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December 21, 2017

BY COURIER

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

Dear Ms. Walli:

EB-2015-0176: Report on Estimated Billing and Billing Accuracy for Hydro One's "Hard to Reach" Time-of-Use (TOU) Regulated Price Plan (RPP) Customers

As ordered by the Board in its Decision and Order ("the Order) issued on September 24, 2015, Hydro One Networks Inc. ("Hydro One") is providing the Board with a report on the frequency and accuracy of estimated bills issued to those identified "hard to reach" TOU customers, whose meters have demonstrated poor levels of communication reliability with the smart meter network. The findings and results in the attached report are based on estimated bills issued over a 12 month span, ending November 30, 2017.

In accordance with the reporting requirements set out in the Order, the attached report provides specific details on the following:

- The number of "hard to reach" customers receiving estimated bills as a result of smart meter network communication issues;
- An assessment of the accuracy of estimated bills received by these customers;
- Efforts undertaken by Hydro One to improve the accuracy of its estimated bills;
- Network and technological improvements to reduce the number of "hard to reach" customers.

In the 12 months ending November 30, 2017, approximately 57,000 (51%) of Hydro One's identified "hard to reach" customers received estimated bills due to smart meter network communication issues. The accuracy of estimated bills was assessed and the results validate the findings of previous year reports that the accuracy of the estimated billing functionality has

improved dramatically since the implementation of Hydro One's customer billing system in 2013. In fact, 97.56% of the estimates analyzed were within a 10% variance of the actual meter readings for the same billing period – an improvement over the 2016 result of 95.71%.

Furthermore, 77.6% of the estimates were found to be within a 1% variance of the actual same day reads – creating an even tighter accuracy bell curve for estimated bills than 2016 when 70.2% of estimates were within 1% of the actual same day reads. Improvements in estimated billing accuracy are due in large part to the availability of better customer-specific historical usage data on which to base the estimation algorithms. The assessment results again confirm that no fundamental changes are required to be made to the billing system estimation routines and logic to improve billing accuracy.

An audit of the outliers of the assessment (estimated bills with a variance greater than 10% of the actual same day reads) has again confirmed that the following three factors continue to have a significant impact on estimated bill accuracy: a) the absence of consumption history for new service/move-in type connections b) changes in a customer's historical consumption profile/pattern and c) issues involving meter access. Hydro One continues to make incremental improvements in these areas overall and in remedial actions taken when a scheduled manual meter read is missed.

In 2016, Hydro One implemented an annual process to assess meter communication reliability for "hard to reach" customers. Where reliability had improved sufficiently, these customers were transitioned to TOU pricing. In the 12 months ending November 30, 2017, approximately 26,000 two-tier priced customers were converted to TOU pricing and are now receiving monthly bills based on actual reads.

Hydro One will continue to annually evaluate the performance reliability of its advanced metering infrastructure and anticipates migrating between 8,000 and 20,000 additional "hard to reach" customers from two-tier to TOU pricing in 2018. The actual volume will depend on the timing of these migrations and the number of new service connections where the meter is shown to be communicating reliably for a sufficient length of time to qualify for migration to TOU pricing. Based on projected migrations for 2018, this will leave between 92,000 and 104,000 remaining "hard to reach" customers, whose meter communication reliability will need to be assessed annually for conversion to TOU pricing.

Hydro One is also pleased to report on several improvements to Bell Canada's telecommunications infrastructure and technological improvements in its Automated Meter Reading Infrastructure that have enhanced communication reliability in the locations of "hard to reach" customers.

Sincerely,

ORIGINAL SIGNED BY FRANK D'ANDREA

Frank D'Andrea

Attach

2017 Report for EB-2015-0176
(Billing Accuracy and Estimated Billing Exemption)

December 21, 2017

BACKGROUND

On May 6, 2015, Hydro One Networks Inc. ("Hydro One") applied for an exemption (EB-2015-0176) from certain sections of the Distribution System Code ("DSC") related to estimated billing and billing accuracy requirements for approximately 170,000 Regulated Price Plan ("RPP") customers who are defined as "hard to reach" (and are the subject of Hydro One's previously-approved Time-of-Use ("TOU") exemption (EB-2014-0360)).

The Board granted the exemption in its Decision and Order on EB-2015-0176, dated September 24, 2015, subject to the condition, among others, that Hydro One perform the following in respect of the "hard to reach" customers:

- For the portion of the ~170,000 "hard to reach" customers that are non-seasonal residential or General Service < 50 kW, Hydro One will bill these customers on a monthly basis and manually read their meters on a quarterly basis. To the extent that the Advanced Metering Infrastructure network provides remote reads within the billing window, these reads will be used to issue monthly bills between quarterly planned actual bills based on an actual read instead of a planned estimate.

