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May 27, 2016

Ms. Kirstin Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Re: Rate Design for Commercial and Industrial Customers (EB-2015-0043)

Dear Ms. Walli:

London Hydro herein files our submission to the Staff Discussion Paper on Rate Design for Commercial and Industrial Customers (EB-2015-0043).

Please feel free to contact me on this submission.

Yours Truly,

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London Hydro Submission

On March 31, 2016 the OEB issued its Staff Discussion Paper on Rate Design for Commercial and Industrial Customers: Aligning the Interests of Customers and Distributors.

The paper provides a number of rate designs with the goal to improve the price signal and influence behavior for the commercial and industrial customers. The influence sought is to assist customers in making informed choices about how they use energy and new technologies, including self-generation using renewable resources. The paper notes that the intent of rate design is to eliminate the need for specialized charging for distributed generation (DG) or net metering since the distribution rate should be designed to recover from customers the costs to serve their use.

The appendix to the report provided information on the potential rate impacts from each option, but it is understood that the impacts could vary depending on the distributor.

The rate design options in the discussion paper are based on the existing customer classifications and are designed to ensure no changes to the underlying allocations to each class.

The discussion paper asked stakeholders to comment on the rate options, rank the options in order of preference, suggest improvements to the rate options and address how customers would respond to the rate options.

London Hydro herein responds to the Board Staff Discussion paper.

Rate Design

London Hydro notes that the OEB's paper proliferates that electricity distributors rates are to be designed to equip customers with the information and the tools they need to make informed choices about how they use energy. These rates are to enable customers to leverage new technologies, including self-generation using renewable resources, help customers manage their bills through conservation, and help customers better understand the value of electricity service.

London Hydro would suggest that the electricity distributor's distribution charges, while not of themselves insignificant to the distributor, are and are becoming more of an insignificant portion of the overall customers electricity bill as commodity charges continue to rise.

Using London Hydro's 2013 Cost of Service billing as an example, distribution charges are a small percentage of the commercial, industrial and institutional customers overall bill.

			Total Bill	Distribution	
Rate Class	**Consumption kWh**	**Demand kW**	**Applied For 2013 COS**	**Applied For 2013 COS**	**% Distribution of Total Bill**
GENERAL SERVICE LESS THAN 50 KW RPP	2,000	-	$ 278.14	$ 50.54	18.2%
GENERAL SERVICE LESS THAN 50 KW TOU	2,000	-	$ 277.43	$ 50.54	18.2%
GENERAL SERVICE >50 KW to 4,999 KW (Interval)	1,095,000	2,500	$ 137,389.74	$ 6,409.40	4.7%
GENERAL SERVICE >50 KW to 4,999 KW (Non-Interval)	1,095,000	2,500	$ 133,096.75	$ 6,409.40	4.8%
GENERAL SERVICE >1000 KW to 4,999 KW (CoGeneration)	1,095,000	2,500	$ 143,379.80	$ 12,897.58	9.0%
LARGE USER	5,600,000	10,700	$ 685,946.25	$ 41,730.33	6.1%

Over the years London Hydro's consumer relation employees who have been dealing with commercial, industrial and institutional customers note that distribution tariffs and charges are rarely the topic of conversation. Rather customers are generally concerned about their debt recovery charges (DRC), global adjustments, and other non-LDC charges. They would suggest that the only time distribution charges become a topic is when a customer is facing re-classification (e.g. from a GS>50 kW customer to a large user). It is not intuitive to them why there should be such a large step change in monthly fixed distribution charges for what appears to be a comparable level of LDC activities associated with servicing that same customer. As such, London Hydro is very supportive of any efforts that aim to address this matter.

To this end London Hydro would suggest that the historical artificial demand based boundaries between rate classes (i.e. 50 kW and 5,000 kW) be eliminated in favour of more original asset based allocation.

The basic electricity distributors business and distributions system is primarily designed to accommodate the lowest level consumers; being the residential and smaller commercial customers. London Hydro applauds the OEB's transition of residential customers to a fully fixed rate. London Hydro would further suggest that fully fixed rates be created for commercial customers with monthly consumption of up to 4,000 kWh or 10 kW[1]. For convenience this class could be termed General Service less than 10 kW, GS<4,000 kWh, or Small Commercial. London Hydro estimates that such classification when combined with residential could recover approximately 80% of London Hydro's revenue requirement.

In reviewing the construct of the current GS<50 kW class, London Hydro observes that approximately two thirds (approximately 8,000 out of 12,000 customers) of this class consumes less than 4,000 kWh per month. London Hydro noted in the study of the 2013 COS that the class average kWh per month is 2,745 kWh.

Using the simplified calculation of $57.93 (from Schedule 2 of London Hydro 2013 COS) as a monthly fixed charge for this class, the monthly impact could be potentially insignificant for most customers in this portion of the rate class. Obviously more work is necessary to fine tune this value to achieve complete fairness.

