December 16, 2019

Ms. Christine Long
Registrar & Board Secretary
Ontario Energy Board
P.O. Box 2319, 27th Floor
2300 Yonge Street
Toronto, ON M4P 1E4

Re: EB-2019-0082 Hydro One Networks Inc. 2020-2022 Transmission Rate Application
AMPCO's Final Submission

Dear Ms. Walli:

Attached please find AMPCO's final submission in the above proceeding.

Please do not hesitate to contact me if you have any questions or require further information.

Sincerely yours,

(Original Signed By)

Colin Anderson
President
Association of Major Power Consumers in Ontario

Copy to: HONI

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EB-2019-0082

Hydro One Networks Inc.

Application for electricity transmission rates for the

period from January 1, 2020 to December 31, 2022

AMPCO Submissions

December 16, 2019

Hydro One Networks Inc. (Hydro One) filed a custom incentive rate-setting application with the Ontario Energy Board (OEB) on March 21, 2019 under section 78 of the Ontario Energy Board Act, 1998, S.O. 1998, c. 15, (Schedule B), seeking approval for changes to the rates that Hydro One Networks charges for electricity transmission, to be effective January 1, 2020 and for each following year through to December 31, 2022.

Hydro One's application is for a Custom Incentive Rate-Setting ("IR") framework to cover a three-year test period commencing January 1, 2020 and ending December 31, 2022. The revenue requirement for the 2020 test year is determined using a cost of service approach. The revenue requirements for subsequent years will be formulaically determined using a proposed Custom IR model.

For 2020, HONI seeks approval of a total transmission revenue requirement of $1,602.3 million and a rates revenue requirement of $1,556.6 million.[1] The increase in 2020 rates revenue requirement is 0.3% compared to 2019, followed by a 5.2% increase in 2021 and a 5.8% increase in 2022.

Rate Base growth is the largest driver of the increase revenue requirement followed by Deferral and Variance Account disposition.[2] AMPCO's submissions are focussed on Hydro One's capital plan and resulting in-service capital additions.

Table 1: Revenue Requirement Comparison

Revenue Requirement ($ M)	2018	2019	2020 COS	2021 RCI	2022 RCI
Total Revenue Requirement	1623.8	1644.4	1602.3	1683.2	1777.1
Variance %			***-2.6%***	***5.0%***	***5.6%***
D&VA	-58.4	-37.6	6.8		
Less External Revenues	-54.7	-54.5	-52.6		
Base Revenue Requirement	**1510.7**	**1552.3**	**1556.5**	**1636.9**	**1731.6**
Variance %		***2.8%***	***0.3%***	***5.2%***	***5.8%***
Ref: J8.5					

[1] HONI AIC P9
[2] Ex A-3-1 P24

Transmission charges represent 7.4% of a Transmission-connected customer's bill.[3] The net impact on average transmission rates is 4.1% in 2020, 5.8% in 2021 and 6.5% in 2022. AMPCO submits these rate impacts are significant for customers.

Hydro One serves 84 Industrial customers, many of whom are AMPCO members. AMPCO's members represent Ontario's major industries: forestry, chemical, mining and minerals, steel, petroleum products, cement, automotive and manufacturing and business consumers in general.

The two largest concerns of AMPCO members are affordability and reliability of electricity service, with affordability currently being paramount, given the rapid rise in industrial rates in recent years. AMPCO's submissions are focussed on these two issues as they relate to Hydro One's proposed 5-year Transmission System Plan (TSP).

In response to a 2017 customer engagement survey question "Is there anything in particular you feel Hydro One can do better?, an End User replies that they are satisfied with overall reliability but the costs make most of our business ventures uncompetitive and the lack of transparency and fixed nature of the billing makes it virtually impossible for us to effect the outcome."[4]

AMPCO's principal interest is to be of assistance to the Board in determining if Hydro One has struck an appropriate balance between risk, reliability, customer cost and customer outcomes in respect of both the quantum and the timing of capital spend in its investment plan. Cost containment is a central theme in AMPCO's submissions in favour of a more reasonably paced capital spending plan that is data driven and provides value for customers. This approach aligns with the top two priorities of AMPCO members and customers in general: price and reliable electric service.

Given the current state of Ontario electricity prices, any upward pressure on rates further reduces the competitiveness of Ontario industry as compared to neighbouring jurisdictions. Even just and reasonable rates are still a problem if they are not affordable for customers. AMPCO would like to see Hydro One do more with less. This philosophy was shared by an LDC who asked in the 2017 customer engagement survey: "Why can't you do more with less?"[5] An End User who completed the same survey commented "How do you plan to improve reliability while decreasing costs - and if you are telling me that it can't be done, then in industry parlance "you're fired"!![6]

TRANSMISSION SYSTEM PLAN

As shown in Table 2 below, Hydro One plans to spend approximately $6.9 billion in capital over the 5-year period, 2020 to 2024. After accounting for $117 productivity and the directive adjustment (-$288 million) the total capital envelope to be embedded in rates is $6.6 billion.

Table 2: Transmission Capital Plan 2015 to 2024

[3] J8.5 P6
[4] B-1-1 Section 1.3 Attachment #1 P67
[5] B-1-1 Section 1.3 Attachment #1 P77
[6] B-1-1 Section 1.3 Attachment #1 P92

Revenue Requirement ($ M)	2015	2016	2017	2018	2019	Total 2015-2019	2020	2021	2022	Total 2020-2022	2023	2024	Total 2020-2024	Variance
System Access	7.6	17.0	42.7	33.7	45.1	**146.1**	24.8	11.3	11.7	**47.8**	12.7	4.1	**64.6**	-81.5
System Renewal	688.9	733.9	740.7	776.2	773.3	**3,713.0**	865.2	1,103.1	1,172.8	**3,141.1**	1,177.4	1,193.8	**5,512.3**	1,799.3
Variance %							***12%***	***27%***	***6%***		***0.0***	***1%***	***48%***	
System Service	157.9	140.9	93.5	73.9	103.8	**570.0**	204.1	148.2	151.8	**504.1**	174.3	204.2	**882.6**	312.6
General Plant	88.6	94.8	76.9	83.6	116.3	**460.2**	115.4	94.4	94.7	**304.5**	83.6	58.9	**447.0**	-13.2
Sub-total	943.0	986.6	953.8	967.4	1,038.5	**4,889.3**	1,209.6	1,357.3	1,431.1	**3,998.0**	1,448.0	1,461.0	**6,907.0**	2,017.7
Progressive Productivity							-17.0	-39.0	-61.0	-117.0	-78.0	-91.0	**-286.0**	-286.0
Directive					-0.3	-0.3	-0.3	-0.3	-0.4	-1.0	-0.4	-0.4	**-1.8**	-1.5
Sub-total							**1,192.3**	**1,318.0**	**1,369.7**	**3,880.0**	**1,369.6**	**1,369.6**	**6,619.2**	
Pension Adjustment					-3.2	-3.2	-4.2	-5.2	-5.4	-14.8	-5.4	-5.4	**-25.6**	
Total					**1,035.0**	**4,885.8**	**1,188.1**	**1,312.8**	**1,364.3**	**3,865.2**	**1,364.2**	**1,364.2**	**6,593.6**	1,707.8
Variance %							***15%***	***10%***	***4%***		***0%***	***0%***	***35%***	

In EB-2016-0160 the OEB approved a capital envelope of $950 million for 2017 and $1,000 million in 2018. This reflects a reduction from its original requested level of $126.1 million in 2017 and $122.2 million in 2018, for a total reduction of $248.3 million. The OEB acknowledged in its Decision that these approved capital amounts are significantly higher than the actual capital expenditure for the three previous years ($776.0 million in 2012, $718.5 million in 2013, and $844.7 million in 2014) and consistent with Hydro One's actual capital expenditure for 2015 ($943 million) and its forecast for 2016 ($1,004 million).[7]

Hydro One spent $986.6 million in 2016, $953.8 million in 2017 and $967.3 million in 2018. In 2019, Hydro One forecasts to spend $1,035. The revised 2019 forecast reflects increased spending in System Service.

Over the 3-year period 2017 to 2019, Hydro One will have spent $2.96 billion and Hydro One proposes to spend $4 billion over 2020 to 2022 test period, a 35% increase.

For the reasons discussed below, AMPCO proposes a $905 million envelope reduction in capital over the test period.[8] This reflects an annual level of spending consistent with the level of spending of the three years, 2017 to 2019, of close to $3 billion.

The development of the Transmission Business Plan (2019 to 2023) was informed by three key inputs:

- Hydro One's strategic priorities and the OEB's expectations under the RRF;
- Input Hydro One has received from its customers; and
- Benchmarking studies

As discussed below under section A, it is AMPCO's view that Hydro One's customer engagement and use of the customer engagement results in Hydro One's investment planning process is flawed and should not be seen as valid in any way to inform Hydro One's $6.6 billion capital investment plan over the 2020 to 2024 planning period.

With respect to specific benchmarking studies, AMPCO concludes that some studies cannot be relied upon to justify Hydro One's proposed capital spend. AMPCO comments regarding the benchmarking studies are part of the discussion regarding specific capital investments.