- Similarly, for the portion of the "hard to reach" customers that are seasonal customers, Hydro One will bill these customers on a quarterly basis and manually read the meters on an annual basis. Again, to the extent that the Advanced Metering Infrastructure network provides remote reads within the billing window for these seasonal customers, these reads will be used to issue quarterly bills based on an actual read instead of a planned estimate.

In addition, the Board required that Hydro One file a report on its progress in transitioning the identified "hard to reach" customers to monthly billing based on actual reads 98% of the time on December 31, 2015, December 31, 2016, December 31, 2017 and December 31, 2018. The Board also required that Hydro One provide information on the following:

  - The number of "hard to reach" customers receiving estimated bills as a result of smart meter network communications issues;
  - An assessment of the accuracy of estimated bills;
  - How Hydro One has and will be improving its accuracy with respect to estimated bills and how it is mitigating future estimated bills to be as accurate as possible.

This report has been prepared to satisfy the reporting requirements issued by the Board in its Decision and Order in the EB-2015-0176 proceeding to grant an exemption to Hydro One from certain sections of the DSC related to estimated billing and billing accuracy. Section 1 of

this report provides an overall summary and discussion of the quantity and accuracy of estimated bills issued to "hard to reach" customers over a 12 month span, ending November 30, 2017. Section 2 of this report provides details on Hydro One's efforts and progress in transitioning identified "hard to reach" customers from RPP two-tier pricing to TOU prices and includes the following information:

- Status updates of any potential significant improvements in telecommunications infrastructure and/or future technological advancements in the Automated Meter Reading Infrastructure;
- An update on reliable cellular network coverage expansion and its impact on affected customers; and
- Hydro One's progress in transitioning hard to reach customers to TOU pricing.

SECTION ONE – ESTIMATED BILLING AND BILLING ACCURACY

This section of the report provides an update to the Report on Billing Accuracy and Estimated Billing submitted on December 31, 2016 that fulfilled the reporting requirements of EB-2015-0176. The term of Hydro One's exemption from estimated billing and billing accuracy requirements coincides with the duration of the TOU exemption for the approximately 170,000 hard to reach customers, and ends on December 31, 2019.

2017 BILLING ESTIMATION FREQUENCY

The total population of "hard to reach" customers fluctuates over time and is currently split about 80/20 between non-seasonal (both residential and commercial) and seasonal customers respectively. As of the end of November 2017, the number of identified "hard to reach" customers stands at approximately 112,000, down 7% from the same time last year. Of the remaining "hard to reach" customers, 91,000 are non-seasonal (residential and commercial) and 21,000 are seasonal residential customers.

During the 12 months ending November 2017, approximately 41,000 of the "hard to reach" non-seasonal customers received estimated bills as a result of smart meter network communication issues. This represents an improvement of 43% over 2016 when 72,000 such customers received estimated bills. In accordance with Hydro One's proposed billing plan, non-seasonal "hard to reach" customers would have received one out of three bills in each quarter (or 33%) based on actual reads, and seasonal customers would have received one out of four bills each year (or 25%) based on actual reads.

The graph in Figure 1 below illustrates the distribution of "hard to reach" non-seasonal customer accounts that received bills based on estimated reads over the one year period ending November 30, 2017. From this figure, it can be seen that the manual meter reading effort and frequency continue to be significantly augmented by the availability of additional actual reads from the Advanced Meter Reading Infrastructure (AMI) network in months when an estimate was originally planned. In addition, improved monitoring of missed on-cycle manual readings has resulted in earlier identification of issues and remedial actions being taken to avoid persistent estimating.

In fact, only 13% (down from 15% in 2016) of non-seasonal customers received four or fewer actual reads over the course of the year, which defines the minimum threshold for the number of actual reads that should be received for non-seasonal customers. As a result, billing accuracy for "hard to reach" customers has greatly improved for two main reasons:

- better than originally planned availability of remote actual reads, and

- implementation of rigorous monitoring, reporting and remedial follow-up on meters that are scheduled for manual reading, but the reading is not obtained within the billing window.

