RESPONSES TO OEB STAFF INTERROGATORIES

INTERROGATORY 101:

Reference(s): Exhibit 3, Tab 1, Schedule 1, p. 1, p. 5
Exhibit 2B, Section E5.1, p. 4

Preamble:

Toronto Hydro's load forecast shows declining load and increasing customer count for 2020 relative to the historic period.

Toronto Hydro's DSP makes many references to the need for capital investments to address population growth in the City of Toronto.

a) Please provide a high-level discussion that reconciles the divergent proposals in the application (i.e. the load forecast for 2020 is reduced relative to the historic period, the customer count is growing slowly, while significant capital expenditures are required to address population grown in the City of Toronto).

b) Please advise whether Toronto Hydro intends to update its load forecast to reflect the inclusion of actual load up to December 2018 (as opposed to December 2017) in its regression model once that information becomes available (Exhibit 3 / Tab 1 / Schedule 1 / p. 5).

RESPONSE:

a) Over the last decade, Toronto Hydro has been contending with the challenge of decreasing aggregate load and "slow" customer growth relative to increasing

investment needs to, among other things, address population growth in the City of Toronto. The challenge is driven by a number of considerations, all of which boil down to two themes: (i) the decline in average load at the system level is not indicative of the growth and density intensification in localized areas of the City; and (ii) customer growth in Toronto Hydro's service territory does not accurately represent population growth.

At a system level, conservation and demand management efforts are resulting in a decreasing average use per customer and an overall decline in load. However, localized growth and density intensification from new high-rise developments due to increasing population are driving the need for investments in specific areas of the City, such as the downtown core. To serve customers in these areas, Toronto Hydro must make capacity related capital investments.

A large portion of the City of Toronto's residential developments are condominiums and multi-unit dwellings that can house hundreds, if not thousands, of individual Torontonians. At the same time, these residential developments may represent only one Toronto Hydro General Service class customer behind a bulk meter. For this reason, the customer growth in Toronto Hydro's service territory is not indicative of the population growth that the City is experiencing.

b) Confirmed.

RESPONSES TO OEB STAFF INTERROGATORIES

INTERROGATORY 102:

Reference(s): Exhibit 3, Tab 1, Schedule 1, p. 7, p. 10

Preamble:

Toronto Hydro states the following:

> "The time trend variables used in the models are intended to capture trends which are not otherwise explained by the other driver variables. The Residential model uses a simple time trend variable which captures an increase in downward trend in consumption over the historical period from 2008 onward. The model is based on consumption with approved CDM loads "added back" to loads. Approved CDM activities alone do not account for additional natural conservation which seems most apparent in 2008 and onward. The GS<50 kW and GS 50-999 kW models use simple time trends over historical 2002 to 2017 in order to help account for trending that other driver variables and CDM adjustments do not fully speak to, as well as to improve overall model fit over the period" (Exhibit 3 / Tab 1 / Schedule 1 / p. 7).

a) Please explain what drivers Toronto Hydro believes the time trend variable accounts for in the GS < 50 kW and GS 50-999 kW models (Exhibit 3 / Tab 1 / Schedule 1 / p. 7).

b) Please advise whether the simple binary trend variable (2008-onwards) in the residential model is solely designed to capture CDM impacts or are there other drivers that Toronto Hydro believes are accounted for by this trend variable. Please explain the response (Exhibit 3 / Tab 1 / Schedule 1 / p. 7).

c) Please describe what other variables Toronto Hydro attempted to use to in the various class-specific models and explain why these variables were rejected. If Toronto Hydro did not try to account for other factors, please provide an explanation (Exhibit 3 / Tab 1 / Schedule 1 / p. 7).

d) If "approved CDM" was not added back to historical actuals but instead was used as an explanatory variable, the coefficient of the CDM variable, which could be different from 1 (one), could be informative about gross CDM impacts (natural and approved CDM, net of decay, "free riders", etc.) (Exhibit 3 / Tab 1 / Schedule 1 / p. 7). Please advise whether Toronto Hydro tested the approach whereby approved CDM was used as an explanatory variable, If so, what were the results. If not, please explain.

e) Please provide a high-level estimate of the potential magnitude of electric vehicles and distributed generation on Toronto Hydro's load forecast for the 2020-2024 period (and in the longer term) (Exhibit 3 / Tab 1 / Schedule 1 / p. 11).

RESPONSE:

a) Toronto Hydro notes that it should have written "GS < 50 kW and GS 1000-4999 kW models"; the GS 50-999 kilowatt model does not contain a time series driver variable.

Toronto Hydro has used time series trends in these models to increase the goodness of fit and predictive accuracy of both models. These time trends may possibly capture, amongst other things, natural conservation behaviour unrelated to CDM initiatives, due to environmental consciousness, as well as escalating electricity prices

over time, i.e. price elasticity.

b) Toronto Hydro used a time series trends in this instance to increase the goodness of fit and predictive accuracy, and reduce unexplained residuals after noting a change in residual trend in 2008 onward within the model. These time trends may possibly capture, amongst other things, natural conservation behaviour unrelated to CDM initiatives, due to environmental consciousness, as well as escalating electricity prices over time.

c) Toronto Hydro ran numerous model specifications with different combinations of the variables noted in the evidence. Toronto Hydro also tested models with electricity price variables, based on average monthly bill prices for Residential, CSMUR, and GS > 50 kilowatts. Ultimately, Toronto Hydro chose models without price variables because they produced a better fit, and because of the difficulty of producing reliable commodity price forecasts to underpin average bill calculations to 2024 as a driver for forecasting purposes.

d) In the past, Toronto Hydro tested models using CDM as an explanatory variable of metered energy, but found that these models did not perform as well as the current methodologies. Also, using CDM savings as a driver variable does not meet the OEB requirement to explicitly identify the amount of CDM included in the load forecasts. As a driver variable for metered energy, rather than an explicit adjustment to the load forecast, the exact amount of CDM savings in the load forecast is not as clear.

e) Please refer to Toronto Hydro's response to interrogatory 2B-DRC-10.

RESPONSES TO OEB STAFF INTERROGATORIES

INTERROGATORY 103:

Reference(s): Exhibit 3, Tab 1, Schedule 1, pp. 4-10

a) Toronto Hydro discusses various variables, including a variable for Toronto unemployment (Exhibit 3 / Tab 1 / Schedule 1 / p. 6). However, in summary Table 3 (Exhibit 3 / Tab 1 / Schedule 1 / p. 10), there is no listing of an unemployment variable for any of the class-specific models. Please indicate where and how the unemployment rate was used in developing the customer or load forecast.

b) Toronto Hydro states, "the forecast of the City of Toronto's unemployment rate and population was derived based on the Conference Board of Canada forecast of the Toronto Census Metropolitan Area ("CMA") unemployment rate and population using a pair regression model" (Exhibit 3 / Tab 1 / Schedule 1 / p. 9).
   i) Please explain what Toronto Hydro means by a "pair regression model".
   ii) Please provide the regression model, model statistics and results, or indicate where these are in the evidence.

RESPONSE:

a) The Toronto Unemployment Rate was used to develop the General Service 1,000-4,999 kW model. Please see the sixth driver variable listed below "General Service 1,000-4,999 kW" in summary Table 3 (Exhibit 3, Tab 1, Schedule 1 at page 10).

b)

i) By "pair regression model" Toronto Hydro means a single variable regression model, where the dependent and independent variables are closely related; in this case, monthly historical data from the City of Toronto's Data Bulletin is the dependent variable, and historical data (quarterly, converted to monthly) Conference Board of Canada numbers published for the Greater Toronto Area is the independent variable. The resulting model is then used to produce an extended City of Toronto forecast for both unemployment and population using the respective Conference Board of Canada forecast as the driver variable.

Where the Conference Board of Canada forecast does not extend sufficiently into the future to construct a full forecast, Toronto Hydro has used a simple linear trend to extend the resulting Toronto Specific forecast.

ii) Please see Appendix A to this response for a summary of model inputs, model statistics, and results.

RESPONSES TO OEB STAFF INTERROGATORIES

INTERROGATORY 104:

Reference(s): Exhibit 3, Tab 1, Schedule 1, Appendix A-2

Preamble:

In Appendix A-2, Toronto Hydro provides the regression model summary statistics for the six class regression models.

The Durbin-Watson statistics for these models are shown in the following table:

Model	Durbin-Watson Statistic	Number of Observations	Number of Variables	5% one-tailed Level	p-value for Null Hypothesis (no autocorrelation)
Residential	1.23	186	6	1.70519	<5%
CSMUR	1.33	56	5	1.38152	<5%
GS < 50 kW	1.13	186	9	1.67124	<5%
GS 50-999 kW	1.38	186	9	1.67124	<5%
GS 1000-4999 kW	1.04	186	9	1.67124	<5%
Large User	1.24	186	9	1.67124	<5%

The Durbin-Watson statistic is standard statistical test for autocorrelation between the residuals. In the context of time series regression,[1] it indicates whether the residual errors show a trend or pattern. This can be indicative of other factors explaining the relationship.

The Durbin-Watson statistic varies between 0 and 4, with a value of 2 indicating no autocorrelation. Values away from 2 indicate a departure from this, with significance

[1] In the time series context, autocorrelation is also referred to as serial correlation.

depending on the number of observations and the number of variables (i.e., the degrees of freedom). Standard tables are available.[2]

Based on the number of observations and variables, it would appear that all of Toronto Hydro's class specific models would fail the null hypothesis of no autocorrelation.

a) Please advise whether Toronto Hydro formally tested for autocorrelation.

b) If so, has Toronto Hydro attempted to correct for autocorrelation, such as through the use of an autoregressive (AR) model, where a previous period endogenous (left-hand side) variable is used to explain the current period. For example, for a monthly model, an AR(1) or AR(12) approach might be used. If Toronto Hydro has tried such an approach, please explain the results and why it was rejected. If Toronto Hydro has not tried to correct for autocorrelation, please explain.

RESPONSE:

a) When Toronto Hydro develops its regression models, its focus is primarily around maximizing good "goodness of fit", maximizing predictive value, and ensuring that explanatory variables in the models make logical sense. Toronto Hydro reviews model statistics, including plots of residual values from regressions. These are the primary tests conducted in the modelling exercise.

[2] <https://www3.nd.edu/~wevans1/econ30331/Durbin_Watson_tables.pdf>

Furthermore, from a forecasting perspective, the presence of autocorrelation in the model residual values does not indicate any bias in the forecast values, but only suggests the prediction variances may be larger than otherwise.

b) AR models are problematic from a forecasting perspective, in that the forecasted values beyond the chosen lag period will rely on forecasts of the dependant variable themselves, making them less reliable. For example, if the model is an AR(1) model, which has a one period lag, when used for forecasting, all forecast periods beyond the first forecast period will rely on forecasts of the dependant variables as a driver. The further the length of the forecast period (in the CIR case, forecasts extend for 84 periods – monthly for 2018 to 2024) the less reliable the forecasts become.

RESPONSES TO OEB STAFF INTERROGATORIES

INTERROGATORY 105:

Reference(s): Exhibit 3, Tab 1, Schedule 1, p. 9, p. 16
Exhibit 3, Tab 1, Schedule 2, p. 3

Preamble:

Toronto Hydro states:

> "Customer additions in Toronto Hydro's service territory have been fairly steady over the recent period, driven mainly by Residential and CSMUR customer additions, while General Service classes remain more flat year over year. The utility's forecast of new customers is primarily based on extrapolation models for each rate class with the exception of the CSMUR rate class (implemented on June 1, 2013), whose forecast customer additions are based on market knowledge of suite metering and multi-unit dwelling construction in Toronto Hydro's service area, as well as an application of expert judgement" (Exhibit 3 / Tab 1 / Schedule 1 / p. 16).

a) Please provide more information on the "extrapolation models" used to derive all customer class forecasts except the CSMUR rate class (Exhibit 3 / Tab 1 / Schedule 1 / p. 16).

b) For the CSMUR rate class, please provide more detail on the model used to derive the load forecast for that class. Please advise to what extent qualitative judgement is used in deriving the forecast for this class. Please advise what factors are taken into account in applying that judgement (Exhibit 3 / Tab 1 / Schedule 1 / p. 16).

c) Please explain why the customer count for the CSMUR rate class is expected to slow beginning in 2018 (relative to the previous years – 2013-2017) with the slower growth continuing through the 2020-2024 period (Exhibit 3 / Tab 1 / Schedule 2 / p. 3).

d) Toronto Hydro references a Toronto city population forecast based on a Toronto Census Metropolitan Area forecast from the Conference Board of Canada (Exhibit 3 / Tab 1 / Schedule 1 / p. 9). Please advise whether this information is used in deriving the customer forecasts for any of the classes. If so, please explain how this data is used.