[7] EB-2016-0160 OEB Decision P29

[8] $3.865 billion (2020-2022) –$2.96 billion (2017-2019 = $905 million

A. Customer Engagement

Hydro One conducted a 2017 Transmission Customer Engagement Survey between May and June 2017, prior to its investment planning process, to specifically inform the TSP and spending levels in this application. This is Hydro One's second Transmission Customer Engagement Survey. Hydro One conducted its first Transmission Customer Engagement Survey in 2016 to inform and support its 2017 and 2018 spending levels in EB-2016-0160. Ipsos Reid conducted the 2016 survey.

Hydro One engaged Innovative Research Group to help design its 2017 customer consultation survey. Of 156 transmission connected customers, 103 completed the 2017 survey: 28 LDCs, 39 End Users and 36 Generators.[9]

AMPCO has significant concerns about the way the survey was designed and how Hydro One is using the information to justify its $6.6 billion capital plan.

Customers were asked to rank seven outcomes that did not include cost.

Transmission-connected customers[10] were asked to rank the following outcomes based on importance: Safety, Reliability, Outage Restoration, Power Quality, Customer Service, Productivity and Environmental Stewardship.

Customers ranked Safety, Reliability and Outage Restoration as most important. Safety was the number one priority (79 out of 103 respondents). Hydro One then took this feedback and input it directly into Hydro One's Investment Planning Process.[11] Cost was not put forward by Hydro One as an outcome in the survey for customers to rank. AMPCO sees this as a significant and fatal omission which results in a flawed customer engagement process that carries forward and biases the investment planning process and the resulting 5-year capital plan.

As previously stated, AMPCO's transmission-connected customers are extremely focussed on all costs, including those costs that contribute directly to Hydro One's portion of the electricity bill. AMPCO's transmission-connected customers frequently contact AMPCO during their budget cycles to obtain a forecast of future transmission rates in order to finalize their budgets. AMPCO members are interested in the forecast of Uniform Transmission Rates (see Table 2[12]) and are vocal that the year-over-year increases in transmission rates impacts their bottom line, particularly the increase in the Network Service Charge which was forecast in the application to reach $4.83/kW by 2022. AMPCO members are also extremely focussed on the Global Adjustment (GA) but are well aware Hydro One is not responsible for GA charges.

[9] B-1-1 Section 1.3 Attachment #1 P4
[10] n=103
[11] Ex B-1-1 TSP Section 1.3 P2
[12] As Filed March 21, 2019

Table 3: Hydro One Transmission Rates ($/kW)

	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Forecast	2021 Forecast	2022 Forecast
Network Service	3.66	3.52	3.61	3.83	4.35	4.58	4.83
Variance %		*-3.8%*	*2.6%*	*6.1%*	*13.6%*	*5.3%*	*5.5%*
Line Connection	0.87	0.88	0.95	0.96	0.83	0.87	0.92
Transformation Connection	2.02	2.13	2.34	2.30	2.44	2.57	2.71
Total	**6.55**	**6.53**	**6.90**	**7.09**	**7.62**	**8.02**	**8.46**
Variance %		**-0.3%**	**5.7%**	**2.8%**	**7.5%**	**5.2%**	**5.5%**

Source: Hydro One Website

When asked about why cost was not included as an outcome to be ranked in the customer engagement survey, Hydro One responded that cost is a certain outcome of any investment so its relative ranking was determined to be less informative as a stand-alone outcome.[13]

This perspective on cost does not make any sense to AMPCO. We know that customer surveys conducted by other LDCs[14] find that residential customers, small business customers (general service<50 kW), and mid-market customers (general service>50 kW) consider price their number one priority and reliability their number two priority whereas larger demand key accounts generally prioritize reliability over price. We also know that in the 2016 customer engagement interruptions and rates were mentioned as the top two concerns by the largest share of customers.[15]

And we know cost was a key customer preference in EB-2016-0160. One of Hydro One's findings in EB-2016-0160 with respect to customer needs and preferences, taking into account all the information collected during its customer engagement activities[16], was that customers prefer competitive or low cost of service, but not at the expense of deteriorated service.[17] Further, with respect to how the 2017 and 2018 capital investment plan reflects Hydro One's general assessment of customer needs and preferences, Hydro One stated "The investment plan reflected in this Application seeks to meet customers' needs regarding service levels, in a manner that controls costs to address their desire for low or competitive costs. Hydro One recognises that customers are sensitive to the total delivered price of power".[18] This is important and instructive because Hydro One did not make this same commitment to control costs in this application.

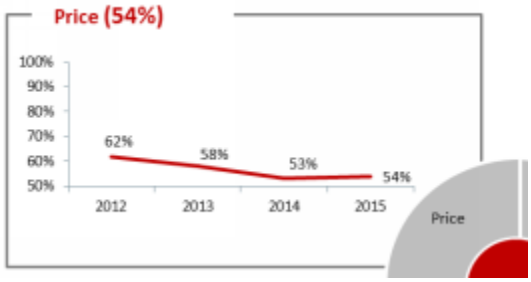
In terms of how Hydro One incorporated customer needs into the plan, Hydro One refers to insights from customer surveys as the basis for understanding customer needs.[19] But in AMPCO's view, none of these surveys appropriately addresses costs. The 2017 customer engagement survey excludes costs as a

[13] CME IR#32
[14] Examples: Alectra, THESL
[15] EB-2016-0160 B1-2-2 Attachment #1 P14
[16] Routine communication; customer forums, power quality working group, customer advisory board, large customer conference, Sarnia area oversight committee, LDC working group, switchyard oversight committees, customer survey research, 2016 customer engagement survey
[17] K7.4 AMPCO Compendium P13
[18] K7.4 AMPCO Compendium P14
[19] B-1-1 TSP Section 1.3 P22

priority customer outcome which AMPCO concludes is inappropriate and wrong.[20] The 2018 Large Transmission Customer Survey dropped questions related to price and the new Hydro One questionnaire that was to be linked to bill impacts was not undertaken in 2019 as planned.[21] It appears to AMPCO that Hydro One simply does not wish to hear about its prices, preferring instead to focus on other aspects of its service.

With respect to the Large Transmission Customer Survey, a Hydro One stated objective is to measure the level of customer satisfaction, and to monitor Hydro One's performance in four dimensions of satisfaction among customers: Price, Customer Service, Product Quality/Reliability and Relationship.[22] However, the results of the actual survey reveals, under Survey Findings, that no price/billing questions pertaining to experience with Hydro One were even asked of LTX customers.[23]

These same objectives were present in the Large Transmission Customer Survey in evidence in EB-2016-0160 where price questions were asked, and the results show that customer satisfaction with price declined over the 2012 to 2015 period from 62% in 2012 to 54% in 2015.[24]



Of further note is that Northstar Fearless Intellect conducted the survey in EB-2016-0160. The 2018 survey, where price questions weren't asked, was conducted by Innovate Research Group, the same firm that completed the 2017 customer engagement survey where cost was not included as an important outcome to rank.

What AMPCO concludes from its review of the evidence is that the most significant input to the TSP on customers' perspectives on costs comes from the 2017 customer engagement survey where the only time customers were asked the importance of cost was relative to reliability outcomes through four illustrative capital investment scenarios with associated impacts on future rates.[25] There was no ability on the part of the survey respondents to adjust the four scenarios in any way or to say, quite frankly, that all four were simply too expensive. Being asked to choose from amongst a group of options – all of which are bad – is not much of a choice. In AMPCO's view this approach provides an inadequate view of how transmission-connected customers value affordability and competitive electricity prices, which in turn has resulted in a TSP that is not affordable for customers.

[20] K7.4 AMPCO Compendium P33
[21] HONI_Vol 7
[22] K7.4 AMPCO Compendium P23
[23] K7.4 AMPCO Compendium P54
[24] EB-2016-0160 B1-1-3 P14
[25] K7.4 AMPCO Compendium P45

The result of the survey was that customers selected Investment Scenario C, to maintain the current level of investment proposed in EB-2016-0160, which results in a 5-year capital investment of $6.6 billion. Hydro One then used this feedback to influence its decision around the overall capital funding envelope.[26] All candidate investments were aggregated into a consolidated portfolio for prioritization with a view to reflect the level of investment most preferred by customers in the customer engagement exercise.[27] This results in a Transmission Business plan with a forecast $6.6 billion capital spend over 5 years; $3,864.7 million for the test period.

Customers concerns regarding costs have not been incorporated in the final capital plan.

Despite the numerous times cost was raised by customers in response to questions throughout the survey, Hydro One shared its views at the oral hearing that cost did not come up as a priority for customers.[28]

In Appendix A, AMPCO has included a summary of most of the comments that customers made regarding price/cost which shows cost should be recognized as a key priority for customers.

Given that Hydro One put forward a spending plan in the end that was not adjusted to reflect the OEB's capital disallowances in EB-2016-0160, AMPCO concludes that Hydro One did not listen to customers and did not incorporate its customers stated desire for low and competitive costs as described above, in setting final investment levels. The proposed average forecast spend of $1.3 billion per year for 2020 to 2022 greatly exceeds the average $975 million capital spend approved by the OEB for 2017 and 2018.

<u>AMPCO's Position</u>

AMPCO does not support the basis of how Hydro One had customers rank outcomes that excluded cost but included safety. Safety is an extremely important issue for AMPCO members but AMPCO sees safety as table stakes; it is quite simply a "given".

