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October 1, 2012

Ontario Energy Board
2300 Yonge Street
P.O. Box 2319
Suite 2700
Toronto, ON M4P 1E4

Attention: Ms Kirsten Walli
Board Secretary

Dear Ms. Walli:

Re: Hydro One Networks Inc.
Change to Electricity Transmission Revenue Requirement and Rates
HQ Energy Marketing Inc. ("HQEM") Evidence
Board File No: EB-2012-0031

Please find attached Intervenor evidence prepared by Elenchus Research Associates Inc. for HQ Energy Marketing Inc. in connection with the above-noted proceeding.

Sincerely,

signed in the original

George Vegh

c. Mr. Matthieu Plante, Hydro Québec
Mr. Yannick Vennes, Hydro Québec
Mr. Michael Roger, Elenchus
Mr. D.H. Rogers, Q.C., Counsel to the Applicant (e-mail)
Mr. Pasquale Catalano, Regulatory Affairs, Hydro One Networks (e-mail)
All Interested Parties (e-mail)

Proceeding EB-2012-0031
Hydro One Transmission
2013-2014 Revenue Requirement

Ontario Cost Allocation and Export Tariff Service

Evidence
Prepared by
Elenchus Research Associates Inc.

For
HQ Energy Marketing Inc.

October 1, 2012

elenchus

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EXECUTIVE SUMMARY

This report reflects our views with respect to how the Ontario Energy Board ("OEB") should be setting the Export Transmission Service ("ETS") tariff in Ontario. In our opinion, the ETS tariff should be established applying the same cost causality principles that the OEB applies in setting the other rates it approves.

Charles Rivers Associates' ("CRA") report filed by the Independent Electricity System Operator ("IESO") presents four alternatives for establishing the ETS tariff, in comparison to the status quo. The alternatives presented have not been evaluated giving cost causality more weight than the other criteria used by CRA. To this date, the IESO has not recommended a preferred alternative.

1 INTRODUCTION

HQ Energy Marketing Inc. ("HQEM") has retained Elenchus in order to assist the Ontario Energy Board ("OEB") in the Hydro One Transmission application on its 2013 and 2014 Revenue Requirement, proceeding EB-2012-0031, by presenting expert opinion evidence on the topic of the Export Transmission Service ("ETS") tariff. In this proceeding, the Independent Electricity System Operator ("IESO") has filed a Charles River Associates ("CRA") study of various ETS tariffs options for Ontario. The CRA study presents results regarding four alternatives and the status quo, without recommending a preferred option. Similarly, to this date, the IESO has not indicated a preferred alternative.

This report includes our assessment and recommendations with respect to how the ETS tariff should be set by the OEB based on accepted cost causality principles.

The evidence presented in this report is divided into 4 main sections. Section 2 describes cost causality principles and how these principles are used in the utility industry, section 3 describes how the same cost causality principles could be applied in establishing the ETS tariff, section 4 provides our observations and section 5 lists our conclusions and recommendations.

John Todd and Michael Roger have been experts dealing with cost allocation, rate design and rate regulation issues for over 30 years. Mr. Todd testified before many regulatory agencies throughout Canada on cost allocation and rate design issues, which are similar to the issue being reviewed at this Proceeding in establishing the appropriate ETS tariff in Ontario. Mr. Roger 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 customers in Ontario. He has also testified on numerous occasions at OEB proceedings.

2 PRINCIPLES OF COST ALLOCATION

2.1 ONTARIO APPROACH

The OEB regulates the electricity sector in Ontario. Ontario Power Generation, all transmission and distribution companies operating in Ontario, the Ontario Power Authority ("OPA") and the IESO are required to submit to the OEB their respective revenue requirements in order for the OEB to approve their operating costs and for those organisations to recover these costs through unbundled electricity rates, in a just and reasonable manner from Ontario electricity customers.