RESPONSE:

a) For all customer classes except CSMUR, Toronto Hydro has chosen to use linear trend to extrapolate customer load forecast. For customer classes GS 1-5 MW, Large Use, and USL, the trend over recent years has been fairly flat, and as a result Toronto Hydro has chosen to keep the customer forecast constant at the latest historical value.

b) Toronto Hydro has used a multi variable linear regression analysis, similar to that for residential and general service classes, to forecast load for CSMUR customers. The number of CSMUR customer forecast used in the regression model is based on CMHC's forecast of housing starts for multi-unit developments in Toronto, with adjustments for contracts that have been signed with developers for new condominium developments and apartment owners for retrofits when deemed appropriate. Toronto Hydro uses its professional judgement to estimate the market

share of the units from this forecast that will be serviced by Toronto Hydro. The CMHC forecast does not cover the entire rate filling period, and as such, professional judgement was used to assume that construction rates will remain at a similar level for the last two years of the rate period.

c) Customer growth began to slow after 2016, due to declining THESL market share relative to Unit Sub-Metering Providers (USMPs). Projected class customer additions reflect the same trend of a higher percentage of developments opting for service from non-regulated USMPs.

d) No, the City of Toronto population forecast was not used to derive the customer forecast for any class. In the interest of completeness, it was tested as a variable as part of developing class specific load forecast models. Ultimately the final models that Toronto Hydro deemed to have best balance of good model fit, yielding good coefficient values which make practical and statistical sense, and providing good predictive value for forecasting were all achieved without electing to use the City of Toronto population forecast.

RESPONSES TO OEB STAFF INTERROGATORIES

INTERROGATORY 106:

Reference(s): Exhibit 3, Tab 1, Schedule 1

The Toronto Transit Commission placed into service the extension of the Spadina subway line on December 17, 2017, extending the line from Downsview to Vaughan.[1] As such, this extension was only in service for two weeks at the end of the historical actuals on which the load forecast is based.

The Metrolinx Crosstown LRT is currently being built along Eglinton Avenue from the west to the east of much of Toronto. The project is expected to be completed in 2021[2], and will therefore come into service during the 2020-2024 period.

Both of these are major projects for electrified mass transit in Toronto. OEB staff recognize that there would also be electricity demand and consumption during the multi-year period for construction, testing and commissioning before going into service. However, it is not clear how Toronto Hydro has factored major projects like these into its load forecast for the applicable customer class.

a) Were there any similar projects during the historical period 2012 to 2017, excepting construction of these two projects? If so, please identify.

[1] <https://www.ttc.ca/Spadina/Project_News/News_Events/News_by_Date/2017/December/SubwayOpens.jsp>
[2] <http://www.metrolinx.com/en/greaterregion/projects/crosstown.aspx>

b) Has Toronto Hydro made any adjustments to account for the Spadina line extension in the forecast for the 2018-2024 bridge and test period? If so, please explain.

c) Has Toronto Hydro made any adjustments to account for the Crosstown LRT entering service during the test period of the plan? If so, please explain.

d) If Toronto Hydro has not adjusted for the Spadina subway extension and/or the Crosstown LRT, please provide the following:
   i) Estimates of the kWh or kW, by year in the plan period on a best efforts basis, of the impact of these two major transportation systems
   ii) Adjusted system load and demand (kWh and kW) including the estimates in part (i).

RESPONSE:

a) No, there were not.

b) No, Toronto Hydro has not made adjustment to account for the Spadina line extension. There has been additional load on Toronto Hydro's system that has been ramping-up since 2011 for construction and commissioning of the Spadina Extension. The existing additional load and upward trend would already have been included in Toronto Hydro's load forecast models. Adjusting for incremental load in 2018 over and above that in 2017 would likely not make materially impact the load forecast, and may not be appropriate due to the noted inclusion of historical load associated with this project.

c) No, Toronto Hydro has not made adjustment to account for the Crosstown LRT. Toronto Hydro was not confident on the in service scheduled date or load requirements. In any event, as the load is not projected to materialize until 2021, it would not affect initial rate setting for 2020, and the load is not large enough to have impact on the growth rate that underpins the g factor in in the proposed CPCI.

d)

i) Please see Table 1 below for the estimated annual billing determinants for the Spadina line extension, and Crosstown LRT.

Table 1: Estimated kWh and kVA impacts

	Spadina Line Extension		Metrolinx Crosstown LRT	
	kWh	**kVA**	**kWh**	**kVA**
2018	23,984,100	87,900	-	-
2019	23,984,100	87,900	-	-
2020	23,984,100	87,900	-	-
2021	23,984,100	87,900	16,911,000	60,900
2022	23,984,100	87,900	36,025,800	129,800
2023	23,984,100	87,900	36,782,100	132,500
2024	23,984,100	87,900	37,538,400	135,200

ii) Please see Table 2 below which shows energy and demand from Table 1 in Exhibit 3, Tab 1, Schedule 1, with adjustment to include the estimated incremental load for both Spadina line extension, and Crosstown LRT.

1 **Table 2: Adjusted Total System Load**

Year		Total Normalized GWh	Total Normalized MVA
2018	Bridge	24,394.3	40,981.3
2019	Bridge	24,139.9	40,817.4
2020	Forecast	24,052.1	40,464.4
2021	Forecast	23,851.1	40,392.7
2022	Forecast	23,704.0	40,386.7
2023	Forecast	23,528.2	40,293.4
2024	Forecast	23,450.4	40,358.1

RESPONSES TO OEB STAFF INTERROGATORIES

INTERROGATORY 107:

Reference(s): **Exhibit 3, Tab 2, Schedule 1, p. 5**
Exhibit 3, Tab 2, Schedule 2
Chapter 2 Appendices, Appendix 2-H

a) Please provide a breakdown of the $6.7 million total net gain on sales that occurred during the 2015-2017 period and explain why Toronto Hydro does not expect there to be any net gains of this nature during the 2020-2024 period (Exhibit 3 / Tab 2 / Schedule 1 / p. 5).

b) Please provide the pole attachment revenues that Toronto Hydro has included in its revenue offset forecast for 2020 and compare to the 2015-2019 period. Please advise where that revenue is included in Appendix 2-H (Exhibit 3 / Tab 2 / Schedule 2).

RESPONSE:

a) Please refer to Table 1 below for the breakdown of $6.7 million total net gain. The properties listed are decommissioned municipal stations. At the time of preparing the application, Toronto Hydro did not have any plans to dispose of any more decommissioned municipal stations over the 2020 to 2024 period. As a result, there were no forecasts of this nature during the period.

Table 1: Net Gain on sale of Assets from 2015-2017

	Net Gain on Sales ($ Millions)
Sale of Property	
1304 Wilson Avenue	**0.3**
1629 Sheppard Avenue West	**0.2**
386 Eglington Avenue East	**1.4**
18 Portland Street	**1.2**
87 North Bonnington Avenue	**0.7**
750 Huntingwood Drive	**0.3**
169 Goulding Avenue	**1.5**
29 Heathrow Drive	**0.1**
Sale of Fleet	**0.9**
Total Gain on Sales 2015-2017*	**6.7**

*Variances may exist due to rounding

b) The pole attachment revenues included in the revenue offset forecast for the year 2020 is $5,482,498. Please refer to Table 2 for a comparison of pole attachment revenues for the 2015 to 2020 period.

Pole attachment revenue is included in Exhibit 3, Tab 2, Schedule 2 (OEB Appendix 2-H) under "Account 4325 - Merchandise and Jobbing Revenue" in the "Pole and Duct Rental" category.

Table 2: Pole Attachment Revenues ($ Millions)

	Actual	Actual	Actual	Bridge Year	Bridge Year	Test Year
	2015	**2016**	**2017**	**2018**	**2019**	**2020**
Pole Attachment Revenue	**3.2**	**4.1**	**5.6**	**4.5**	**5.0**	**5.5**

RESPONSES TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO INTERROGATORIES

INTERROGATORY 66:

Reference(s): Exhibit 3, Tab 2, Schedule 1, p. 1, Table 1

Please add 2013 and 2014 Actuals to the Table 1.

RESPONSE:

Refer to table below for 2013 and 2014 actuals.

Table 1: Other Revenue Summary ($ Millions)

Description	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	Bridge Year 2018	Bridge Year 2019	Test Year 2020
Specific Service Charges	6.4	6.5	6.8	9.5	7.2	6.5	6.5	6.6
Late Payment Charges	3.8	4.1	4.1	4.5	3.7	3.7	3.7	3.8
Other Operating Revenues	3.7	3.6	10.8	12.0	13.4	12.3	12.4	12.0
Other Income or Deductions	11.5	14.6	16.1	18.7	21.4	21.4	24.0	25.4
Total	**25.4**	**28.8**	**37.8**	**44.7**	**45.7**	**43.9**	**46.7**	**47.7**

RESPONSES TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO INTERROGATORIES

INTERROGATORY 67:

Reference(s): Exhibit 3, Tab 2, Schedule 1, p. 1, Table 1

a) Please provide the % of OM&A budget that is contracted out each year.

b) Please summarize the forecast work to be undertaken by external contractors in 2020 and explain any changes since 2015.

c) Please add two columns to Table 1 to show the number of FTEs in each program in 2015 compared to 2020.

RESPONSE:

The noted exhibit reference provided by the intervenor is not applicable or relevant to the questions posed by the intervenor. As such, Toronto Hydro is assuming that the questions intended to reference the OM&A section which should be Exhibit 4A, and has answered the questions accordingly based on this assumption.

a) Please refer to the following table for the information requested:

Table 1: Percentage of Third-Party Contractors cost included in the OM&A

	2015 Actual	2016 Actual	2017 Actual	2018 Bridge	2019 Bridge	2020 Test
Third-Party Contractors	34.8%	37.7%	41.2%	39.4%	39.0%	38.7%

b) Toronto Hydro's overall workforce staffing plan and strategy are discussed in Exhibit 4A, Tab 4, Schedule 3. Section 5.4 on page 25 more specifically explains the use of third party service providers.

c) Please refer to Appendix A.

Appendix A: FTE by OM&A Program

	FTE		FTE (exc. Students)	
OM&A Programs ($ Millions)	**2015 Actual**	**2020 Test**	**2015 Actual**	**2020 Test**
Predictive and Preventative Maintenance Overhead	12.5	7.4	12.1	7.3
Predictive and Preventative Maintenance Underground	7.6	4.5	7.5	4.5
Predictive and Preventative Maintenance Stations	11.9	18.2	11.7	17.8
Corrective Maintenance	33.8	37.3	33.1	35.8
Emergency Response	59.1	49.7	51.8	45.2
Disaster Preparedness Management	3.5	12.3	3.5	11.4
Control Centre Operations	30.2	43.0	27.6	41.4
Customer Driven Work	9.5	20.5	11.3	20.3
Asset and Program Management	56.2	52.0	43.1	41.8
Work Program Execution	107.3	106.7	104.2	103.7
Fleet and Equipment	32.8	28.0	31.0	27.0
Facilities Management	31.2	28.1	28.4	27.2
Supply Chain	41.4	31.3	40.8	30.3
Customer Care	133.2	147.9	124.4	133.9
Human Resources and Safety	72.8	74.3	62.3	67.6
Finance	84.3	72.2	78.4	67.4
Information Technology	88.8	88.8	80.8	84.1
Legal and Regulatory	35.8	39.4	32.9	36.8
Common Costs and Adjustments	9.6	6.3	8.1	5.8
Charitable Donations and LEAP[1]	-	-	-	-
Allocations and Recoveries[1]	-	-	-	-
Total OM&A FTE	**861.5**	**867.9**	**793.0**	**809.1**

Note 1 :

No FTEs are assigned to the programs identified above given the nature of the programs.

RESPONSES TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO INTERROGATORIES

INTERROGATORY 68:

Reference(s): Exhibit 3, Tab 2, Schedule 1, p. 1

a) Please discuss any significant challenges in the last 5-years related to execution of the OM&A plan.

b) Please discuss any new initiatives underway to address these challenges.

RESPONSE:

a) Toronto Hydro has faced a number of significant internal and external challenges over the 2015-2019 period in planning and executing its OM&A work plan. Examples are included below and found throughout Toronto Hydro's evidence in this Application:

General external cost pressures: Significant general cost pressures reflected in this Application are driven by a number of external factors, including inflationary pressures, insurance premiums and deductibles, exchange rates, and other increases such as postage. For instance, in 2017, Toronto Hydro spent $2.2 million in postage costs alone with the implementation of monthly billing.[1]

[1] Please see Exhibit 4A, Tab 2, Schedule 16, Exhibit 4A, Tab 2, Schedule 17, Exhibit 9, Tab 1, Schedule 1, and Exhibits 2B and 4A throughout.