When asked why safety didn't come up in the 2016 customer engagement survey, Innovative Research group states

> "the general thing that we find across the board in all samples is that when we ask people in an open-ended way what needs are important, safety is taken as a given. And many times, when utilities consider what their priorities are, safety is dealt with as a compliance issue and isn't an incremental decision. There often aren't incremental spending choices related to safety because they're dealt with in the base budget and there is no discretion. So a lot of times, and even in our own surveys, safety won't be listed because it's not going to inform one of the choices, because all the necessary safety investments are already made. In an open-ended response, safety often doesn't get mentioned because it is table stakes. People just assume it is being done and we have measures of whether they're satisfied on things like that. If customers

[26] B-1-1 TSP Section 1.3 P24
[27] B-1-1 TSP Section 1.3 P25
[28] HONI_VOL1_20191021 P76

are satisfied on something that is important to them, they won't mention it in response to a needs question. They will mention the things that they're unhappy with."[29]

AMPCO members are unhappy about costs. Cost should have been included as an outcome to be ranked. Hydro One missed an opportunity to better understand how customers would rank costs relative to other outcomes that customers care most about. This is especially important given that Hydro One's 2018 Large Transmission Customer Survey dropped the questions related to price. In AMPCO's view, if cost was included as an outcome, Hydro One's investment levels in the TSP would be significantly lower. If Hydro One had undertaken its customer engagement for the TSP following the OEB's Decision in EB-2016-0160, the investment level put to customers under Scenario C would have been lower and the capital envelope in the TSP would be lower.

Hydro One states the results of the customer engagement survey have been re-affirmed by feedback received from subsequent ongoing customer engagement activities but Hydro One does not provide any details to support this.[30]

In AMPCO's view the 2017 customer engagement process was inherently flawed because it included safety (a given), excluded reduced costs as an outcome, put forward an investment scenario to customers to maintain the current level of spending in EB-2016-0160 that due to timing did not reflect the OEB's capital disallowances and was not subsequently adjusted to reflect reality, and did not appropriately consider customer comments regarding costs. The process was not appropriately structured to identify customer needs and preferences.

If the OEB agrees that the customer engagement process is seriously flawed, AMPCO submits the Investment Planning Process is also flawed given its specific reliance on the feedback from customer engagement.

B. Investment Planning Process

Hydro One uses two main components to manage its transmission assets: the Asset Needs Assessment and the Investment Planning Process.

During the Asset Needs Assessment process Hydro One identifies a portfolio of investment candidates that becomes a major input into the Investment Planning Process. During the Investment Planning Process, Hydro One scores the investment candidates, and prioritizes, reviews and develops a capital investment plan.

There is a tight link between the customer engagement feedback and Hydro One's new methodology and investment strategy.[31] In AMPCO's view, this tight link, or rather the exposed deficiencies of the customer engagement survey, is the shortcoming in how Hydro One set its 2020 to 2024 capital budget.

Since EB-2016-0160, Hydro One revised and implemented an eight-stage investment planning process as follows:

[29] HONI_VOL7_20191031 P85
[30] B-1-1 TSP Section 1.3 P2
[31] B-1-1 TSP Section 1.3 Page 4

1. Investment Planning Context
2. Candidate Investment Development
3. Investment Assessment & Calibration
4. Prioritization and Optimization
5. Enterprise Engagement
6. Develop Final Plan
7. Review and Approval
8. Execution and Performance Monitoring

The investment planning context (Stage 1) is directly informed by Hydro One's customer engagement surveys and Hydro One is relying on the customers' selection of Scenario C with an expenditure of $6.6 billion to inform how it came up with the spending envelopes.[32]

Given that the planning context set at Stage 1 relies upon flawed consultation and underpins the entire Investment Planning Process,[33] AMPCO submits the entire Investment Planning Process is flawed at this point. No customer engagement surveys undertaken by Hydro One considered low cost in a meaningful way. Further, in the 2017 survey, customers thought they were choosing between illustrative scenarios. Hydro One stressed to customers that they were not committed to any of the scenarios and their purpose was to help Hydro One understand what customers value. Hydro One further stated that when it makes its Ontario Energy Board filing, Hydro One will incorporate feedback received through this process, but does not commit to pursuing any of these illustrative scenarios specifically.[34] This is not what happened. Hydro One fully aligned its TSP spending with Scenario C and did not incorporate the numerous comments from customers on the need to reduce costs. Plus, Scenario C (maintain current level of investment) is inflated compared to the Board's Decision regarding 2017 and 2018 spending. AMPCO submits this approach does not accurately reflect the feedback of customers and, as such, is unfair to customers.

A spending level of $6.6 billion or on average $1.3 billion per year as a budget constraint with a rate impact of 5.1% (excluding load)[35] greatly exceeds what the OEB approved for 2017 and 2018 and was misleading to customers in the engagement survey who thought they were considering a scenario that maintained the current level of investment when in fact it far exceeded it.

Table 2 below summarizes the results of the Investment Planning Process which resulted in a capital spending forecast of $6.6 billion. Clearly the results of the 2017 customer engagement survey greatly influenced the Investment Planning Process at many stages as intended. The number of candidate investments and spending levels increased during Hydro One's final development, review and approval of the plan, and after productivity savings are removed, the final budget is fully aligned with Scenario C.

[32] HONI_VOL1_20191021 P48
[33] B1-1-1 TSP Section 2.0 P
[34] B-1-1 Section 1.3 Attachment #1 Appendix 1.2 P21
[35] 6.2% with load

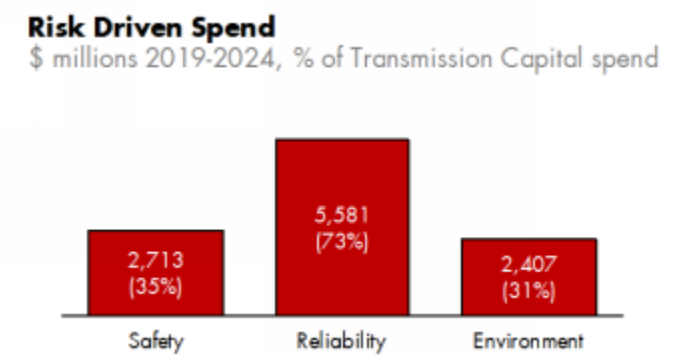
Table 4: Outcome of Investment Planning Process

	Investment Planning Process	# of Candidate Investments	Capital Spending Forecast ($M)	Variance ($ M)
1	Candidate Investment Development	577	7,616	
2	Prioritization & Optimization	532	6,540	-1,076
3	Enterprise Engagement	541	6,511	-29
4	Develop Final Plan/Review and Approval	563	6,907	396
	Less Progressive Productivity Placeholder		286	
	Less Directive Adjustment		2	
	Total		**6,619**	**-288**

In the 2019 to 2024 Transmission Business Plan dated December 14, 2018, Hydro One states "Customer priorities are as follows: safety, reliability, outage restoration, power quality, customer service, productivity and environmental stewardship." There is no mention of low cost as a key priority in the Business Plan even though customers did mention low costs numerous times in the 2017 survey, have done so historically and no doubt would have done so as part of other ongoing Hydro One customer engagement activities such as the annual Large Customer Conference.

Other Changes Based on 2017 Customer Engagement Survey

In response to the 2017 customer engagement survey, Hydro One added outage frequency to the probability framework[36], and revised the risk assessment framework in the Investment Planning Process to assess safety, reliability and environmental risk, (the top three outcome priorities in the customer survey), as a new stand-alone step (Stage 3) to provide consistent risk assessment of these factors. Risk is now scored based on new safety, reliability and environmental taxonomies. The Figure below shows how forecast capital spend over the 2019 to 2024 period is allocated to the three risk factors – safety, reliability and environment.[37]



In AMPCO's view, the initial budget constraint, risk taxonomies and investment prioritization process would look very different if low cost was ranked as a priority outcome by customers.

[36] B-1-1 TSP Section 2.1 P19
[37] A-3-1 Attachment #1 P14

AMPCO's Position

The 2017 customer engagement survey results are driving Hydro One's entire transmission business planning process including the pace of the TSP. If the Board accepts that the customer survey undertaken by Hydro One, specifically to inform the TSP, is fatally flawed because low cost was not identified as an outcome customers care about and illustrative scenario C was in the end not illustrative at all, but represented reality, then AMPCO submits the budget constraint that underpins the Investment Planning Process is flawed and the resulting $6.6 billion capital spending forecast and resulting in-service additions for the 2020 to 2022 period should not be approved by the OEB.

The average spend over the historical 3-year period is $977 million. If this annual amount is applied to the test period (2020 to 2022), the resulting capital spending envelope is $2.9 billion capital compared to the $4 billion Hydro One is requesting. This reflects a capital reduction of $366 million per year.

AMPCO submits a capital budget consistent with the average annual spend over the 2017 to 2019 period is more appropriate as cost was a consideration in setting budget levels in EB-2016-0160 and this pace of investment is more affordable for customers. The 2016 Ispsos-Reid survey concludes with respect to the prioritization of customers' greatest concerns that "Interruptions and rates (specifically rate increases greater than 5%) were mentioned as the top two concerns by the largest share of customers."[38]

C. Other Comments Regarding Customer Engagement

1. Reliability Risk Model

As part of the 2017 customer engagement survey, customers were asked to choose between four "illustrative" scenarios that offered different levels of reliability risk from Scenario A with a 5-year capital envelope of $1.8 billion and a 30% increase in reliability risk to Scenario D with a 5-year capital envelope of $7.4 billion and a 15% decrease in reliability risk.