The OEB also regulates the natural gas sector in Ontario. Union Gas Limited, Enbridge Gas Distribution Inc. and Natural Resource Gas Limited are the regulated natural gas distribution companies operating in Ontario. They are required to submit their revenue requirements for approval by the OEB to recover their operating and capital costs through bundled and unbundled natural gas rates in a just and reasonable manner from Ontario natural gas customers. The OEB also approves all major natural gas facility projects including the manner in which the cost of the proposed facilities will be recovered from customers.

There are widely accepted principles that provide guidance to regulators in determining rates that are just and reasonable. These are often referred to as Generally Accepted Regulatory Principles ("GARP"). The seminal work of James C. Bonbright, which sets out ten "attributes of a sound rate structure"[1], is a primary reference used by regulators and regulatory experts in identifying the key ratemaking principles. Although the broad principles have been restated over the years in many different ways in the literature on economic regulation[2] the basic concepts remain at the heart of economic regulation.

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[1] Bonbright, James C., Albert L. Danielson and David R. Kamerschen, (1988) Principles of Public Utility Rates (Second Edition), Public Utilities Reports, Inc., pages 383-384.

[2] A particularly thorough and relatively recent restatement of the Bonbright principles made by a regulator appears in Newfoundland and Labrador Board of Commissioners of Public Utilities, in the

We note that the OEB has explicitly endorsed a version of the Bonbright Principles, as stated in the Staff Discussion Paper for Rate Design for Recovery of Electricity Distribution Costs[3].

> *The Board identified three rate design principles for the purposes of this process. These principles encompass all of the "Bonbright attributes of a sound rate structure[5]" identified in the March 2007 Staff Discussion Paper:*
>
> *1. full cost recovery;*
>
> *2. fairness; and*
>
> *3. efficiency.*

In our opinion, the Generally Accepted Regulatory Principles used as a touchstone for determining just and reasonable rates for transmitters and distributors are equally relevant for setting the ETS tariff in Ontario.

Cost allocation is an important step in the overall rate making process and it is guided by the aforementioned Bonbright Principles. The most essential element of these principles is that costs should be allocated to customer classes in a manner that reflects cost causality. The importance of this approach within the OEB's regulatory regime was clearly stated in the Report of the Board EB-2007-0667.

> *The establishment of specific revenue requirements through cost causality determinations is a fundamental rate-making principle. Cost allocation is key to implementing that principle. Cost allocation policies reasonably allocate the costs of providing service to various classes of consumers and, as such, provide an important reference for establishing rates that are just and reasonable.*[4]

With respect to interruptible rates, Bonbright's book on page 402 "Interruptible Rates Considered" states that: "The company might also instigate lower charges for interruptible sales", (emphasis added) and on page 403 it continues and states that:"...interruptible power may be curtailed or interrupted if conditions arise that are burdensome to the supplier. In short, the interruptible customer is buying lower quality

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Matter of an Application by Newfoundland and Labrador Hydro for a General Rate Review, Decision and Order of the Board, Order No. P.U. 7 (2002-2003), June 7, 2002, pages 28-29.

[3] Ontario Energy Board, Staff Discussion Paper, Rate Design for Recovery of Electricity Distribution Costs, EB-2007-0031, March 31, 2008 (revised June 6, 2008).

[4] Ontario Energy Board, Report of the Board, Application of Cost Allocation for Electricity Distributors, EB-2007-0667, November 28, 2007.

service that a cost incurrence philosophy would deem appropriate for a lower rate." On the same page, Bonbright states: "Interruptible customers are charged lower rates since they do not have any demand or capacity costs."

Also with respect to interruptible rates, on page 106[5] Alfred Khan states that: "In the presence of excess capacity, utility companies ought to make every effort to design rates, down to SRMC (Short Run Marginal Costs), to put it to use." Khan continues and states that: "Therefore, the essential proviso would have to be attached that the proffer of any such temporarily low rates be accompanied with the warning that service would be interrupted as demand caught up…".