Extreme weather events: Extreme weather has shifted from an infrequent occurrence to a regular condition of operating a distribution system, and drives how the utility must plan and executes its ordinary course work and responds to emergencies. For instance, in the first half of 2018, the utility faced four extreme weather-related events leaving nearly 160,000 customers without electricity. Over the 2015-2017 period, Toronto Hydro received 24,000 calls per year related to events that required crew dispatch, representing over half of the calls received by dispatchers. These conditions create both generalized cost pressures as explained further throughout this Application, as well as specific ones. For instance, freezing rain on March 3, 2015 contributed to approximately $2.1 million in response costs.[2]

Technology driven challenges: While smart grids, infrastructure automation, and other technological advancements offer significant opportunities, they also create incremental security needs. In recent years, electric utilities have been targeted for security breaches because of the critical role they play in enabling essential services. Ongoing changes and advancements in technology are driving a need for increased investment in cyber security and resilient software.[3]

Retiring workforce: Toronto Hydro employees are essential in supporting the maintenance of a safe and reliable distribution system and a growing city, and filling roles left vacant due to retirements requires up to six years lead time. For instance, Power System Controller Apprentices, irrespective of educational backgrounds and prior experience, must complete a 4.5 year apprentice program, including 2-3 years of

[2] Please see Exhibit 1B, Tab 1, Schedule 1, Table 1, Exhibit 4A, Tab 2, Schedule 5, and Exhibits 2B and 4A throughout.
[3] Please see Exhibit 2B, Section E8.1, and Exhibit 4A, Tab 2. Schedule 17

progressively more complex assignments, to substantially familiarize themselves with Toronto Hydro's system and become fully qualified Power System Controllers.[4]

Increasing customer expectations: Customers expect more of their utility, whether this means convenience of receiving and paying bills, scheduling service calls, and getting information on outages in real-time. Meeting these expectations drives cost pressures, such as 24/7 support, including through increased support in areas such as around-the-clock control centre support and extended call centre hours, a self-service portal and online outage map, and presence on tools such as social media.[5]

Evolving legislative and regulatory requirements: The ongoing and evolving legislative and regulatory changes introduced during the 2015-2018 period have driven an increase in costs and necessitated additional resources in interpreting and implementing these initiatives. Examples include: introduction of the Ontario Electricity Support Program ("OESP"), the expiry of the Ontario Clean Energy Benefit ("OCEB") and Debt Retirement Charges ("DRC"), introduction of the Ontario Rebate for Electricity Consumers ("OREC"), Fair Hydro Plan ("FHP"), and MDM/R integration. For instance, the mandatory move to monthly billing resulted in approximately $4.6 million in incremental costs.[6]

b) Despite all the significant challenges cited above, Toronto Hydro is continuing the commitments made in its last application. The efficiencies achieved through Toronto Hydro's efforts have allowed the utility to partially offset some of the costs resulting from the challenges described in part (a), above. For instance, within the Customer

[4] Please see Exhibit 4A, Tab 2, Schedule 7, Exhibit 9, Tab 1, Schedule 1, and Exhibit 4A, Tab 2, Schedule 18.
[5] Please see Exhibit 4A, Tab 2, Schedule 7, Exhibit 4A, Tab 2, Schedule 14, and Exhibit 1B, Tab 2, Schedule 3 at pages 6-7.
[6] Please see Exhibit 4A, Tab 2, Schedule 14

Care program, the annual cost of moving to monthly billing is being mitigated by increasing the penetration of ebilling, which is significantly less expensive than paper billing. The utility is proposing to further drive ebilling adoption through the 2020-2024 period. [7] For details on other cost control measures, and productivity and process improvements, please see Exhibit 4A, Tab 2, Schedules 1 through 21, Exhibit 1B, Tab 2, Schedule 1, and Toronto Hydro's responses to a number of interrogatories, including 1B-CCC-14.

[7] Please see Exhibit 4A, Tab 2, Schedule 14 and 2B, Section C2

RESPONSES TO CONSUMERS COUNCIL OF CANADA INTERROGATORIES

INTERROGATORY 32:

Reference(s): Exhibit 3, Tab 1, Schedule, p. 1

Please recast Table 1: Total Load, Revenues and Customers and include all forecast numbers for each year 2013-2018.

RESPONSE:

Table 1 below provides the 2014-2018 forecasts that were filed in the utility's 2015-2019 rate application ("the 2015 Application"). Toronto Hydro did not prepare a 2013 forecast for rate setting purposes, and therefore cannot provide the requested information.

Table 1: Total Forecast Load, Revenues, and Customers

Year	Total Normalized GWh	Total Normalized MVA	Total Distribution Revenue ($M)	Total Customers
2014	25,018.5	42,712.7	539.4	736,974
2015	24,993.3	42,697.2	662.2	749,679
2016	25,027.4	42,806.2	697.9	763,091
2017	24,841.6	42,631.3	755.1	773,850
2018	24,696.9	42,584.4	811.3	785,107

Toronto Hydro's weather normal year is based on an average of the 10 most recent full years of historical weather data; as a result, the weather normalization assumptions underlying the normalized GWh forecast in the 2015 Application are different than the assumptions underlying the historical normalized GWh in Table 1 of Exhibit 3, Tab 1,

Schedule 1. Please also note that the forecast Total Distribution Revenue was based on the rates that Toronto Hydro proposed in its 2015 Application, and not on the rates that the OEB approved in that application.

RESPONSES TO CONSUMERS COUNCIL OF CANADA INTERROGATORIES

INTERROGATORY 33:

Reference(s): Exhibit 3, Tab 1, Schedule 1, pp. 1213

Please provide an estimate of the potential impact on THESL's annual revenue assuming that there will not be a continuation of the Conservation First Framework.

RESPONSE:

Toronto Hydro's CDM forecast as it relates to the load forecast, is set out in Exhibit 3, Tab 1, Schedule 1, section 5. Accordingly, Toronto Hydro forecasts that the Conservation First Framework ("CFF") will affect its load in 2020, which is the final scheduled year of that initiative, and Toronto Hydro's rebasing year.

Toronto Hydro forecasts that the CFF will end (consistent with the assumption underpinning this interrogatory), as scheduled, at the end of 2020. Toronto Hydro's evidence in section 5.3 of that Exhibit is that it forecasts "a continuation of CDM programs" for 2021-2024 that are separate from the concluded CFF.

Given the priority shared by the Government, OEB, Toronto Hydro, and the public – to pursue cost-effective electricity policy choices – it is reasonable to expect that the low cost of CDM relative to other supply options will result in continuing CDM during this near term period.

Toronto Hydro customers have demonstrated their interest in CDM. From 2015-2017, customers worked with Toronto Hydro to save 981,950,525 kWh of electricity. CDM

provides customers with the ability to exert control over their electricity bills, which they have acted on now for over a decade. From 2007 to 2017, Toronto Hydro's CDM programs have helped to reduce residential household monthly consumption down from an average of 732 kWh to 581 kWh. Because most of the bill is charged on a volumetric basis, when customers save electricity through CDM, they save money.

Toronto Hydro's Application is premised on the costs of that CDM continuing to be funded in the same manner as they are in the CFF. In the event that the paradigm is different in type or magnitude over the period, Toronto Hydro will consider the available options for funding treatment.

RESPONSES TO CONSUMERS COUNCIL OF CANADA INTERROGATORIES

INTERROGATORY 34:

Reference(s): Exhibit 3, Tab 2, Schedule 2, p. 1

Please file the Board-approved numbers for Other Operating Revenue. Please describe the process used to forecast pole attachment revenue. Please include all assumptions

RESPONSE:

The revenue offsets-related revenue requirement approved by the OEB in 2015 was $41.3 million, consistent with Toronto Hydro's application. In its application, Other Operating Revenue for 2015 was $11.5 million.[1]

Forecasted pole attachment revenues (including revenues from wireline and non-wireline attachments) for 2018-2020 were determined by multiplying the forecasted annual billable pole attachment units and the applicable rates for access to power poles. For wireline attachment rates, please refer to Exhibit 8, Tab 2, Schedule 1, page 3 for additional information about the specific charge. For non-wireline attachment rates, the contracted rates in force at the time of forecasting (2017) were used for the forecast period.

Annual forecast units consisted of the historical actual volumes based on the latest available data (2017) at the time of forecasting, and projected number of new applications for the forecast periods (2018-2020). Based on Toronto Hydro's experience,

[1] EB-2014-0116 Decision, December 29, 2015, page 38.

established pole attachment contracts are regularly renewed thus it is reasonable to assume that this trend would continue over the forecast period. Toronto Hydro has projected an annual growth of 2% based on its recent experience.

Toronto Hydro assumed that the average billable pole per new application would remain consistent with historical data.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 74:

Reference(s): Appendix 2-H

Please update Appendix 2-H to include 2018 actuals.

RESPONSE:

Toronto Hydro expects to provide 2018 actuals as part of the planned update to the evidence, which is discussed in Exhibit 1A, Tab 3, Schedule 1, Appendix B. Please refer to Toronto Hydro's response to interrogatory 1A-Staff-1 for a list of the 2018 financial figures that Toronto Hydro plans to update.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 17:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, p. 1, p. 16**
Exhibit 3, Tab 1, Schedule 2

a) With respect to the historical and forecast customer/connection counts in Schedule 2, what point in the each year are they based on? If mid-year, is this equivalent to a June value?

b) The footnote to Table 1 (page 1) indicates that the customer counts are "as of mid-year". Are these values calculated from those set out in Schedule 2?
   i) If yes, please explain the derivation.
   ii) If not please provide the annual (historical and forecast) breakdown by customer class and explain how they were determined.

c) Please provide a schedule setting out the actual customer/connection count by customer count for the most recently available month in 2018 and indicate the month used.

RESPONSE:

a) Historical and forecast customer and connection numbers in Schedule 2 are June values. "Mid-year" and June are used interchangeably.

b) Total Customers in Table 1 are the sum of June values. Please see the table below.

Table 1: Number of Customers Breakdown

		Residential	CSMUR	GS < 50 kW	GS 50-999 kW	GS 1000-4999 kW	Large Use	USL	Total
2013	***Actual***	606,350	36,156	68,312	11,885	516	52	873	**724,144**
2014	***Actual***	609,928	43,022	69,078	11,852	447	47	888	**735,262**
2015	***Actual***	610,961	54,516	70,628	10,364	432	44	866	**747,811**
2016	***Actual***	611,021	65,685	70,499	10,475	443	42	866	**759,031**
2017	***Actual***	611,660	71,041	71,116	10,407	431	44	860	**765,559**
2018	***Bridge***	612,675	75,371	71,306	10,396	430	44	857	**771,079**
2019	***Bridge***	614,320	79,347	71,403	10,385	430	44	857	**776,786**
2020	***Forecast***	615,965	85,161	71,499	10,374	430	44	857	**784,330**
2021	***Forecast***	617,609	90,045	71,596	10,363	430	44	857	**790,944**
2022	***Forecast***	619,254	95,962	71,692	10,352	430	44	857	**798,591**
2023	***Forecast***	620,899	101,879	71,788	10,341	430	44	857	**806,238**
2024	***Forecast***	622,544	107,796	71,885	10,330	430	44	857	**813,886**

c) Please see the tables below for breakdown of December 2018 customer numbers, as well as Street Lighting devices and Unmetered Scattered Load (USL) connections.

Table 2: December 2018 Customer Numbers

Residential	CSMUR	GS < 50 kW	GS 50-999 kW	GS 1000-4999 kW	Large Use	USL	Total
612,754	76,806	71,400	10,462	430	38	825	**772,715**

Table 3: December 2018 Devices and Connections

Street Lighting	USL
164,687	12,180

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 18:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, p. 16**
Exhibit 3, Tab 1, Schedule 2

Preamble:

The Application (page 16) states that "the utility's forecast of new customers is primarily based on extrapolation models for each rate class with the exception of the CSMUR rate class".

a) What historical years were for the extrapolation models? If the years used included ones prior to 2013 please provide the historical customer/connection counts for those years as well.

b) The annual increase in GS<50 customers between 2013-2017 is significantly greater than the forecasted annual increase through to 2024 (see Schedule 2, page 4). Please provide details regarding the extrapolation used to forecast the GS<50 customer count.

c) With respect to Schedule 2, page 8, are the values shown for Street Lighting the number of connections (as the table indicates) or the number of devices?

RESPONSE:

a) When forecasting number of customers, Toronto Hydro considered long term trends, and short term trends, dating back as far as 2004. Please see 3-VECC-18 Appendix A.

b) Historical amounts from 2013-2017 include significant growth for FIT customer additions which were scheduled to stop by the end of 2017. The forecast to 2024 excludes the continuation of FIT additions, and extrapolates the forecast 2018-2024 customer additions based on the historical linear trend of GS>50 kW customer excluding FIT customers.

c) The values shown for Street Lights in Exhibit 3, Tab 1, Schedule 2, page 8 are number of devices. The OEB's Appendix 2-IB, presented in Schedule 2, has been formatted and locked by the OEB and does not give the option to select devices, only "Customers" or "Connections".