The Reliability Risk Model (RRM) was central to customer engagement in the last transmission case and the OEB had issues with the use of the RRM in the customer engagement.

In its Decision in EB-2016-0160, the OEB stated[39]:

> "Regarding RRM, the OEB finds that the model needs further refinement and testing to be used to convey customer information about the value of capital investments in terms of system reliability. As expected, the IPSOS-Reid report indicated that customers expected to see improvement in actual reliability performance, not necessarily only a reduced reliability risk for the proposed level of investment.
>
> Based on the above-noted shortcomings of both the customer engagement process and the

[38] EB-2016-0160 B1-2-2 Attachment #1 P14
[39] EB-2016-0160 Decision P24

RRM, the OEB does not place significant weight on the evidence associated with these elements and therefore will not rely on the outcome as reported from Hydro One as compelling evidence of customer support for the proposed level of capital expenditures."

In METSCO's third-party assessment of Hydro One's Asset Analytics, Asset Risk Assessment and RRM, METSCO also identified issues with the RRM as follows:[40]

> "With respect to the Reliability Risk Model, METSCO's finding is that the tool's analytical underpinnings and functionalities trail advanced industry system reliability practices where these are deployed in the asset management. In making this observation, we note that a number of utilities do not or have not until recently attempted to formally forecast system reliability in a comprehensive manner. This contextual observation suggests that the RRM capability constitutes a bona fide continuous improvement step. Given that the RRM tool is currently used primarily as a customer communications tool to convey indicative changes to reliability risk levels across spend scenarios, the observed gaps in its technical parameters pose no meaningful risks from the asset planning perspective. We observe that the RRM tool's outputs could add a valuable "technical implications" dimension to customer engagement efforts, so long as HONI is clear about the tool's purpose and the implications of its analysis."

The 2017 customer engagement occurred before the OEB's Decision in EB-2016-0160 and before METSCO's findings on the RRM were know. AMPCO submits the OEB should take this information into consideration in evaluating customers' selection of Scenario C with a proposed 10% decrease in risk based on reliability risk.

Information on the RRM was not part of the main survey but was included in an Appendix 1.3 to the survey that customers may not have reviewed and therefore may not have been aware of the implications if its analysis.

2. Long Term Reliability Impact included in Survey was Based on Judgement

Each illustrative scenario in the 2017 customer engagement survey included a long-term reliability impact prediction that was decreasing for Scenarios A and B and increasing for Scenarios C and D. Hydro One confirms it was based on judgement.

MR. JESUS: It was based on our assessment, our judgment of directionally how long-term reliability would be impacted by the investment levels being proposed.
MR. RUBENSTEIN: So it is your judgment.
MR. JESUS: In our judgment.

3. No Direct Input from End-Users of LDCs

[40] B-1-1 TSP Section 1.4 Attachment #13 P6

In its EB-2016-0160 Decision, the OEB directed that in the next application, Hydro One to seek input from LDCs and their end-users.

Hydro One indicated it did not consult directly with End-Users of LDCs on its proposed TSP. AMPCO submits this is an additional shortcoming of Hydro One's customer engagement process. It is reasonable to assume lower costs would have been raised by the End-Use customers of LDCs and these concerns should have been incorporated into the plan.

4. Background Information related to assets was not updated in 2017 survey compared to 2016 survey

In its Decision in EB-2016-0160, the OEB directed Hydro One to ensure in its next application that information presented to customers was unambiguous and easy to understand.

In the first survey in 2016, AMPCO had criticisms regarding the information presented to customers and the OEB agreed it was misleading.[41] In the 2017 survey, Hydro One provided substantially less background information. Hydro One indicates it kept all background information to a minimum, in order "to recognize the high level of electricity system knowledge of many participants."

Additional information related to Hydro One's transmission system was provided in Appendix 1.3 and survey participants could access the information through buttons throughout the survey. Hydro One indicated at the oral hearing that it has no way of knowing how many survey participants accessed Appendix 1.3 and the additional information to inform their choices.

AMPCO notes the asset health information provided in Appendix 1.3 related to contribution to equipment-related interruption duration by asset class system-wide is the same information provided in the 2016 survey, reflecting the average of 2011 to 2015 data. This is important because in the 2016 survey, based on this same information, customers were asked to consider three 5-year investment scenarios for the period 2016 to 2020 of $5.1 billion, $5.6 billion and $6.2 billion and customers preferred spending between $5.6 billion and $6.2 billion or under $6 billion.[42]

Hydro One is using this same asset health information and is now asking customers to support $6.6 billion in capital over the 5-year period 2020 to 2024. If Hydro One expects customers to support increases in spending over the next five year term it should have presented customers with an analysis that shows a decline in asset health from the data provided in the 2016 survey. Hydro One did not make this case.

5. Customers were not provided with other important t information to inform Decision Making

The customer engagement did not provide customers with information related to Hydro One's allowed and achieved Return on Equity (ROE). Hydro One explains that in recognition of the time and effort of our customers to participate in the engagement process, there is a desire to keep the engagement focused on areas that are of greatest importance to them.[43]

AMPCO submits its members are interested in the ROE of Hydro One and all regulated entities. In fact, AMPCO sees a reduction in regulated ROE as a potential viable mechanism to lower the GA.

[41] EB-2016-0160 OEB Decision P22
[42] EB-2016-0160 B1-2-2 Attachment #1 P14
[43] CCC-14

The allowed and achieved ROE for Hydro One Transmission for the 5 historical years 2014-2018 are shown in the Table 5 below.[44]

Table 5: Allowed and Achieved ROE

$millions	2018	2017	2016	2015	2014
Approved Revenue Requirement*	1,510.7	1,437.8	1,480.7	1,477.3	1,446.4
Allowed Return	9.00%	8.78%	9.19%	9.30%	9.36%
Achieved Return	11.08%	9.03%	10.02%	10.93%	13.12%

**Rates Revenue Requirement*

AMPCO submits future customer engagement surveys should include ROE information.

AMPCO's Position

In summary, AMPCO submits the OEB should take the above additional information into consideration in evaluating the validity of Hydro One's 2017 customer engagement survey in setting rates over the test period.

D. Individual Capital Projects/Programs

Hydro One performs a continuous Asset Risk Assessment (ARA) process to determine individual asset needs. The ARA evaluates assets based on six risk factors: condition, demographics, criticality, performance, utilization and economics.

The outputs of the ARA process are potential candidate investments.[45] Hydro One indicates ARAs establish the necessary fact base to later assess the probability and consequence of safety, reliability and environmental risks at the scoring stage of the Investment Planning Process.

Hydro One's System Renewal budget is increasing by $2 billion or 41% over the 2020 to 2024 period compared to the previous five years.

At a high level, AMPCO observes that Hydro One plans to replace 26% more assets over the 2020 to 2024 period (29,292.2) compared to 2015 to 2019 (23,364).[46]

[44] EP-24 (b)
[45] B-1-1 TSP Section 2.1 P17
[46] JT1.24

Table 6: Asset Replacements 2015 to 2024

Hydro One Asset Replacement						Total						Total	
JT1.24	2015	2016	2017	2018	2019	2015-19	2020	2021	2022	2023	2024	2020-24	Variance
Transformer Portfolio	24	18	15	28	20	105	9	23	19	40	17	108	3
Circuit Breaker Portfolio	31	73	108	155	88	455	135	105	88	215	95	638	183
Protection Systems Portfolio	445	627	298	325	453	2148	465	370	503	681	384	2403	255
Conductor Portfolio	201	183	119	51	140	694	64	483	795	309	475	2126	1432
Wood Pole Portfolio	845	761	966	735	560	3867	800	800	800	800	800	4000	133
Street Structure Portfolio	371	86	725	1050	220	2452	260	500	500	500	500	2260	-192
Insulator Portfolio	155	2100	3623	3958	3700	13536	3700	3700	3450	3450	3450	17750	4214
Underground Cable Portolio	0	2.3	0	0	4.7	7	0	0	0	0	7.2	7.2	0.2
Total						**23264.0**						**29292.2**	**6028.2**
Variance %													**26%**

AMPCO submits Hydro One's proposal to replace 26% more assets over the planning period has not been appropriately justified.

Hydro One indicates it uses Expected Service Life (ESL) as a general guideline to inform investment decisions but the primary driver of replacement decisions is always asset condition.[47]

ESL provides an asset population perspective and is defined as the average time duration in years that an asset can be expected to operate under normal system conditions and is determined by considering manufacturer guidelines and Hydro One's historical asset retirement data. Hydro One's view is that assets operating beyond ESL generally have a higher likelihood of failing or being in poor condition.[48]

End of Life (EOL) is defined as the likelihood of failure, or loss of an asset's ability to provide the intended functionality, wherein the failure or loss of functionality would cause unacceptable consequences.

Hydro One claims its asset renewal strategy is to address assets with a high or very high risk condition in order to maintain asset condition and continue to deliver the reliability that was intended.[49]

AMPCO takes no issue with Hydro One's use of ESL as a way to flag assets for assessment and view the transmission system but in the case of transformers (discussed below) the near term investment strategy goes beyond maintaining asset condition, and it appears that ESL is driving asset replacement levels more than asset condition. This is important because assets may be operating beyond ESL but they may not be at EOL. If these assets are being replaced based on ESL or other factors that have not been justified, they are being replaced prematurely.

