MR. LUSNEY: I think a high-level comment would be that Hydro One, by not having that value, at least -- by not having that value, it's difficult to determine what the benefits or optimization for efficient -- for reduction of transmission losses.

So it would be difficult to determine how much to spend to gain how many losses if you don't have that avoided cost.

MR. ELSON: Thank you. If I could ask you to turn to the compendium. This is the compendium that Environmental Defence put forward for panel 5, and I figured rather than having duplicate amounts of information I could just use the same document here.

If you could turn to tab 1, and there is on page 1 a calculation of transmission loss volumes. I don't want to get into this in any detail. I don't want to ask you to confirm the underlying numbers. And the Panel does have a copy of the compendium on the dais.

MR. QUESNELLE: We do.

MR. ELSON: And for the record, this is Exhibit 5.4.

MR. QUESNELLE: Thank you.

MR. ELSON: And so Mr. Lusney, does this methodology seem reasonable to you?

MR. LUSNEY: As a high-level estimate of transmission volumes and cost, looking at it, I will say on an annual basis the methodology is reasonable. It takes an average losses throughout the year and applies it to a wholesale market generation cost, and I will clarify, wholesale is the inclusion of both the commodity price where in Ontario it's the hourly Ontario energy price, or HOEP, along with a global adjustment, which is a contract top-up for conservation, regulatory, and contracted facilities, and so the combination of the two gets you a total wholesale, so it takes that cost by the total amount of losses to produce an estimated total cost.

MR. ELSON: And can you comment briefly on whether it would be reasonable to calculate this just based on the HOEP, not including the global adjustment, if you are trying to get an accurate measure of the total cost of losses?

MR. LUSNEY: So Ontario's electricity market can be referred to as a hybrid market, though it has a wholesale real-time market and dispatch based on energy offers into the power system and energy bids. It is heavily influenced and those bids and activities are heavily influenced by contracted facilities and regulated facilities along with costs of conservation. They are all included in global adjustment.