Date	Residential Historic	CSMUR Historic	GS<50 Historic	50-1000 kW Historic	1000-4999 kW Historic	Large Use Historic	Street Lighting Devices Historic	Scattered Load Connections Historic	Scattered Load Customers Historic
Jan-04	590,973		66,973	10,939	497	47		13,486	1,559
Feb-04	591,378		67,046	10,971	497	47		13,069	1,475
Mar-04	591,576		67,001	10,986	499	47		13,981	1,562
Apr-04	591,585		66,920	11,007	498	47		13,322	1,502
May-04	591,293		66,875	11,018	498	47		14,141	1,567
Jun-04	591,523		66,789	11,038	494	47		13,860	1,541
Jul-04	591,374		66,753	11,045	495	47		14,123	1,604
Aug-04	590,996		66,715	11,076	494	47		14,243	1,600
Sep-04	590,899		66,658	11,104	494	47		13,708	1,526
Oct-04	590,303		66,496	11,097	495	47		14,385	1,709
Nov-04	591,275		66,585	11,119	498	47		14,467	1,509
Dec-04	594,976		66,505	11,146	498	47		14,450	1,557
Jan-05	592,297		66,464	11,167	501	47		13,831	1,455
Feb-05	593,094		66,628	11,184	501	47		14,170	1,219
Mar-05	593,950		66,630	11,198	504	47		12,856	1,835
Apr-05	599,920		66,556	11,426	523	48		13,906	1,671
May-05	593,982		66,482	11,185	506	47		13,660	1,771
Jun-05	594,499		66,668	11,214	507	47		9,167	1,296
Jul-05	594,652		66,741	11,233	507	47		18,315	1,436
Aug-05	594,858		66,807	11,242	509	47		13,882	1,093
Sep-05	595,630		66,885	11,255	510	47		13,708	1,592
Oct-05	595,500		66,923	11,267	514	47		20,306	1,116
Nov-05	596,783		67,066	11,286	515	47		20,733	1,410
Dec-05	597,469		67,147	11,498	517	47		20,676	1,475
Jan-06	597,795		67,209	11,349	519	47		20,944	1,447
Feb-06	598,290		67,183	11,358	504	46		18,869	1,314
Mar-06	598,190		67,145	11,358	517	47		20,196	1,449
Apr-06	597,720		67,108	11,375	519	47		20,470	1,446
May-06	597,691		67,030	11,377	512	46		21,137	1,476
Jun-06	597,435		67,004	11,397	521	48		19,811	1,240
Jul-06	597,281		67,009	11,389	520	48		20,407	1,250
Aug-06	597,724		67,089	11,417	522	49		19,776	1,108
Sep-06	597,887		67,095	11,430	519	49		19,744	1,100
Oct-06	598,144		67,051	11,441	521	49		20,452	1,155
Nov-06	598,636		67,068	11,426	515	49		19,682	1,124
Dec-06	599,041	39	67,017	11,444	516	49		20,369	1,143
Jan-07	598,696	406	66,920	11,426	509	49	159,861	20,345	1,153
Feb-07	599,570	422	66,923	11,452	519	49	161,844	18,263	1,030
Mar-07	600,370	434	66,853	11,502	517	48	161,844	20,317	1,141
Apr-07	600,116	476	66,814	11,476	517	49	161,876	19,717	1,122
May-07	599,807	504	66,682	11,469	508	48	161,876	20,326	1,146
Jun-07	599,298	504	66,617	11,440	517	49	161,876	19,335	902
Jul-07	598,760	504	66,486	11,497	515	49	161,889	21,063	1,160
Aug-07	598,575	503	66,386	11,537	519	49	161,946	20,666	1,161
Sep-07	598,402	643	66,288	11,556	519	49	161,959	21,317	1,126
Oct-07	598,352	1,052	66,199	11,550	518	49	161,963	22,097	1,160
Nov-07	598,909	1,435	66,143	11,586	519	49	161,967	21,401	1,126
Dec-07	599,867	1,648	66,245	11,590	513	49	161,968	22,131	1,150
Jan-08	600,778	1,650	66,054	11,754	517	49	161,998	22,115	1,155
Feb-08	601,489	1,694	66,150	11,863	518	48	162,007	20,647	1,080
Mar-08	601,621	1,737	66,093	11,929	519	48	162,024	22,148	1,156
Apr-08	601,637	1,832	66,152	11,977	519	48	162,031	21,457	1,120
May-08	601,983	1,926	66,094	12,016	520	49	162,040	22,189	1,164
Jun-08	602,075	2,007	66,311	12,066	520	49	162,120	21,371	1,115
Jul-08	601,908	2,246	66,286	12,063	517	49	162,155	22,135	1,161
Aug-08	602,057	2,442	66,226	12,077	518	49	162,210	22,094	1,156
Sep-08	602,306	2,701	66,293	12,105	517	48	162,212	21,314	982
Oct-08	602,576	2,816	65,867	12,095	516	48	162,215	22,123	1,164
Nov-08	602,114	3,287	66,084	12,128	517	47	162,218	21,440	1,098
Dec-08	601,806	3,703	65,917	12,156	515	47	162,219	22,071	1,138
Jan-09	601,647	4,351	65,700	12,147	516	47	162,219	22,102	1,134
Feb-09	602,022	5,117	66,133	12,181	516	47	162,219	20,162	1,016
Mar-09	602,423	5,382	66,140	12,189	514	47	162,219	22,048	1,143
Apr-09	602,792	5,455	65,846	12,163	514	47	162,219	21,394	1,098

Date	Residential Historic	CSMUR Historic	GS<50 Historic	50-1000 kW Historic	1000-4999 kW Historic	Large Use Historic	Street Lighting Devices Historic	Scattered Load Connections Historic	Scattered Load Customers Historic
May-09	603,186	5,766	65,798	12,208	515	47	162,219	21,857	1,122
Jun-09	603,560	5,879	66,074	12,231	515	47	162,219	21,286	1,093
Jul-09	603,489	6,287	65,854	12,287	511	47	162,324	22,392	1,150
Aug-09	603,447	6,399	66,047	12,295	510	47	162,324	21,603	1,109
Sep-09	603,302	6,911	66,100	12,337	510	47	162,371	21,364	1,097
Oct-09	603,331	7,088	65,873	12,316	506	47	162,371	20,927	1,102
Nov-09	603,533	7,288	65,835	12,384	502	47	162,472	20,362	1,072
Dec-09	603,607	7,750	65,883	12,444	509	47	162,476	14,771	1,131
Jan-10	603,694	8,970	65,607	12,597	507	47	162,509	15,647	1,128
Feb-10	604,996	9,387	66,056	12,574	511	47	162,513	14,479	1,018
Mar-10	604,959	10,206	66,156	12,703	510	47	162,520	15,788	1,122
Apr-10	604,058	10,991	65,995	12,826	510	47	162,640	15,021	1,087
May-10	603,691	11,760	65,681	12,829	511	47	162,713	15,185	1,120
Jun-10	603,665	12,729	65,799	12,873	509	47	162,964	12,159	1,107
Jul-10	604,151	13,635	66,029	12,906	509	46	162,969	12,569	1,113
Aug-10	603,134	14,352	65,895	12,916	507	46	162,985	12,377	1,124
Sep-10	602,557	15,242	65,794	12,978	506	46	162,988	11,724	1,092
Oct-10	602,703	15,560	66,041	12,980	505	46	163,001	12,576	1,125
Nov-10	603,073	15,939	65,976	13,021	504	46	163,007	12,151	1,134
Dec-10	604,121	16,380	66,167	13,168	500	50	163,014	12,539	1,113
Jan-11	605,061	16,692	65,996	13,266	498	50	163,022	12,333	1,193
Feb-11	605,857	17,004	65,942	13,314	498	50	163,019	11,133	1,068
Mar-11	606,278	17,359	65,945	13,246	501	50	163,033	11,881	1,109
Apr-11	605,031	18,323	65,856	12,938	503	50	163,047	11,386	1,087
May-11	603,400	19,876	66,224	12,795	503	50	163,067	12,252	1,096
Jun-11	603,896	20,753	66,681	12,845	503	50	163,071	12,499	1,028
Jul-11	603,612	21,315	66,723	12,824	503	50	163,092	12,512	903
Aug-11	603,858	22,423	66,900	12,824	499	50	163,095	12,515	912
Sep-11	603,770	23,132	67,017	12,791	498	51	163,096	12,511	885
Oct-11	603,414	24,046	67,050	12,701	495	51	163,097	12,320	900
Nov-11	603,800	24,462	67,175	12,562	496	51	163,103	12,269	872
Dec-11	603,819	25,230	67,261	12,587	498	52	163,117	12,245	897
Jan-12	604,189	25,787	67,460	12,357	497	52	163,128	12,228	896
Feb-12	603,857	26,615	67,536	12,195	498	51	163,139	11,720	834
Mar-12	603,465	27,317	67,538	12,125	498	51	163,166	11,711	899
Apr-12	603,052	27,843	67,538	12,037	497	52	163,190	11,703	869
May-12	603,834	28,128	67,506	12,116	497	52	163,210	11,696	897
Jun-12	603,644	28,503	67,401	12,129	496	52	163,210	11,697	868
Jul-12	604,573	28,910	67,410	12,159	496	52	163,224	11,679	897
Aug-12	604,163	29,715	67,513	12,175	495	52	163,225	11,703	894
Sep-12	605,280	30,187	67,661	12,183	495	52	163,226	11,768	864
Oct-12	606,087	30,491	67,903	12,184	494	52	163,226	11,713	891
Nov-12	606,133	31,331	67,986	12,205	497	52	163,265	11,709	861
Dec-12	605,815	32,095	67,970	12,225	504	52	163,265	11,712	890
Jan-13	606,091	32,806	67,994	12,259	508	53	163,287	11,728	884
Feb-13	606,422	33,407	68,018	12,262	507	53	163,364	11,714	799
Mar-13	605,599	34,810	68,091	12,206	510	53	163,376	11,794	882
Apr-13	606,232	35,038	68,106	12,199	511	53	163,377	11,771	847
May-13	605,972	35,811	68,117	12,074	512	53	163,380	11,778	873
Jun-13	606,350	36,156	68,312	11,885	516	52	163,426	11,784	873
Jul-13	606,559	36,777	68,405	11,924	516	51	163,450	11,774	870
Aug-13	606,817	37,407	68,481	11,913	517	51	163,458	11,745	867
Sep-13	607,376	37,871	68,566	11,923	517	51	163,492	11,719	836
Oct-13	608,372	38,174	68,661	11,890	519	51	163,505	11,705	863
Nov-13	609,147	38,253	68,692	11,904	521	51	163,689	11,760	895
Dec-13	609,778	38,602	68,702	11,914	521	51	163,689	11,707	898
Jan-14	610,338	39,542	68,728	11,904	520	51	163,810	11,720	898
Feb-14	610,539	40,438	68,683	11,913	516	52	163,810	11,713	898
Mar-14	610,446	41,224	68,753	11,970	436	50	163,810	11,707	895
Apr-14	610,519	42,022	68,840	11,931	442	45	163,810	11,699	893
May-14	610,224	42,409	68,976	11,886	446	48	163,810	11,701	890
Jun-14	609,928	43,022	69,078	11,852	447	47	163,810	11,754	888
Jul-14	609,803	43,554	69,186	11,767	447	46	163,923	11,761	889
Aug-14	609,363	44,190	69,132	11,779	447	46	163,923	11,729	877
Sep-14	609,499	44,785	70,029	10,845	446	45	163,923	11,772	874

Date	Residential Historic	CSMUR Historic	GS<50 Historic	50-1000 kW Historic	1000-4999 kW Historic	Large Use Historic	Street Lighting Devices Historic	Scattered Load Connections Historic	Scattered Load Customers Historic
Oct-14	609,999	45,725	70,330	10,622	440	46	163,946	11,882	873
Nov-14	610,227	46,681	70,329	10,632	446	43	163,954	11,935	872
Dec-14	610,617	47,754	70,496	10,537	448	43	163,968	11,938	871
Jan-15	611,127	48,980	70,531	10,502	446	44	164,000	11,995	869
Feb-15	611,348	49,914	70,501	10,492	446	44	164,000	11,991	869
Mar-15	611,362	50,816	70,543	10,478	444	44	164,001	11,966	868
Apr-15	611,223	51,933	70,531	10,435	441	44	164,001	11,946	867
May-15	610,995	53,094	70,595	10,380	440	44	164,001	11,934	866
Jun-15	610,961	54,516	70,628	10,364	432	44	164,008	11,942	866
Jul-15	610,575	57,061	70,595	10,368	434	44	164,008	11,957	866
Aug-15	610,268	58,994	70,536	10,376	434	44	164,008	11,943	865
Sep-15	610,311	60,600	70,543	10,388	436	44	164,009	11,943	866
Oct-15	610,758	61,353	70,565	10,425	438	44	164,009	11,941	865
Nov-15	611,167	62,050	70,586	10,446	440	44	164,045	11,955	864
Dec-15	611,554	62,647	70,576	10,475	441	44	164,045	11,936	865
Jan-16	612,055	63,370	70,577	10,496	442	44	164,081	11,936	865
Feb-16	612,347	63,732	70,570	10,510	442	44	164,146	11,983	867
Mar-16	611,533	64,294	70,533	10,510	443	44	164,163	12,024	867
Apr-16	611,584	64,680	70,531	10,508	444	44	164,168	12,038	867
May-16	611,309	64,917	70,517	10,502	443	44	164,281	12,056	867
Jun-16	611,021	65,685	70,499	10,475	443	42	164,296	12,056	866
Jul-16	610,430	65,758	70,566	10,359	441	44	164,332	12,051	866
Aug-16	610,265	66,456	70,544	10,310	431	44	164,369	12,079	867
Sep-16	610,423	66,796	70,527	10,318	431	44	164,383	12,090	867
Oct-16	610,575	67,351	70,508	10,333	431	44	164,389	12,084	867
Nov-16	611,012	67,985	70,497	10,343	430	44	164,403	12,102	865
Dec-16	611,245	68,472	70,539	10,352	430	44	164,419	12,148	865
Jan-17	611,636	69,066	70,495	10,364	429	44	164,485	12,199	865
Feb-17	611,857	69,376	70,529	10,386	429	44	164,496	12,197	864
Mar-17	611,974	69,954	70,899	10,370	430	44	164,506	12,206	861
Apr-17	611,830	70,312	71,111	10,399	431	44	164,518	12,201	861
May-17	611,846	70,637	71,074	10,448	429	44	164,537	12,205	860
Jun-17	611,660	71,041	71,116	10,407	431	44	164,537	12,196	860
Jul-17	611,153	71,093	71,140	10,413	430	44	164,545	12,194	859
Aug-17	611,011	71,591	71,163	10,418	430	44	164,550	12,191	859
Sep-17	611,147	71,834	71,187	10,424	430	43	164,551	12,171	859
Oct-17	611,277	72,231	71,211	10,430	430	44	164,552	12,237	857
Nov-17	611,652	72,683	71,235	10,436	430	44	164,587	12,260	858
Dec-17	611,852	73,031	71,258	10,441	430	44	164,622	12,272	857

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 19:

Reference(s): Exhibit 3, Tab 1, Schedule 1, pp. 2-3

a) Do the purchased energy values set out in Figure 1 include microFIT, SOP and FIT purchases as well as purchases from the IESO? If not, please revise the figure to also include these purchases.

b) Which customer classes account for the material decrease in weather normalized purchases in 2009?

c) Which customer classes account for the material decrease in weather normalized purchases in 2017?

