ONTARIO ENERGY BOARD

EB-2020-0265

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 Hydro One Networks Inc. for the Hawthorne to Merivale Reconductoring Project

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Submissions of Environmental Defence

Hydro One – Hawthorne to Merivale Reconductoring

March 23, 2021

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Summary

Based on a request from the IESO, Hydro One is planning to replace its lines between Hawthorne and Merivale. This is required for reliability purposes. It will also: (a) reduce transmission losses; (b) enable greater imports of power from Quebec; and (c) help to resolve a potential bottleneck with respect to generation in Eastern Ontario. Environmental Defence strongly supports this project.

Environmental Defence respectfully requests that the Board approve the project while also asking Hydro One to improve its assessment and documentation of project alternatives in future cases with respect to: (i) transmission loss valuation; and (ii) the monetary value of system-wide benefits.

Hydro One initially proposed what is now known as alternative 4.[1] This was the basis of the IESO "hand-off letter" to Hydro One.[2] Hydro One later selected alternative 3, which involved a

[1] Exhibit I, Tab 2, Schedule 12.
[2] *Ibid*.

smaller conductor.[3] Environmental Defence retained an expert, Travis Lusney, to review this decision. Mr. Lusney concluded that "transmission losses are greatly and inaccurately undervalued" in the Hydro One analysis.[4] He also concluded that the capacity value for projects on the bulk network system should be accounted for.[5]

Additional analysis almost tipped the scales between the two alternatives, but we ultimately believe the project should proceed as proposed to avoid delay. However, this case has shed light on Hydro One's cost-effectiveness methodology, which we hope will lead to better results in the future. Environmental Defence makes the following two recommendations.

First, Hydro One should improve its valuation of loss reduction benefits in comparing project alternatives by:

(a) Accounting for all avoided costs, not just the Hourly Ontario Energy Price ("HOEP");

(b) Documenting the valuation of transmission loss reductions for inclusion in Board filings;

(c) Using electricity price forecasts, not just a static historical figure;

(d) Using hourly or seasonal data to account for the fact that loss reductions are highest at the peak;

(e) Having an explicit threshold to establish cost-effectiveness;

(f) Making a net present value calculation; and

(g) Conducting a sensitivity analysis, in addition to, not in replacement of, an appropriate cost-effectiveness test.

To avoid unnecessary effort, Hydro One could implement initial screening criteria to determine whether more detailed transmission loss reduction analysis is needed. However, screening criteria would need to be documented and carefully constructed.

Second, Hydro One should work with the IESO to develop a protocol to determine the monetary value of the relative system benefits (e.g., capacity) of project alternatives, or the lack thereof.

Although we are not asking the Board to direct Hydro One to implement each of those items, we believe that customers would benefit from a more general direction to improve Hydro One's analysis of alternatives with reference to the points raised in this proceeding.

[3] *Ibid.*
[4] Evidence of Travis Lusney, p. 2.
[5] *Ibid*.

Transmission Losses – Background and Board Directives

Transmission losses cost Ontario energy consumers hundreds of millions of dollars every year.[6] 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."[7]

The Board has repeatedly directed Hydro One and the IESO to work to better address the issue of transmission losses. In the 2017 Hydro One rates case, the Board directed Hydro One to work jointly with the IESO to explore cost-effective opportunities to reduce transmission losses and report on these initiatives. The direction from EB-2016-0160 reads as follows:

> *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.*[8]

In the IESO's 2017 fees case, the Board again directed the IESO and Hydro One to work on transmission losses issues, stating as follows:

> *The OEB expects the IESO to work with Hydro One and to report on initiatives for economically reducing transmission line loses in the first revenue requirement submission following the completion of the joint work with Hydro One.*[9]

In the IESO's 2018 fees case, the Board added a stand-alone transmission losses issue to the issue list.[10] The Board approved a settlement that included a number of provisions regarding transmission losses, including the following:

> *The IESO will engage with stakeholders regarding the IESO's transmission losses work/report (similar to the 2017 engagement the IESO undertook on the development of its regulatory scorecard) including a discussion of the transmission losses processes used by National Grid UK, the recommendations of the Council of European Energy Regulators, and methodologies to assess the cost effectiveness of transmission loss reduction measures.*[11]

In Hydro One's 2019 rates case, the Board again directed it to work on the transmission losses issue, stating as follows:

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[6] Ballpark estimates from EB-2016-0160 range from $280 million to $390 million in 2015 alone; see 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; see also the Board's Decision in EB-2016-0160, p. 31 (finding that "the cost of transmission line losses is very large").
[7] *Ontario Energy Board Act, 1998*, s. 1(1)1.
[8] Decision in EB-2016-0160, p. 32.
[9] EB-2017-0150, *Decision and Procedural Order No. 5*, October 31, 2017, p. 2.
[10] EB-2018-0143, *Decision on Issues List and Procedural Order No. 2*, July 30, 2018, p. 5
[11] EB-2018-0143, *Decision and Order*, October 25, 2018, Schedule A (Settlement Proposal), p. 15.

> *The OEB directs Hydro One to provide an update on the status of its work which was ordered by the OEB in the EB-2016-0160 proceeding regarding opportunities for reducing transmission line losses. This status update is for information purposes only to inform the OEB that progress is being made, but will not be adjudicated as part of this proceeding as it has no impact on the requested RCI adjustment.*
>
> *The OEB's expectation is that the work ordered by the OEB in the EB-2016-0160 proceeding will be substantially advanced and reported as part of Hydro One's next rebasing application.*[12]

In Hydro One 2020 rates case, the Board again affirmed the importance of this issue and the need for progress, stating as follows:

> *[T]he OEB concludes that the importance of this matter warrants a separate issue. The OEB shall include an explicit separate issue in the approved issues list dealing with transmission line losses. …*
>
> *The OEB finds that this is a significant issue which needs to have a visible profile in this proceeding. …*
>
> *The OEB finds that, given that OEB's initial direction was given to Hydro One more than two years ago, more focus should be placed in this proceeding on Hydro One's specific actions so far as well as plans going forward to achieve concrete results.*[13]

In the Board's decision in Hydro One's 2020 rates case, the Board outlined a number of expectations, including that Hydro One prepare transmission loss valuation guidelines by Q1 of 2020. That has not yet occurred, but is in process. The full Board findings were as follows:

> *Hydro One filed a letter with the OEB in which it and Environmental Defence reached a settlement on Issue 8. No parties opposed the settlement. The OEB accepts the settlement proposal and confirms that Hydro One is expected to take the following steps:*
>
> 1. *Hydro One will participate in, and contribute to, the ongoing IESO stakeholder engagement on transmission line losses, including offering to be a contributor to the final report which will document the IESO and Hydro One's respective practices with regard to mitigating transmission line losses as well as identifying potential areas for overall net benefit reductions in transmission line losses.*
>
> 2. *As part of the IESO stakeholder engagement process, Hydro One will endeavor to identify any additional opportunities to cost-effectively reduce transmission losses including through improved processes, option analysis methodologies, documentation*

[12] EB-2018-0130, *Procedural Order No. 1*, January 24, 2019, p. 3.
[13] EB-2019-0082, *Decision on Issues List and Confidentiality*, September 23, 2019, p. 3-4.

and reporting. This includes the opportunities for improvement identified in points 3 and 4 below.

3. *Hydro One will prepare an internal Hydro One guideline delineating the transmission line loss process that Hydro One will follow and is accountable for. This will be developed in Q1 2020 and refined throughout the IESO stakeholder consultation as necessary.*

4. *In business cases for projects where transmission line losses are material, Hydro One will include an option analysis and report on transmission line losses. This will be implemented over the course of 2020 for any projects meeting a documented materiality threshold.*

5. *At the end of the IESO stakeholder consultation and issuance of the IESO report, if the IESO determines that it will not proceed to engage an independent third party to review the IESO's and Hydro One's processes, Hydro One will initiate an independent third party review of its own processes for cost-effectively reducing transmission line losses, to be filed at its next rate application. This review would aim to identify any additional opportunities to cost-effectively reduce transmission line losses, including through improved processes, option analysis methodologies, documentation, and reporting, and would invite input from stakeholders.*

Hydro One stated that its loss mitigation practices are not formally documented but are ingrained in the way that it plans and considers its investments. Hydro One committed to formalizing these practices through written documentation for greater transparency. Hydro One also committed to include in its report an analysis and justification for its proposed materiality for step 4 above. As part of the report to be completed for the settlement proposal, the OEB expects to review these matters in Hydro One's next rebasing application.[14]

These decisions clearly show that transmission losses are important and should be analyzed and managed appropriately by Hydro One to protect the interests of energy consumers.