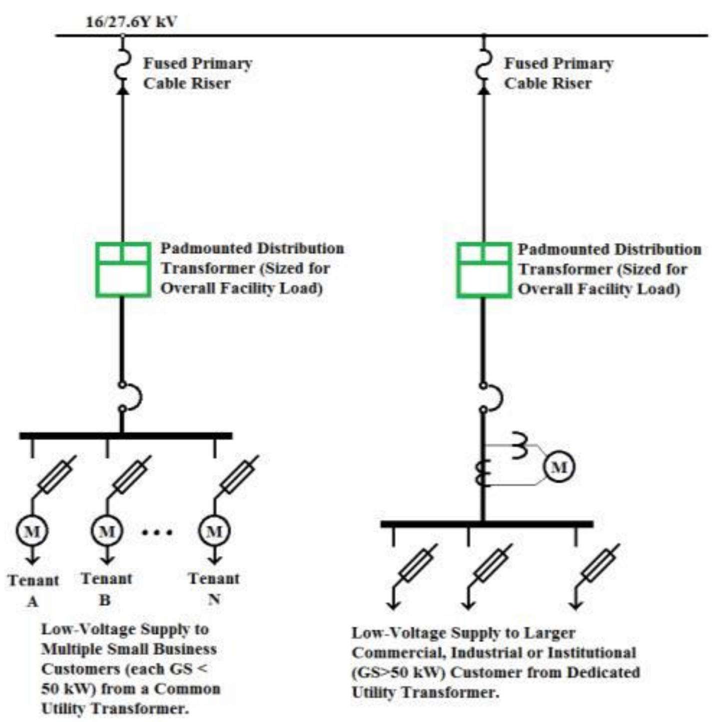
	kWh	kW	LF	Fixed	Variable	Total	¢/kWh	100% Fixed	Change
GS<50	1,000	2.51	55%	$ 30.70	$ 9.92	$ 40.62	$ 0.0406	$ 57.93	$ 17.31
	2,000	5.01	55%	$ 30.70	$ 19.84	$ 50.54	$ 0.0253	$ 57.93	$ 7.39
	2,745	6.88	55%	$ 30.70	$ 27.23	$ 57.93	$ 0.0211	$ 57.93	$ -
	3,000	7.52	55%	$ 30.70	$ 29.76	$ 60.46	$ 0.0202	$ 57.93	$ -2.53
	4,000	10.02	55%	$ 30.70	$ 39.68	$ 70.38	$ 0.0176	$ 57.93	$ -12.45

London Hydro notes that the change over the next four years to a 100% fixed residential rate would increase the recovered amount from fixed charges from 48% to 75%. By adding in the class proposed here, London Hydro could potentially recover upwards of 80% of its revenue through fixed rates.

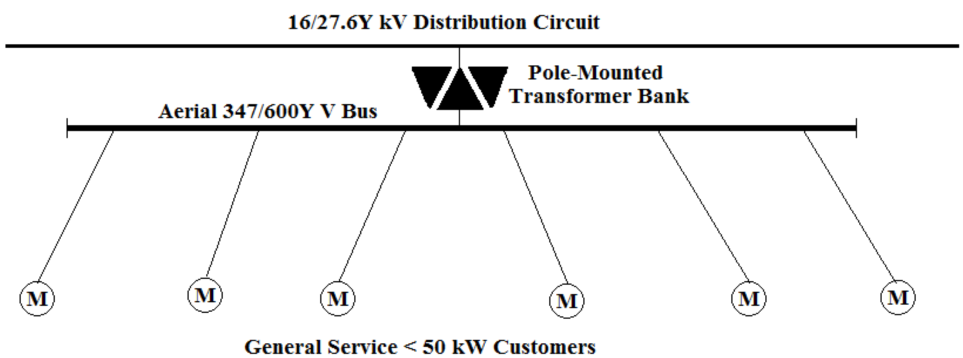
[1] London Hydro Submission EB-2015-0043 August 10, 2015

Throughout the OEB's discussion paper it is eluded that the big difficulty is in designing rates for industrial and commercial customers beyond our proposed 10 kW boundary wherein the stratification of usage and demand becomes considerable.

In general (at London Hydro anyway), commercial customers in the GS<50 kW class and commercial customers in the GS>50 kW class both receive a low-voltage supply (at 120/240 Vac, 120/208Y Vac or 347/600Y Vac) via a distribution transformer that is supplied, owned, operated and maintained by the LDC. The only real difference is GS>50 kW customers will generally be provided with a distribution transformer that is dedicated to one customer, whereas for GS<50 kW customers there is greater opportunity for several customers to be supplied from a common distribution transformer. For example, and as illustrated below, in a retail strip mall, London Hydro will supply a three-phase pad mounted distribution transformer of sufficient capacity for the entire facility, and the main electrical room will be outfitted with a metered load centre that in turn supplies the various tenants within the strip mall, with most if not all tenants being small business (i.e. GS<50 kW) customers.