RESPONSE:

a) Yes.

b) Please see Table 1 below for a breakout of the 2009 decrease.

Table 1: Breakout of Normalized GWh Decrease, 2009

Class	Variance
Residential	(91)
CSMUR	14
GS<50 kW	(117)
GS 50-999 kW	(81)
GS 999-4999 kW	(207)
Large Use	(117)
Street Lighting	1
Unmetered Scattered Load	(1)
Total Variance	**(599)**

c) Please see Table 2 below for a breakout of the 2017 decrease.

Table 2: Breakout of Normalized GWh Decrease, 2017

Class	Variance
Residential	(261)
CSMUR	15
GS<50 kW	(11)
GS 50-999 kW	(131)
GS 999-4999 kW	(95)
Large Use	2
Street Lighting	(1)
Unmetered Scattered Load	-
Total Variance	**(482)**

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 20:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, pp. 3-10**
Exhibit 3, Tab 1, Schedule 1, Appendix A-2, p. 1

Preamble:

It is noted that the independent variables used in the current Residential model are not the same as those used in the 2015-2019 Application (EB-2014-0116).

a) Please explain why "population" was dropped as an independent variable in the Residential model.

b) Please explain why the time trend variable only starts in 2008.

c) It is noted that, apart from the time trend variable, the current Residential model does not include any variable related to changes in the level of Residential "activity" such as population or customer count.
   i) Was customer count tested as a potential independent variable? If yes, why was it excluded?
   ii) If not, please provide the regression results (similar to Appendix A-2) where customer count is also included as an independent variable and the resulting Residential energy forecast for 2020 to 2024.

RESPONSE:

a) Toronto Hydro revaluates all models when updating its load forecasts, and generally attempts to achieve a combination of variables that create a balance of good model fit, yield coefficient values that make practical and statistical sense, and provide good predictive value.

In the case of the population variable, models tested resulted in coefficient values on the population variable with the incorrect sign (i.e., a negative coefficient – suggesting an increase in population leads to a decrease in loads).

b) Toronto Hydro tested several time trend variables for this model, including a time series that began in July 2002, and chose 2008 because it yielded the best modeling result. One possible explanation for this time-trend being a statistically significant explanatory variable is that it may serve to capture natural conservation behaviour that may otherwise not be included in Toronto Hydro's CDM programming offered to customers beginning around the same timeframe.

c) Toronto Hydro found that when the number of customers was revaluated as a variable it did not strengthen the model. Similar to answer a) above, it resulted in negative coefficients on the customer variable. Toronto Hydro does not believe a forecast using a variable with an incorrectly signed variable is appropriate.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 21:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, pp. 3-10**
Exhibit 3, Tab 1, Schedule 1, Appendix A-2, p. 3

Preamble:

It is noted that the independent variables used in the current GS<50 model are not the same as those used in the 2015-2019 Application (EB-2014-0116).

a) Please explain why each of the independent variables used in the 2015-2019 Application but currently excluded was dropped.

b) What was the source for the GDP forecast used in the GS<50 (and other) models and when was it prepared?

c) Is a more recent GDP forecast now available? If yes, please provide a schedule that compares it with the 2020-2024 GDP forecast used in the Application.

RESPONSE:

a) Toronto Hydro revaluates all models when updating its load forecasts, and generally attempts to achieve a combination of variables that create a balance of good model fit, yield coefficient values that make practical and statistical sense, and provide good predictive value. The current combination of variables gave a better balance of these

characteristics compared to those used in the 2015-2019 forecast.

b) Toronto Hydro sources its Toronto specific GDP forecast values from the Conference Board of Canada, and extends the forecast using simple linear trend when the forecast does not cover the full rate application period. Toronto Hydro obtained the information for its regression modeling in February 2018. At the time the information was obtained, the latest information available was dated as being prepared by the Conference Board of Canada in September 2017.

c) Yes, a more recent report is available now, dated September 2018. Please see 3-VECC-21 Appendix A, for a comparison of the two Conference Board of Canada quarterly reports, as well as a monthly formatted report with linear trend extension which Toronto Hydro has derived from these reports.

Conference Board of Canada
GDP at Basic Prices - Toronto (Millions $ 2007)

Notes

1) Report dated 9.8.2017 extended using linear trend for 2022-2024
2) Report dated 9.21.2018 extended using linear trend for 2023-2024

GDP Report Comparison

Quarterly		
Period	**Issue Date**	
Quarter	9.8.2017	9.21.2018
2002.02	241,424	242,497
2002.03	242,794	244,692
2002.04	243,634	246,287
2003.01	245,594	247,801
2003.02	245,595	247,334
2003.03	244,976	246,382
2003.04	248,524	249,504
2004.01	249,333	250,804
2004.02	252,612	254,129
2004.03	254,553	256,218
2004.04	256,006	257,794
2005.01	258,194	259,915
2005.02	259,274	260,936
2005.03	261,817	263,454
2005.04	263,709	265,302
2006.01	266,905	268,576
2006.02	267,342	269,042
2006.03	266,555	268,277
2006.04	269,164	270,822
2007.01	270,390	271,678
2007.02	272,290	273,665
2007.03	274,890	276,641
2007.04	274,956	277,334
2008.01	273,220	275,340
2008.02	273,939	275,782
2008.03	274,509	276,019
2008.04	268,890	270,101
2009.01	262,772	264,098
2009.02	262,594	264,137
2009.03	266,605	268,341
2009.04	269,177	271,295
2010.01	271,166	273,233
2010.02	273,395	275,289
2010.03	275,596	277,282
2010.04	278,026	279,449
2011.01	280,700	282,320
2011.02	280,098	281,858
2011.03	284,726	286,611
2011.04	286,949	288,868
2012.01	287,854	289,591
2012.02	289,466	291,280
2012.03	290,430	292,093
2012.04	289,315	290,906
2013.01	291,461	292,310
2013.02	295,026	296,274
2013.03	296,401	298,199

Converted to Monthly, with Linear Trend Extension		
Period	**Issue Date**	
Month	9.8.2017	9.21.2018
Jul-02	241,881	243,229
Aug-02	242,337	243,961
Sep-02	242,794	244,692
Oct-02	243,074	245,224
Nov-02	243,354	245,756
Dec-02	243,634	246,287
Jan-03	244,287	246,792
Feb-03	244,940	247,296
Mar-03	245,594	247,801
Apr-03	245,594	247,645
May-03	245,594	247,490
Jun-03	245,595	247,334
Jul-03	245,389	247,017
Aug-03	245,182	246,699
Sep-03	244,976	246,382
Oct-03	246,159	247,423
Nov-03	247,341	248,463
Dec-03	248,524	249,504
Jan-04	248,793	249,937
Feb-04	249,063	250,371
Mar-04	249,333	250,804
Apr-04	250,426	251,913
May-04	251,519	253,021
Jun-04	252,612	254,129
Jul-04	253,259	254,825
Aug-04	253,906	255,522
Sep-04	254,553	256,218
Oct-04	255,037	256,743
Nov-04	255,522	257,269
Dec-04	256,006	257,794
Jan-05	256,735	258,501
Feb-05	257,464	259,208
Mar-05	258,194	259,915
Apr-05	258,554	260,255
May-05	258,914	260,596
Jun-05	259,274	260,936
Jul-05	260,122	261,775
Aug-05	260,970	262,614
Sep-05	261,817	263,454
Oct-05	262,448	264,070
Nov-05	263,079	264,686
Dec-05	263,709	265,302
Jan-06	264,775	266,394
Feb-06	265,840	267,485
Mar-06	266,905	268,576
Apr-06	267,051	268,731

GDP Report Comparison

Quarterly		
Period	**Issue Date**	
Quarter	9.8.2017	9.21.2018
2013.04	298,574	300,885
2014.01	298,720	300,196
2014.02	304,143	305,703
2014.03	307,924	309,470
2014.04	310,562	311,863
2015.01	311,901	313,507
2015.02	314,404	316,301
2015.03	317,595	320,221
2015.04	320,050	321,997
2016.01	326,290	327,273
2016.02	324,995	326,821
2016.03	326,621	328,593
2016.04	328,336	330,633
2017.01	334,098	336,243
2017.02	337,504	338,745
2017.03	340,352	339,591
2017.04	343,009	342,881
2018.01	343,917	344,397
2018.02	345,979	346,137
2018.03	348,003	347,725
2018.04	350,009	349,811
2019.01	351,867	351,976
2019.02	353,925	354,102
2019.03	355,992	356,259
2019.04	358,099	358,484
2020.01	360,296	360,904
2020.02	362,486	363,234
2020.03	364,666	365,543
2020.04	366,865	367,864
2021.01	369,066	370,121
2021.02	371,334	372,522
2021.03	373,597	374,932
2021.04	375,884	377,381
2022.01		379,868
2022.02		382,426
2022.03		384,993
2022.04		387,599

Converted to Monthly, with Linear Trend Extension		
Period	**Issue Date**	
Month	9.8.2017	9.21.2018
May-06	267,197	268,886
Jun-06	267,342	269,042
Jul-06	267,080	268,787
Aug-06	266,818	268,532
Sep-06	266,555	268,277
Oct-06	267,425	269,126
Nov-06	268,295	269,974
Dec-06	269,164	270,822
Jan-07	269,573	271,108
Feb-07	269,981	271,393
Mar-07	270,390	271,678
Apr-07	271,023	272,340
May-07	271,657	273,003
Jun-07	272,290	273,665
Jul-07	273,157	274,657
Aug-07	274,023	275,649
Sep-07	274,890	276,641
Oct-07	274,912	276,872
Nov-07	274,934	277,103
Dec-07	274,956	277,334
Jan-08	274,378	276,670
Feb-08	273,799	276,005
Mar-08	273,220	275,340
Apr-08	273,460	275,487
May-08	273,699	275,635
Jun-08	273,939	275,782
Jul-08	274,129	275,861
Aug-08	274,319	275,940
Sep-08	274,509	276,019
Oct-08	272,636	274,046
Nov-08	270,763	272,074
Dec-08	268,890	270,101
Jan-09	266,851	268,100
Feb-09	264,811	266,099
Mar-09	262,772	264,098
Apr-09	262,713	264,111
May-09	262,653	264,124
Jun-09	262,594	264,137
Jul-09	263,931	265,538
Aug-09	265,268	266,939
Sep-09	266,605	268,341
Oct-09	267,462	269,325
Nov-09	268,320	270,310
Dec-09	269,177	271,295
Jan-10	269,840	271,941
Feb-10	270,503	272,587
Mar-10	271,166	273,233
Apr-10	271,909	273,918
May-10	272,652	274,603
Jun-10	273,395	275,289
Jul-10	274,129	275,953
Aug-10	274,862	276,617
Sep-10	275,596	277,282
Oct-10	276,406	278,004
Nov-10	277,216	278,726
Dec-10	278,026	279,449

