Compendium

Association of Power Producers of Ontario

Witness Panel 4

Hydro One 2020-2022
Transmission Rates Application

EB-2019-0082

INDEX

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

Ontario

EB-2012-0031

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 an order or orders approving a transmission revenue requirement and rates and other charges for the transmission of electricity for 2013 and 2014.

BEFORE: Paula Conboy
Presiding Member

Cynthia Chaplin
Vice Chair and Member

Emad Elsayed
Member

DECISION AND ORDER
2013 EXPORT TRANSMISSION SERVICE RATES
June 6, 2013

Hydro One Networks Inc. ("Hydro One") filed an application with the Ontario Energy Board (the "Board") on May 28, 2012. The application was filed under section 78 of the *Ontario Energy Board Act, 1998*, c.15, Schedule B, seeking approval for changes to its 2013 and 2014 transmission revenue requirement and for changes to the provincial uniform transmission rates charged for electricity transmission, to be effective January 1, 2013 and January 1, 2014.

A Settlement Conference was held in which parties achieved settlement on all but one issue, namely Issue #23 from the approved Issues List: "What is the appropriate level for Export Transmission Rates in Ontario?" Export Transmission Service ("ETS") rates are charged to customers using the transmission system to export and wheel-through transactions at the point of interconnection with neighbouring markets. The Independent Electricity System Operator ("IESO") collects and remits the ETS revenue on a monthly basis to Hydro One as a revenue offset used to reduce transmission rates paid by domestic customers.

The Settlement Proposal was approved by the Board in an oral decision on November 8, 2012. On December 7, 2012 the Board issued a Decision on Interim Rates and Procedural Order #10, declaring Hydro One's current ETS rate of $2.00/MWh final as of January 1, 2013 until such time as the Board makes its decision in this proceeding.

The Board issued a rate order on December 20, 2012, approving the Ontario Uniform Transmission Rates, effective January 1, 2013.

Background

In 1999, when Ontario's electricity market opened, the Board set an ETS rate of $1.00/MWh as a "placeholder" with the acknowledgment that the rate was "not the product of an objective, principled or pragmatic study."[1]

The Board next considered changes to the ETS rate in 2010 as part of its decision concerning Hydro One's 2011 and 2012 Transmission Rates (EB-2010-0002) and increased the rate to $2.00/MWh. However, the Board concluded that, "…the most pressing requirement is that a genuinely comprehensive study be undertaken to identify a range of proposed rates and the pros and cons associated with each proposed rate in time for the next transmission rate application."[2] The Board directed the IESO to undertake this comprehensive study.

The IESO engaged Charles River Associates ("CRA") to perform the study which was then filed as part of the evidence in this proceeding ("CRA Study").

CRA, with input from stakeholders, studied five ETS rate options:

[1] RP-2009-0044, page 66
[2] EB-2010-0002, page 75

1. the status quo of $2.00/MWh;
2. unilateral elimination (i.e., a $0.00/MWh);
3. an increase to the current Equivalent Average Network Charge ("EANC") of $5.80/MWh;
4. a tiered rate of $5.80/MWh during on-peak hours and $0.00/MWh during off-peak hours; and
5. a tiered rate of $3.50/MWh on-peak and $1.00/MWh off-peak.

CRA reviewed the tariff and structures in neighbouring markets and assessed the proposed rate options against generally accepted rate making principles (consistency, simplicity, fairness and efficiency). CRA also analyzed the impact of each option on Ontario consumers, producers and the Ontario Market as a whole by estimating the impacts on consumer welfare, producer welfare (more commonly referred to throughout the proceeding as "consumer surplus" and "producer surplus") and Intertie Congestion Revenue ("ICR" or "IC Revenue"). In aggregate, CRA indicated that these three elements provide a measure of "total welfare" or "total surplus" to Ontario as a whole. The CRA Study also assessed the impact of each option on the frequency and duration of surplus baseload generation [3]("SBG"). CRA did not attach any weighting or preferences to the criteria or provide a recommendation on the most appropriate ETS rate.

The Association of Power Producers of Ontario ("APPrO") and Hydro Quebec Energy Marketing Inc. ("HQEM") each filed expert evidence in response to the CRA Study.

APPrO retained Navigant Economics ("Navigant") which filed a report outlining the shortcomings of the quantitative analysis component of the CRA Study, some of which Navigant maintained were material. Navigant argued for the lowering or elimination of the ETS rate. APPrO also filed evidence by Mr. Marc-Andre Laurin, Senior Trader at Brookfield Energy Marketing LP. Mr. Laurin's evidence assessed the CRA options from the perspective of "real world" electricity trading. His analysis concluded that given the current state of the wholesale power market in Ontario and in surrounding jurisdictions, any ETS rate higher than $0 would greatly reduce the incentive to export out of Ontario, especially in periods of SBG.

[3] Surplus Baseload Generation occurs when electricity production from baseload facilities (such as nuclear, hydro and wind) is greater than Ontario demand.

HQEM engaged Elenchus Research Associates ("Elenchus") to assess how the ETS rate should be set. Elenchus concluded that it would be inappropriate for the Board to establish an ETS rate in the absence of a proper cost allocation study. Elenchus recommended applying the principle of cost causality to determine the ETS rate and suggested that it could be achieved by creating a separate rate class for exporters.

An expert pre-hearing conference was held on December 12 and 13, 2012. The experts (CRA, Navigant, and Elenchus) subsequently filed a Joint Written Statement with the Board on January 16, 2013.

The experts testified during an oral hearing on February 25 and 26, 2013 as a concurrent witness panel. Mr. Darren Finkbeiner of the IESO was included on the concurrent expert witness panel for the purpose of answering clarification questions regarding the IESO market. Mr. Laurin appeared as a separate witness panel.

The IESO filed its final submission on March 8, 2013. On March 22, 2013, the Board received submissions from HQEM, APPrO, the Association of Major Power Consumers in Ontario ("AMPCO"), the Consumers Council of Canada ("CCC"), Canadian Manufacturers and Exporters ("CME"), Energy Probe, the School Energy Coalition ("SEC"), the Vulnerable Energy Consumers Coalition ("VECC"), the London Property Management Association ("LPMA"), the Power Workers Union ("PWU") and Board staff. The IESO filed its reply submission on April 1, 2013.

Board Findings

The Board has determined that the ETS rate should remain unchanged at $2.00/MWh. In coming to this conclusion, the Board considered the following alternatives:

- Setting the ETS rate to the Equivalent Average Network Charge. This approach was favoured by VECC, SEC and CCC.
- Eliminating the ETS rate. This approach was supported by the IESO, APPrO and the PWU.
- Setting a two-tiered ETS rate, as supported by CME.
- Retaining the $2.00 ETS rate. This approach was supported by Energy Probe, HQEM, LPMA and Board staff.

Each of these alternatives is discussed below.

Should the Equivalent Average Network Charge apply?

In arguing that the ETS rate be set to the same level as domestic transmission (EANC of $5.80/MWh), VECC, SEC and CCC submitted that the service offered to export customers is fundamentally the same as that offered to domestic customers. VECC and SEC raised the "user pay" argument which, from a "fairness" perspective, would require the user of an asset to contribute towards its costs. SEC submitted that the "user pay" principle should apply unless different customer types have different transmission rights (and hence different access to the system) or significant system benefits that warrant another rate-setting approach. CCC supported VECC's submissions.

APPrO and HQEM submitted that export customers are treated differently than domestic customers. In their view, the Ontario transmission system was designed and built to serve domestic load; export customers use only excess capacity and therefore impose no incremental cost. These parties argued that the IESO largely operates the Ontario transmission grid in a way that benefits domestic loads over exports. For example, export customers in Ontario, unlike exporters in other jurisdictions, can be curtailed and are unable to participate in capacity markets of neighbouring jurisdictions. In their view, export service should be viewed as interruptible service when setting appropriate rates.

The Board will not increase the ETS rate to $5.80/MWh for three reasons. First, whether curtailments originate from generation issues or transmission issues, the Board agrees that export service does not receive the same priority access as domestic service. The Board accepts that the market rules treat exporters more as an interruptible load. This difference in treatment related to generation capacity has consequences for the overall service, even if export transmissions rights are technically as firm as domestic transmission rights. As a result, the Board finds that it may be appropriate for the export service to be viewed as a separate class. Second, absent a cost allocation study, the degree to which the differences in service should be reflected in a rate differential is unknown. There is simply no clear evidence in this proceeding as to the costs caused by export customers in Ontario. Third, increasing the ETS rate from $2.00/MWh to the current Equivalent Average Network Charge of $5.80/MWh in one step would represent an unacceptable increase in the rate paid by exporters.

Should the ETS rate be eliminated?

The IESO, PWU and APPrO argued that given the results of the CRA study, the appropriate ETS rate is zero. These parties focussed on the following factors:

- benefits to Ontario consumers, producers and the province as a whole;
- enhanced Ontario market efficiency, including during SBG events; and
- consistency with neighbouring jurisdictions who have zero tariffs.

The Board's conclusion is that there is insufficient evidentiary support for these factors to warrant the elimination of the ETS rate. Each factor is discussed below.

Generally, the CRA study concluded that lower export tariffs lead to higher levels of exports, resulting in higher market prices in Ontario. These changes are largely offset by changes in Global Adjustment payments so that the net impact on consumers' bills and producers' net income is generally small. The main impact on the surplus estimation comes from the level of Inter-Tie Congestion Revenue ("ICR"). These amounts flow to the IESO in the form of congestion rents. There was disagreement amongst the experts, and amongst the parties, as to how the allocation of the producer surplus and ICR should be viewed. The allocation of these amounts to Ontario consumers, either directly or indirectly, impacts which ETS rate option appears to provide the greatest benefit.

For example, while CRA treated net income earned by Ontario Power Generation ("OPG") on its non-prescribed hydroelectric operations as producer surplus, some parties argued that OPG's revenues ultimately flow to Ontario consumers. The factor which has the largest impact on the results is the ICR. The experts differed as to how much of that the ICR benefit flows to customers (versus traders), and how directly (via payments from the IESO). Navigant expert witness, Mr. Hamal, testified that that the ICR should be interpreted as flowing completely to Ontario consumers, and he pointed to recent IESO payouts as support for this interpretation. CRA did not agree, and maintained that some of the ICR would likely flow to traders. Further complicating the issue is the fact that the IESO is undertaking a review in this area, which may subsequently affect the level and distribution of congestions rents, auction revenue, etc.

The IESO submitted that compared to the other options, elimination of the ETS rate would best encourage the efficient operation of the wholesale market, specifically efficiency in the generation, transmission and sale of electricity. This conclusion was

supported by PWU and APPrO. APPrO submitted that other benefits of eliminating the ETS rate are even greater than those quantified in the CRA study.

Those who did not support the elimination of the ETS rate pointed to disagreement among parties on the calculation and allocation of the system benefits. Issues were raised with respect to the treatment of uplift charges, the validity of the assumptions about the Western Climate Initiative, the allocation of the ICR benefits, etc.