In a similar vein, in commercial subdivisions, London Hydro will construct an aerial 347/600Y V bus system as illustrated below. The smaller businesses (i.e. GS<50 kW customers) can be supplied at 347/600Y V directly from this aerial bus, whereas larger customers (i.e. GS>50 kW) will generally have a dedicated (utility-owned) pad mounted distribution transformer installed to provide the customer with a low-voltage supply at 120/208Y V or 347/600Y V.



The only customers that receive supply (generally at 16/27.6Y kV) from the medium-voltage electricity distribution system are those customers with customer-owned substations. Such supply arrangements occur when the customer requires a supply voltage considered non-standard in Canada (e.g. 277/480Y V), the customer's load produces harmonics in excess of design limitations of the LDC's distribution transformer, or the customer's load requirements well exceed the capacity of the largest distribution transformer supplied by the LDC (which is inevitably the case with Large Users).

London Hydro has experienced considerable fluctuation in our customer classes. Since 2011 London Hydro has reclassified 185 GS>50kW customers to the GS<50kW customer class. London Hydro has also lost one large use customer (current facility purpose indeterminate), and reclassified one large use customer to GS>50kW. These fluctuations impact revenue and require additional resources to facilitate rate reclassification action.

What is concerning is that while the rate reclassifications take place the assets supporting those customers do not change. When larger commercial and industrial customers come on stream, the utility is required to plan, engineer and implement service based on proposed loads, usually ESA calculated. Assets are put in place to facilitate that requirement. Granted the original customer is required to put forward contributions to facilitate that installation. However if the in place artificial boundaries are crossed it is incumbent on the distributor to reclassify those customers to an alternative assigned rate class. With the current OEB's five year cost of service rate review process the utility is put in the position of carrying the risk, or rewards, of such fluctuations. The distributor's options are to absorb the differences or file for a full rate rebasing to correct these anomalies.

Hence it is London Hydro's recommendation that the OEB consider creating a singular fixed rate class of GS<10 kW and that the historical artificial demand based boundaries between rate classes (i.e. 50 kW and 5,000 kW) be eliminated in favour of more original asset based allocation.

Distributed Energy Resources

London Hydro notes on page 2 – fourth paragraph within Section A.2, Objectives, contains the statement: "Actions that customers take to reduce their bills will lower long term investments by distributors and help contain future distribution system costs". While this may be fanciful thinking, it isn't necessarily based on the evidence. In London Hydro's formal response to the government's stakeholder feedback session on net metering[2], London Hydro pointed out that "solar photovoltaic energy systems don't really make a significant contribution to reducing the peak electrical demand, i.e. London Hydro's system peak electrical demand usually occurs between 4:00 pm and 7:00 pm, whereas the peak output from a solar photovoltaic energy system occurs about noon – by late afternoon the output has diminished to almost nothing."

Most LDC's will concede that the biggest problem with distributed generation is its negative impact on voltage regulation, so it is not clear to London Hydro why the OEB would position distributed generation as being beneficial from a voltage regulation perspective. To explain this comment one needs to recognize that a transformer station supplies numerous feeder circuits, and the voltage diminishes from the station bus to the end of the feeder in proportion to the feeder load, i.e. the greater the feeder load, the greater the voltage drop. Transformer stations are generally equipped with under-load tap changers (with associated controls) that continuously adjust the taps on the power transformers to maintain the bus voltage and predicted feeder end voltage within the voltage limits stipulated in CSA Standard CAN3-C235

[2] Letter, dated October 22, 2015, to Paul Kersman (Ontario Ministry of Energy) from Gary Rains (London Hydro); re: Feedback from Engagement Session on Proposed Transition of Ontario's microFIT Program to a Net Metering / Self-Consumption Program.

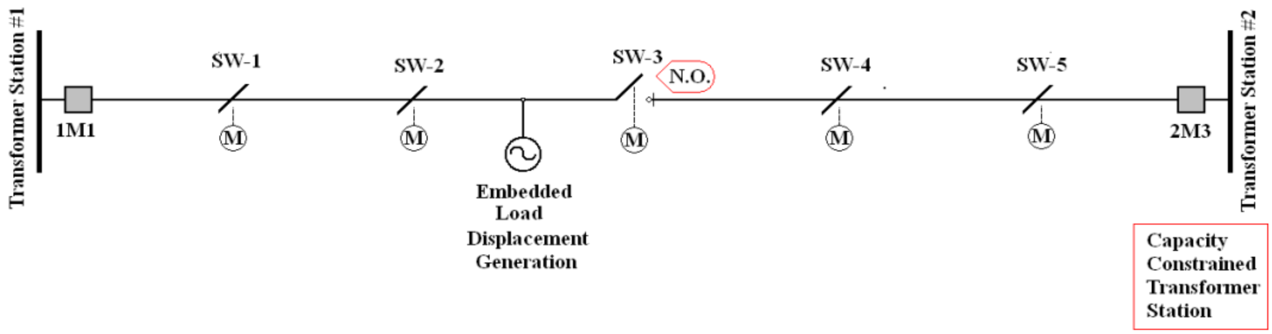
(R2015), Preferred Voltage Levels for AC Systems, 0 to 50 000 V. A large embedded generation system located near the end of a particular feeder can result in over-voltages on that feeder and under-voltage conditions on the other feeders emanating from the same transformer station.