In evidence, Hydro One provided the percentage of assets by major asset groups that are in high or very high risk condition comparing EB-2016-20160 to EB-2019-0082.

Table 7: Assets at Very High or High Risk

Asset Type	EB-2016-02160 % Assets at High or Very High Risk	EB-2016-02160 #Assets at High or Very High Risk	EB-2019-0082 % Assets at High or Very High Risk	EB-2019-0082 # Assets at High or Very High Risk

[47] HONI_VOL1_20191021 P22
[48] B TSP Section 2.2 P1
[49] HONI_VOL2_20191022 P24

Transformers	15%	108	17%	122
Circuit Breakers	11%	499	9%	460
Protection Systems	27%	3267	27%	3,363
Conductors	9%	2,643	13%	3,680
Wood Poles	12%	4,832	13%	5,630
Underground Cables (km)	4%	11	3%	8

AMPCO has some concerns regarding the change in asset condition data for transformers and conductors which is discussed below as part of AMPCO's submissions on individual capital programs.

Transformers

Hydro One currently has 716 transformers. 17% of transformers are in very high risk or high risk condition[50] compared to 15% in 2016. In EB-2016-0160, 28% of transformers were beyond ESL.[51] Currently, 24.7% of Hydro One's transformer population is beyond ESL.[52]

In the last proceeding there were significant data issues identified by the Auditor General, many of which have been addressed by Hydro One. Of concern in this proceeding is that METSCO reports that for transformers, the average data availability is 65.2% for condition, 46.7% for utilization, and 59.8% for criticality and certain transformers could have incomplete data across multiple categories, for instance, no data about condition or utilization. [53] With numerous data gaps, the degree of confidence that the asset condition reflects true condition may be low. This underscores the importance of having the best data to assess asset degradation to ensure the best decisions are made regarding which transformers to replace.

Hydro One engaged EPRI to assess the condition of its transformers using the PTX analysis program. Results of PTX Analysis of Hydro One's Transformer Fleet found that 80.5% of the asset condition assessments for Hydro One's transmission transformer fleet aligned with EPRI's PTX analysis based on dissolved gas in oil content and oil quality data. For the remaining 19.5% of assessments, the results of which were not well aligned, the majority of the differences are attributed to data issues such as oil cross contamination between tap changer and main tank oil.[54] Hydro One plans to correct the data due to data entry or collection error but will not remedy the condition assessment results that differ from ERPI.

Hydro One indicates that condition remains the primary driver for all asset replacement decisions,[55] yet over the period 2015 to 2018, Hydro One replaced 86 transformers all of which were past their ESL but only 51 or 60% were in very high risk or high risk condition.[56] Of the 45 total transformers replaced in 2017 and 2018, just over half (24) were in very high risk or high risk condition. The balance of the

[50] B TSP Section 2.2 P3
[51] EB-2016-0160 B1-2-6 P3
[52]
[53] CME-24
[54] B-1-1 TSP Section 1.4 P8
[55] B-1-1 TSP Section 2.1 P28
[56] AMPCO #28 Attachment #1

transformer replacements were beyond ESL but would therefore have been in very low, low or medium risk condition based on the results of AMPCO IR#28 which asked for the number of assets by asset type replaced in the years 2015 to 2018 that were beyond ESL, in very high risk or high risk condition or both.[57] [58]

Hydro One provided a table of the transformers tested by ERPI which shows the risk taxonomy designation (high risk, risk, fair, etc.) of 93 transformers and whether Hydro One is planning on refurbishing or replacing any part of the transformer during the plan period based on Dissolved Gas Analysis. Of the 93, only 44 (10 in very high risk and 34 in high risk)[59] or 47% of the transformers are in deteriorated condition meaning Hydro One plans to replace more, 56% over the period 2020 to 2024, that are in either very low, low or fair condition. This raises concerns if Hydro One is replacing the right transformers and if transformer condition trends can be relied upon.

Further, the percentage of delivery point interruptions from transformers has improved. Between 2011 to 2015, the percentage of equipment interruptions from transformers was 9%[60] compared to 13%[61] over the 2008 to 2017 period, with improvements over the 2015 to 2017 period. [62]

Hydro One proposes to spend $293.6 million on transformers replacements over the test period to replace 51 transformers. AMPCO submits this funding has not been appropriately justified.

Protection Systems

Hydro One currently has 12,506 protection systems in-service.

Asset condition has not changed. Currently, 27% of the protection system population are in very high or high risk condition which is consistent with EB-2016-0160.[63]

The percentage of delivery point interruptions from protection equipment has improved in recent years. Between 2011 to 2015, the percentage of equipment interruptions from protection equipment was 6%[64] compared to 17%[65] over the 2008 to 2017 period.

Over the 2017 to 2018 period, Hydro One replaced 1,076 protection systems. Even though asset condition has remained constant at 27% and Hydro One's asset renewal strategy is to maintain asset condition, Hydro One proposes to increase the replacement rate over the 2020 to 2022 period to 1,338 protection systems, 88 more.[66]

[57] AMPCO #28 Attachment #1
[58] In JT1.24, Hydro One updated the number of transformer asset quantities replaced in each year resulting in a total of 85 transformers replaced which does not impact AMPCO's overall conclusion

[59] CME IR#19 Attachment#1
[60] B-1-1 Section 1.3 Attachment #1 Appendix 1.3 P8
[61] B TSP Section 2.2 P4
[62] B TSP Section 2.2 P11
[63] JT1.21
[64] B-1-1 Section 1.3 Attachment #1 Appendix 1.3 P8
[65] B TSP Section 2.2 P4
[66] JT1.24

Given that asset condition has been maintained at 27% for protection systems and delivery point interruptions from protection systems has improved, AMPCO submits the forecast number of replacements over the test period should be maintained at the historical replacement level.

Hydro One spent $160.6 million on protection system replacements over the period 2016 to 2018 and proposes to spend $198.9 million over the test period. AMPCO submits the historical finding should be maintained resulting in a capital reduction of $38 million.

Conductors

Hydro One currently has 29,107 circuit km of conductors.[67] Hydro One's evidence is that 13% of conductors are in high risk condition compared to 9% in EB-2016-0160.

Hydro One replaced 353 circuit km of conductors over the 2016 to 2018 period. Hydro One now proposes to replace 1,342 circuit km over the 2020 to 2022 period, close to four times more.[68]

AMPCO submits this accelerated pace is excessive, unwarranted and not affordable for customers. The evidence does not justify this level of increase.

First, the overhead conductor forced outage frequency and the overhead conductor forced outage duration are on average trending down over the period 2008 to 2017.[69] Plus, following a study undertaken by the Electric Power Research Institute (ERPI) Hydro One changed its ESL for its ACSR conductor type (98% of fleet) from 70 years to 90 years.[70] Conductors are lasting longer. As a result, the percentage of conductors beyond ESL has changed from 19% in EB-2016-0160[71] to 5% in the current application.[72]

With respect to condition data, AMPCO notes that in EB-2016-0160 9,104 km of conductors required assessment. In EB-2019-0082, the km to be assessed has been reduced to 6,061 km. It's likely that the increase in the percentage of high and very high risk condition is due to unassessed conductors falling into this category, rather than an overall deterioration of the asset class.

In considering the above, AMPCO submits that the pace of conductor renewal should be continued at historical levels. Hydro One proposes to spend $553.9 million on conductors over the test period compared to $156.5 million for the years 2016 to 2018.[73] AMPCO submits a $397.4 million capital reduction is appropriate.

Wood Poles (SR-21)

Hydro One has 42,000 wood poles on its transmission system. 13% of wood poles are in high risk condition compared to 12% in EB-2016-0160.[74]

[67] B TSP Section 2.2 Section 2.2 P55
[68] JT1.24
[69] HONI_VOL2_20191022 P18
[70] B TSP Section 2.2 Section 2.2 P54
[71] EB-2016-0160 B1-2-4 P12
[72] B TSP Section 2.2 P54
[73] K3.4 P9
[74] JT1.21

Over the 2016 to 2018 period, Hydro One replaced 2,462 wood poles which is slightly less than the 2,400 wood pole replacements planned over the test period. [75] AMPCO takes no issue with the forecast pace of renewal.

Wood Pole Portfolio									
# Replacements	761	966	735	2462	800	800	800	2400	
% of Fleet	1.8%	2.3%	1.8%		1.9%	1.9%	1.9%		
Capital ($M)	42.8	41.2	35.3	**119.3**	51.0	52.0	53.0	**156.1**	**36.8**

Hydro One proposes to spend $156.1 million over the test period to replace 2,400 wood poles which is $36.8 million more than the previous period (2016 to 2018) where Hydro One replaced more poles (2,462) for less money ($119.3 million).

ISD SR-21 indicates the following factors impact capital expenditures: structure type, pole size and location of the pole Hydro One explains that part of the increase in 2020 to 2022 is due to wood pools in critical areas where the cost to get to those circuits, is actually more expensive on a unit cost basis.[76]

Over the 2020 to 2024 period, Hydro One forecasts to spend on average $17.5 million more per year to replace less poles. ISD SR-21 does not specifically address the issue of more funding needed due to replace the same number of poles due to critical areas.