In our opinion, the applicability of the concept of allocating and recovering costs in a manner that reflects cost causality is not limited to electricity distributors; it is a core principle that guides the setting of just and reasonable rates in all applications of economic regulation, including the setting of the ETS tariff. Certainly, the cost causality principle is not the sole determinant of just and reasonable rates; however, significant deviations from this principle should result from an explicit determination of the appropriateness of any departure from pure cost causality. By definition, such departure creates cross-subsidies among customers, which need to be accounted for when balancing relevant rate making principles.

Furthermore, in our opinion, it would be inappropriate to establish a charge without first determining the causal costs in play. Those costs would serve as a reference point in determining whether any deviation from strict cost causality is appropriate and necessary, considering other rate making principles or policy considerations. In our opinion, it would be inconsistent with GARP to accept rates as just and reasonable when they embed cross-subsidies that have not been quantified and have not been explicitly recognized and accepted by the regulator.

[5] The Economics of Regulation: Principles and Institutions, Volume 1, Alfred E. Khan,

2.2 FIRM AND INTERRUPTIBLE CUSTOMERS

In Ontario, domestic customers and exporters both utilize the transmission system, of which Hydro One Transmission accounts for over 95%. However, as stated in the evidence and in response to interrogatory 23.0-HQ-1, i and ii, electricity exports are not taken into consideration when planning the transmission system. In response to interrogatory 23.0-HQ-2, i and ii, the IESO confirms that when operating the electricity system in Ontario, export transactions are curtailed before non-dispatchable loads in case of emergency. This confirms that exports are *per the IESO market rules* treated as interruptible customers, while domestic loads are treated as firm customers with respect to transmission service.

Given that export transactions are treated differently than loads and that exporters use only the excess capacity on the transmission system, based on costs causality principles, the cost allocation methodology used to set the ETS tariff should take into consideration the costs that exporters impose on the transmission system.

2.3 COST ALLOCATION METHODOLOGY

In order to determine cost based rates, a cost allocation study is performed by a utility to fairly allocate assets and expenses to the customer groups served by the utility. Traditionally three steps are followed in a cost allocation study: Functionalization, Categorization or Classification, and Allocation.

Functionalization of assets and expenses is the process of grouping assets and expenses of a similar nature, for example, generation, transmission, distribution, customer service, meter reading, etc. Hence, as a first step in a cost allocation study, each account in the utility's system of accounts is functionalized. That is, the function(s) served by the assets or expenses contained in each account is identified so that the 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 demand, energy 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 system demand, energy throughput or the number of customers.

Allocation, which is the final step, is the process of attributing the demand, energy and customer related assets and expenses to the customer classes being served by the utility. This allocation is accomplished by identifying allocators related to demand, energy, 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. For example, if the necessary investment in a particular class of asset (e.g., certain transmission lines) is caused strictly by the single peak in annual demand, then the relevant costs would be allocated using the 1-coincident peak (1-CP) method.

It is in this third step that customers are grouped based on common characteristics, or utility asset utilization reflecting cost causality. Firm customers would be in a different classification than interruptible customers.

Firm customers would get allocated the costs they impose on the utility including transmission costs. On the other hand, interruptible customers would not get allocated all transmission costs to the extent that interruptible customers do not impose these costs on the utility. Finally, if there are identifiable variable costs that interruptible customers impose on utilities, these costs would be reflected in the setting of interruptible rates.

2.4 ONTARIO NATURAL GAS UTILITY COST ALLOCATION METHODOLOGY

In Ontario most natural gas interruptible customers supply their own gas for storage, balancing, fuel and redelivery to the customer's facilities.

Following the cost allocation methodology used by the OEB to regulate Ontario Natural Gas utilities, firm customers are allocated the costs they impose on the utility including distribution, storage, commodity and transmission costs. On the other hand, interruptible customers are not allocated all distribution, storage, commodity and

transmission costs, to the extent that interruptible customers do not impose all of these costs on the utility. If there are identifiable variable costs that interruptible customers impose on utilities, these costs are reflected in the setting of interruptible rates.