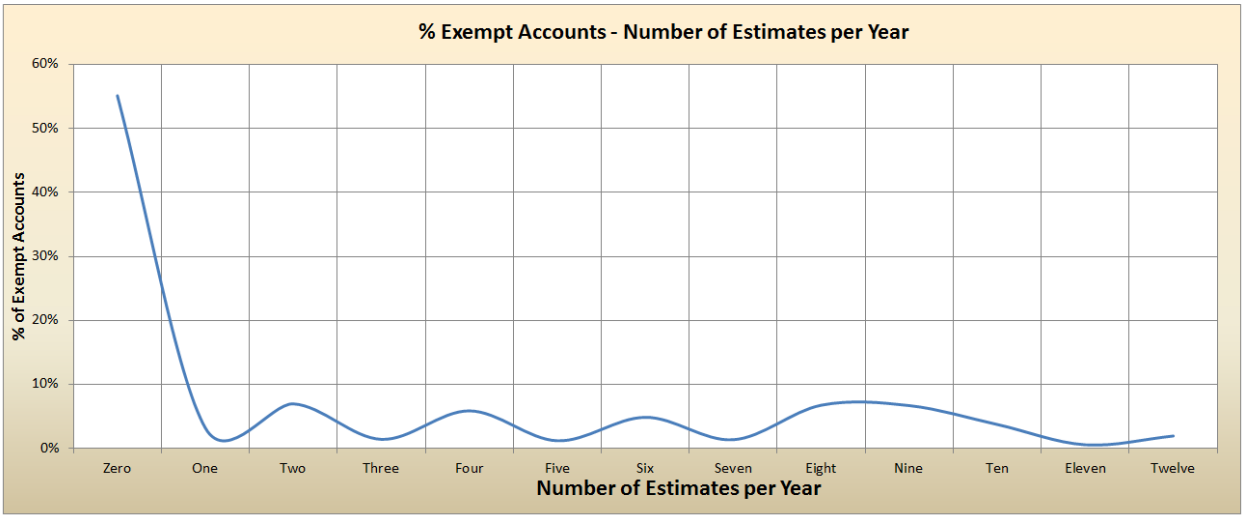

Figure 1: Percentage Distribution of Non-Seasonal "Hard to Reach" Customers Receiving Bills Based on Estimated Reads

For the 12 months ending November 2017, the number of bills issued based on actual reads to "hard to reach" customers was substantially higher than planned such that:

- 55% of non-seasonal "hard to reach" customers (approximately 50,000) received *all* of their bills based on actual meter reads and this segment has been assessed for potential migration to TOU rates;

- 94% of these customers had more than 75% of their bills issued based on actual reads, compared to the minimum planned level of 33% and;

- 80% of these customers had more than 60% of their bills issued based on actual reads.

However, despite better performance for the vast majority of these customers, Hydro One was unable to obtain manual readings as specified in its proposed plan for approximately 13% of the identified non-seasonal "hard to reach" customers and less than 2% of seasonal "hard to reach" customers. These customers received a higher number of estimated bills than planned. For these occurrences, manual readings could not be obtained due to meter access issues – specifically the inability to gain physical access to inside meters and access issues due to road conditions or water access issues in more remote areas.

For the identified seasonal "hard to reach" customers, 98% received a higher number of bills based on actual readings than planned, with 39% receiving *all* of their bills based on actual meter readings due to the availability of automated meter reads. Less than 2% of seasonal customers identified as "hard to reach" (379 customers) received a higher number of estimates than planned because Hydro One was unable to obtain the planned annual manual reading due to access issues.

2017 BILLING ESTIMATION ACCURACY

The accuracy of estimated bills was assessed by comparing *estimated* usage data from Hydro One's billing system to *actual* meter read/usage data reported to our Advanced Meter Reading Infrastructure from those same meters, for the same billing cycle period.

The graph in Figure 2 below shows that for 97.56% of bills issued based on estimated data, the variance was within10% of the actual meter readings/data. Furthermore, 77.6% of those bills were based on estimates that were within a variance of 1% the actual meter reads. This estimate accuracy is an improvement over that identified in the 2016 report (95.71% and 70.21% respectively).

It is evident based on the assessment performed that the accuracy of billing estimates from Hydro One's billing system continues to be dramatically improved since its implementation in 2013, due to the availability of more customer-specific historical consumption data. A detailed review of the billing system estimation routines and algorithms has not revealed any significant or systemic issues with the logic and this is further supported by the analysis presented below.