	Wood Pole Structure Replacements	Actual	Actual	Actual	Actual	Forecast	Total	Annual
ISD	**Investment Name $ Million**	**2015**	**2016**	**2017**	**2018**	**2019**	**2015-19**	**Average**
SR-21	Wood Pole Structure Replacements	20.8	43.8	42.7	35.3	34.8	177.4	35.5
		Forecast	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Total**	
SR-21	Wood Pole Structure Replacements	**2020**	**2021**	**2022**	**2023**	**2024**	**2020-2024**	
		51.0	52.0	53.0	54.1	55.2	265.3	53.1

AMPCO submits there is no detailed evidence to account for this substantial increase to replace fewer poles. AMPCO submits wood pole replacements should be tracked as a unit cost metric on the scorecard.

Legacy SONET System Replacement (SR-11)

The Legacy SONET Systems Replacement project involves the replacement of Hydro One's Synchronous Optical Network ("SONET") system with a new packet-based technology.

The main risk to the Project is finding a solution that satisfies Hydro One's functional and economical requirements. The developmental phase of the Project will find a technology that will fulfill these requirements by the end of 2019 before pursuing implementation.[77]

AMPCO questioned the status of Hydro One finding a technology by the end of 2019 in order to be able to pursue implementation.[78] In response to undertaking J3.8, Hydro One indicates the SONET system replacement project will continue in the development and estimation phase in 2020 and then in 2021, project execution will begin.

[75] K3.4 P9
[76] HONI_VOL3_20191024 P140
[77] SR-11 P9
[78] HONI_VOL3_20191024 P161-162

Without confirmation that Hydro One has found a technology that will fulfill the requirements of this project, AMPCO questions whether the implementation phase will proceed as planned. Hydro One proposes funding of $57.7 million over the test period: $4.1 million, $26 million and $27.6 million in the years 2020, 2021 and 2022 respectively. In AMPCO's view there is a real possibility that the budget amounts won't be spent in the year planned. As such, AMPCO submits the spending timeframe should be extended out.

AMPCO proposes a $20 million capital reduction over the test period.

Tower Foundation Assess/Clean/Coat Program (SR-23)

The Tower Foundations Assess/Clean/Coat Program involves coating and/or repairing steel structure tower foundations that have deteriorated.

Hydro One proposes to increase the spending on Tower Foundation Coating Program from $27.8 million (2015 to 2019) to $103.9 million, almost four times more. AMPCO does not support this extreme increase in spending. Based on AMPCO's review of the evidence, AMPCO does not see a significant change in circumstances to warrant this increase in spending.

	Tower Foundation	Actual	Actual	Actual	Actual	Forecast	Total	Annual
ISD	Investment Name $ Million	2015	2016	2017	2018	2019	2015-19	Average
SR-23	Tower Foundation Assess/Clean/Coat Program	1.4	1.6	7.0	4.7	13.1	27.8	6
		Forecast	Forecast	Forecast	Forecast	Forecast	Total	
SR-23	Tower Foundation Assess/Clean/Coat Program	2020	2021	2022	2023	2024	2020-2024	
		11.8	22.3	22.8	23.3	23.7	103.9	21

In EB-2016-0160, Hydro One forecast to assess, coat and refurbish 700 grillage foundations in both 2017 and 2018 at a cost of $15.6 million. Hydro One spent less ($11.7 million)[79].

Hydro One is now proposing to assess, clean, and coat 820 grillage foundations in 2020 and 1600 foundations per year from 2021-2024 for a total of 7,220.

At the oral hearing AMPCO inquired about the drivers for the close to 400% increase in spending on this Tower Foundation Coating program. Hydro One indicated the predominant factor for the change is the way they classify them, they're not specifying them as grillage foundations.[80] This is contrary to ISD-23 which states that the Program focuses on steel grillage footings.[81] Hydro One plans to prioritize the foundations based on line voltage, type of structures and geographic location of the lines.[82] Hydro One indicates the need of the Program is asset condition driven.[83] Hydro One does not present a change in strategy, asset focus, or asset condition that would drive this increase in spending.

[79] AMPCO IR#37
[80] HONI_VOL3_20191024 P164
[81] SR-23 P1
[82] SR-23 P5
[83] SR-23 P1

AMPCO does not support this accelerated pace of Tower Foundation Coating. AMPCO proposes a spending level consistent with 2017 and 2018 spending of $6 million per year. This results in a capital reduction over the test period of $39 million.[84]

Transmission Line Shieldwire Replacement (SR-24)

Hydro One has approximately 34,600 km of shieldwire that is used to provide lightning protection and grounding continuity for the transmission line.

In the last application, Hydro One planned to replace 150 km of shieldwire in 2017 and 2018 at a cost of $14.1 million, reflecting an average replacement rate of about 0.4% over each test year. At that time, Hydro One indicated 480 km of galvanized shieldwire is at end of life.[85]

In this application, Hydro One proposes to replace double the amount of shieldwire, increasing the average replacement rate to 0.8% or 290 km in each of the years 2020 to 2022[86], at a cost of $37.8 million.

Overall, Hydro One proposes to spend two times more in 2020 to 2024 compared to the previous 5 years ($64.2 million vs. $30.8 million).[87]

	Transmission Line Shieldwire Replacement	Actual	Actual	Actual	Actual	Forecast	Total	Annual
ISD	**Investment Name $ Million**	**2015**	**2016**	**2017**	**2018**	**2019**	**2015-19**	**Average**
SR-24	Transmission Line Shieldwire Replacement	4.8	1.4	5.4	9.3	9.9	30.8	6.2
		Forecast	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Total**	
		2020	**2021**	**2022**	**2023**	**2024**	**2020-2024**	
SR-24	Transmission Line Shieldwire Replacement	12.3	12.6	12.8	13.1	13.4	64.2	12.8

The current quantity of shieldwire at EOL was not provided in this application and Hydro One has not provided evidence to explain the need to change the asset strategy and replace double the km in shieldwire over the test period. AMPCO submits funding for shieldwire replacement should be maintained at historical levels. AMPCO submits a $19 capital reduction is appropriate.

<u>Other Projects with Execution Risks that may impact budget spend</u>

- ISD GP 02 – Grid Control Network Sustainment

  Over the 2020 to 2024 period, Hydro One forecasts to spend $40.1 million on Grid Control Network Sustainment compared to $17.6 million over the previous 5 years (2015 to 2019).

  Hydro One indicates there is a possibility it may not obtain the project outages necessary for field commissioning and cancellations may arise due to higher priority projects or unforeseen system contingencies.

  A review of 2015 to 2018 plan versus actuals shows that Hydro One spent 75% of the planned

[84] $57 million - $18 million = $39 million
[85] EB-2016-0160 B1-03-11 Reference #: S78 P1
[86] JT1.13
[87] AMPCO IR#37 & AMPCO IR#38

budget.[88] [89]

Hydro One is requesting $20.5 million over the 3-year test period. AMPCO submits funding should be approved for 75% of the budget to account for cancellations and other risks. This results in a capital budget reduction of $5 million.

- ISD GP-03 – Network Management System Capital Sustainment

  Hydro One proposes to spend $38.4 million over the years 2020 to 2024 on Network Management System Capital Sustainment. In 2015, Hydro One spent on a Network Management System upgrade. The existing Network Management System is at end of life in 2022.

  Hydro One's forecast spend over the 2020 to 2022 period is $30.2 million.

  To reduce project execution risk, Hydro One plans to wait for another utility to first implement the new product and review the success with that utility to learn from their implementation experience. This approach leverages Hydro One's 2015 project experience to avoid product maturity risk by avoiding the installation of a product that is not yet in production release status.[90]

  It's not clear what plan is in place to ensure another utility will implement and test the project in time. AMPCO submits 2022 and 2022 costs may be pushed out farther. AMPCO recommends a 25% capital reduction or $8 million to account for delays.

- ISD GP-10 Facility Accommodation & Improvements Service Centres & Admin

  This project involves improvements or additions to existing facilities and/or the construction of new facilities as needed. Hydro One proposes to spend $46.2 million over the planning period (2020 to 2024) compared to $23.9 million over the previous 5 years (2015 to 2019).[91]

  Hydro One indicates development of new facilities will in many instances depend on the availability of suitable sites and ability to obtain municipal approvals.[92] AMPCO submits timelines for development and regulatory work are more often than not extended resulting in schedule delays.

  Over the 2015 to 2018 period, Hydro One forecast to spend $28.8 million on facility improvements/construction and spent 33% less ($16.7 million).

AMPCO does not believe there is cost certainty over the test period given the nature of the work, regulatory timelines and historical underspending. Hydro One plans to spend $21.2 million over the test period (2020 to 2022). AMPCO recommends a 33% decrease ($7 million) capital reduction related to Facility Accommodation & Improvements Service Centres & Admin work.

[88] AMPCO IR#38
[89] $10.4 actual/$13.8 planned = 75%
[90] ISD GP-03 P8
[91] AMPCO IR#37 & AMPCO IR#38
[92] ISD GP-10 P8

AMPCO's Position

AMPCO submits the above proposed capital reductions support its position that Hydro One has not the justified the large increase in capital and a slower pace of investment consistent with historical spending provides an appropriate pacing of capital expenditures that achieves a proper balance of need and rate impacts.

THIRD PARTY REVIEWS

The OEB required Hydro One to complete an independent third-party assessment of its TSP and to file this assessment with its next transmission rate application. This assessment should include Hydro One's asset condition assessment and capital investment planning processes.[93]"

Hydro One engaged Metsco Energy Solutions to review its asset condition assessment process and the Boston Consulting Group to review its capital investment planning process.