GDP Report Comparison

Quarterly		
Period	**Issue Date**	
Quarter	9.8.2017	9.21.2018

Converted to Monthly, with Linear Trend Extension		
Period	**Issue Date**	
Month	9.8.2017	9.21.2018
Jan-11	278,917	280,406
Feb-11	279,808	281,363
Mar-11	280,700	282,320
Apr-11	280,499	282,166
May-11	280,298	282,012
Jun-11	280,098	281,858
Jul-11	281,640	283,442
Aug-11	283,183	285,027
Sep-11	284,726	286,611
Oct-11	285,467	287,364
Nov-11	286,208	288,116
Dec-11	286,949	288,868
Jan-12	287,250	289,109
Feb-12	287,552	289,350
Mar-12	287,854	289,591
Apr-12	288,391	290,154
May-12	288,929	290,717
Jun-12	289,466	291,280
Jul-12	289,788	291,551
Aug-12	290,109	291,822
Sep-12	290,430	292,093
Oct-12	290,058	291,697
Nov-12	289,687	291,301
Dec-12	289,315	290,906
Jan-13	290,031	291,374
Feb-13	290,746	291,842
Mar-13	291,461	292,310
Apr-13	292,650	293,632
May-13	293,838	294,953
Jun-13	295,026	296,274
Jul-13	295,485	296,916
Aug-13	295,943	297,558
Sep-13	296,401	298,199
Oct-13	297,125	299,095
Nov-13	297,850	299,990
Dec-13	298,574	300,885
Jan-14	298,622	300,656
Feb-14	298,671	300,426
Mar-14	298,720	300,196
Apr-14	300,527	302,032
May-14	302,335	303,867
Jun-14	304,143	305,703
Jul-14	305,403	306,959
Aug-14	306,663	308,214
Sep-14	307,924	309,470
Oct-14	308,803	310,268
Nov-14	309,683	311,065
Dec-14	310,562	311,863
Jan-15	311,008	312,411
Feb-15	311,454	312,959
Mar-15	311,901	313,507
Apr-15	312,735	314,438
May-15	313,569	315,369
Jun-15	314,404	316,301
Jul-15	315,467	317,607
Aug-15	316,531	318,914

GDP Report Comparison

Quarterly		
Period	**Issue Date**	
Quarter	9.8.2017	9.21.2018

Converted to Monthly, with Linear Trend Extension		
Period	**Issue Date**	
Month	9.8.2017	9.21.2018
Sep-15	317,595	320,221
Oct-15	318,413	320,813
Nov-15	319,232	321,405
Dec-15	320,050	321,997
Jan-16	322,130	323,756
Feb-16	324,210	325,514
Mar-16	326,290	327,273
Apr-16	325,858	327,122
May-16	325,426	326,971
Jun-16	324,995	326,821
Jul-16	325,537	327,411
Aug-16	326,079	328,002
Sep-16	326,621	328,593
Oct-16	327,193	329,273
Nov-16	327,765	329,953
Dec-16	328,336	330,633
Jan-17	330,257	332,503
Feb-17	332,178	334,373
Mar-17	334,098	336,243
Apr-17	335,233	337,077
May-17	336,369	337,911
Jun-17	337,504	338,745
Jul-17	338,453	339,027
Aug-17	339,402	339,309
Sep-17	340,352	339,591
Oct-17	341,237	340,688
Nov-17	342,123	341,785
Dec-17	343,009	342,881
Jan-18	343,312	343,386
Feb-18	343,614	343,892
Mar-18	343,917	344,397
Apr-18	344,604	344,977
May-18	345,292	345,557
Jun-18	345,979	346,137
Jul-18	346,654	346,666
Aug-18	347,328	347,196
Sep-18	348,003	347,725
Oct-18	348,672	348,420
Nov-18	349,341	349,116
Dec-18	350,009	349,811
Jan-19	350,629	350,533
Feb-19	351,248	351,254
Mar-19	351,867	351,976
Apr-19	352,553	352,685
May-19	353,239	353,394
Jun-19	353,925	354,102
Jul-19	354,614	354,821
Aug-19	355,303	355,540
Sep-19	355,992	356,259
Oct-19	356,695	357,001
Nov-19	357,397	357,743
Dec-19	358,099	358,484
Jan-20	358,831	359,291
Feb-20	359,563	360,097
Mar-20	360,296	360,904
Apr-20	361,026	361,681
May-20	361,756	362,457
Jun-20	362,486	363,234

GDP Report Comparison

Quarterly		
Period	**Issue Date**	
Quarter	9.8.2017	9.21.2018

Converted to Monthly, with Linear Trend Extension		
Period	**Issue Date**	
Month	9.8.2017	9.21.2018
Jul-20	363,213	364,003
Aug-20	363,940	364,773
Sep-20	364,666	365,543
Oct-20	365,399	366,316
Nov-20	366,132	367,090
Dec-20	366,865	367,864
Jan-21	367,598	368,616
Feb-21	368,332	369,369
Mar-21	369,066	370,121
Apr-21	369,822	370,922
May-21	370,578	371,722
Jun-21	371,334	372,522
Jul-21	372,088	373,325
Aug-21	372,842	374,128
Sep-21	373,597	374,932
Oct-21	374,359	375,748
Nov-21	375,121	376,565
Dec-21	375,884	377,381
Jan-22	376,449	378,210
Feb-22	377,014	379,039
Mar-22	377,580	379,868
Apr-22	378,145	380,721
May-22	378,710	381,574
Jun-22	379,276	382,426
Jul-22	379,841	383,282
Aug-22	380,406	384,137
Sep-22	380,972	384,993
Oct-22	381,537	385,861
Nov-22	382,102	386,730
Dec-22	382,667	387,599
Jan-23	383,233	388,175
Feb-23	383,798	388,752
Mar-23	384,363	389,328
Apr-23	384,929	389,905
May-23	385,494	390,481
Jun-23	386,059	391,057
Jul-23	386,625	391,634
Aug-23	387,190	392,210
Sep-23	387,755	392,787
Oct-23	388,321	393,363
Nov-23	388,886	393,940
Dec-23	389,451	394,516
Jan-24	390,017	395,092
Feb-24	390,582	395,669
Mar-24	391,147	396,245
Apr-24	391,712	396,822
May-24	392,278	397,398
Jun-24	392,843	397,974
Jul-24	393,408	398,551
Aug-24	393,974	399,127
Sep-24	394,539	399,704
Oct-24	395,104	400,280
Nov-24	395,670	400,857
Dec-24	396,235	401,433

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 22:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, pp. 3-10**
Exhibit 3, Tab 1, Schedule 1, Appendix A-2, p. 4

Preamble:

It is noted that the independent variables used in the current GS 50-999 model are not the same as those used in the 2015-2019 Application (EB-2014-0116).

a) Please explain why each of the independent variables used in the 2015-2019 Application but currently excluded was dropped.

b) Why is there no time trend variable used in the GS 50-999 model?

RESPONSE:

a) Toronto Hydro revaluates all models when updating its load forecasts, in an effort to achieve a combination of variables that 1) create a balance of good model fit, 2) yield coefficient values which make practical and statistical sense, and 3) provide good predictive value for forecasting. The current combination of variables provides a better balance of these factors compared to those used in the 2015-2019 forecast.

b) Toronto Hydro prefers to use time trend variables when other variables do not yield satisfactory model fit or predictive value. In this case, the variables used give satisfactory model fit and predictive value, and using a time trend variable does not

add appreciable value to the class model. Adding a time series variable serves to move coefficient weighting from variables such as customer numbers and GDP, which have supportable and explainable historical and forecasts.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 23:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, pp. 3-10**
Exhibit 3, Tab 1, Schedule 1, Appendix A-2, p. 4

Preamble:

It is noted that the independent variables used in the current GS 1,000-4,999 model are not the same as those used in the 2015-2019 Application.

a) Please explain why customer count was dropped but GDP added as an independent variable.

b) At page 9, reference is made to the use of a "pair regression model" to forecast unemployment rate and population. Please explain more fully the approach used to develop these forecasts and why it was necessary.

c) Please indicate where the population forecast is used in the load forecast models.

RESPONSE:

a) Toronto Hydro revaluates all models when updating its load forecasts, in an effort to achieve a combination of variables that 1) create a balance of good model fit, 2) yield coefficient values which make practical and statistical sense, and 3) provide good predictive value for forecasting. The current combination of variables including GDP

and excluding customer count reflects the best balance of these factors.

b) Please refer to Toronto Hydro's response to interrogatory 3-Staff-103.

c) Toronto Hydro considers population in the evaluation process of its class specific multi variable regression models every time it reforecasts; however, in this application the population variable was not used in either of the final class models for the reasons mentioned above in part (a).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 24:

Reference(s): **Exhibit 3, Tab 1, Schedule 1**
Exhibit 3, Tab 1, Schedule 1, Appendix A-1
Exhibit 3, Tab 1, Schedule 1, Appendix B, p. 2
Exhibit 3, Tab 1, Schedule 1, Appendix C
Exhibit 3, Tab 1, Schedule 2

a) Please confirm that the GWh values presented in Tables 1, 2 & 8 of Tab 1, Schedule 1 and in Appendix B are purchased values (i.e., include a mark-up for losses) while the MWh values in Tables 4 & 6 of Tab 1, Schedule 1 as well as those in Appendix A-1, Appendix C and Schedule 2 are all delivered MWh (i.e., no mark-up for losses).
    i) If not confirmed, please clarify basis for tables.

b) If the values used in the customer class models (i.e., Appendix A-1) were estimated using purchased energy for each customer class (i.e., marked-up for losses) please provide the following:
    i) The loss factors used to convert historic delivered energy values to purchased values and what they were based on.
    ii) Confirmation as to whether the gross CDM values reported by the IESO are based on purchased or delivered energy including supporting references to IESO.

iii) The loss factors used to convert the forecast 2020-2024 energy values to delivered energy and what they were based on.

c) If the models are based on delivered energy, what loss factor(s) were used to convert the forecast customer class values for 2018-2024 to purchased energy and how were they determined?

RESPONSE:

a) Tables 1, 2, and 8 of Tab 1, Schedule 1, as well as Appendix A-1 and Appendix B, are all purchased values.

Tables 4 and 6 of Tab 1, Schedule 1, as well as Appendix C and Schedule 2 are delivered values.

b) The values used in the class energy models are purchased energy values.

i) For purposes of converting delivered values to purchased values in the class models, Toronto Hydro used the proposed loss factors resulting from its most recent loss study, which can be found in Exhibit 8, Tab 4, Schedule 1 (OEB Appendix 2-R).

ii) Gross CDM values reported by the IESO are delivered energy values at the customer meter. Reference can be found on the "Methodology" tab in Toronto Hydro's 2017 Final Verified Annual LDC CDM Program Result Report, provided in Toronto Hydro's response to interrogatory 3-VECC-28, Appendix A.

"All results are at the end-user level, i.e. not including losses as a result transmission and distribution lines."

iii) Toronto Hydro used the proposed loss factors resulting from its most recent loss study, found in Exhibit 8, Tab 4, Schedule 1 (OEB Appendix 2-R), to convert the forecast 2020-2024 delivered energy values to purchased energy.

c) Not applicable.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 25:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, pp. 12-13**
Exhibit 3, Tab 1, Schedule 1, Appendix A-1

a) Please provide copies of the IESO Reports setting out the 2006-2016 verified results used in the Application (per page 12).

b) Based on the results from the IESO's verified reports please complete the following schedule:

Verified Gross CDM Savings per IESO Reports (MWh)							
Program Year	Calendar Year						
	2006	2007	Annual Values for 2008 to 2023				2024
2006							
2007	X						
2008	X	X					
2009	X	X					
2010	X	X					
2011	X	X					
2012	X	X					
2013	X	X					
2014	X	X					
2015	X	X					
2016	x	x					
Total							

c) Based on the monthly CDM values set out in Appendix A-1 please complete the following schedule:

CUMULATIVE ANNUAL GROSS CDM SAVINGS (MWh)							
Year	Residential	CSMUR	GS<50	GS50 - 999	GS1,000 – 4,999	LU	Total
2006							
2007							

2008							
2009							
2010							
2011							
2012							
2013							
2014							
2015							
2016							

d) Please demonstrate that the total cumulative savings by year as used in the load forecast models (per the response to part (c)) can be reconciled with the reported results verified by the IESO (as summarized in the response to part (b)).

RESPONSE:

a) Please refer to Appendix A for 2006-2010 Final OPA CDM Result Report – Toronto Hydro-Electric System Limited; Appendix B for 2011-2014 Final IESO CDM Result Report – Toronto Hydro-Electric System Limited; and Appendix C for 2015-2016 Final Verified IESO CDM Result Report – Toronto Hydro-Electric System Limited, all filed in Excel format.

b) Please refer to Appendix D for Table 1: Verified Gross CDM Savings per IESO Reports (MWh).

c) Please see Table 2: Cumulative Annual Gross CDM Savings (MWh).

Table 2: Cumulative Annual Gross CDM Savings (MWh)

Year	CUMULATIVE ANNUAL GROSS CDM SAVINGS (MWh)						
	Residential	CSMUR	GS<50 kW	GS50 -999 kW	GS1,000 – 4,999 kW	LU	**Total**
2006	23,313						**23,313**
2007	103,768		15,343	16,419	15,361	15,176	**166,068**
2008	235,175		68,860	72,201	70,410	69,562	**516,208**
2009	279,009	82	99,392	103,830	108,702	118,935	**709,950**
2010	337,827	339	172,024	177,259	187,221	205,179	**1,079,848**
2011	374,671	599	222,990	240,023	225,718	221,152	**1,285,155**
2012	420,517	924	279,629	329,866	262,119	250,368	**1,543,423**
2013	442,802	983	324,468	407,697	280,186	261,249	**1,717,385**
2014	470,067	1,251	369,658	502,074	324,639	283,352	**1,951,041**
2015	504,357	1,951	414,378	648,721	426,561	351,826	**2,347,794**
2016	558,221	3,934	435,190	780,596	509,886	410,205	**2,698,032**

d) The differences between the verified results and CDM values set out in Appendix A-1 are created mostly by the following variances: persistence, realization rates, and line losses.