Improvements to Hydro One's Valuation of Transmission Loss Reductions

As noted above, Hydro One should improve its valuation of loss reduction benefits in comparing project alternatives. Under its current practices, according to Mr. Lusney, "transmission losses are greatly and inaccurately undervalued."[15] Although this may not have an impact on the choice of alternatives in all cases, overall, it will result in missed opportunities to cost-effectively reduce losses and therefore reduce energy bills.

As detailed below, Environmental Defence recommends that Hydro One improve its valuation of loss reduction benefits in comparing project alternatives by:

[14] EB-2019-0082, Decision and Order, April 23, 2020
[15] Evidence of Travis Lusney (updated March 18, 2021), pp. 2-3.

(a) Accounting for all avoided costs, not just the HOEP;

(b) Documenting the valuation of transmission loss reductions for inclusion in Board filings;

(c) Using electricity price forecasts, not just a static historical figure;

(d) Using hourly or seasonal data to account for the fact that loss reductions are highest at the peak

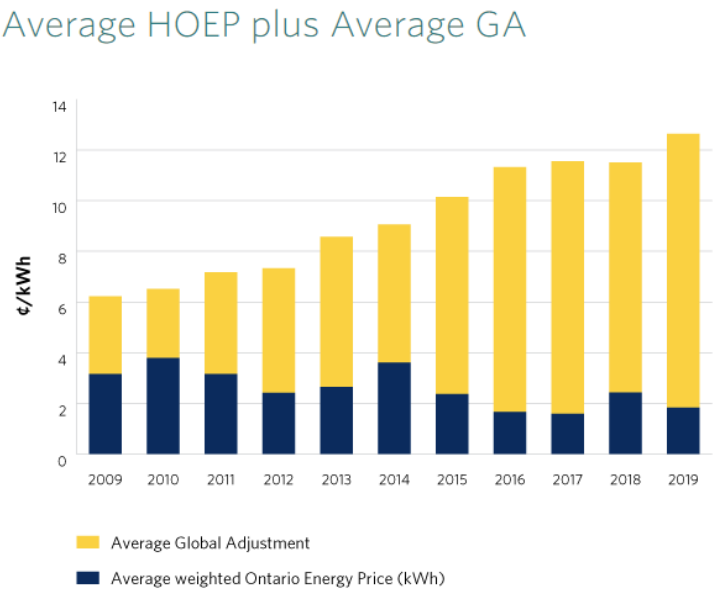
(e) Having an explicit threshold to establish cost-effectiveness;

(f) Making a net present value calculation; and

(g) Conducting a sensitivity analysis, in addition to, not in replacement of, an appropriate cost-effectiveness test.

Account for all avoided costs, not just the HOEP

It is critical that the valuation of loss reductions be based on actual avoided electricity costs, not only the HOEP. This is likely the most important issue with respect to transmission loss reduction valuation. Although a sensitivity analysis was conducted after-the-fact in this case, the initial decision to screen out a larger conductor was based on a valuation of loss reductions ($/MWh) based only on the value of the HOEP.[16] Mr. Lusney's evidence shows that this excludes roughly 85% of the actual price of electricity in 2019.[17] This is illustrated in the following figure:



[16] Technical Conference Transcript, March 16, 2021, p. 118 ("MR. ELSON: You just mentally took 600 megawatts, 17 multiplied it by the HOEP, and based on that decided that alternative 4 was not cost-effective. Correct? MR. QURESHY: Right.").
[17] Evidence of Travis Lusney (updated March 18, 2021), p. 8.