Although LDC's are the billing agents for a host of upstream government and quasi-government agencies (IESO, HONI, Ministry of Finance, etc.), the rate design process needs to remember that the prime beneficiary of the Distributed Energy Resource is the party that should be providing the bill credit (i.e. reimbursing the LDC). For example, a customer with a significant embedded load displacement generation system may elect to maximize its electrical output in response to projected market prices (HOEP) that are abnormally high or in response to an economic or emergency demand response call. Unless the generation is located in a distribution constrained area, the generator provides no benefit to the LDC.

Proponents of solar PV energy systems, combined heat and power systems, and similar distributed energy systems are quick to highlight the benefits of their technology and suppress the negative impact that same technology has on the operation or flexibility of the electricity distribution system. Reciprocal arrangements are always fairer than lop-sided arrangements. London Hydro presumes that if the LDC is compelled to provide a credit for perceived benefits, there will be a reciprocal arrangement whereby an LDC can apply a surcharge to a distributed energy resource that restricts the flexibility of the electricity distribution system or otherwise results in additional costs to the LDC.

Illustrative Example:

In urban service territories, medium-voltage distribution feeder circuits generally have what is termed a "loop-designed, radially-operated" configuration, meaning that distribution feeder circuits are equipped with sectionalizing switches to allow major load segments to be readily transferred to other feeder circuits (often emanating from different transformer stations) to improve restoration of service after an unplanned outage. A major embedded generation system can however negatively impact operating flexibility that previously existed. The following schematic illustrates the case where one transformer station has connection capability for a Combined Heat and Power (CHP) system but the other transformer station has no residual connection capability.



In this particular case, the distribution automation switches that the LDC previously procured and installed to quickly transfer a portion or all of the load from the 1M1 feeder to the 2M3 feeder (by remotely opening distribution automation switch SW-2 and closing distribution automation switch SW-3) can no longer be used effectively because transformer station #2 has no residual connection capacity to accommodate the CHP system.

The fundamental question here is: Should the CHP system, that is entirely responsible for loss of operating flexibility, be burdened with a surcharge to cover the LDC costs of re-locating their distribution automation switches (and associated communications) to an alternative location where they might provide greater benefit, or should that continue to be a societal cost?

In addition the purported objective of this staff discussion paper is to reform / modernize the distribution tariff structures to "encourage greater economic use by customers of distributed energy resources", the entire topics of "gross load billing", "standby charges", "reserve capacity charges", etc. has been entirely omitted from this staff discussion paper. In fact the staff discussion paper suggests the "the intention is to avoid creating specialized rate classes for load displacement generation and net metered customers and charges like standby rates that can be a barrier to customer choice. The paper suggest that reducing peak capacity through distributed generation will lower the distributor's investment needs to meet peak capacity and save money over time. Building this driver into the rates will align the interests of the customer and the distributor. The expectation is that a rate design that addresses underlying cost drivers will lead to each customer paying their fair share of the system.

London Hydro has established Co-Generation and Standby Power Service rate classes that allows London Hydro to apply standby charges against contracted (nameplate rating) amounts. Experience has shown that there are times when generation is not available, i.e. shut down for maintenance or emergency repairs. This requires London Hydro to have reserved capacity in place to service any eventualities that can occur. One of our co-generation accounts is a hospital which cannot have interrupted power in the eventuality of a generator failure.

London Hydro believes that the principles around “gross load billing”, “standby charges”, “reserve capacity charges”, etc. be kept on the table for continued discussion.

Conclusion

Please do not misconstrue these comments as an objection to modernization of the electricity system (and the underlying methodologies for establishing fair and just tariff structures). London Hydro has been and continues to be very supportive of providing customers with the tools to make informed decisions, and providing leadership on the Smart-grid front (i.e. promote and accommodate the proliferation of distributed generation, electric vehicles, modern communications systems related to these objectives, etc.). Rather, our intent is to preclude unintended consequences if the new tariff structure is based on an incomplete or incorrect understanding of the manner in which electricity distribution systems are designed and operated.

All of which is respectfully submitted.