Persistence: This is an adjustment made to conservation program savings to help account only for the savings that can be directly attributable to the program's impact, so for instance a measure with a 5 year life will only have savings attributed to it for the measure life. However, for load forecasting purposes persistence impacts are removed as it is assumed that the measure will be replaced with a similar technology at end of life and thus the load reduction will be permanent.

Realization Rates: The IESO verified savings are full year savings for each project aggregated to a total, so do not account for the implementation of projects throughout the year. The load forecast takes into account the fact that projects are

implemented throughout the year, so not all savings attributed to a specific year are in place at the beginning of a year. For the 2015-2020 Conservation First programs savings are assumed to occur evenly throughout a year. For earlier conservation programs the savings distribution is based on historical analysis.

Line Losses: In order to appropriately interpret the CDM impact on purchased energy, the CDM savings were grossed up to account for line losses.

Table 3 demonstrates numerical reconciliation summary of CDM verified results and cumulative CDM savings by year as used in the load forecast models.

Table 3: Reconciliation of CDM Verified Results and Cumulative CDM Savings Used in Load Forecast

Year	CDM Verified Results (MWh)	Persistence Variance (MWh)	Realization Rates Variance (MWh)	Line Loss Varinace (MWh)	CDM in Load Forecast Appendix A-1 (MWh)
2006	56,010	-	-33,367	670	23,313
2007	381,928	-	-220,454	4,595	166,068
2008	492,314	88,040	-78,164	14,017	516,208
2009	686,443	101,199	-96,695	19,002	709,950
2010	1,028,306	151,343	-128,417	28,615	1,079,848
2011	1,282,183	151,350	-182,707	34,329	1,285,155
2012	1,236,660	344,677	-79,105	41,191	1,543,423
2013	1,410,555	355,618	-94,730	45,942	1,717,385
2014	1,671,655	395,250	-168,248	52,384	1,951,041
2015	1,929,280	534,933	-179,558	63,139	2,347,794
2016	2,093,043	662,333	-129,863	72,519	2,698,032

RESPONSE TO 3-VECC-25 Part b

Table 1: Verified Gross CDM Savings per IESO/OPA Reports

Verified Gross CDM Savings per IESO/OPA Reports (MWh)																				
Program Year	Calendar Year																			
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2006	56,010	56,010	56,010	56,010	9,964	9,964	9,138	9,138	8,604	8,604	8,145	8,145	8,145	8,145	7,400	6,206	6,206	6,206	3,341	**341,389**
2007	-	325,918	237,877	226,833	226,833	226,824	40,551	40,551	40,551	18,405	15,514	12,062	12,062	12,062	12,062	5,774	1,403	1,256	1,256	**1,457,795**
2008	-	-	198,427	196,101	195,318	195,318	189,358	182,963	161,114	132,580	118,377	89,579	87,072	87,072	85,420	85,153	85,032	82,365	16,808	**2,188,058**
2009	-	-	-	207,499	183,543	183,543	183,487	182,023	177,457	170,241	157,083	106,015	74,958	58,123	36,220	26,986	26,976	26,616	23,866	**1,824,635**
2010	-	-	-	-	412,648	376,505	376,497	376,461	374,876	319,471	253,239	236,281	209,686	99,652	24,345	24,345	24,176	24,160	24,160	**3,156,503**
2011	-	-	-	-	-	290,029	289,158	287,288	280,372	278,421	274,558	263,083	262,934	243,971	238,509	208,193	207,404	206,173	35,115	**3,365,210**
2012	-	-	-	-	-	-	148,470	146,814	144,960	139,327	134,919	123,593	117,465	117,404	114,059	77,560	67,968	62,334	49,951	**1,444,823**
2013	-	-	-	-	-	-	-	185,316	182,084	175,009	169,472	155,245	147,549	147,471	143,269	138,920	120,027	93,232	88,365	**1,745,959**
2014	-	-	-	-	-	-	-	-	301,636	289,914	280,742	257,174	244,424	244,296	237,336	237,336	231,486	198,351	161,708	**2,684,402**
2015	-	-	-	-	-	-	-	-	-	397,309	389,832	385,053	384,740	384,278	383,152	375,930	375,834	372,162	291,543	**3,739,833**
2016	-	-	-	-	-	-	-	-	-	-	291,163	291,163	291,163	291,163	286,325	283,121	283,121	283,121	269,273	**2,569,611**
	56,010	**381,928**	**492,314**	**686,443**	**1,028,306**	**1,282,183**	**1,236,659**	**1,410,554**	**1,671,654**	**1,929,281**	**2,093,044**	**1,927,393**	**1,840,198**	**1,693,637**	**1,568,097**	**1,469,524**	**1,429,633**	**1,355,976**	**965,386**	**24,518,218**

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 26:

Reference(s): Exhibit 3, Tab 1, Schedule 1, pp. 12-13, p. 14 (Table 4)

a) Please provide a copy of Toronto Hydro's recently approved 2015-2020 CDM Plan.

b) Based on the THESL's CDM assumptions used in the current Application for 2017-2024, please complete the following schedule for each customer class and for THESL overall. Note: The values should represent annualized savings. i.e., assuming all programs implemented January 1st.

GROSS ANNUALIZED CDM SAVINGS (MWh)								
	Calendar Year							
Program Year	2017	2018	2019	2020	2021	2022	2023	2024
2017								
2018	X							
2019	X	X						
2020	X	X	X					
2021	X	X	X	X				
2022	X	X	X	X	X			
2023	X	X	X	X	X	X		
2024	X	X	x	X	X	X	X	
Total								

c) Do the values provided in part (b) reconcile with THESL's most recently approved CDM Plan? If not, why not?

d) Based on the monthly CDM values set out in Appendix A-1 please complete the following schedule:

CUMULATIVE GROSS CDM SAVINGS (MWh)							
Year	Residential	CSMUR	GS<50	GS50 -999	GS1,000 – 4,999	LU	Total
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							

e) Do the 2017-2024 values set out in Table 4 for each customer class equal the annual totals for each class that would be obtained if the monthly kWh/day values in Appendix A-1 were translated into annual values for each customer class (per the response to part (d))? If not, what do the values in Table 4 represent?

f) For each customer class and for the total of all customer classes please complete the following schedule based on CDM values used in the forecast models (Appendix A-1). If the totals do not reconcile with Table 4 in the Application and the response to part (d), please explain why:

GROSS ANNUAL CDM SAVINGS (MWh)								
	Calendar Year							
Program Year	2017	2018	2019	2020	2021	2022	2023	2024
2006-2016								
2017								
2018	X							
2019	X	X						
2020	X	X	X					
2021	X	X	X	X				
2022	X	X	X	X	X			
2023	X	X	X	X	X	X		
2024	X	X	x	X	X	X	X	
Total								

g) Please demonstrate that the CDM savings assumed from 2017-2020 programs for purposes of the load forecast (as set out in the response to part (f) above) can be reconciled with the annualized values provided in the response to part (b).

h) Please demonstrate that the CDM savings assumed for 2021-2024 for purposes of the load forecast (as set out in the response to part (f) above) can be reconciled with the annualized values provided in the response to part (b).

RESPONSE:

a) Please refer to Appendix A to this response for Toronto Hydro's latest approved CDM plan.

b) The tables below illustrate Toronto Hydro's CDM assumptions used in the current Application for 2017-2024, for each customer class, and for Toronto Hydro overall.

Table 1: Residential Gross Annualized CDM Savings (MWh)

Program Year	Calendar Year							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
2017	51,519	51,519	51,519	51,519	51,519	51,519	51,519	51,519
2018		31,996	31,996	31,996	31,996	31,996	31,996	31,996
2019			12,616	12,616	12,616	12,616	12,616	12,616
2020				9,709	9,709	9,709	9,709	9,709
2021					9,709	9,709	9,709	9,709
2022						9,709	9,709	9,709
2023							9,709	9,709
2024								9,709
Total	51,519	83,515	96,131	105,839	115,548	125,256	134,965	144,673

Table 2: CSMUR Gross Annualized CDM Savings (MWh)

Program Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2017	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579
2018		6,681	6,681	6,681	6,681	6,681	6,681	6,681
2019			6,427	6,427	6,427	6,427	6,427	6,427
2020				6,300	6,300	6,300	6,300	6,300
2021					6,300	6,300	6,300	6,300
2022						6,300	6,300	6,300
2023							6,300	6,300
2024								6,300
Total	1,579	8,260	14,687	20,987	27,286	33,586	39,885	46,185

Table 3: GS <50 kW Gross Annualized CDM Savings (MWh)

Program Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2017	20,456	20,456	20,456	20,456	20,456	20,456	20,456	20,456
2018		22,923	22,923	22,923	22,923	22,923	22,923	22,923
2019			21,113	21,113	21,113	21,113	21,113	21,113
2020				19,486	19,486	19,486	19,486	19,486
2021					19,486	19,486	19,486	19,486
2022						19,486	19,486	19,486
2023							19,486	19,486
2024								19,486
Total	20,456	43,379	64,492	83,978	103,463	122,949	142,435	161,921

Table 4: GS 50 -999 kW Gross Annualized CDM Savings (MWh)

Program Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2017	217,367	217,367	217,367	217,367	217,367	217,367	217,367	217,367
2018		168,284	168,284	168,284	168,284	168,284	168,284	168,284
2019			126,585	126,585	126,585	126,585	126,585	126,585

Program Year	Calendar Year							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
2020				120,277	120,277	120,277	120,277	120,277
2021					120,277	120,277	120,277	120,277
2022						120,277	120,277	120,277
2023							120,277	120,277
2024								120,277
Total	217,367	385,651	512,236	632,512	752,789	873,066	993,342	1,113,619

Table 5: GS 1,000 – 4,999 kW Gross Annualized CDM Savings (MWh)

Program Year	Calendar Year							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
2017	51,259	51,259	51,259	51,259	51,259	51,259	51,259	51,259
2018		103,036	103,036	103,036	103,036	103,036	103,036	103,036
2019			73,831	73,831	73,831	73,831	73,831	73,831
2020				68,744	68,744	68,744	68,744	68,744
2021					68,744	68,744	68,744	68,744
2022						68,744	68,744	68,744
2023							68,744	68,744
2024								68,744
Total	51,259	154,295	228,126	296,870	365,614	434,357	503,101	571,845

Table 6: Large Use Gross Annualized CDM Savings (MWh)

Program Year	Calendar Year							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
2017	61,035	61,035	61,035	61,035	61,035	61,035	61,035	61,035
2018		36,662	36,662	36,662	36,662	36,662	36,662	36,662
2019			91,033	91,033	91,033	91,033	91,033	91,033
2020				30,089	30,089	30,089	30,089	30,089
2021					30,089	30,089	30,089	30,089
2022						30,089	30,089	30,089
2023							30,089	30,089

Program Year	Calendar Year							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
2024								30,089
Total	61,035	97,697	188,730	218,819	248,908	278,997	309,086	339,175

Table 7: Total Gross Annualized CDM Savings (MWh)

Prog. Year	Calendar Year							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
2017	403,214	403,214	403,214	403,214	403,214	403,214	403,214	403,214
2018		369,582	369,582	369,582	369,582	369,582	369,582	369,582
2019			331,606	331,606	331,606	331,606	331,606	331,606
2020				254,603	254,603	254,603	254,603	254,603
2021					254,603	254,603	254,603	254,603
2022						254,603	254,603	254,603
2023							254,603	254,603
2024								254,603
Total	403,214	772,796	1,104,402	1,359,005	1,613,608	1,868,211	2,122,815	2,377,418

c) The values provided in part (b) do not reconcile with Toronto Hydro's most recently approved CDM Plan because the CDM Plan has since been updated and approved by the IESO.

d) Table 8 below contains 2017-2024 cumulative gross CDM savings.

Table 8: Cumulative Gross CDM Savings (MWh)

Year	CUMULATIVE GROSS CDM SAVINGS (MWh)						
	Residential	**CSMUR**	**GS<50 kW**	**GS50 -999 kW**	**GS1,000 – 4,999 kW**	**LU**	**Total**
2017	614,566	6,188	451,471	950,451	569,647	459,558	**3,051,881**
2018	656,931	10,604	473,882	1,147,405	650,744	508,472	**3,448,038**
2019	679,274	17,344	496,493	1,297,862	740,855	575,146	**3,806,975**

Year	CUMULATIVE GROSS CDM SAVINGS (MWh)						
	Residential	CSMUR	GS<50 kW	GS50 -999 kW	GS1,000 – 4,999 kW	LU	Total
2020	690,673	23,892	517,341	1,424,743	814,089	634,811	**4,105,550**
2021	700,669	30,378	537,404	1,548,580	884,868	665,418	**4,367,317**
2022	710,665	36,864	557,466	1,672,417	955,646	696,024	**4,629,083**
2023	720,661	43,350	577,529	1,796,254	1,026,425	726,631	**4,890,849**
2024	730,657	49,836	597,592	1,920,091	1,097,203	757,237	**5,152,616**

e) The 2017-2024 CDM values set out in Table 4 do not equal CDM totals obtained from Appendix A-1 due to line losses.

f) The tables below represent each customer class and the total of all customer classes based on CDM values used in the forecast models (Appendix A-1). The totals below do not reconcile with Table 4 in the application because these savings were grossed up to account for line losses. The totals in the tables below do align with the response to part (d).