In the following lengthy excerpt, Mr. Lusney explains why the HOEP is not appropriate to value transmission loss reductions:

> *In Ontario, wholesale energy prices are determined by two components. The first component is the Hourly Ontario Energy Price (HOEP), which is partially representative of the commodity portion of wholesale electricity prices. Due in part to Ontario's hybrid market structure, the market clearing price (which is reflected in the HOEP) does not reflect the entire wholesale electricity price. Practically all generation resources receive additional payments for their energy production. The additional payments are made through contracts from IESO or for rate-regulated generation assets owned by Ontario Power Generation. The additional payments to supply resources are collected from customers through the GA.*
>
> *Over the past decade, the portion of wholesale electricity prices attributed to HOEP has fallen from ~50% in 2009 to roughly 15% in 2019 …*
>
> *The value of transmission loss reductions is derived from the price paid to generation resources in Ontario. If no transmission losses existed in the electricity grid, the price paid to generators for injecting energy into the grid would also be the price paid by electricity consumers throughout the province. The existence of transmission losses means the volume of energy used to determine payment for energy injected by generators is higher than the volume of energy delivered to customers. In other words, transmission losses represent the volume of energy Ontario consumers have paid generators to inject into the grid but have lost to inefficiencies in the power system. The simple diagram below provides an illustrative example.*

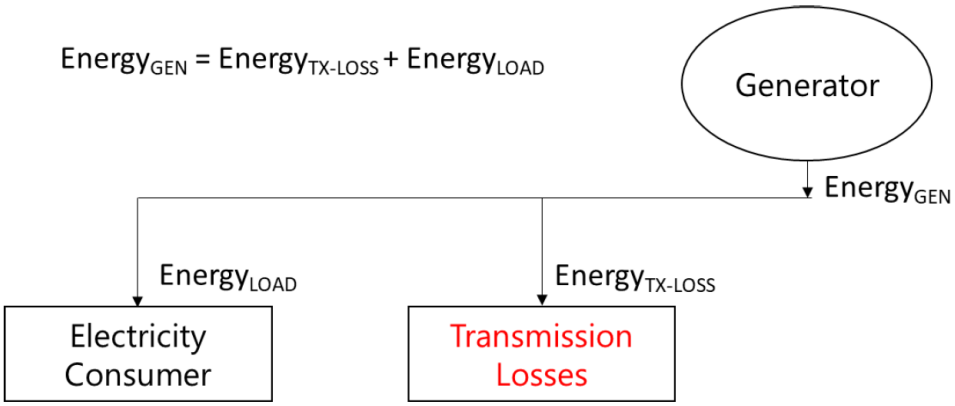


Figure 3: Illustrative Example of Transmission Losses

> *HOEP is an energy payment for all supply resources that inject energy into the Ontario electricity grid. Contract payments and rate-regulation funding generally take two forms: an energy payment for energy injected or a capacity payment for maintaining the participation of the generator in the Ontario electricity market. Typically, the energy payment under contracts or rate-regulation is through a Contract-For-Differences (CfD) structure where the*

amount paid to generators is the difference between the contract price and HOEP; thus, ensuring the generator receives the contract price regardless of variations in HOEP.

A vast majority of the generation resources in Ontario receive energy payments through their contract or rate-regulation arrangements. This includes all of Ontario's nuclear generation fleet, almost all hydroelectric facilities, all the non-hydro renewables (i.e., solar, wind and bioenergy) and some of the gas-fired generators. In total I estimate that roughly 90% of the annual energy production by supply resources in Ontario in 2020 receives a top-up payment in addition to HOEP for energy injected into the Ontario electricity grid.

Put simply, transmission losses represent energy that has been paid for by ratepayers but is unusable due to system inefficiencies. For this reason, it is incorrect to only use HOEP when valuing transmission loss reductions for the purpose of comparing alternative solutions. A much more accurate alternative is to use the total cost of wholesale electricity (i.e., HOEP + GA) to determine the value of transmission loss reductions…

The behaviour of the HOEP during times of surplus baseload provides another illustration of why it is inaccurate to rely on the HOEP alone to value loss reductions. Due in part because of oversupply and top-up payments from contracts and rate-regulated assets, Ontario experiences significantly more negative-priced hours for HOEP then the market energy price in other jurisdictions. When looking at the HOEP alone, it appears as though generators are paying customers for the energy they produce and inject into the system. Contract & rate-regulation payments from the IESO create an offset such that generators are net-revenue-positive. More importantly, the top-up payments for generators are costs that ratepayers must fund even through the market price for electricity suggests ratepayers are being paid for energy.
Ontario has experienced many hours of Surplus Baseload Generation that leads to negative HOEP, and the IESO expects Surplus Baseload Generation conditions to continue over the next 20 years

Using only HOEP in transmission loss analysis leads to inappropriate conclusions. Transmission losses for negative priced hours for HOEP would appear to be a net savings for customers even though energy is being lost in the transmission system. Further, when HOEP is $0/MWh the system would appear lossless even though energy is being lost throughout the system. This market dynamic significantly skews the assessment of transmission losses and does not reflect the actual cost of lost energy in the transmission system.