The Board agrees that there may be instances when it is appropriate to depart from strict cost causality when setting a rate. One circumstance might be where there will be demonstrable and significant benefits from an alternative approach. However, the benefits would have to be compelling and substantial to justify providing exporters with a service for which they make no contribution to the associated cost. In this case, it is certain that eliminating the ETS rate will raise transmission rates for all other customers, however small that increase may be. Balanced against this are uncertain benefits flowing from a more efficient generation market. There is further uncertainty as to the distribution of those benefits amongst the various parts of the market. It is therefore highly uncertain whether the customers bearing the increased transmission costs will receive benefits of a similar magnitude.

With respect to the impact on SBG, the CRA study found that none of the tariff options would materially affect the volume of exports during SBG periods. However, APPrO argued that increased exports resulting from the elimination of the ETS rate would help reduce the incidence of SBG, and the resulting costs of managing SBG. The PWU made similar submissions.

All parties agreed that there are non-price factors that limit the ability of marketers to sell outside the province to take advantage of the price separations during SBG periods. The Board notes that IESO is continuing to take steps to reduce these non-price limitations and to generally mitigate SBG. The Board concludes that those initiatives are likely to have a greater impact on reducing the incidence of SBG than eliminating the ETS rate would. As with the general system efficiency benefits discussed above, the Board is not convinced that the potential benefits from reduced SBG are sufficient to warrant the increase in transmission rates to other customers.

With respect to comparisons with other jurisdictions, APPrO argued that eliminating the ETS rate would bring the all-in costs payable by Ontario exporters more in line with the

costs payable by exporters in neighbouring jurisdictions. APPrO noted the elimination of ETS rates between New York Independent System Operator and Independent System Operator New England, and between MISO and PJM and argued that Ontario should also eliminate its ETS rate. VECC submitted that it is more important to look at the comparability of the methodologies underlying the derivation of the ETS tariffs than the comparability of the actual level of the ETS rates themselves across jurisdictions. This was supported by SEC. VECC noted that the elimination of tariffs in the cited examples was the result of reciprocal bilateral arrangements between the two jurisdictions and not unilateral decisions by one jurisdiction as is proposed in this case. AMPCO and CME made similar submissions that elimination of the ETS rate in Ontario should not be done unilaterally as other neighbouring jurisdictions would have no reason to reduce their rates if Ontario had already done so. The IESO noted that for most of Ontario's neighbouring jurisdictions establishing reciprocal transmission pricing agreements is not a priority.

Some jurisdictions near Ontario have cost based export charges; some have arranged bilateral agreements to eliminate export charges. On the basis of these comparisons, the Board finds that the arguments for eliminating the ETS rate are not persuasive. There is no proposal before the Board for the mutual elimination of export charges.

Should the Board adopt a two-tiered approach to setting the ETS rate?

The CRA Study also provided two two-tier options: Option A ($5.80/MWh on-peak and $0.00/MWh off-peak) and Option B ($3.50/MWh on-peak and $1.00/MWh off-peak). Only CME submitted that a two-tiered option was preferable, but suggested an alternative two-tiered option that was not part of the CRA Study: $5.80/MWh on-peak and $1.00/MWh off-peak. In addition, Board staff suggested that apart from the *status quo*, the option suggested by APPrO witness Mr. Hamal of $2.50/MWh on-peak and $0.00/MWh off-peak could be an alternative worth considering, but that there was insufficient evidence on the record in order for the Board to consider it properly.

The Board concurs with most parties' submissions that the two-tiered options put forward did not provide compelling benefits that would justify moving to a more complex and administratively difficult methodology. Mr. Laurin, an electricity trader, testified that a two-tiered structure would be more difficult for trading in the market. The Board also notes that the options suggested by CME and Board staff were not addressed in the CRA Study with little or no evidence to support the potential benefits of those scenarios.

In addition, these options have no demonstrable basis in cost causality. Therefore, the Board finds that the two-tiered options are not preferred solutions.

Should the ETS rate stay at $2.00/MWh?

Board staff submitted that there was no compelling evidence that the current $2.00/MWh rate is not in the best interests of consumers or that it causes economic inefficiency, which are the Board's statutory objectives most relevant to this proceeding. Board staff recommended that a cost allocation study be conducted to determine the actual costs of the ETS service before a rate change is approved. LPMA also submitted that there is insufficient evidence at this point to support a change to the ETS rate.

HQEM submitted that the Board should not approve any rate change and that if in the future Hydro One seeks to change the ETS it should prepare a cost allocation study that provides an evidentiary basis for a new rate.

Energy Probe also supported the conclusion that the ETS rate should remain at $2.00/MWh until a full cost allocation study is undertaken in time for Hydro One's next transmission rate case. While the PWU submitted that the evidence "overwhelmingly" supported the elimination of the ETS rate, it also submitted that if the Board decided a cost allocation study is required then the ETS should remain at $2.00/MWh until the study is completed.

The Board finds that absent an analysis of cost causality (through a cost allocation study), there is insufficient basis for the Board to conclude that any change to the ETS rate is just and reasonable. The Board concludes, therefore, that the rate should remain unchanged.

The Board will require Hydro One to perform a cost allocation study to establish a cost basis for the ETS rate. Some parties have suggested that such a study would be prohibitively costly. However, the Board accepts the Elenchus testimony that a study could be properly scaled to address the magnitude of the issue and could be completed for a reasonable cost. The Board expects that this study will be completed in time for Hydro One's next cost of service transmission rate application. While Hydro One has the responsibility for completing this study, the Board expects that the IESO will assist Hydro One as required to fully address the ETS rate issue.

THEREFORE, THE BOARD ORDERS THAT:

1. Hydro One's current Export Transmission Service rate of $2.00/MWh is confirmed as final.

2. Hydro One shall prepare a cost allocation study involving the network assets utilized by export transmission customers and report the results of this study, including a proposal of the appropriate cost based ETS rate with supporting rationale, to the Board at its next transmission rates application.

Cost Awards

The Board may grant cost awards to eligible parties pursuant to its power under section 30 of the Ontario Energy Board Act, 1998. When determining the amount of the cost awards, the Board will apply the principles set out in section 5 of the Board's Practice Direction on Cost Awards. The maximum hourly rates set out in the Board's Cost Awards Tariff will also be applied.

1. Intervenors shall file with the Board and send to Hydro One, their respective cost claims within **7 days** from the date of issuance of this Decision.

2. Hydro One shall file with the Board and send to intervenors, any objections to the claimed costs within **17 days** from the date of issuance of this Decision.

3. Intervenors shall file with the Board and send to Hydro One, any responses to any objections for cost claims within **24 days** of the date of issuance of this Decision.

4. Hydro One shall pay the Board's costs incidental to this proceeding upon receipt of the Board's invoice.

All filings with the Board must quote the file number, EB-2012-0031, and be made through the Board's web portal at www.pes.ontarioenergyboard.ca/service/, and consist of two paper copies and one electronic copy in searchable / unrestricted PDF format.

Filings must be received by the Board by 4:45 p.m. on the stated date. Parties should use the document naming conventions and document submission standards outlined in the RESS Document Guideline found at www.ontarioenergyboard.ca. If the web portal is not available, parties may e-mail their documents to the attention of the Board Secretary at BoardSec@ontarioenergyboard.ca. All other filings not filed via the Board's web portal should be filed in accordance with the Board's Practice Directions on Cost Awards.

ISSUED at Toronto, June 6, 2013

ONTARIO ENERGY BOARD

Original Signed By

Kirsten Walli
Board Secretary

Filed: 2014-09-16
EB-2014-0140
Section II

SECTION II

PROPOSED SETTLEMENT AGREEMENT

Filed: 2014-09-16
EB-2014-0140
Section II

SETTLEMENT AGREEMENT

Hydro One Networks Inc.
Test year 2015 and 2016 Transmission Rates

September 16, 2014

Hydro One Networks Inc.
Test Year 2015 and 2016 Transmission Rates

SETTLEMENT AGREEMENT

PREAMBLE:

This Settlement Agreement ("the Agreement" or "this Agreement") is filed with the Ontario Energy Board ("the Board") in support of an Application for an Order or Orders approving the revenue requirement and customer rates for the transmission of electricity by Hydro One Networks Inc. ("Hydro One") to be implemented on January 1, 2015, and January 1, 2016.

On June 25th, 2014 Hydro One convened a meeting with Stakeholders to present its 2015-2016 Transmission rates and revenue requirement. Those invited were Intervenors that participated in the Hydro One 2013-2014 Transmission Rate case (EB-2012-0031) and representatives from Board Staff. The purpose of the meeting was to inform Stakeholders of Hydro One's proposal and provide an opportunity for Stakeholders to better understand the proposal. A copy of the slides presented can be referenced in Section III, i, 2. a. of this application. During the session, Hydro One agreed to provide additional, more detailed, information. This information package was provided on June 27. On or before July 11, participants provided their Interrogatories to Hydro One. On July 17, Hydro One provided answers to the Interrogatories. On July 23, 29 and July 30, technical conferences were held. Answers to all technical conference undertakings were provided to participants by August 6.

A Settlement negotiation between Hydro One and the Stakeholders took place on August 12 and August 13. The product of those negotiations is the comprehensive settlement on a proposed revenue requirement and resulting transmission rates over the 2015-2016 period, the approvals for which Hydro One will apply to the Board.

These negotiations followed the *Ontario Energy Board Rules of Practice and Procedure* ("Rules") and the Board's Practice Direction on Settlement Conferences.

Hydro One and the following participants ("the parties") participated in the settlement conference:

Association of Major Power Consumers in Ontario ("AMPCO")
Association of Power Producers of Ontario ("APPrO")
Bruce Power Inc. ("BP")
Building Owners and Managers Association Toronto ("BOMA")

Canadian Manufacturers & Exporters ("CME")
Consumers Council of Canada ("CCC")
Energy Probe Research Foundation ("Energy Probe")
Independent Electricity System Operator ("IESO")
HQ Energy Marketing Inc. ("HQEM")
London Property Management Association ("LPMA")
Ontario Power Generation ("OPG")
Power Workers' Union ("PWU")
School Energy Coalition ("SEC")
Society of Energy Professionals ("SEP")
Vulnerable Energy Consumers Coalition ("VECC")

Ontario Energy Board Staff attended and observed the settlement process but are not a party to this Agreement.

All issues were completely resolved.

The positions taken by the various parties on each of the settled issues are identified throughout the Agreement. A party who is noted as taking no position on an issue may or may not have participated in the discussion on that particular issue and takes no position on the settlement reached or on the sufficiency of the evidence filed to date.

The Agreement provides a brief description of each of the settled issues and rationales for the settled position, together with references to the evidence filed. The applicable parties agree that the evidence filed in support of each settled issue contains sufficient detail, rationale and quality of information to allow the Board to make findings in keeping with the settlement reached. The parties are relying on the accuracy and completeness of the Appendices in entering into this Agreement.

The Board's Practice Direction on Settlement Conferences (p.4) requires the parties to consider whether a settlement agreement should include an adjustment mechanism for any settled issue that may be affected by external factors. Hydro One and the other parties who participated in the Settlement Conference consider that no settled issues require such an adjustment mechanism other than those expressly set forth in this Agreement.