2.5 ONTARIO ENERGY BOARD APPROVED INTERRUPTIBLE NATURAL GAS SERVICES

Natural gas service in Ontario is provided to over 3.35 million customers. Almost all Ontario natural gas customers use firm service. Large contract customers who have the capability to maintain operations during gas service curtailments are provided the option of contracting for interruptible natural gas service. Only a small number of customers contract for interruptible service. Interruptible gas services are provided at a lower rate than the equivalent firm service. The interruptible rate design is based on the customer agreeing to be curtailed during peak periods upon terms and conditions contained within the interruptible contract. This allows for the gas system to be designed to meet a lower peak day capacity thereby avoiding capital costs associated with a system that would be designed to meet the full peak day design had all customers' peak requirements been firm. This higher peak day firm design would likely only be used a few days each year. By designing the system to meet only the lower firm design day requirements all utility customers benefit from the reduced capital cost and a more efficient system than if all customers were served on a firm basis.

The OEB has approved bundled and unbundled interruptible rates for these large contract customers utilizing traditional cost allocation methods.

2.5.1 UNION GAS LIMITED'S COST ALLOCATION

The OEB has approved the following cost allocation methodology for Union's interruptible services:

a) Functionalization: Union uses four functions generally accepted as necessary to obtain and move gas to market: purchase and production of gas, storage, transmission, and distribution.
b) Classification: Demand-related costs (or capacity-related) are costs that vary with peak day usage of the system. Commodity-related costs are costs that are typically variable in nature and vary with the level of gas consumed. Customer-related costs are costs that are incurred by virtue of a customer taking service and do not vary with either peak day demand or consumption, and
c) Allocation: Allocation factors that reflect the underlying cause of cost incurrence are used in the allocation process. Demand-related costs are allocated using the peak day demands of each rate class. Commodity-related costs are allocated based on rate class consumption. Customer-related costs are allocated based on the number of customers in a rate class.

The allocation of distribution demand costs to customers in Union South is based on the design day demand of firm and interruptible customers served by distribution facilities, excluding customers served directly off transmission lines. Distribution demand costs are allocated to the rate classes in the North area using system peak day demand and system peak and average day demand.

Table 1 below shows a comparison between Union Gas's current firm delivery tariffs and interruptible tariffs. These tariffs are for transportation service only. Interruptible tariffs are between 41% and 66% lower than firm tariffs.

Table 1

COMPARISON OF UNION GAS LIMITED FIRM AND INTERRUPTIBLE RATES			
Delivery Rates	**Current Rate (cents/m^3)**	**Firm Rate Minus Interruptible (cents/m^3)**	**Interruptible Discount From Firm Rate (%)**
Union South			
Firm Contract Commercial / Industrial M5 (F)	2.7592		
Interruptible Contract Commercial / Industrial M5 (I)	1.6298	1.1294	40.9
Firm Special Large Volume Contract M7 (F)	2.7417		
Interruptible Special Large Volume Contract M7 (I)	0.9551	1.7866	65.2
Union North and East			
Large Volume Firm Rate 10	5.2606		
Large Volume Interruptible 25	1.8052	3.4554	65.7

Data Source: EB-2011-0210, Exhibit H3, Tab 1, Schedule 3, Page 2 of 2, Filed: 2011-11-23

2.5.2 ENBRIDGE'S COST ALLOCATION

Enbridge uses a very similar approach to Union's for allocating costs to its interruptible rate classes. Enbridge also uses the three-step process to functionalize (Gas Supply, Storage, Sales Pressure Regulators, Distribution Pressure Regulators, Services, Mains, Meters, Rental Equipment, Sales/Marketing, Customer Accounting and Unidentifiable), classify (The costs are classified into three cost groups based on whether costs vary with commodity (i.e. – volumes), capacity, or other customer specific factors), and allocate costs. This is necessary to facilitate costing of the variety of services required that are identifiable with each customer class. Enbridge believes that the consistent application of these steps results in an approach that allocates to each rate class the average costs associated with specific, shared, and common facilities used to provide services required by customers.