Boston Consulting Group (BCG) found that Hydro One has implemented a consistent and thorough capital investment planning process that meets or exceeds expectations for an above average utility planning process.

AMPCO supports SEC's submissions that the third-party review provided by BCG was far from independent and does not fulfill the OEB's directive and as a result the OEB should give little weight to BCG's assessment of Hydro One's capital investment planning process. As part of its next filing, the OEB should require Hydro One to file a truly independent assessment.

PRODUCTIVITY

Hydro One commits to deliver on $704 million in Tier 1 productivity savings over the 5-year planning term[94], of which $370 million is expected over the 3-year test period.[95] Hydro One has embedded these costs into the cost forecasts.[96] Hydro One Transmission achieved $97.4 million in savings in the 2016-2018 period.[97]

[93] EB-2016-0160 Decision P117/18
[94] B-1-1 TSP Section 1.6 P7
[95] A-3-1 P21
[96] A-3-1 P20
[97] CCC-11

Table 1 - Productivity Savings Forecast Summary ($Millions)

$mm	2020	2021	2022	2023	2024	Total
Operations	47	52	53	53	54	259
Progressive Operations (Defined Capital)	6	12	12	10	10	49
Corporate	12	11	9	7	6	45
Capital Total	**$65**	**$74**	**$73**	**$70**	**$70**	**$353**
Operations	9	10	9	9	9	45
Information Technology	6	9	10	10	10	44
Corporate	7	6	5	4	3	25
OM&A Total	**$22**	**$25**	**$23**	**$23**	**$22**	**$114**
Total Defined	**$87**	**$99**	**$97**	**$93**	**$92**	**$468**
Progressive Operations (Undefined Capital)	11	27	49	68	81	237
Grand Total	**$98**	**$126**	**$146**	**$161**	**$173**	**$704**
Progressive Productivity						
Progressive Operations (Defined Capital)	6	12	12	10	10	49
Progressive Operations (Undefined Capital)	11	27	49	68	81	237
Progressive Productivity Placeholder	17	39	61	78	91	286

The $370 million productivity savings[98] are made up of defined capital and OM&A initiatives ($253 million) and progressive productivity initiatives for capital ($117).

Progressive productivity reflects a commitment from Hydro One to find further efficiencies over the test period. AMPCO submits only progressive productivity initiatives are incremental. The rest of the savings are not and reflect the impact of prior productivity initiatives that persist into the test period and should not be accepted by the OEB.

AMPCO submits the OEB should reduce Hydro One's 2020 to 2022 capital budget by $117 million of progressive productivity savings to provide a true benefit to customers.

PERFORMANCE METRICS

The final stage of Hydro One's Investment Planning Process is Execution and Performance Management.

Hydro One indicates it continuously compares actual investment costs to and accomplishments to the proposed investment plan. Variances from plan are identified and managed through a variance and redirection process.[99]

[98] $98 M + $126 M +$146 M = $370 M
[99] B-1-1 TSP Section 2.1 P45-47

To track Asset and Project Management, Hydro One proposes the following measures on the scorecard.

- Transmission System Plan Implementation Progress
- CapEx as % of Budget
- OM&A Program Accomplishment (composite index)
- Capital Program Accomplishment (composite index)

In AMPCO's view, Asset and Project Management metrics should be expanded to include project control metrics. Through interrogatories[100] and questions at the Technical Conference, AMPCO tried to get a sense of how Hydro One tracks variances in cost, schedule and scope at the project level and portfolio level and the thresholds used. In response to JT1.16, Hydro One provided refined cost and schedule metrics that Hydro One uses to track, cost, schedule and scope.

Project Level Metrics:

- On-time: Project In-Service Date Forecast versus Current Approved
- On-time: Project In-Service Date Forecast versus Original Approved
- On-budget: Gross Project Total Forecast versus Current Approved
- On-budget: Gross Project Total Forecast versus Original Approved

Portfolio Level Metrics:

- In-Service Additions: Annual Forecast versus Budget
- Capital Expenditures: Annual Forecast versus Budget
- Portfolio Risk: Number of Projects Forecasting a Major Variance (+/- 10%) to Budget
- Portfolio Risk: Value of Projects Forecasting a Major Variance (+/- 10%) to Budget
- Project Cost Performance: Number of Projects complete within AACE Estimate Class Range documented in original approval
- Project Cost Performance: Value of Projects complete within AACE Estimate Class Range documented in original approval
- Cost Variance Distribution: Portion of Project Portfolio Delivered On Budget, Over Budget, Under Budget
- Cost Variance Distribution: Standard Deviation of Project Cost Performance represented as a percentage of original Budgets
- Schedule Variance Distribution: Portion of Project Portfolio Delivered On-time, Late, Early
- Schedule Variance Distribution: Standard Deviation of Schedule Variance in Days

Hydro One's draft scorecard In EB-2016-0160 included Preliminary Tier 2 metrics that addressed Project Management: % of budgeted work completed on or ahead of schedule and Actual costs versus estimated costs for completed capital projects (%).

[100] AMPCO IR#23

The TCB study recommended that Hydro One reinstitute its earned value analysis to measure project progress, establish performance metrics that use the forecasted monthly cash flow and earned value analysis.[101]

Hydro One's evidence in this proceeding is that in the past it performed earned value analysis only on very large, high profile projects. The cost of implementing earned value analysis across the broader portfolio was neither practical nor prudent. Hydro One is now in the process of examining the level of cost and schedule control rigor to be used across the portfolio and is considering a tiered approach which would involve greater cost and schedule controls being implemented on projects of higher value and complexity and lesser controls being implemented on smaller, simpler projects.

AMPCO submits that OEB should require Hydro One to have Portfolio level project management metrics on the scorecard such as Portfolio Risk: Number of Projects Forecasting a Major Variance and Value of Projects Forecasting a Major Variance in terms of schedule, cost and scope. AMPCO submits it may be helpful for Hydro One, Board Staff and Intervenors to work together to develop these metrics.

Reliability Metrics

Reducing the frequency of power interruptions is more important than reducing the duration. Most important is reducing the number of day-to-day interruptions.[102]

Given the importance of frequency of interruptions, AMPCO submits the OEB should require an interruption frequency metric on the scorecard.

[101] CME-3
[102] HONI_VOL1_20191021 P20

DEPRECIATION EXPENSE

Hydro One's depreciation expense for 2020 to 2022 is shown in Table 5 below.[103]

Table 5: Transmission Depreciation Expense

	2020	2021	2022	Total
Depreciation $ M	474.5	503.4	528.9	1,506.80

AMPCO has concerns regarding the variances in Hydro One's actual depreciation amounts compared to OEB approved amounts.

A comparison of 2015 to 2018 OEB approved depreciation amounts in rates compared to actuals shows that over the 2015 to 2018 period, Hydro One's actual depreciation expenses are $114.9 million less than the OEB approved amounts.[104] This is a windfall for Hydro One.

Description	2015			2016			2017			2018		
	OEB Approved	Historical	Variance	OEB Approved	Historical	Variance	OEB Approved	Historical	Variance	OEB Approved	Historical	Variance
Depreciation on Fixed Assets	349.2	339.0	(10.2)	364.1	350.8	(13.3)	381.3	370.6	(10.7)	402.0	387.3	(14.7)
Less: Capitalized Depreciation	(6.4)	(9.0)	(2.6)	(6.7)	(12.0)	(5.3)	(12.1)	(12.6)	(0.5)	(12.8)	(13.0)	(0.2)
Asset Removal Costs	38.1	29.0	(9.1)	33.7	34.6	0.9	53.4	38.3	(15.1)	69.2	37.7	(31.5)
Losses/ (Gains) on asset disposition	-	-	-	-	(0.1)	(0.1)	-	(2.0)	(2.0)	-	(0.5)	(0.5)
Total	**380.9**	**359.0**	**(21.9)**	**391.1**	**373.3**	**(17.8)**	**422.6**	**394.3**	**(28.3)**	**458.4**	**411.5**	**(46.9)**

14 **figures in millions*

For 2017 to 2018, the variance was $75.2 million. Over the same period, in-service capital additions were within +1% of forecast (+$4.5 million) in 2017 and -2% (-$18 million) in 2018.[105]

Hydro One explains the reason for the large variance in depreciation compared to in-service additions as follows:[106]

[103] J8.5 P3
[104] AMPCO IR#87
[105] C-2-1 P2 updated 2019-06-19
[106] HONI_VOL5_20191028 P86

MR. CHHELAVDA: So we will talk about the depreciation on fixed assets. It is a function of the mix of assets.

So when we planned the work, you had a certain expectation that you would have certain assets placed in-service and then throughout the redirection process, it was deemed that, you know, work would be redirected and we would focus on other areas.

So the primary driver is there were projects that were in certain US of A accounts that have a higher depreciation that were either scaled back or not being proceeded with, and we proceeded with projects that were on the transmission side that have a lower depreciation rate. So that is causing the difference in depreciation rates.

It is counterintuitive. When you see the in-service numbers being fairly tight, you expect the depreciation numbers to be close. But it is the mix of assets.

Hydro One indicates the methodology used to forecast depreciation rates is consistent with the methodology used to calculate actuals.

It's unclear to AMPCO what is driving the change in asset mix and specifically which projects with higher depreciation rates were scaled back and which projects with lower depreciation rates went forward over a 4-year period, but the OEB needs to be aware of this issue.