Finally, unless stated otherwise, the settlement of any particular issue in this proceeding and the positions of the parties are without prejudice to the rights of parties to raise the same issue and/or to take any position thereon in any other proceedings.

The Settlement Conference commenced with an information package and two presentations made by Hydro One. Interrogatories were then posed by the other parties, undertakings were asked for by the other parties, and Hydro One provided answers, including documents, to respond to all the interrogatories and satisfy the undertakings.

The particulars of the Agreement are detailed below by issue.

GENERAL

1. Has Hydro One responded appropriately to all relevant Board directions from previous proceedings?

Settled

The only Board directive to Hydro One Transmission from the previous transmission proceeding was to prepare an Export Transmission Service Cost Allocation Study. This study is provided in Exhibit H1, Tab 5, Schedule 1, Attachment 1.

All parties agree that the study was provided as directed by the Board.

Evidence: The evidence in relation to this issue includes the following:

H1-5-1	Rates for Export Transmission Service
I-2-1	CME Interrogatory #1
I-2-2	CME Interrogatory #2
I-10-1	SEC Interrogatory #1
I-12-1	CCC Interrogatory #1

Supporting Parties: AMPCO, APPrO, BOMA, BP, CME, CCC, Energy Probe, HQEM, IESO, LPMA, OPG, PWU, SEC, SEP and VECC
Parties taking no position: None

2. Is the overall increase in 2015 and 2016 revenue requirement reasonable?

Settled

As proposed in the information package provided to all the parties, Hydro One was seeking revenue requirement of $1,617.1M in 2015 and $1,689.2M in 2016. The resulting rate increase would have been 3.2% in 2015 and 3.3% in 2016, after adjusting for the load forecast.

For the purposes of reaching a settlement, the parties agree that the settled revenue requirement before adjustment of $1,577.2M in 2015 and $1,659.7M in 2016 is reasonable. This represents a decrease of $39.9M in 2015 and a decrease of $29.5M in 2016 from Hydro One's original request. The resulting rate increase will be 1.1% in 2015 and 1.7% in 2016, versus 3.2% and 3.3% as proposed originally, after adjusting for the settlement on the load forecast.

Supporting Parties: AMPCO, BOMA, BP, CME, CCC, Energy Probe, LPMA, SEC and VECC
Parties taking no position: APPrO, HQEM, IESO, OPG, PWU and SEP

COST ALLOCATION

21. Is the cost allocation proposed by Hydro One appropriate?

Settled

Hydro One proposed to continue to use the cost allocation methodology previously approved by the Board. The parties agreed that the cost allocation proposed by Hydro One is appropriate.

Attached at Appendix C is an updated Draft Summary Uniform Transmission Rates and Revenue Disbursements Factors for 2015 and 2016.

Evidence: The evidence in relation to this issue includes the following:

G1-1-1 Cost Allocation and Charge Determinants
H1-2-1 Transmission Customers Load Forecast
H1-3-1 Charge Determinants
H1-4-1 Rates for Wholesale Meter Service
I-04-29 EP Interrogatory #29
I-04-30 EP Interrogatory #30
I-06-02 VECC Interrogatory #2
I-06-10 VECC Interrogatory #10

Supporting Parties: AMPCO, BOMA, BP, CME, CCC, Energy Probe, LPMA, SEC, SEP and VECC
Parties taking no position: APPrO, HQEM, IESO, OPG and PWU

EXPORT TRANSMISSION SERVICE RATES

22. What is the appropriate level for Export Transmission Rates in Ontario?

Settled

Hydro One proposed to adopt an Export Transmission Service ("ETS") Rate of $1.7 per MWh for 2015 and 2016, as recommended in the Elenchus Study filed as Attachment 1 to Exhibit H1, Tab 5, Schedule 1.

For purposes of reaching a settlement, all parties agreed to an ETS rate of $1.85 per MWh for 2015 and 2016. The Parties further agree that agreement on the level of ETS rate of $1.85 per MWh shall not be construed as acceptance of the methodology, assumptions, or scenarios used in the Elenchus Study.

Because this is the first case where a cost allocation study was filed in evidence to inform the ETS Rate, the parties observe that the cost allocation methodology proposed by the Elenchus Study remains untested and the parties do not necessarily agree with that methodology. The parties therefore agreed on the ETS rate on the understanding that the methodologies, assumptions and scenarios used in the Elenchus Study do not have precedential value and may be challenged in subsequent proceedings.

The impact on revenue requirement to move to $1.85MWh from $2.00MWh increases the rate revenue requirement by $2.5 million in 2015, and $2.6 million in 2016.

Evidence: The evidence in relation to this issue includes the following:

H1-5-1 Rates for Export Transmission Service
H1-5-1 Attachment #1 Elenchus Export Transmission Service Rate – Cost Allocation Methodology
I-02-12 CME Interrogatory #12
I-04-31 EP Interrogatory #31
I-06-08 VECC Interrogatory #8
I-06-09 VECC Interrogatory #9
I-06-11 VECC Interrogatory #11
I-06-12 VECC Interrogatory #12
I-06-13 VECC Interrogatory #13
I-06-14 VECC Interrogatory #14
I-09-09 AMPCO Interrogatory #9
I-09-10 AMPCO Interrogatory #10
I-09-11 AMPCO Interrogatory #11
I-10-18 SEC Interrogatory #18
I-11-01 APPrO Interrogatory #1
I-11-02 APPrO Interrogatory #2
I-11-03 APPrO Interrogatory #3
I-11-04 APPrO Interrogatory #4
I-11-05 APPrO Interrogatory #5
I-11-06 APPrO Interrogatory #6
I-11-07 APPrO Interrogatory #7
I-11-08 APPrO Interrogatory #8
I-11-09 APPrO Interrogatory #9

I-11-10 APPrO Interrogatory #10
I-11-11 APPrO Interrogatory #11
I-11-12 APPrO Interrogatory #12
I-11-13 APPrO Interrogatory #13
I-11-14 APPrO Interrogatory #14
I-11-15 ApprO Interrogatory #15
I-12-18 CCC Interrogatory #18
TCJ1.04 VECC Technical Conference #1 Response #4
TCJ2.01 VECC Technical Conference #2 Response #1
TCJ2.02 VECC Technical Conference #2 Response #2
TCJ2.03 VECC Technical Conference #2 Response #3
TCJ2.04 APPrO Technical Conference #2 Response #4
TCJ2.05 APPrO Technical Conference #2 Response #5
TCJ2.06 VECC Technical Conference #2 Response #6
TDJ2.07 EP Technical Conference #2 Response #7

Supporting Parties: AMPCO, BOMA, BP, CME, CCC, Energy Probe, IESO, LPMA, SEC, VECC, APPrO, HQEM and OPG
Parties taking no position: PWU and SEP

OTHER

23. Intervenor proposal for an independent cost benchmarking study.

Settled

Intervenors want to better understand the cost of Hydro One's work relative to similar companies. A cost benchmarking study would also be supportive of the Board's Renewed Regulatory Framework. Hydro One agrees to complete an independent Transmission Cost Benchmarking Study that will be filed with Hydro One's next Transmission rates application.

Intervenors and Board Staff will be consulted, and agreement will be sought, in defining the Terms of Reference that will be included in the Request for Proposal document. The Request for Proposal document will be used in the selection process for the independent party that will complete the Study. After Hydro One selects the independent party that will complete the Study, Intervenors and Board Staff will review the Study proposal provided by the independent party to help ensure that the proposal meets the requirements of the Terms of Reference.

Intervenors and Board Staff will also be provided with an opportunity to review and provide comments on the preliminary results prior to finalizing the Study. Hydro One

Filed: 2019-08-21
EB-2019-0082
Exhibit JT-1.36-Q02
Attachment 4
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Export Transmission Service Rate

Cost Allocation Methodology

Report Prepared by
Michael Roger
Elenchus Research Associates Inc.

On Behalf of HONI

May 7, 2014

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EXECUTIVE SUMMARY

This report presents Elenchus' recommendation on the cost allocation methodology that should be used to determine a cost-based Export Transmission Service rate in Ontario.

The recommended methodology should be based on:

- Using prior year actual hourly data for domestic and export customers,
- 12 CP should be the allocator used in apportioning assets between domestic and export customers in order to develop composite allocators to allocate shared OM&A expenses,
- Only dedicated assets used to serve export customers and the related costs should be allocated to the export customer class,
- OM&A expenses related to the use of shared assets should be allocated to export customers using composite assets as allocator,
- No external revenues should be allocated to the export customer class,
- The ETS rate should be based on HONI's OEB approved Network revenue requirement, as used in determining the Uniform Transmission Rates, marked-up to include other transmitters' approved revenue requirement as reflected in the Uniform Transmission Rates.

The proposed cost allocation methodology determines the ETS rate based on cost causality principles. Given the range of values calculated using 2013, 2015, 2016 data in the proposed methodology and the related scenario sensitivity results, a value between $1.7/MWh and $1.8/MWh for the ETS rate can be considered to be cost-based.

Based on the proposed 2015 and 2016 HONI financial data, Elenchus recommends an ETS rate of $1.7 MWh be implemented for 2015 and that the ETS rate be maintained for at least 2 years to provide stability in determining the rate.

1 INTRODUCTION

Hydro One Networks Inc. ("HONI") retained Michael Roger of Elenchus Research Associates Inc. in order to develop a cost-based methodology to establish the Export Transmission Service ("ETS") rate.

In its Decision with Reasons dated June 6, 2013 on 2013 Export Transmission Service rates, (EB-2012-0031, Decision and Order, page 10), the Ontario Energy Board ("OEB") directed HONI to include a proposal of the appropriate cost-based ETS rate, with supporting rationale, to the OEB at its next transmission rates application.

More specifically the OEB stated on page 9 of its Decision with Reasons in Proceeding EB-2012-0031 that:

> *"The Board will require Hydro One to perform a cost allocation study to establish a cost basis for the ETS rate. Some parties have suggested that such a study would be prohibitively costly. However, the Board accepts the Elenchus testimony that a study could be properly scaled to address the magnitude of the issue and could be completed for a reasonable cost. The Board expects that this study will be completed in time for Hydro One's next cost of service transmission rate application. While Hydro One has the responsibility for completing this study, the Board expects that the IESO will assist Hydro One as required to fully address the ETS rate issue."*

This report presents the results of the cost-based methodology developed by Elenchus to establish the ETS rate.

This report is divided into 5 main sections. Section 2 provides a background on the evolution of the ETS rate from market opening in 2002 until now, section 3 presents the principles of cost allocation methodology, section 4 describes the proposed cost allocation methodology to determine the ETS rate, section 5 presents the results of applying the recommended methodology using 2013 proposed data and 2015 and 2016 proposed data and section 6 presents conclusions and recommendations to the OEB on the proposed cost allocation methodology and the ETS rate. Appendix A contains the CV for Michael Roger.