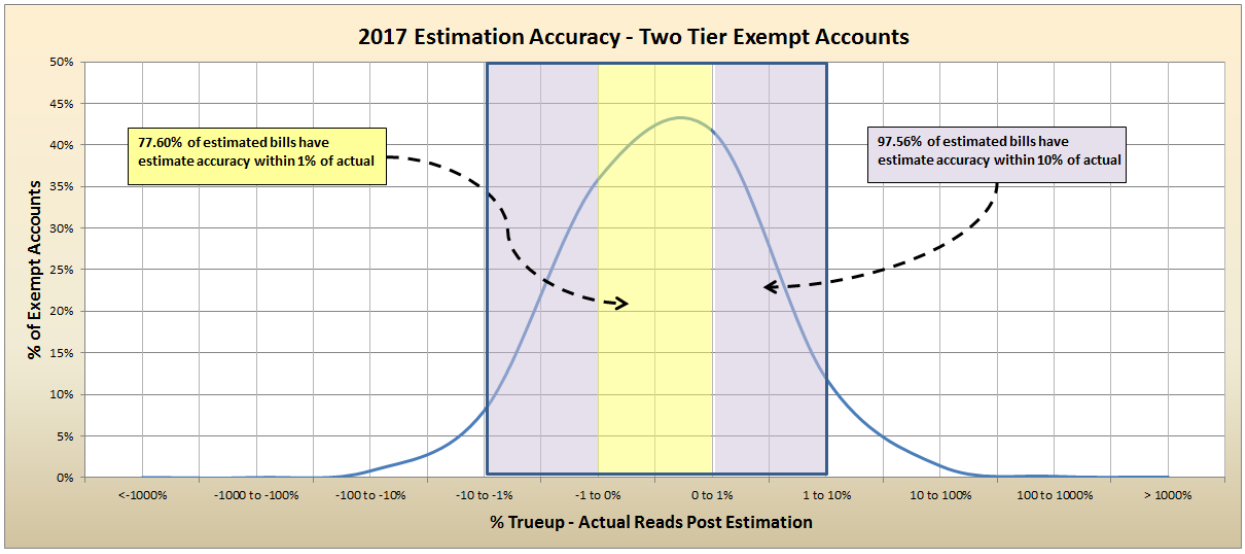

Figure 2: Bill Estimation Accuracy for all "Hard to Reach" Customers

An audit of those "hard to reach" accounts where the estimates exceeded 10% of the actual/true-up meter read was performed utilizing billing/usage history, contact notes and service notifications for the account to gain insight into the specific factors that led to the less accurate estimates. As in prior years, the following factors were identified in cases involving estimates with a greater than 10% variance:

1. Significant change in customer consumption pattern from the previous year, typically caused by a change in heating source at the premise, a significant building renovation or expansion, a household change in terms of number of occupants/occupancy pattern or a major equipment addition/removal.

2. New service/move-in connections where there is no relevant consumption history available.

3. Meter access challenges (i.e. meters located on islands, seasonally closed roads, meters located within enclosures, breakers that are before (on the line side versus the load side) of the meter, etc.)

Hydro One continues to improve the estimates in these situations in the following ways:

- requesting additional information from customers at the time of new service/move-in connection;

- where there is inadequate customer-specific usage history available, using usage history for the premise or the average for the rate class in the geographic area;

- continuing to encourage customers to advise of significant changes in their consumption patterns and/or power-consuming equipment;

- continuing to work with customers where we have persistent access challenges by encouraging customer reads and/or providing advance notice to the customer of the next planned meter reading window so that, to the extent possible, access issues can be resolved and our field staff can obtain actual meter readings/data.

- Identifying services where the breaker is on the line side (rather than the load side) of the meter

SECTION TWO – PROGRESS IN TRANSITIONING CUSTOMERS TO TOU PRICING

This section of the report provides information on significant technological improvements and updates on reliable cellular network expansion in Hydro One's service territory, as well as technological improvements made to Hydro One's AMI network.

TECHNOLOGICAL AND COMMUNICATION INFRASTRUCTURE IMPROVEMENTS

In 2017, Bell Canada continued to commission macro cell sites in the Hydro One service territory in an effort to reinforce communication reliability within existing service areas. Bell continues to expand their network, but this is occurring at a slowing rate. Most of Bell's focus is aimed at upgrading existing sites with Long Term Evolution (LTE) infrastructure. In addition, Hydro One continues to working on replacing meters as a result of Bell's CDMA decommissioning scheduled for April of 2018. The upgrade continues to be successful and there has been no degradation of Hydro One's meter performance.

CUSTOMERS MIGRATED TO TOU PRICING IN 2017

The results from Bell network upgrades and Hydro One's AMI network reinforcement and equipment upgrades to address the decommissioning of CDMA technology have improved meter communication reliability and allowed Hydro One to migrate approximately 26,000 "hard to reach" customers to TOU pricing in 2017 and we expect to move approximately 8,000 to 20,000 "hard to reach" customers from two-tier to TOU pricing in 2018.

The actual volume will be dependent on when the migrations occur in 2018 and on the number of new service connections where the meter has been installed for a sufficient length of time to qualify for migration to TOU. The 2018 migrations will leave between 92,000 and 104,000 remaining "hard to reach" customers, whose meter communication reliability will continue to be assessed annually to determine whether they can be moved to TOU pricing.