Over the 2015 to 2018 period, the total variance is 7%.[107] The OEB may wish to adjust Hydro One's $1,506.8 million forecast depreciation expense by 7% to account for this average historical variance.

As shown in the table below this would result in a decrease in the deprecation expense of $33 million in 2020, $35 million in 2021 and $36.8 million in 2022 for a total reduction of $104.7 million over the test period.

[107] $1,538.1 M Actuals/$1653 M Forecast = 7% Variance

	2020	2021	2022	Total
Depreciation $ M	474.5	503.4	528.9	1,506.80
7% adjustment	441.5	468.4	492.1	1,402.06
Reduction	**33.0**	**35.0**	**36.8**	**104.7**

OPERATIONS, MAINTENANCE & ADMINISTRATION (OM&A)

Hydro One seeks approval of a Revenue Requirement of $374.1 million in 2020. This is a 4.6% increase relative to 2019.

Board Staff filed its argument on December 11, 2019. AMPCO has reviewed Board Staff's argument, specifically its submissions regarding OM&A costs and compensation and supports those submissions. AMPCO agrees a revised 2020 OM&A based on the 2019 forecast of $356.5 million plus inflation is appropriate for the following reasons:

- Hydro One has not provided sufficient OM&A savings associated with newer capital;
- In 2016 and 2017, Hydro One's actual OM&A levels were lower than OEB Approved amounts by 6.6% and 3.2%respectively, which demonstrates that Hydro One may have overstated the OM&A budget for 2020;
- The $214.2 million requested OM&A Sustainment budget may be too high, as Hydro One has not sufficiently supported its argument that the deferment of maintenance schedules that occurred in 2019 cannot be carried forward;
- The overall level of Hydro One Transmission compensation of $680 million (of which 26% is allocated to OM&A) appears to be too high;
- OM&A productivity savings of $22 million embedded in the 2020 OM&A budget may not be genuine savings.
- The 2019 OM&A budget better reflects a normal level of spending for Hydro One.

COMPENSATION

Hydro One is requesting a 2020 transmission compensation level of $680 million of which 26% is allocated to Hydro One Transmission OM&A and 74% to capital. Hydro One's compensation costs remain above market median.

AMPCO supports the compensation reductions in OM&A and capital put forward by Board Staff.

Vehicle Utilization Rate

Hydro One provided information regarding its Vehicle Utilization Rate that shows that over the period 2015 to 2018, Hydro One's vehicle operating costs have increased from $133.1 million in 2015 to $135.7 million in 2018. Over the same period vehicle utilization hours have decreased from 6.2 million hours to 5.7 million hours. This results in a 12% increase in the Vehicle Utilization Rate from $21.4 in 2015 to $24 in 2018.[108]

in $ millions, u.o.s.	2015	2016	2017	2018	
Operating Cost	133.1	133.2	133.7	135.7	Ⓐ
Utilization, *in millions of hours*	6.2	6.2	5.8	5.7	Ⓑ
Utilization Rate	**21.4**	**21.3**	**23.0**	**24.0**	Ⓐ÷Ⓑ

Based on these results, some assets may be underutilized and there may be opportunities to reallocate vehicles to areas of need to improve utilization or retire underutilized vehicles. This is important because Hydro One spends a significant portion of its annual budget on vehicles.

AMPCO submits Hydro One should be looking for ways to reverse this trend to ensure Hydro One is operating efficiently and maintaining the optimal level of fleet complement. AMPCO submits Hydro One Vehicle Utilization Rate is a candidate for the scorecard with a view to improving vehicle costs and utilization over time.

Resource Utilization Rate

With respect to billable hours for the majority of employee in the Transmission and Stations organization, Hydro One provided the following data which shows that its Billable Hours Ratio (Billable Hours charged to work programs/Total Hours) is at 84% in 2015 declining slightly to 83% in 2018.[109]

(%)	2015	2016	2017	2018
Billable Hours Ratio	84	84	84	83
Non-Billable Hours Ratio	16	16	16	17
Total Hours	**100**	**100**	**100**	**100**

AMPCO submits the Resource Utilization Rate or Billable Hours Ratio is a candidate for the scorecard with a view to reducing cost and improving performance over time.

[108] JT2.19
[109] JT2.22

Appendix A – Customer comments from 2017 customer survey regarding costs.
(B-1-1 Section 1.3 Attachment #1)

- reliable supply of electricity at a reasonable cost[1] [2]
- Price or cost - what is the value for money.[3]
- Costs; You will say its inferred in productivity and others. This is the reason we are in a mess.
- Balanced investments so rate increases are aligned with inflation. Electricity in Ontario is extremely expensive and has put Ontario business at a significant disadvantage. While investments are necessary so are ensuring competitive costs.[4]
- Ontario residents are already suffering high energy costs.[5]
- Transmission costs are already too high. More needs to be done to ensure the investment $$ are being spent wisely.[6]
- In response to an open-ended question, LDC survey participants identified costs and local support as the primary areas where they feel Hydro One can do more to help them meet the needs of their customers.[7]
- Reduce operating, maintenance and administrative costs as a whole and pass the savings onto the customer base.[8]
- Costs to businesses are kept in control. Evidence that cost control at Hydro One is in place and effective.[9]
- Transmission costs are already too high. More needs to be done to ensure the investment $$ are being spent wisely.[10]
- I do not agree with Hydro One's premise that there should be increases in Hydro rates amongst all the options. Like any other business; Hydro One needs to improve how it runs its business; how it seeks innovative answers; how it can deliver the same or better service for less money. I fundamentally disagree with all the options above; Hydro One has to stop acting in a way that it think it is entitled to more money or else the lights go out; Hydro One needs to start thinking like all other businesses; get lean; lower costs; meet customer expectations. The people and businesses
- of Ontario shouldn't have to keep paying for Hydro One's excesses. Rates should be kept constant; and the service should improve for that cost moving forward.[11]

[1] B-1-1 Section 1.3 Attachment #1 P16
[2] P70
[3] P25
[4] P35
[5] P36
[6] P49
[7] P54
[8] 55
[9] P70
[10] P86
[11] P87

Response to Question: Is there anything in particular you feel Hydro One can do better?[12]

- Lower costs[13]

Response to Question: Do you have any specific comments or suggestions regarding any of the seven outcomes that you just rated or any additional outcomes you added?[14]

- Cost reductions should be a top priority and given serious consideration and not just lip service.[15]
- The main outcome should be to provide reliable power at the best possible cost which should be benchmarked to a world standard to remain competitive and to make it so people don't have to choose between eating and having access to power. [16]
- Its unfortunate the state of power in Ontario. Hydro One should reflect on their performance vs other provinces and states. What are we doing wrong when it costs so much to produce power vs other areas?[17]
- Hydro One needs to start thinking like all other businesses; get lean; lower costs; meet customer expectations. The people and businesses of Ontario shouldn't have to keep paying for Hydro One's excesses. Rates should be kept constant; and the service should improve for that cost moving forward.[18]
- Some of these question miss the mark.I don't care about productivity; I care about costs going down.[19]

Response to Question: Why do you prefer the scenario you chose over the other two scenarios?[20]

- Hydro is too expensive.

- As a customer ourselves managing the rate increases so infrastructure investments are financed at a reasonable pace i.e. inflation plus 2%.

- Balanced investments so rate increases are aligned with inflation. Electricity in Ontario is extremely expensive and has put Ontario business at a significant disadvantage. While investments are necessary so are ensuring competitive costs.

With respect to Point 3 - "Scenario A" preferred by those who want to limit rate increases

- Clever OEB type presentation Ontario in very fragile economic condition Just focus on cutting cost There is not as you imply direct correlation between cost reduction and reliability.[21]
- Scenario A seems the most favourable at this time; companies are very cost focussed and margins are currently very tight.

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[12] P67
[13] P67
[14] [14] P27
[15] P27
[16] P27
[17] P36
[18] P50
[19] P74
[20] P36
[21] P48

- Low rates a priority and managed risks - information is imperfect and so the best investment is to get better data/information while you have the time to drive better investment outcomes while living within a cost affordability index. Are you getting the right bang for your investment today? That data was not made available - can you assume you will get more for the money you are investing?
- Keep increases at inflation.
- You should manage your business to be at or below the annual Canadian index price increase and still be reliable. Actual rates are already very high. We pay anywhere between $120-150/MW which is too high.
- I recognize HONI has very difficult choices to make. However, it is very difficult to support a transmission rate increase that is greater than 1.5 times CPI[22]

Response to Question: Are there any outcomes we missed?

- COST COST
- Costs; You will say its inferred in productivity and others. This is the reason we are in a mess.[23]

Response to Question: Was there any content missing that you would have liked to have seen included?[24]

- Yes - already told you your current performance on asset plans was missing, your risk management plans were missing, your productivity improvement plan to show what you get for the $ invested and how much more is expected so that I could "trade" off appropriately[25]
- Cost reduction; show customers what you're doing to save money and find efficiency.
- More detailed breakdown of cost
- Cost reduction; show customers what you're doing to save money and find efficiency.
- I simply don't agree with some conclusions and feel the analysis was skewed towards the higher investment options.
- It would be good to know what Hydro One is doing to improve its own efficiency in order to free up funds to cover some of the investments
- A breakdown of the "key assets" where the major investments are required[26]

[22] P48
[23] P72
[24] P90
[25] P90
[26] P90