The year 2016, when the existing HxM path experienced the highest loading to date, is a good example of how skewed transmission loss analysis can be if only HOEP is used. The table below provides a summary of the negative priced hours (i.e., HOEP <$0/MWh), zero-dollar hours (i.e., HOEP = $0/MWh), and positive priced hours. In 2016 almost a quarter of all hours were negative or $0. That means a transmission loss assessment would view no cost for transmission losses in some hours or potentially a benefit of having transmission losses in the system. Viewing inefficiencies as a benefit to the power system for ~12% of the hours clearly shows the flaw of using HOEP only for transmission loss assessments.

Table 1: 2016 Hourly HOEP Summary[12]

2016 Hourly HOEP	Hours	% of Year
HOEP < $0 (Negative Priced Hours)	1,076	12%
HOEP = $0	920	10%
HOEP > $0	6,788	77%

It is clear from Mr. Lusney's evidence that it is inaccurate to use the HOEP to value transmission loss reductions. Neither the IESO nor Hydro One has disputed Mr. Lusney's evidence.[18] Neither the IESO nor Hydro One submitted evidence to show that the HOEP should be used. Hydro One specifically stated that it has "no comments" on Mr. Lusney's report and does not disagree with it.[19] The IESO specifically agreed that it "isn't taking the position that the appropriate method is to use only the HOEP."[20]

Finally, we note that Hydro One conducted a sensitivity analysis that included what it described as a $100/MWh HOEP. This is a positive step forward, but is not sufficient because:

(a) Hydro One initially screened out the larger conducted using analysis based on the HOEP alone.[21]

(b) The sensitivity analysis was not conducted when the initial decision to screen out the larger conductor was made. It was only conducted long afterwards, to justify the previous decision when responding to an interrogatory.[22]

Hydro One should not be valuing transmission loss reductions based on the HOEP when that excludes roughly 85% of actual electricity costs.

Document the valuation of transmission loss reductions for inclusion in Board filings

Hydro One should document its valuation of transmission loss reductions and include that documentation, or a summary of it, in its Board filings. This is necessary to substantiate its decision to choose one project alternative over another.

In this case, the process would have benefitted from more information in the application. The application merely noted that the larger conductor would reduce losses by an additional 10% and that this would not be sufficient to cover the additional $4.5 million cost. However, it did not

[18] Technical Conference Transcript, March 16, 2021.
[19] Technical Conference Transcript, March 16, 2021, p. 154.
[20] Technical Conference Transcript, March 16, 2021, p. 21.
[21] Technical Conference Transcript, March 16, 2021, p. 118 ("MR. ELSON: You just mentally took 600 megawatts, multiplied it by the HOEP, and based on that decided that alternative 4 was not cost-effective. Correct? MR. QURESHY: Right.").
[22] Technical Conference Transcript, March 16, 2021, p. 114 ("MR. ELSON: So this sensitivity analysis, these numbers in table 1, you prepared sometime in February of 8 2021 for the purpose of answering this interrogatory. MR. QURESHY: Yes.").

indicate the actual value of the loss reductions, the incremental loss reductions, how it valued those losses, or its cost-effectiveness test. This is important to substantiate the utility's decision and to allow intervenors to consider whether the value of loss reductions, *plus potential other monetary benefits*, might be sufficient to tip the scales between alternatives. More information would have led to greater regulatory efficiency in this case.

When Hydro One screened out the larger conductor, "no documentation was prepared," not even a "spreadsheet in Excel."[23] The analysis filed in response to our interrogatory was prepared after-the-fact in response to the interrogatory to justify the previous decision.[24] The initial decision was made, in the words of Hydro One, based simply on "mental math."[25] That is not sufficient.

Use electricity price forecasts, not just a static historical figure

When Hydro One estimates the value of transmission loss reductions, it should use an electricity price forecast, not a static historical figure ($/MWh).[26] The IESO agreed with this recommendation.[27]

When Hydro One screened out the larger conductor, it did so based on an annual average HOEP, not an electricity price forecast.[28] Although it conducted a sensitivity analysis after the fact to justify its earlier decision, a sensitivity analysis is not a replacement for applying a cost-effectiveness test up-front with accurate assumptions.