Interruptible Rates 145 and 170 do not have any capacity related charges for peak transportation and storage deliverability.

Table 2 below shows a comparison between Enbridge's firm delivery tariffs and interruptible tariffs. These tariffs are for transportation service only. Interruptible tariffs are approximately 29% lower than firm tariffs.

Table 2

COMPARISON OF ENBRIDGE GAS FIRM AND INTERRUPTIBLE DELIVERY RATES			
Delivery Rates	**Current Rate (cents/m^3)**	**Firm Rate Minus Interruptible (cents/m^3)**	**Interruptible Discount From Firm Rate (%)**
Rate 100 Average C&I Firm	0.1128		
Rate 145 Average C&I Interruptible	0.0806	0.0322	28.5
Rate 110 Average Industrial Firm	0.0761		
Rate 170 Average Industrial Interruptible	0.0538	0.0223	29.3

Data Source: EB-2011-0354, Exhibit H2, Tab 7, Schedule 1, Page 1 of 8, Updated: 2012-06-08

3 CRA STUDY OPTIONS EVALUATIONS

In the CRA study, the four options (and the *status quo* scenario) presented were evaluated based on the following criteria: Consistency, Simplicity, Fairness, and Efficiency[6]. As stated in responses to interrogatory 23.0-HQ-4, iii and 23.0-HQ-6, cost causality is an accepted rate making principles and CRA treated all criteria the same when evaluating the four options, that is without assigning more or less weight to any criterion.

3.1 CRITERIA FOR ESTABLISHING THE ETS TARIFF

It is our view that the OEB should be setting the ETS tariff using the same principles of cost causality that the OEB applies in setting Transmission and Distribution rates in Ontario for domestic customers. A separate rate class should be explicitly created for exporters as interruptible customers and an appropriate ETS tariff should be determined. Exporters are already considered a different customer class since no transmission capacity is built to satisfy their needs and the IESO, as per its market

[6] Exhibit H1-5-2, Appendix B, pages 39 and 40

rules, treats exporters as interruptible load while domestic customers are treated as firm load[7].

In order for the ETS tariff to be deemed fair and reasonable, the main criterion that should be used is cost causality, taking into consideration that exporters are treated as interruptible customers by the IESO (see responses to interrogatory 23.0-HQ-2, i and ii), that the transmission system, when being planned, does not take exporters capacity needs into consideration (see responses to interrogatory 23.0-HQ-1, i and ii) and, finally, that exporters only use the excess capacity on the transmission system when wheeling across and exporting from Ontario.

When establishing interruptible rates, the difference between firm and interruptible rates reflects the savings to the utility of not having to build capacity or infrastructure to serve interruptible loads. Further, it is common for the frequency or duration of curtailment to be limited under interruptible rates. The greater the limits on permitted curtailment, the less the avoided infrastructure costs are likely to be. In the case of electricity exports in Ontario, there appears to be no limits or preconditions to the frequency or duration of curtailments.

3.2 EXAMPLES OF INTERRUPTIBLE RATES

3.2.1 ELECTRICITY INTERRUPTIBLE RATES

Ontario Hydro in the early 1990's used to have interruptible rates that were based on the avoided costs of building a Combustion Turbine Unit and offered discounts based on the level of possible interruptions, not based on the level of actual interruptions. By offering interruptible rates, Ontario Hydro was able to utilize its system more efficiently by supplying electricity when there was excess capacity available, without having to

[7] It should be noted that in our view, exports have always been treated as a *de facto* separate interruptible rate class, with a rate lower than the firm rate. As a result, our recommendations to explicitly recognize exports' interruptible nature and set an appropriate rate for them do not represent a departure from the current practice.

build additional capacity. As a result of the opening of the Ontario electricity market to competition in May 2002, the interruptible rates program ended.