Michael Roger has been an expert dealing with cost allocation, rate design and rate regulation issues for over 35 years. Michael worked for over 32 years at Ontario Hydro, Ontario Power Generation and Hydro One and spent most of his career dealing with Cost Allocation and Rate Design issues for wholesale and retail electricity customers in Ontario. He has also testified on numerous occasions at OEB proceedings on behalf of utilities and other stakeholders and also has provided expert advice to the OEB in various task forces dealing with cost allocation and rate design issues. Michael's vast experience with Cost Allocation issues was applied in developing the cost-based cost allocation methodology to develop the ETS rate and forms the basis for Elenchus recommended methodology to the OEB.

2 BACKGROUND

In Proceeding RP-1999-0044 the OEB reviewed the issue of establishing an ETS rate to be implemented at market opening.

In its Decision with Reasons dated May 26, 2000, the OEB summarized the various arguments presented by stakeholders in this proceeding on what the ETS rate should be. The OEB decided that as an interim measure, the ETS rate should be fixed at $1/MWh. This was seen as a reasonable compromise between the competing interests and proposals presented by stakeholders in the proceeding on what was described as a complex and contentious issue. Among other things, the contention emerged from what stakeholders believed should be the basis of, or purpose of, the tariff design and what ought to be an appropriate charge level to help defray the costs to domestic customers for the use of the network transmission facilities to facilitate export and wheel-through transactions.

The OEB directed that HONI monitor and report at its next main rate submission how the export market was functioning and the developments in interconnected jurisdictions and whether the ETS rate should be reviewed.

HONI retained R. J. Rudden to do a "Jurisdictional Survey of Export and Wheel-through Service Rates". The survey was filed with the OEB on June 26, 2006 and was reviewed in proceeding EB-2006-0501.

As part of EB-2006-0501, the OEB approved a stakeholder settlement agreement which maintained the ETS rate of $1/MWh. In the agreement, the Independent Electricity System Operator ("IESO") was identified as the entity responsible for undertaking a study on the appropriate ETS rate. The settlement agreement stated that:

> *"...the IESO should now be identified as entity responsible to pursue and negotiate, with neighbouring jurisdictions, acceptable reciprocal arrangements with the intention to eliminate the ETS tariff, and study the appropriate ETS tariff, including those options identified in H1/T5/S1. The IESO will seek input from market participants and interested intervenors in this proceeding and keep the parties informed of the progress of negotiations and the study. It is agreed that the IESO will make its report available to the Board upon completion which will be no later than June 1, 2009 with the results of reciprocal arrangement negotiations and the study including recommendations for an appropriate ETS tariff. Hydro One Networks Inc. remains responsible for seeking changes to its approved transmission revenues and rates and will do so as part of the 2010 transmission rate-resetting process period, following the publishing of the study."*[1]

The IESO retained Charles River Associates ("CRA") to do a quantitative analysis of the future effect of several export rate scenarios, with respect to exports and wheel-through volumes, ETS tariff revenue, and the Hourly Ontario Energy Price. The IESO's ETS study and recommendation was filed with the OEB on August 28, 2009 and was reviewed in proceeding EB-2010-0002. The IESO study reviewed four alternatives for setting the ETS rate:

1. Status Quo;
2. Equivalent average network charge;
3. Reciprocal treatment, and
4. Elimination.

[1] EB-2006-0501, Exhibit M, Tab I, Schedule 1, page 17, April 3, 2007

The IESO recommended the status quo alternative to the OEB.

In the Decision with Reasons in proceeding EB-2010-0002, page 75, the OEB concluded that an additional study was required. The OEB stated that:

> *"The Board concludes therefore that the most pressing requirement is that a genuinely comprehensive study be undertaken to identify a range of proposed rates and the pros and cons associated with each proposed rate in time for the next transmission rate application. In the Board's view, the most appropriate party to undertake this study is the IESO. In procuring the study, the IESO should circulate the terms of reference to the Applicant and the intervenors of record in this case with a view to ensuring that the resulting study will provide detailed analysis on the issues.*
>
> *This review of the terms of reference is not intended to be a strategic negotiation, but rather a technical exercise to ensure that the scope of the project is sufficiently broad and well-defined to ensure a useful and appropriate outcome. Work on this study should begin soon, to ensure completion well in advance of the time for the filing of the next transmission rates application by Hydro One."*

The OEB in the same proceeding increased the ETS rate to $2/MWh, providing the following rationale:

> *"Accordingly, the Board will direct that a change be made to the ETS rate for 2011 and 2012, increasing the rate to two dollars per MWh. In making this change the Board seeks to recognize the directional preference of the CRA study, and the absence of any particular analytical underpinning for the current rate. Subsequent panels assessing the level of this rate should not, however regard this new rate as having any particular precedential value. It is the Board's view that the new rate has more analytical support than the status quo, but that in order to arrive at a genuinely robust and valid rate, more study is required."*

In response to the OEB directive, the IESO engaged CRA to conduct a further review of the ETS rate. CRA reviewed the tariff and structures in neighbouring markets and assessed five proposed rate options against generally accepted rate making principles (consistency, simplicity, fairness and efficiency). The rate options considered were:

1. Status Quo
2. Elimination

3. Equivalent average network charge
4. Tiered rates (two alternatives)

The CRA study was filed and reviewed in proceeding EB-2012-0031.

In the IESO's submission to the OEB, the IESO indicated that none of the ETS tariff options materially impact reliability, but elimination of the tariff would best promote efficient operation of the wholesale electricity market.

As stated in the introduction in this report, the OEB directed HONI in proceeding EB-2012-0031 to develop a cost-based methodology to determine the ETS rate.

3 PRINCIPLES OF COST ALLOCATION

In order to determine cost-based rates, a cost allocation study is performed by a utility to fairly allocate shared assets and expenses to the customer groups served by the utility.

The cost allocation study is based on actual historical or forward looking test year data and reflects the operating circumstances of the utility at a particular point in time, either the last year for which actual historical information is available, or for the future test year for which rates are being established.

Traditionally three steps are followed in a cost allocation study: Functionalization, Categorization or Classification, and Allocation.

Assets and expenses that are identified with a particular customer class and that are not shared with other customer classes are "Directly" allocated to that particular customer class.

Functionalization of assets and expenses is the process of grouping assets and expenses of a similar nature, for example, generation, high voltage transmission, customer service, meter reading, etc. Hence, as a first step in a cost allocation study, the function(s) served by the assets or expenses of the utility are identified so that costs can be attributed appropriately to the identified functions.

Categorization or Classification is the process by which the functionalized assets and expenses are classified as energy, demand and/or customer related. Hence, the costs associated with each function are attributed to these categories based on the principle that the quantum of costs is reflective of the quantum of volume, system demand, or number of customers.

Allocation, which is the final step, is the process of attributing the energy, demand, and customer related assets and expenses to the customer classes being served by the utility. This allocation is accomplished by identifying allocators related to energy, demand, or customer counts that are reflective of the relationship between different measures of these cost drivers and the costs that are deemed to be caused by each customer class.

It is in this Allocation step that customers are grouped based on common characteristics, or utility asset utilization reflecting cost causality.

4 PROPOSED COST ALLOCATION METHODOLOGY

Elenchus proposes a cost allocation methodology to determine the ETS rate that is based on cost causality, is simple and follows the traditional three steps of a cost allocation methodology.

Elenchus looked at how transmission assets are being used to sell electricity, either to domestic customers of to neighbouring jurisdictions by exporters.

In Ontario generators do not pay for the use of the transmission system when they inject power into the grid in order to supply domestic electricity needs. Elenchus applied this same principle when evaluating the interconnected assets with neighbouring jurisdictions used by exporters. The interconnected assets are used to both export and import power and since generators in Ontario do not pay for the use of the transmission assets and the ETS rate is not applied to power imported into Ontario, Elenchus assumed that importers would also continue to not be charged for the use of the transmission system.

The proposed methodology considered the sale of electricity to domestic customers and neighbouring jurisdictions, not how the electricity was sourced and made available to satisfy sales.

HONI's 2013 transmission assets and revenue requirements were used in developing the recommended approach.

The proposed cost allocation methodology to determine the ETS rate reflects the interruptible nature of exports. The basis for treating exports as interruptible loads is found in the OEB's Decision with Reason in proceeding EB-2012-0031 that on page 5 states that:

> *"First, whether curtailments originate from generation issues or transmission issues, the Board agrees that export service does not receive the same priority access as domestic service. The Board accepts that the market rules treat exporters more as an interruptible load. This difference in treatment related to generation capacity has consequences for the overall service, even if export transmissions rights are technically as firm as domestic transmission rights. As a result, the Board finds that it may be appropriate for the export service to be* viewed as a separate class."

This has implications for how costs are allocated, as discussed in Section 4.3.

4.1 FUNCTIONALIZATION

In consultation with HONI, Elenchus determined that the assets and expenses associated with export activities can be found in the following HONI's transmission functions:

- Network (500 kV, 230 kV, and 115 kV lines)
- Dual Function lines (Network portion)
- Generation Line Connection
- Generation Transformation Connection
- Common (telecommunication equipment, control centre)
- Other (facilities not allocated to other functions under normal operating conditions)

These functions include dedicated and shared assets, and related expenses used by domestic and export customers.

The remaining functions used by Hydro One Transmission in determining its revenue requirement (e.g. transformation, line connection, line connection portion of dual function lines) are considered to be used only by domestic customers.

External revenues were also considered in the development of the cost allocation methodology. These revenues result mainly from secondary land use in right of ways and from providing maintenance services to other entities. These revenues are the result of using HONI's assets which have been designed to serve domestic customers only, therefore, no external revenues are proposed to be allocated to export customers.

4.2 CLASSIFICATION

Generally in costs allocation, transmission assets and expenses are classified as demand related. Transmission assets are designed to meet the maximum demand imposed by users of the system. Based on the functions evaluated, it was determined that the assets and expenses considered in the development of the ETS rate methodology are all demand related. There are no energy related or customer related assets and expenses.

4.3 ALLOCATION

In the cost allocation methodology developed to determine the ETS rate two customer groups are considered: domestic and export.

Assets dedicated to domestic customers are assets that only serve to connect Hydro One customer's load to the network.

Assets dedicated to interconnect (export) are assets that only serve to connect to another transmission utility.

Shared assets are those that serve both domestic and export customers, including assets associated with generation connection.

As export is considered to be interruptible service, no asset related costs associated with shared assets are proposed to be allocated to the export customer class.

This is considered appropriate because, as confirmed by Hydro One staff, HONI's planning of the Network transmission system does not take into consideration the capacity needed to supply export customers, transmission planning is only based on the capacity needs of domestic customers.

The assets dedicated to serve export customers have been directly allocated to the export customer class as well as the related expenses.

The OM&A expenses related to the use of shared assets have been allocated between domestic and export customers using the allocators described below.

4.3.1 Coincident Peak Allocator

In cost allocation, the allocation of demand related assets that are closest to the customer are allocated based on the non-coincident demand of the customer. The required assets are sized reflecting the maximum customer electricity demand.