Using hourly or seasonal data to account for the fact that loss reductions are highest at the peak

Transmission losses are highest at peak demand.[29] Therefore, using a figure that represents total annual transmission losses and multiplying it by an average annual electricity price can undervalue the actual loss reduction benefits.[30] For example, if the line in question is a critical path, a higher amount of transmission loss reductions at the peak would allow a greater degree of firm capacity to be relied on through that wire. The most accurate way to assess losses is to examine them on an hourly basis.[31] The next best option is on-peak, mid-peak, and off-peak.[32] A number of valuation techniques can be used to account for this factor in an efficient way.

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[23] Technical Conference Transcript, March 16, 2021, p. 118 ("MR. QURESHY… no documentation was prepared. MR. ELSON: You didn't even prepare your own spreadsheet in Excel, for example. MR. QURESHY: Right.")
[24] Technical Conference Transcript, March 16, 2021, p. 114 ("MR. ELSON: So this sensitivity analysis, these numbers in table 1, you prepared sometime in February of 8 2021 for the purpose of answering this interrogatory. MR. QURESHY: Yes.").
[25] Technical Conference Transcript, March 16, 2021, p. 116.
[26] Evidence of Travis Lusney (updated March 18, 2021), pp. 2-3.
[27] Technical Conference Transcript, March 16, 2021, pp. 23-24.
[28] Technical Conference Transcript, March 16, 2021, p. 118 ("MR. ELSON: You just mentally took 600 megawatts, multiplied it by the HOEP, and based on that decided that alternative 4 was not cost-effective. Correct? MR. QURESHY: Right.").
[29] Technical Conference Transcript, March 16, 2021, p. 22.
[30] Technical Conference Transcript, March 16, 2021, p. 23.
[31] *Ibid*.
[32] *Ibid*.

Having an explicit threshold to establish cost-effectiveness;

It is important to have an explicit threshold to establish cost-effectiveness. This is a key component of any cost-effectiveness test. Hydro One does not have this.

First, Hydro One initially assesses loss reduction valuation using an HOEP base case, from which a "breakeven" period is calculated. However, Hydro One does not have a single explicit breakeven period at which it considers an alternative cost-effective.

Second, the sensitivity analysis only worsens the problem. This analysis is pasted below:

Table 1 – Evaluation of Alternatives

		Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Average annual HOEP Price $/MWh	A	$18.62	$50.00	$100.00	$18.62	$50.00	$100.00
Losses Alt 3 (MWh)	B	3650	3650	3650	7731	7731	7731
Losses Alt 4 (MWh)	C	3052	3052	3052	6463	6463	6463
Incremental Losses (MWh)	D=B-C	598	598	598	1268	1268	1268
Incremental Loss Savings	E=A*D	$11,135	$29,900	$59,800	$23,610	$63,400	$126,800
Additional Capital cost of Alternative #4	F	$4,530,000	$4,530,000	$4,530,000	$4,530,000	$4,530,000	$4,530,000
Annual Revenue Requirement	G	$339,313	$339,313	$339,313	$339,313	$339,313	$339,313
Additional cost to ratepayers	H=G-E	$328,179	$309,413	$279,513	$315,703	$275,913	$212,513
Breakeven Period (Years)	I=F/E	407	152	76	192	71	36

As you can see, there is no single cost-effectiveness threshold. For example, it is not clear what breakeven period is necessary for case 1 to be cost-effective. Nor is it clear whether a project is cost-effective with a long breakeven period for case 1 but a shorter one for, say, case 3 or 6.

Although professional judgment can always be applied, a cost-effectiveness threshold is needed to provide the rigor that the Board usually expects.

Make a net present value calculation

The assessment of transmission loss reductions should be conducted with a net present value (NPV) calculation because:

(a) Almost all economic assessments set out in Board guidelines involve an NPV calculation.

(b) NPV assessments give you a clear cost-effectiveness threshold.

(c) NPV assessments are easy to do.

(d) NPV assessments result in a net costs/savings figure that can be added to other benefits or subtracted from other costs to assess the overall cost-effectiveness of an alternative.

For the reasons outlined in Mr. Lusney's evidence, a societal discount rate in the range of 2% is appropriate when assessing transmission loss reduction values.