Natural Gas Interruptible Rates Table 3 lists the interruptible rates that Union Gas and Enbridge provide:

Table 3

Ontario Natural Gas Interruptible Rates				
Union Gas Limited				
Rate	**Minimum Annual Volume**	**Days of Curtailment and Notice**	**Conditions of Service**	**Typical Customer**
M5	At least 700,000 m^3/year	Up to 40 days a year	Contract; must be able to shut off their natural gas service and use an alternate fuel if required. Consume between 4,800 m^3 and 140,870 m^3 of natural gas each day. Electronic metering	Union South: hospitals, large greenhouses, auto part plants, and manufacturers) are located in Union's southern operation area
M7	At least 28,327,840 m^3 of natural gas each year	Up to 40 days a year	Contract; must be able to shut off their natural gas service and use an alternate fuel if required. Electronic metering	Union South: typically large manufacturers requiring a very large volume of natural gas for industrial processes – such as steel, auto and chemical
25		No limit of days of curtailment	Contract; must be able to shut off their natural gas service and use an alternate fuel if required. Electronic metering	Union North and Eastern Region: typically large manufacturers requiring a very large volume of natural gas for industrial processes
Enbridge Gas Distribution				
145	Not less than 340,000 m^3/year	Subject to curtailment for either capacity and/or supply reasons at the option of the Company. Not less than 72 hours .	Contract; must be able to shut off their natural gas service	Typically large manufacturers requiring a very large volume of natural gas
170	Not less than 30,000 m^3/day and a minimum annual volume of 5,000,000 m^3, to a single terminal location	Subject to curtailment for either capacity and/or supply reasons at the option of the Company. Not less than 4 hours notice.	Contract; must be able to shut off their natural gas service and use an alternate fuel if required	Typically large industrial customers requiring a very large volume of natural gas for industrial processes

4 OBSERVATIONS

The OEB has used cost causality determinations in the establishment of revenue requirements as a fundamental rate-making principle. Cost allocation is the key to implementing that principle. Cost allocation policies reasonably allocate the costs of providing service to various classes of consumers and, as such, provide an important reference for establishing rates that are just and reasonable.

The OEB has approved interruptible services for natural gas customers in Ontario using sound cost allocation principles. Interruptible rates have been used in Ontario for over 30 years. Using this approach, Ontario's natural gas infrastructure has been designed to meet the firm peak day requirements of natural gas users. For example, Enbridge's Interruptible Rates 145 and 170 do not have any capacity related charges for peak transportation and storage deliverability. The bulk of the allocated costs are related to gas commodity and upstream transportation. Further, the only costs allocated to interruptible rates are the costs attributable to interruptible customers.

Final rates are established only after this cost allocation stage has been completed. As a result, both Enbridge's and Union's interruptible tariffs are at rates substantially (29% to 66%) below firm tariffs.

To be consistent with previous experience and to ensure a just and reasonable tariff, the same approach should be used in establishing the ETS tariff: a proper cost allocation model should be used taking into account the specific characteristics of interruptible transmission customers, and only then should the final ETS tariff be determined. Furthermore, it is at the rate design stage, and not at the cost allocation stage, that other considerations (e.g., fairness and rate stability) should be taken into account, if the OEB deems it appropriate.

5 SUMMARY OF RECOMMENDATION

It is our opinion that the following findings and recommendations be adopted by the OEB in this proceeding in setting the ETS tariff:

#1: The principle of cost causality should be applied in determining the ETS tariff. This can be achieved by creating a separate customer class for exporters taking into consideration that:

- #1.1: Exporters use only the excess capacity on the transmission system; therefore they should not be charged the same rate as firm customers when using the Ontario transmission system.

- #1.2: Exporters' capacity requirements are not taken into consideration by transmission planners in the planning and designing the Ontario transmission system.

- #1.3: The IESO treats exporters as interruptible customers when operating the Ontario transmission system.

#2: If the OEB establishes the ETS tariff taking into consideration other rate principles that depart from cost causality, the reasons for such departure should be provided. It should be identified that domestic customers would be receiving a subsidy from exporters and the amount of the contribution should be clearly stated.