Further away from the customer and closer to the generation system, it is the aggregate electricity demand of all customers, and not the sum of the individual customer demands, that determines the size of the facilities required to satisfy customers' electricity needs. In cost allocation, when apportioning assets and expenses further away from the customer (e.g. generation, transmission) and closer to the generation of electricity, it is the coincident demand that is used as an allocator, reflecting the criteria used to size the required assets.

Using 2010, 2011 and 2012 actual hourly load data for domestic and export customers from the IESO, coincident peak ("CP") allocators were developed.

Coincident peak is the hourly demand of domestic and export customers at the hour of maximum demand in the Ontario electricity system.

1 CP is the demand for each customer class at the hour of maximum system demand in a year. 12 CP is the average of the demand for each customer class at the hour of each month's maximum system demand.

1 CP or 12 CP are used by utilities in cost allocation studies to apportion generation and transmission costs amongst customer groups.

The following table includes the values developed for coincident peak.

Table 1

Coincident peak 2010 to 2012

	2010			2011			2012			Average		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
1CP	2,687	25,048	27,735	2,549	25,450	27,999	2,179	24,636	26,815	2,472	25,045	27,516
12CP	30,897	255,485	286,382	31,343	250,819	282,161	28,164	251,842	280,006	30,134	252,715	282,850

The 1 CP and 12 CP percentage allocators using 2010 to 2012 data are show in the table below

Table 2

Coincident peak %

	2012 Data			Average 2010 – 2012 Data		
Coincident Peak	Total	Domestic	Export	Total	Domestic	Export
1 cp	100.00	91.87	8.13	100.00	91.02	8.98
12 cp	100.00	89.94	10.06	100.00	89.35	10.65

The 1 CP and 12 CP values for the period 2011 to 2013 using actual hourly data are shown in the table below.

Table 3

Coincident peak 2011 to 2013

	2,011			2,012			2,013			Average		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
1CP	2,549	25,450	27,999	2,179	24,636	26,815	1,952	24,927	26,879	2,227	25,004	27,231
12CP	31,343	250,819	282,161	28,164	251,842	280,006	30,240	255,417	285,657	29,916	252,692	282,608

The 1 CP and 12 CP percentage allocators using 2011 to 2013 data are show in the table below

Table 4

Coincident peak %

	2013 Data			Average 2011 – 2013 Data		
Coincident Peak	Total	Domestic	Export	Total	Domestic	Export
1 cp	100.00	92.74	7.26	100.00	91.82	8.18
12 cp	100.00	89.41	10.59	100.00	89.41	10.59

Elenchus recommends that 12 CP should be used to allocate shared assets between domestic and export customers using the last year for which information is available.

When system loads are relatively flat and do not show a pronounced yearly peak, 12 CP is usually used by utilities to allocate demand related assets and expenses. In instances where there is a significant yearly peak compared to other peaks in the year, that is a very peaky load profile with low load factor, then 1 CP would be used to allocate demand related assets and expenses.

In Proceeding RP-1999-0044, the OEB reviewed allocators that could be used to recover Network assets and expenses and recommended against the use of non-

coincident peak and settled on the use of coincident peak. With respect to using 1 CP, in paragraph 3.4.27 of the OEB Decision it states that:

> *"A rate design aimed at customer demand reduction during the system's coincident peak hours would meet the test of economic efficiency, but only if the network transmission system is generally capacity-constrained. This is not the case for the OHNC [Hydro One] network transmission system either today or in the foreseeable future."*

12 CP is used by HONI in apportioning assets and expenses when allocating Dual Function Line assets, (Proceeding EB-2012-0031, Exhibit G1, Tab 2, Schedule 1, pages 110-111).

4.3.2 Composite Allocators

The asset functions identified in section 4.1 were apportioned between domestic and export customers using the 12 CP allocator based on 2012 actual hourly data in order to develop composite allocators used to allocate shared OM&A expenses to domestic and export customer classes.

The OM&A expenses related to the identified shared functions were allocated in the cost allocation methodology to domestic and export customers using Net Shared Assets as composite allocators. Table 5 includes the percentage allocation of the composite allocators to the two customer classes based on 12 CP.

Table 5

Composite Allocators using 2012 actual hourly data

	Total	Domestic	Export
Net Shared Assets	**100.00%**	**92.89%**	**7.11%**
Dedicated to Domestic	**100.00%**	**100.00%**	**0.00%**
Dedicated to Interconnect	**100.00%**	**0.00%**	**100.00%**

Using 2013 actual domestic and export hourly data, the composite allocators are included in the following tables based on 12 CP and the 2015 and 2016 financial data.

Table 6

Composite Allocators using 2013 actual hourly data for 2015

	Total	Domestic	Export
Net Shared Assets	100.00%	92.74%	7.26%
Dedicated to Domestic	100.00%	100.00%	0.00%
Dedicated to Interconnect	100.00%	0.00%	100.00%

Table 7

Composite Allocators using 2013 actual hourly data for 2016

	Total	Domestic	Export
Net Shared Assets	100.00%	92.79%	7.21%
Dedicated to Domestic	100.00%	100.00%	0.00%
Dedicated to Interconnect	100.00%	0.00%	100.00%

5 ETS RATE RESULTS

The results of applying the proposed cost allocation methodology to develop a cost-based ETS rate are shown below.

The proposed cost allocation methodology was developed using 2012 actual hourly load data and 2013 proposed HONI financial data as submitted in proceeding EB-2012-0031.

The model was run again with 2013 actual hourly load data and the proposed 2015 and 2016 financial data being submitted by HONI at its rate submission.

5.1 USING 2012 LOAD DATA AND 2013 HONI PROPOSED FINANCIAL DATA

5.1.1 BASE CASE ETS RATE

The base case result for developing the ETS rate using the proposed cost allocation methodology is based on the following assumptions:

- Shared Assets are apportioned using 2012 actual hourly data between domestic and export customers using the 12 Coincident Peak method in order to develop the composite allocators to be used to allocate shared expenses
- Only dedicated assets used to serve export customers and related expenses are being allocated to export customers
- No asset related costs associated with shared assets are allocated to export customers
- Shared OM&A expenses are allocated between domestic and export customers based on composite allocator of Net Shared Assets
- No External revenue credit is allocated to export customers
- HONI's proposed 2013 data, (Assets and Expenses), as submitted in proceeding EB-2012-0031 were used to develop the ETS rate based on the proposed cost allocation model.

Using HONI's export sales forecast for 2013, the resulting ETS rate is $1.77/MWh.

5.1.2 ETS RATE INCLUDING OTHER TRANSMITTERS' REVENUE REQUIREMENT

The hourly data used from the IESO reflect all transmission electricity sales in Ontario, not just Hydro One's, while the financial assets and expense data used in developing the cost allocation methodology reflects only Hydro One's data. Marking-up the calculated ETS rate to reflect other transmitters approved Network revenue requirement would result in consistency between the sales data and the financial data, both of which would reflect all transmitters in Ontario.

As seen in the 2014 Uniform Transmission Rates, HONI's Network function revenue requirement is $882.9 million. The revenue requirement for all Ontario transmitters is $912.8 million, or 3.4% higher than HONI's revenue requirement.

Increasing the ETS rate of $1.77/MWh by 3.4%, results in an ETS rate of $1.83/MWh. This higher ETS rate would take into account the revenue requirement of all transmitters in Ontario.

5.1.3 SCENARIOS

The following scenarios were run in order to determine the results sensitivity of the proposed cost allocation methodology to various assumptions.

Table 8 Scenarios (2012 load data)

Scenario	Description	ETS rate ($/MWh)[2]
1	Same as Base case, but using 12 CP average of 3 years (2010 to 2012)	1.82
2	Same as Base case, but using 1 CP (2012)	1.59
3	Same as Base case, but using 1 CP average of 3 years (2010 to 2012)	1.67
4	Same as Base case, but allocation $0.16M External Revenue credit to Export customers	1.76
5	Allocating only shared OM&A costs to Export customers, no dedicated export assets allocated to Export[3]	1.22
6	Allocating to Export customers same Network function assets and expenses as Domestic customers, $1.43M External Revenue credit, using 12 CP (2012)[4]	4.73

5.2 USING 2013 LOAD DATA AND 2015 AND 2016 HONI PROPOSED FINANCIAL DATA

5.2.1 BASE CASE ETS RATE

The same assumptions described in section 5.1.2 are used in developing the ETS rate:

- Shared Assets are apportioned using 2013 actual hourly data between domestic and export customers using the 12 Coincident Peak method in order to develop

[2] Using HONI 2013 export sales forecast
[3] Assuming exporters do not pay for dedicated assets and related expenses
[4] Assuming export is treated as firm load, similar to domestic load

the composite allocators to be used to allocate shared expenses to domestic and export customer classes

- Only dedicated assets used to serve export customers and related expenses are being allocated to export customers
- No asset related costs associated with shared assets are allocated to export customers
- Shared OM&A expenses are allocated between domestic and export customers based on composite allocator of Net Shared Assets
- No External revenue credit is allocated to export customers
- HONI's proposed 2015 and 2016 data, (Assets and Expenses), as submitted in this proceeding are used to develop the ETS rate based on the proposed cost allocation model.

Using HONI's 2015 and 2016 export sales forecast, the resulting ETS rate is $1.63/MWh for 2015 and $1.62/MWh for 2016.

5.2.2 ETS Rate Including Other Transmitters' Revenue Requirement

In HONI's proposed 2015 and 2016 Uniform Transmission Rates, HONI's Network function revenue requirements are $933.6 million and $972.0 million respectively. The revenue requirements for all Ontario transmitters are $963.0 million, and $1,001.3 million for 2015 and 2016, or 3.2% and 3.0% higher than HONI's proposed revenue requirements.

Increasing the 2015 ETS rate of $1.63/MWh by 3.2%, and the 2016 ETS rate of $1.62/MWh by 3.0% results in ETS rate of $1.68/MWh for 2015 and $1.67/MWh for 2016. This higher ETS rates would take into account the revenue requirements of all transmitters in Ontario.

5.2.3 Scenarios

The following scenarios were run in order to determine the results sensitivity of the proposed cost allocation methodology to various assumptions.

Table 9 Scenarios (2013 load data)

Scenario	Description	ETS rate 2015 ($/MWh)[5]	ETS rate 2016 ($/MWh)[6]
1	Same as Base case, but using 12 CP average of 3 years (2011 to 2013)	1.63	1.62
2	Same as Base case, but using 1 CP (2013)	1.34	1.33
3	Same as Base case, but using 1 CP average of 3 years (2011 to 2013)	1.42	1.41
4	Same as Base case, but allocation $0.12M External Revenue credit to Export customers	1.62	1.61
5	Allocating only shared OM&A costs to Export customers, no dedicated assets allocated to Export [7]	1.15	1.13
6	Allocating to Export customers same Network function assets and expenses as Domestic customers, $1.3M External Revenue credit, using 12 CP (2013)[8]	4.84	4.88

6 CONCLUSIONS AND RECOMMENDED METHODOLOGY

The results of the proposed cost allocation methodology to develop a cost-based ETS rate and the sensitivity scenarios run using 2010 to 2012 load data show a Base Case result of $1.77/MWh and a range for the ETS rate between $1.22/MWh to $1.82/MWh

[5] Using HONI 2015 export sales forecast
[6] Using HONI 2016 export sales forecast
[7] Assuming exporters do not pay for dedicated assets and related expenses
[8] Assuming export is treated as firm load, similar to domestic load

for scenarios 1 to 5. The financial data is based on HONI's 2013 proposed data and excludes other transmitter's revenue requirement.