Conduct a sensitivity analysis, in addition to, not in replacement of, an appropriate cost-effectiveness test

Lastly, a sensitivity analysis is not a replacement for an appropriate cost-effectiveness test. That is particularly important here where the "actual" assessment used to determine whether to screen out the larger conductor is based on the HOEP. Although in this case a more robust analysis also came to the conclusion that the larger conductor cannot be justified based on transmission losses alone, that will not always be the case.

Screening Criteria to Reduce Analysis Needed

Hydro One may argue that the above analysis would be onerous to do in every case. That is a fair comment. However, rather than have an inappropriate cost-effectiveness test, this can be addressed with screening criteria. For example, Hydro One could screen alternatives by assessing the losses at 1.5 times the current HOEP plus GA multiplied by the incremental loss reductions at maximum flow. This would be a calculation that could be made in 10 minutes or less in an excel spreadsheet.

However, screening out in this way is only appropriate where there are no other system benefits that can be monetized. If there are other system benefits, it will likely be necessary to calculate the full net benefits associated with transmission losses so that a global net benefits/costs figure can be arrived at. Although this may take time, the cost of a number of hours to pay an engineer is well worth it because millions of dollars are on the line and it is important to satisfy the Board and the public that the best option was chosen.

We are not recommending specific screening criteria. However, any screening criteria should be documented and carefully constructed.

Conclusion re Loss Reduction Practices

Losses cost customers hundreds of millions of dollars. It is important that they be accurately accounted for in planning decisions. We therefore ask the Board to direct Hydro One to continue updating its processes with reference to the points raised in this proceeding.

Protocol to consider and document the relative system benefits

Environmental Defence recommends that Hydro One work with the IESO to develop a protocol to consider and document the monetary value of relative system benefits of alternatives once a project has been handed off to Hydro One. This is an area where important considerations can

"fall through the cracks" as between Hydro One as the transmission system owner and the IESO as the transmission system operator and system planner.

Once Hydro One is asked to develop a project to meet a need, Hydro One generally decides which alternative should be implemented to meet that need. However, some alternatives will have monetary benefits that are within the IESO's expertise to determine. The most obvious example is increased capacity along a critical path. It is important that a step be included in Hydro One's assessment of alternatives in which it asks the IESO to comment on the monetary value of any system benefits.

In this case, the project will allow increased firm imports from Quebec and resolve a potential bottleneck with respect to generation in Eastern Ontario. However, there was no evidence in the application on whether these additional benefits would be greater with the larger conductor or, if those additional benefits hinged on other investments, the cost of those. In other words, there was no cost-benefit analysis of those alternatives.

It became clear at the technical conference that the larger conductor would not provide additional capacity because of the need for expensive additional stations and intertie upgrades. However, Mr. Lusney calculated the potential benefits, with a number of caveats, at $11.6 million annually.[33] We mention this not because we are recommending the larger conductor, but to note that this was an important issue to consider and to have documented.

It is particularly important because of the looming capacity deficits in Ontario to ensure that system benefits are considered as between alternatives. Ontario needs 2,000 to 3,000 MW of new capacity by 2030.[34] It will also be contracting for 10,000 to 12,000 of competitive capacity by 2040 as existing contracts expire.[35] When considering the monetary value of alternatives on the bulk system that may provide more options and thus more competition for capacity, it is important that the IESO be involved.

Documentation is also important. In this case, there was no documentation of any assessment of system benefits, or the lack thereof. Documentation in future projects could even be as short as a page or two or an email chain appended as an attachment. It does not need to be onerous. But it is necessary for the applicant to establish that they have selected the most cost-effective option.

Conclusion

As noted above, we are not asking the Board to direct Hydro One to adopt each of the above specific recommendations. However, we are seeking a more general direction that Hydro One assess and improve its analysis of alternatives with reference to the points raised in this proceeding. This could result in better decisions that help reduce electricity bills in the future.

[33] Evidence of Travis Lusney (updated March 18, 2021), pp. 2-3.
[34] Technical Conference Transcript, March 16, 2021, p. 52.
[35] *Ibid*.

When a conductor is being replaced or built, there is a one-time opportunity to consider upsizing it. Once the project is complete, that opportunity is lost. It is important that time and effort be taken to ensure the right decision is made.