Using hourly load data for the period 2011 to 2013 and financial data for HONI as proposed for 2015 and 2016, the Base Case result for the ETS rate for 2015 is $1.63/MWh and for 2016 is $1.62/MWh. The range for the ETS rate is between $1.13/MWh to $1.63/MWh for scenarios1 to 5. The financial data excludes other transmitter's revenue requirement.

It is Elenchus' recommendation that the cost allocation methodology to be used to develop the ETS rate should be based on:

- Using the last year of actual hourly data for domestic and export customers. Forecast domestic and export hourly data is not available either from HONI or IESO,
- 12 CP should be the allocator used in apportioning assets between domestic and export customers in order to develop composite allocators to allocate shared expenses.
- Only dedicated assets used to serve export customers and related expenses should be allocated to the export customer class,
- No asset related costs associated with shared assets should be allocated to export customers
- Expenses related to the use of shared assets should be allocated to export customers using composite assets as allocator,
- No External revenues should be allocated to the export customer class, and
- The ETS rate should be based on HONI's OEB approved Network revenue requirement, as used in determining the Uniform Transmission rate, marked up to include other transmitters' approved revenue requirement as reflected in the Uniform Transmission Rates.

The proposed cost allocation methodology provides a supporting basis for determining the ETS rate based on cost causality principles. Given the range of values calculated using 2013, 2015, 2016 data and the related scenario sensitivity results, a value

between $1.7/MWh and $1.8/MWh for the ETS rate can be considered to be cost-based.

Based on the proposed 2015 and 2016 HONI financial data, Elenchus recommends an ETS rate of $1.7 MWh be implemented for 2015 and that the ETS rate be maintained for at least 2 years to provide stability in determining the rate.

APPENDIX A - CV MICHAEL ROGER

MICHAEL J. ROGER

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ASSOCIATE, RATES AND REGULATION

Michael has over 35 years of experience in the electricity industry dealing in areas of finance, cost allocation, rate design and regulatory environment. Michael has been an expert witness at numerous Ontario Energy Board proceedings and has participated in task forces dealing with his areas of expertise. Michael is a leader and team player that gets things done and gets along well with colleagues.

PROFESSIONAL OVERVIEW

Elenchus — 2010 - Present

Associate Consultant, Rates & Regulation

- Provide guidance on the Regulatory environment in Ontario for distributors, with particular emphasis in electricity rates in Ontario and the regulatory review and approval process for cost allocation and rate design. Some of the clients that Michael provides advice include: Hydro Quebec Energy Marketing Inc., GTAA, Ontario Energy Board, City of Hamilton, Hydro One Transmission, Powerstream, Hydro Ottawa, Veridian, APPrO and Hydro 2000.

Hydro One Networks Inc. — 2002 - 2010

Manager, Pricing, Regulatory Affairs, Corporate and Regulatory Affairs

- In charge of Distribution and Transmission pricing for directly connected customers to Hydro One's Distribution system, embedded distributors and customers connected to Hydro One's Transmission system. Determine prices charged to customers that conform to guidelines and principles established by the Ontario Energy Board, (OEB). Provide expert testimony at OEB Hearings on behalf of Hydro One in the areas of Cost Allocation and Rate Design. Keep up to date on Cost Allocation and Rate Design issues in the industry. Ensure deliverables are of high quality, defensible and meet all deadlines.

Keep staff focused and motivated and work as a team member of the Regulatory Affairs function. Provide support to other units as necessary.

Ontario Power Generation Inc. 1999 - 2002

Manager, Management Reporting and Decision Support, Corporate Finance

- In charge of producing weekly, monthly, quarterly and annual internal financial reporting products. Input to and coordination of senior management reporting and performance assessment activities. Expert line of business knowledge in support of financial and business planning processes. Coordination, execution of review, and assessment of business plans, business cases and proposals of an operational nature. Provide support to other units as necessary. Work as a team member of the Corporate Finance function.

Ontario Hydro 1998 - 1999

Acting Director, Financial Planning and Reporting, Corporate Finance

- In charge of the day to day operation of the division supporting the requirements of Ontario Hydro's Board of Directors, Chairman, President and CEO, and the Chief Financial Officer, to enable them to perform their due diligence role in running the company. Interact with business units to exchange financial information.

Financial Advisor, Financial Planning and Reporting , Corporate Finance 1997

- Responsible for co-ordinating Retail, Transmission, and Central Market Operation divisions' support of Corporate Finance function of Ontario Hydro to ensure financial information consistency between business units and Corporate Office, review business units compliance with corporate strategy. Provide advice to Chief Financial Officer and Vice President of Finance on business unit issues subject to review by Corporate Officers.
- Participate or lead task team dealing with issues being evaluated in the company. Supervise professional staff supporting the function. Co-ordinate efforts with advisors for GENCO and Corporate Function divisions to ensure consistent treatment throughout the company.

Section Head, Pricing Implementation, Pricing 1986 - 1997

- In charge of pricing experiments, evaluation of marginal costs based prices, cost-of-service studies for municipal utilities, analysis and comparison of prices in the electric industry, rate structure reform evaluation, analysis of cost of servicing individual

customers and support the cost allocation process used to determine prices to end users.

- The section was also responsible for the derivation of wholesale prices charged to Municipal Electric Utilities and retail prices for Direct Industrial customers, preparation of Board Memos presented to Ontario Hydro's Board of Directors and support the department's involvement at the Ontario Energy Board Hearings by providing expert witness testimony.

Section Head, (acting), Power Costing, Financial Planning & Reporting, Corporate Finance **1994 - 1995**

- Responsible for the allocation of Ontario Hydro's costs among its customer groups and ensure that costs are tracked properly and are used to bill customers. Maintain the computer models used for cost allocation and update the models to reflect the structural changes at Ontario Hydro. Participate at the Ontario Energy Board Hearings providing support and expert testimony on the proposed cost allocation and rates. Provide cost allocation expertise to other functions in the company.

Additional Duties **1991**

- Manager (acting) Rate Structures Department.
- Review of utilities' rates and finances for regulatory approval.
- Consultant. Sent by Ontario Hydro International to Estonia to provide consulting services on cost allocation and rate design issues to the country's electric company.

Analyst, Rates **1983 - 1986**

- In charge of evaluating different marketing strategies to provide alternatives to customers for the efficient use of electricity. Co-ordinate and supervise efforts of a work group set up to develop a cost of service study methodology recommended for implementation by Municipal Electric Utilities and Ontario Hydro's Rural Retail System. Provide support data to Ontario Hydro's annual Rate Submission to the Ontario Energy Board. Participate in various studies analysing cost allocation areas and financial aspects of the company.

Forecasting Analyst, Financial Forecasts **1980 - 1983**

- Evaluating cost data related to electricity production by nuclear plants and preparing short term forecasts of costs used by the company. Maintain and improve computer models used to analyse the data.

- Review Ontario Hydro's forecast of customer revenues, report actual monthly, quarterly and yearly results and explain variances from budget. Support the development of new computerized models to assist in the short-term forecast of revenues.

Project Development Analyst, Financial Forecasts **1979 - 1980**

- In charge of developing computerized financial models used by forecasting analysts planning Ontario Hydro's short term revenue and cost forecasts and also in the preparation of Statement of Operations and Balance Sheet for the Corporation¬.

Assistant Engineer – Reliability Statics, Hydroelectric Generations Services **1978 - 1979**

- In charge of analysing statistical data related to hydroelectric generating stations and producing periodic report on plants' performance.

ACADEMIC ACHIEVEMENTS

1977	Master of Business Administration, University of Toronto. Specialized in Management Science, Data Processing and Finance. Teaching Assistant in Statistics.
1975	Bachelor of Science in Industrial and Management Engineering, Technion, Israel Institute of Technology, Haifa, Israel.

RATES FOR EXPORT TRANSMISSION SERVICE

1. INTRODUCTION

The Independent Electricity System Operator ("IESO") collects Export Transmission Service ("ETS") revenues and remits them on a monthly basis to Hydro One, whose transmission system is used to facilitate export transactions at the point of interconnection with the neighbouring markets.

2. EXPORT TRANSMISSION SERVICE TARIFF DESIGN

Since the initial setting of the ETS rate, there have been many competing views advanced by stakeholders with respect to the basis of the tariff design and appropriateness of the charge level. As a result, over the years, the ETS rate has been determined through a combination of stakeholder agreements and Board interim Decisions, informed by Board-directed studies performed by both the IESO, and most recently, by Hydro One Transmission.

As a part of Hydro One's 2015/2016 Transmission Rate Application (EB-2014-0140), Hydro One Transmission engaged Elenchus Research Associates ("Elenchus") to perform a cost allocation study of network assets utilized by export transmission customers to determine the ETS rate based on cost causality principles. The Elenchus study was stakeholdered with interested parties and a final report was included in Exhibit H1, Tab 5, Schedule 1, Attachment 1 of that application.

The criteria for Elenchus' recommended methodology to allocate costs are defined below:

- Utilize the prior year actual hourly data for domestic and export customers;

- Utilize the 12 Coincident Peak[1] ("CP") as the allocator in apportioning assets between domestic and export customers in order to develop composite allocators to allocate shared expenses;
- Allocate only dedicated assets used to serve export customers and related expenses to the export customer class. No asset related costs associated with shared assets should be allocated to export customers;
- Allocate OM&A expenses related to the use of shared assets to export customers using composite assets as allocator;
- Exclude external revenues from the allocation to the export customer class; and
- Calculate the ETS rate based on Hydro One Transmission's proposed Network revenue requirement, adjusted to include other transmitters' approved revenue requirement reflected in the Uniform Transmission Rates ("UTRs").

The cost allocation study completed by Elenchus recommended an ETS rate of $1.70/MWh for 2015 and 2016 as being reflective of the cost of providing export service.

For the purpose of reaching a settlement, all parties agreed to an ETS rate change from the $2.00/MWh, currently in effect at the time, to $1.85/MWh. This rate was approved by the Board in its EB-2014-0140 Decision as the effective rate for 2015 and 2016, and subsequently maintained as the effective rate for 2017 and 2018 in its EB-2016-0160 Decision.

In this application, Hydro One updated the 2015 Elenchus cost allocation model utilizing the latest available information. This included updates to: the fixed assets dedicated to interconnections, the 2018 system peak and export load data used to determine the 12 CP allocator, and the forecast for 2020 ETS exports (MWh). Based on the updated cost

[1] Domestic and Export Demand at Ontario system peak.

allocation model data and Hydro One's proposed 2020 revenue requirement, the 2020 ETS rate calculated using the Elenchus study methodology has been determined to be $1.25/MWh. The decrease in the calculated ETS rate as compared to the 2015 study primarily reflects a decrease in Hydro One's OM&A costs relative to what was proposed at the time the 2015 study was completed, and an increase in forecast exports (MWh) from what was assumed in the 2015 study. The following Table 1 demonstrates these key differences in the parameters utilized in 2015 Elenchus cost allocation study and the updated cost allocation study in this application.

Table 1: ETS Rates Derived Using Elenchus Cost Allocation Study

Year	Total Hydro One Revenue Requirement allocated to Export	ETS Exports (MWh)	ETS Rate ($/MWh)
2015	27.2 million	16,700,000	1.70
2020	22.1 million	18,800,000	1.25

While the updated cost allocation study resulted in a calculated ETS rate of $1.25/MWh, the current ETS rate of $1.85/MWh represents a negotiated rate that was established as part of the Settlement Agreement in Proceeding EB-2014-0410. In addition, a decrease in the ETS rate will negatively impact the transmission rates that Ontario customers pay and could be perceived as benefiting customers in neighbouring jurisdictions at the expense of Ontario consumers. As such, Hydro One proposes to continue using the current ETS rate of $1.85/MWh to establish the ETS revenue used to offset the transmission revenue requirement as discussed in Section 3.

3. EXPORT TRANSMISSION SERVICE REVENUE

Hydro One's ETS revenue, used for establishing the rates revenue requirement proposed in this Application, is calculated using the currently approved tariff of $1.85/MWh and

the three year historical rolling average volume of electricity exported from, or wheeled-through, Ontario over its transmission system. Table 2 provides the forecast of ETS revenue for the period 2020 to 2022.

Table 2: ETS Revenue Forecast ($ Millions)

Year	ETS Revenue
2020	35.9
2021	35.9
2022	36.3

The ETS revenue will continue to be disbursed as a decrease to the revenue requirement for the Network rate pool, as per the cost allocation process approved by the Board.

Hydro One proposes to revise its rates revenue requirement to reflect the Board's Decision and Order with respect to the ETS tariff as part of the Draft Rate Order to be submitted in finalizing the 2020 Uniform Transmission Rates.

APPRO INTERROGATORY #2

Reference:

I2-04-01 p.3, Settlement Agreement in EB-2014-0140

Interrogatory:

Preamble:

Hydro One states that while the updated cost allocation study resulted in a calculated ETS rate of $1.25/MWh, the current ETS rate of $1.85/MWh represents a negotiated rate that was established as part of the Settlement Agreement in Proceeding EB-2014-0140.

Based on the Settlement Agreement filed on September 15, 2014 and approved on December 2, 2014 in EB-2014-0140 (the "Settlement Agreement"), please confirm the following:

a) As per Issue 2 of the Settlement Agreement at page 5 of 27, is Hydro One proposing to adopt in its current application the settled revenue requirement before adjustment as agreed by the parties to EB-2014-0140? If no, why not?

b) As per Issue 4 of the Settlement Agreement at page 8 of 27, is Hydro One proposing to adopt in its current application the settled external revenues of as agreed by the parties to EB-2014-0140? If no, why not?

c) As per the section under Overall OM&A Settlement and its Rationale in the Settlement Agreement at page 9 of 27, is Hydro One proposing to adopt in its current application the OM&A expenditures as agreed by the parties to EB-2014-0140? If no, why not?

d) As per Issue 8 of the Settlement Agreement at page 12 of 27, is Hydro One proposing to adopt in its current application the transmission overhead capitalization rate agreed by the parties in EB-2014-0140? If no, why not?

e) As per Issue 11 of the Settlement at page 16 of 27, is Hydro One proposing to adopt in its current application the rate base agreed by the parties in EB-2014-0140? If no, why not?

f) Is Hydro One proposing to maintain in its current application the outputs of the cost allocation model that was agreed to by the parties in EB-2014-0140? If no, why not?

Response:

a) to e) No. The items referenced (i.e. revenue requirement, external revenues, OM&A expenditures, overhead capitalization rate, rate base) are all inputs to the determination of revenue requirement over the 2020 to 2022 period that need to be reviewed and approved by the OEB in this proceeding.

f) No. The allocation of costs to the transmission rate pools must be updated to reflect the revenue requirement and rate base proposed for the 2020 to 2022 period.

APPRO INTERROGATORY #1

Reference:

I2-04-01 p.2-3

Interrogatory:

Preamble:

Hydro one has updated the 2015 Elenchus cost allocation model utilizing the latest available information and the ETS rate calculated using the elenchus study methodology has been determined to be $1.25/MWh.

a) Please file a complete copy of the 2015 Elenchus cost allocation model updated using the latest available information used to calculate the ETS Rate for $1.25/MWh. Please file this cost allocation model in live excel format.

b) Please provide a summary table that explains at a high level how the cost allocation model arrives at $1.25/MWh.

c) Please provide the date of the latest available information referenced in the preamble.

Response:

a) The excel version of the 2015 Elenchus cost allocation model updated using the latest available information used to calculate the ETS Rate of $1.25MWh is provided as Attachment 1 to this response.

b) A high level description of how the cost allocation model allocates the costs associated with providing export service is provided on pages 1 to 2 of Exhibit I2, Tab 4, Schedule 1. The table provided below summarizes the calculation of the $1.25/MWh ETS Rate.

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$22.1	18,800.0	$1.17	$977.6	$1,041.9	106.6%	$23.5	$1.25

Note: All revenue requirement amounts are based on Hydro One's proposed 2020 revenue requirement, as shown in Exhibit I2, Tab 4, Schedule 1, Table 1.

c) The 2015 Elenchus cost allocation model was updated using the latest available data, which consists of:

- Fixed Assets dedicated to Exports (interconnections) as of 2017 year-end;
- 12 CP Allocator based on the total of the 2018 monthly IESO domestic and export peak data;
- Hydro One's actual 2018 export volume (MWh); and
- IESO's average domestic volume (MWh) from 2016-2018 (inclusive).

UNDERTAKING - JT 1.36 - Q1

Reference:

I2-APPrO-1

I-10-VECC-55

Undertaking:

Preamble:

In response to I2-APPrO-1, Hydro One filed a copy of the 2015 Elenchus cost allocation model in live excel format with information that was updated to calculate the ETS Rate of $1.25/MWh.

Hydro One also provided the following table summarizing the calculation of the $1.25/MWh in response to I2-APPrO-1:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	Volume (GWh)	Rate ($/MWh)	Hydro One Total ($M)	Ontario Total ($M)	Escalation Factor	Ontario ETS Revenue Requirement ($M)	Ontario ETS Rate ($/MWh)
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$22.1	18,800.0	$1.17	$977.6	$1,041.9	106.6%	$23.5	$1.25

Note: All revenue requirement amounts are based on Hydro One's proposed 2020 revenue requirement, as shown in Exhibit I2, Tab 4, Schedule 1, Table 1.

In response to I-10-VECC-55, Hydro One explained that:

Response:

a) The export volumes for 2020 to 2022 were calculated based on a three year rolling average of the prior year's amounts. The table below provides the export volumes for 2020 to 2022 period as used in the initial Application:

2015 Actual	2016 Actual	2017 Actual	2018 (2015 - 2017 Avg)	2019 (2016 - 2018 Avg)	2020 (2017- 2019 Avg)	2021 (2018- 2020 Avg)	2022 (2019- 2021 Avg)
23,138,052	22,157,981	19,346,599	21,547,544	21,017,374	20,637,172	21,067,364	20,907,304

b) The same calculation as in part (a) was used for the Updated Application; however the data for 2018 was updated to reflect actual volumes. The table below provides the export volumes for 2020 to 2022 period as used in the Updated Application:

2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 (2016 - 2018 Avg)	2020 (2017- 2019 Avg)	2021 (2018- 2020 Avg)	2022 (2019- 2021 Avg)
23,138,052	22,157,981	19,346,599	18,771,464	20,092,015	19,403,359	19,422,279	19,639,218

a) In respect of I10-VECC-55, please explain the benefits of using a three-year rolling average to forecast export volumes.

Witness: Clement Li

b) Please confirm that Hydro One is forecasting 2020 export volumes in the Updated Application of 19,403,359 MWh, however Hydro One's calculation of the ETS Rate of $1.25/MWh assumes the allocated 2020 export revenue requirement of $22,080,665 is collected from an export volume of 18,800 GWh.

c) Please update the calculation of the ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from Hydro One's forecasted 2020 export volumes of 19,403,359 MWh. In connection with this update, please provide:
    a. the resulting ETS Rate,
    b. an update to the summary table that was provided in I2-APPrO-1 showing the values used for this scenario, and
    c. a revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario.

d) Please update Hydro One's forecast of export volumes using a four-year rolling average methodology (rather than a three-year rolling average), and provide updated forecasts of export volumes for 2019, 2020, 2021, and 2022.

e) Please update the calculation of the ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from the forecast of 2020 export volumes calculated in response to part (d) above. In connection with this update, please provide:
    a. the resulting ETS Rate,
    b. an update to the summary table that was provided in I2-APPrO-1 showing the values used for this scenario, and
    c. a revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario.

Response:

a) Normally, a three-year rolling average has the benefit that it captures the up and down fluctuations of prior years for a value being forecast. However, as shown in the response to Exhibit I, Tab 10, Schedule VECC-55 part (b), export volumes have been on a clear downward trend since 2015 and therefore the three-year average does not provide the best estimate of what the forecast exports will be in 2020.

b) Confirmed. For the purpose of cost allocation and rate design, Hydro One believes that an export volume of 18,800 GWh is the best estimate of export volumes in 2020.

c) The resulting ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from the forecasted 2020 export volumes using three-year rolling average of 19,403,359 MWh is $1.21/MWh.

Below is the updated table as requested:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$22.1	19,403.4	$1.14	$977.6	$1,041.9	106.6%	$23.5	$1.21

A revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario is provided as Attachment 1 to this undertaking.

d) The table below provides the requested information:

Export Volume Forecast using 4-year Rolling Average			
2019 Export MWh Forecast (2015 - 2018 Avg)	**2020 Export MWh Forecast (2016- 2019 Avg)**	**2021 Export MWh Forecast (2017- 2020 Avg)**	**2022 Export MWh Forecast (2018- 2021 Avg)**
20,853,524	20,282,392	19,813,495	19,930,219

e) The resulting ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from the forecasted 2020 export volumes using four-year rolling average of 20,282,392 MWh is $1.16/MWh.

Below is the updated table as requested:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$22.1	20,282.4	$1.09	$977.6	$1,041.9	106.6%	$23.5	$1.16

A revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario is provided as Attachment 2 to this undertaking.

UNDERTAKING - JT 1.36

Reference:

APPRO Panel 4 questions

Undertaking:

To respond to APPRO's written technical conference questions for panel 4 provided by Mr. Vellone.

Response:

APPrO submitted two written questions (I2-APPrO-TC1 and I2-APPrO-TC2) at the Technical Conference dated August 12, 2019. Please refer to Exhibit JT1.36-Q01 and Exhibit JT1.36-Q02 for responses to these questions, respectively.

UNDERTAKING - JT 1.36 - Q1

Reference:

I2-APPrO-1

I-10-VECC-55

Undertaking:

Preamble:

In response to I2-APPrO-1, Hydro One filed a copy of the 2015 Elenchus cost allocation model in live excel format with information that was updated to calculate the ETS Rate of $1.25/MWh.

Hydro One also provided the following table summarizing the calculation of the $1.25/MWh in response to I2-APPrO-1:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	Volume (GWh)	Rate ($/MWh)	Hydro One Total ($M)	Ontario Total ($M)	Escalation Factor	Ontario ETS Revenue Requirement ($M)	Ontario ETS Rate ($/MWh)
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$22.1	18,800.0	$1.17	$977.6	$1,041.9	106.6%	$23.5	$1.25

Note: All revenue requirement amounts are based on Hydro One's proposed 2020 revenue requirement, as shown in Exhibit I2, Tab 4, Schedule 1, Table 1.

In response to I-10-VECC-55, Hydro One explained that:

Response:

a) The export volumes for 2020 to 2022 were calculated based on a three year rolling average of the prior year's amounts. The table below provides the export volumes for 2020 to 2022 period as used in the initial Application:

2015 Actual	2016 Actual	2017 Actual	2018 (2015 - 2017 Avg)	2019 (2016 - 2018 Avg)	2020 (2017- 2019 Avg)	2021 (2018- 2020 Avg)	2022 (2019- 2021 Avg)
23,138,052	22,157,981	19,346,599	21,547,544	21,017,374	20,637,172	21,067,364	20,907,304

b) The same calculation as in part (a) was used for the Updated Application; however the data for 2018 was updated to reflect actual volumes. The table below provides the export volumes for 2020 to 2022 period as used in the Updated Application:

2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 (2016 - 2018 Avg)	2020 (2017- 2019 Avg)	2021 (2018- 2020 Avg)	2022 (2019- 2021 Avg)
23,138,052	22,157,981	19,346,599	18,771,464	20,092,015	19,403,359	19,422,279	19,639,218

a) In respect of I10-VECC-55, please explain the benefits of using a three-year rolling average to forecast export volumes.

Witness: Clement Li

b) Please confirm that Hydro One is forecasting 2020 export volumes in the Updated Application of 19,403,359 MWh, however Hydro One's calculation of the ETS Rate of $1.25/MWh assumes the allocated 2020 export revenue requirement of $22,080,665 is collected from an export volume of 18,800 GWh.

c) Please update the calculation of the ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from Hydro One's forecasted 2020 export volumes of 19,403,359 MWh. In connection with this update, please provide:
    a. the resulting ETS Rate,
    b. an update to the summary table that was provided in I2-APPrO-1 showing the values used for this scenario, and
    c. a revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario.

d) Please update Hydro One's forecast of export volumes using a four-year rolling average methodology (rather than a three-year rolling average), and provide updated forecasts of export volumes for 2019, 2020, 2021, and 2022.

e) Please update the calculation of the ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from the forecast of 2020 export volumes calculated in response to part (d) above. In connection with this update, please provide:
    a. the resulting ETS Rate,
    b. an update to the summary table that was provided in I2-APPrO-1 showing the values used for this scenario, and
    c. a revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario.

Response:

a) Normally, a three-year rolling average has the benefit that it captures the up and down fluctuations of prior years for a value being forecast. However, as shown in the response to Exhibit I, Tab 10, Schedule VECC-55 part (b), export volumes have been on a clear downward trend since 2015 and therefore the three-year average does not provide the best estimate of what the forecast exports will be in 2020.

b) Confirmed. For the purpose of cost allocation and rate design, Hydro One believes that an export volume of 18,800 GWh is the best estimate of export volumes in 2020.

c) The resulting ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from the forecasted 2020 export volumes using three-year rolling average of 19,403,359 MWh is $1.21/MWh.

Below is the updated table as requested:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$22.1	19,403.4	$1.14	$977.6	$1,041.9	106.6%	$23.5	$1.21

A revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario is provided as Attachment 1 to this undertaking.

d) The table below provides the requested information:

Export Volume Forecast using 4-year Rolling Average			
2019 Export MWh Forecast (2015 - 2018 Avg)	**2020 Export MWh Forecast (2016- 2019 Avg)**	**2021 Export MWh Forecast (2017- 2020 Avg)**	**2022 Export MWh Forecast (2018- 2021 Avg)**
20,853,524	20,282,392	19,813,495	19,930,219

e) The resulting ETS Rate assuming Hydro One's proposed 2020 export revenue requirement is collected from the forecasted 2020 export volumes using four-year rolling average of 20,282,392 MWh is $1.16/MWh.

Below is the updated table as requested:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$22.1	20,282.4	$1.09	$977.6	$1,041.9	106.6%	$23.5	$1.16

A revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario is provided as Attachment 2 to this undertaking.

UNDERTAKING - JT 1.36 - Q2

Reference:

I2-APPrO-1

Section 4.3.1 of the Elenchus Cost Allocation Methodology Report for the Export Transmission Service Rate (filed in EB-2014-0140, Exhibit H1-5-1 at Attachment 1) (the "Elenchus Report")

Undertaking:

Preamble:

In response to I2-APPrO-1, Hydro One filed a copy of the 2015 Elenchus cost allocation model in live excel formation with information that was updated to calculate the ETS Rate of $1.25/MWh.

In response to part (c) of I2-APPrO-1, Hydro One confirmed that:

> c) The 2015 Elenchus cost allocation model was updated using the latest available data, which consists of:
>
> - Fixed Assets dedicated to Exports (interconnections) as of 2017 year-end;
> - 12 CP Allocator based on the total of the 2018 monthly IESO domestic and export peak data;
> - Hydro One's actual 2018 export volume (MWh); and
> - IESO's average domestic volume (MWh) from 2016-2018 (inclusive).

a) Please confirm that in Section 4.3.1 of the Elenchus Report, Elenchus explored using both the 1 CP and 12 CP Allocator for cost allocation to exporters.

b) Please provide updates to Tables 1 and 2 shown in Section 4.3.1 of the Elenchus Report to demonstrate the difference in coincident peak values for 1 CP and 12 CP, as split between export, domestic, and total, for the three-year period 2016- 2018, as well as the three-year average over that period.

c) Please update the calculation of the ETS Rate by allocating Hydro One's proposed 2020 revenue requirement using the 1 CP Allocator, rather than the 12 CP Allocator. In connection with this update, please provide:
   a. the resulting ETS Rate,
   b. an update to the summary table that was provided in I2-APPrO-1 showing the values used for this scenario, and
   c. a revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario.

Witness: Clement Li

d) Please update the calculation of the ETS Rate by combining the changes requested in I2-APPrO-TC1(c) and I2-APPrO-TC2(c) together in a single update. In connection with this update, please provide:
   a. the resulting ETS Rate,
   b. an update to the summary table that was provided in I2-APPrO-1 showing the values used for this scenario, and
   c. a revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario.

e) Please update the calculation of the ETS Rate by combining the changes requested in I2-APPrO-TC1(e) and I2-APPrO-TC2(c) together in a single update. In connection with this update, please provide:
   a. the resulting ETS Rate,
   b. an update to the summary table that was provided in I2-APPrO-1 showing the values used for this scenario, and
   c. a revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario.

f) Finally, please confirm that Hydro One is not using the 12 CP Allocator to allocate costs elsewhere in this Application to any other customers (i.e. other than in connection with the calculation of the ETS Rate). If not confirmed, please specify exactly where the 12 CP Allocator is being use and for what purpose.

g) For completeness of the evidentiary record, please file a copy of the Elenchus Report on the evidentiary record in this proceeding.

Response:

a) Confirmed.

b) The export and domestic 1CP and 12 CP in 2016, 2017 and 2018 are provided in the table below:

Table 1: Coincident peak 2016 to 2018

Coincident Peak	2016			2017			2018			Average		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
1CP	1,905	23,213	25,118	3,729	19,829	23,558	4,121	20,429	24,550	3,252	21,157	24,409
12CP	30,004	244,498	274,502	27,922	231,663	259,585	25,336	241,536	266,872	27,754	239,232	266,986

The 1 CP and 12 CP percentage allocators using 2016 to 2018 data are shown in the table below:

Table 2: Coincident peak %

	2018 Data			Average 2016-2018 Data		
Coincident Peak	**Total**	**Domestic**	**Export**	**Total**	**Domestic**	**Export**
1 CP	100	83.21	16.79	100	86.68	13.32
12 CP	100	90.51	9.49	100	89.60	10.40

c) Below is the requested information updated to reflect this scenario.

a. The resulting ETS Rate using the 1 CP Allocator, rather than the 12 CP Allocator to allocate Hydro One's proposed 2020 revenue requirement is $1.71/MWh.

b. Below is the updated table as requested:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$30.2	18,800.0	$1.61	$977.6	$1,041.9	106.6%	$32.2	$1.71

c. A revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario is provided as Attachment 1 to this undertaking.

d) Below is the requested information updated to reflect this scenario.

a. The resulting ETS Rate using forecasted 2020 export volume based on a three-year rolling average and using 1CP Allocator together in a single update is $1.66/MWh.

b. Below is the updated table as requested:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$30.2	19,403.4	$1.56	$977.6	$1,041.9	106.6%	$ 32.2	$1.66

c. A revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario is provided as Attachment 2 to this undertaking.

e) Below is the requested information updated to reflect this scenario.

a. The resulting ETS Rate using forecasted 2020 export volume based on a four-year rolling average and using 1CP Allocator together in a single update is $1.59/MWh.

b. Below is the updated table as requested:

			UTR Network Revenue Requirement				
ETS Allocated Revenue Requirement ($M)	**Volume (GWh)**	**Rate ($/MWh)**	**Hydro One Total ($M)**	**Ontario Total ($M)**	**Escalation Factor**	**Ontario ETS Revenue Requirement ($M)**	**Ontario ETS Rate ($/MWh)**
A	B	C=A/B	D	E	F=E/D	G=A X F	H=G/B
$ 30.2	20,282.4	$1.49	$977.6	$1,041.9	106.6%	$32.2	$1.59

c. A revised version of the live excel version of the Elenchus cost allocation model updated to reflect this scenario is provided as Attachment 3 to this undertaking.

f) Hydro One does not explicitly use either 1 CP or 12 CP allocators as part of the cost allocation process, but as noted in Exhibit I1, Tab 1, Schedule 2 pages 6 and 9, Hydro One does use (i) customers' average monthly CP for splitting the cost of Dual Function Lines, and (ii) customers' annual non-coincident peak demand for splitting the cost of line and transformation connection assets to which generation is connected.

g) The Elenchus Report was put on record in EB-2014-0140 as Attachment 1 to Exhibit H1, Tab 5, Schedule 1 and a copy is provided as Attachment 4 to this undertaking as requested.