Table 9: Residential – Gross Annual CDM Savings (MWh)

Prog. Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2006-2016	586,387	586,387	586,387	586,387	586,387	586,387	586,387	586,387
2017	28,179	53,044	53,044	53,044	53,044	53,044	53,044	53,044
2018		17,501	32,943	32,943	32,943	32,943	32,943	32,943
2019			6,901	12,990	12,990	12,990	12,990	12,990
2020				5,310	9,996	9,996	9,996	9,996
2021					5,310	9,996	9,996	9,996
2022						5,310	9,996	9,996
2023							5,310	9,996
2024								5,310
Total	614,566	656,931	679,274	690,673	700,669	710,665	720,661	730,657

Table 10: CSMUR – Gross Annual CDM Savings (MWh)

Prog. Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2006 - 2016	5,324	5,324	5,324	5,324	5,324	5,324	5,324	5,324
2017	864	1,626	1,626	1,626	1,626	1,626	1,626	1,626
2018		3,655	6,879	6,879	6,879	6,879	6,879	6,879
2019			3,515	6,617	6,617	6,617	6,617	6,617
2020				3,446	6,486	6,486	6,486	6,486
2021					3,446	6,486	6,486	6,486
2022						3,446	6,486	6,486
2023							3,446	6,486
2024								3,446
Total	6,188	10,604	17,344	23,892	30,378	36,864	43,350	49,836

Table 11: GS < 50kW – Gross Annual CDM Savings (MWh)

Prog. Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2006 - 2016	440,282	440,282	440,282	440,282	440,282	440,282	440,282	440,282
2017	11,189	21,061	21,061	21,061	21,061	21,061	21,061	21,061
2018		12,538	23,601	23,601	23,601	23,601	23,601	23,601
2019			11,548	21,738	21,738	21,738	21,738	21,738
2020				10,658	20,063	20,063	20,063	20,063
2021					10,658	20,063	20,063	20,063
2022						10,658	20,063	20,063
2023							10,658	20,063
2024								10,658
Total	451,471	473,882	496,493	517,341	537,404	557,466	577,529	597,592

1 **Table 12: GS 50-999 kW – Gross Annual CDM Savings (MWh)**

Prog. Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2006 - 2016	831,557	831,557	831,557	831,557	831,557	831,557	831,557	831,557
2017	118,894	223,801	223,801	223,801	223,801	223,801	223,801	223,801
2018		92,047	173,265	173,265	173,265	173,265	173,265	173,265
2019			69,239	130,332	130,332	130,332	130,332	130,332
2020				65,788	123,837	123,837	123,837	123,837
2021					65,788	123,837	123,837	123,837
2022						65,788	123,837	123,837
2023							65,788	123,837
2024								65,788
Total	950,451	1,147,405	1,297,862	1,424,743	1,548,580	1,672,417	1,796,254	1,920,091

2

3 **Table 13: GS 1,000 – 4,999 kW – Gross Annual CDM Savings (MWh)**

Prog. Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2006-2016	541,610	541,610	541,610	541,610	541,610	541,610	541,610	541,610
2017	28,037	52,776	52,776	52,776	52,776	52,776	52,776	52,776
2018		56,358	106,086	106,086	106,086	106,086	106,086	106,086
2019			40,384	76,017	76,017	76,017	76,017	76,017
2020				37,601	70,779	70,779	70,779	70,779
2021					37,601	70,779	70,779	70,779
2022						37,601	70,779	70,779
2023							37,601	70,779
2024								37,601
Total	569,647	650,744	740,855	814,089	884,868	955,646	1,026,425	1,097,203

4

Table 14: Large Use – Gross Annual CDM Savings (MWh)

Prog. Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2006-2016	426,575	426,575	426,575	426,575	426,575	426,575	426,575	426,575
2017	32,982	62,085	62,085	62,085	62,085	62,085	62,085	62,085
2018		19,812	37,292	37,292	37,292	37,292	37,292	37,292
2019			49,193	92,599	92,599	92,599	92,599	92,599
2020				16,260	30,607	30,607	30,607	30,607
2021					16,260	30,607	30,607	30,607
2022						16,260	30,607	30,607
2023							16,260	30,607
2024								16,260
Total	459,558	508,472	575,146	634,811	665,418	696,024	726,631	757,237

Table 15: Total – Gross Annual CDM Savings (MWh)

Prog. Year	Calendar Year							
	2017	2018	2019	2020	2021	2022	2023	2024
2006-2016	2,831,735	2,831,735	2,831,735	2,831,735	2,831,735	2,831,735	2,831,735	2,831,735
2017	220,146	414,392	414,392	414,392	414,392	414,392	414,392	414,392
2018		201,910	380,067	380,067	380,067	380,067	380,067	380,067
2019			180,781	340,293	340,293	340,293	340,293	340,293
2020				139,063	261,766	261,766	261,766	261,766
2021					139,063	261,766	261,766	261,766
2022						139,063	261,766	261,766
2023							139,063	261,766
2024								139,063
Total	3,051,881	3,448,038	3,806,975	4,105,550	4,367,317	4,629,083	4,890,849	5,152,616

g) For reconciliation between the two parts, the following adjustments need to be made:

1) Cumulative 2016 persistence – The annualized values provided in the response to part (b) do not account for persistent savings from previous years (2006-2016).

2) Variance from realization rates – Please refer to Toronto Hydro's response to interrogatory 3-VECC-25 part (d) for a description of the variance due to realization rates.
3) Variance from line losses – Please refer to Toronto Hydro's response to interrogatory 3-VECC-25 part (d) for a description of the variance from line losses.

h) Please see response to part (g).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 27:

Reference(s): Exhibit 3, Tab 1, Schedule 1, p. 4, p. 11

a) For each of the customer classes and for the distribution system overall, please provide a schedule that sets out the forecast energy (gross of CDM), the assumed CDM impact and the resulting forecast (net of CDM) for the years 2017 to 2024 (i.e., the results of each of the three steps set out on page 4).

b) For each of the demand billed customer classes please provide: i) a six-year history of the historical relationship between energy and demand, ii) the average for the latest 3 years (as used in the Application per page 11). Please also confirm that both the energy and billing demand values used to determine the relationship are net of CDM.

c) Please confirm that using this three-year (net) average to convert energy (gross of CDM) to billing demand (gross of CDM) assumes that, for each customer class, the relationship/ratio between CDM energy and demand savings is the same as the relationship/ratio between net energy use and net billed demand.

d) For each demand billed customer class, please provide a schedule that for each of the years 2020-2024 sets out: i) the relationship/ratio between the cumulative forecast CDM energy impacts (Table 4) and the cumulative CDM demand impacts (Table 5) and ii) the three year average used to convert the gross energy to gross billing demand.

RESPONSE:

a) Please see Appendix A to this response.

b) Please see Appendix B to this response. Confirmed, both energy and billing demand values used to derive the relationships are net of CDM.

c) Confirmed. Toronto Hydro uses three-year average load factors derived from billed actuals which are naturally equivalent to "net of CDM" to determine its gross of CDM demand kW. This assumes consistent load factors apply to both demand billed, and demand savings from CDM. Toronto Hydro notes that using three-year average load factors is a reasonable approach as annual class load factors have not changed significantly over the last decade while CDM programming has continued to grow.

d) Please see Appendix C to this response.

APPENDIX A: Forecast Energy, Assumed CDM Impact, and Forecast net of CDM (2017-2024)

Purchased Energy GWh

	Residential			CSMUR			GS < 50 kW			GS 50-999 kW			GS 100-4999 kW			Large User			Street Lighting	USL	Total Company		
	Energy Gross of CDM	CDM	Energy Net of CDM	Energy Gross of CDM	CDM	Energy Net of CDM	Energy Gross of CDM	CDM	Energy Net of CDM	Energy Gross of CDM	CDM	Energy Net of CDM	Energy Gross of CDM	CDM	Energy Net of CDM	Energy Gross of CDM	CDM	Energy Net of CDM	Energy	Energy	Energy Gross of CDM	CDM	Energy Net of CDM
2017	5,260.9	614.6	4,646.3	258.5	6.2	252.3	2,839.8	451.5	2,388.3	10,968.4	950.5	10,018.0	5,336.8	569.6	4,767.2	2,654.8	459.6	2,195.3	117.9	42.4	27,479.5	3,051.9	24,427.6
2018	5,372.0	656.9	4,715.1	274.4	10.6	263.8	2,849.3	473.9	2,375.4	11,086.5	1,147.4	9,939.1	5,448.9	650.7	4,798.1	2,634.7	508.5	2,126.2	118.0	42.4	27,826.2	3,448.0	24,378.2
2019	5,345.0	679.3	4,665.7	289.0	17.3	271.7	2,845.3	496.5	2,348.8	11,170.4	1,297.9	9,872.6	5,468.0	740.9	4,727.2	2,652.3	575.1	2,077.2	118.2	42.4	27,930.7	3,807.0	24,123.8
2020	5,334.4	690.7	4,643.7	309.2	23.9	285.3	2,851.9	517.3	2,334.5	11,295.3	1,424.7	9,870.6	5,510.2	814.1	4,696.1	2,679.3	634.8	2,044.5	118.8	42.5	28,141.6	4,105.6	24,036.0
2021	5,290.9	700.7	4,590.2	325.7	30.4	295.4	2,842.2	537.4	2,304.8	11,355.7	1,548.6	9,807.1	5,518.5	884.9	4,633.6	2,691.3	665.4	2,025.9	118.6	42.4	28,185.4	4,367.3	23,818.0
2022	5,263.9	710.7	4,553.2	346.0	36.9	309.1	2,837.1	557.5	2,279.6	11,434.8	1,672.4	9,762.4	5,530.8	955.6	4,575.1	2,707.2	696.0	2,011.2	118.8	42.4	28,280.9	4,629.1	23,651.8
2023	5,236.8	720.7	4,516.1	366.4	43.3	323.1	2,829.5	577.5	2,252.0	11,506.6	1,796.3	9,710.4	5,543.0	1,026.4	4,516.6	2,722.4	726.6	1,995.8	119.0	42.4	28,366.2	4,890.8	23,475.3
2024	5,225.9	730.7	4,495.2	387.9	49.8	338.1	2,831.5	597.6	2,233.9	11,617.3	1,920.1	9,697.3	5,577.3	1,097.2	4,480.1	2,747.2	757.2	1,990.0	119.6	42.5	28,549.3	5,152.6	23,396.7

APPENDIX B: Historical Load Factor Details

Six Year Historical Class Load Factors

	GS 50-999 kW	GS 1000-4999 kW	Large User
Jan-12	60.1%	69.3%	65.2%
Feb-12	64.8%	74.7%	70.5%
Mar-12	54.1%	66.2%	63.2%
Apr-12	56.7%	63.9%	64.4%
May-12	59.3%	68.2%	62.2%
Jun-12	57.4%	67.9%	63.7%
Jul-12	60.4%	67.7%	62.9%
Aug-12	58.3%	68.4%	63.5%
Sep-12	56.9%	66.9%	62.6%
Oct-12	56.0%	67.0%	63.4%
Nov-12	61.4%	72.3%	67.4%
Dec-12	59.4%	66.6%	62.1%
Jan-13	60.4%	69.6%	62.6%
Feb-13	69.5%	78.7%	71.5%
Mar-13	58.8%	70.1%	65.6%
Apr-13	59.7%	71.1%	65.4%
May-13	54.6%	64.8%	61.3%
Jun-13	57.0%	66.9%	62.7%
Jul-13	57.4%	65.1%	61.2%
Aug-13	57.7%	67.3%	62.0%
Sep-13	55.1%	65.2%	61.5%
Oct-13	56.1%	66.9%	62.2%
Nov-13	61.1%	71.7%	65.0%
Dec-13	58.0%	66.3%	61.5%
Jan-14	62.4%	70.7%	65.1%
Feb-14	68.7%	79.8%	72.7%
Mar-14	61.7%	71.0%	65.5%
Apr-14	59.6%	70.9%	66.1%
May-14	55.9%	65.4%	61.7%
Jun-14	59.3%	68.9%	64.6%
Jul-14	57.7%	67.1%	62.3%
Aug-14	57.3%	66.8%	61.7%
Sep-14	57.2%	66.6%	61.1%
Oct-14	56.2%	66.4%	61.4%
Nov-14	61.6%	71.1%	64.6%
Dec-14	59.3%	68.2%	61.7%
Jan-15	62.6%	70.6%	64.6%
Feb-15	71.1%	79.7%	75.6%
Mar-15	60.3%	70.0%	65.0%
Apr-15	59.1%	69.5%	64.8%
May-15	56.4%	65.4%	59.6%
Jun-15	59.2%	68.8%	63.7%
Jul-15	60.1%	67.1%	60.2%
Aug-15	56.3%	65.4%	60.5%
Sep-15	59.5%	68.2%	62.6%

Three Year Average Class Load Factors

	GS 50-999 kW	GS 1000-4999 kW	Large User
January	61.4%	69.6%	63.9%
February	68.6%	77.8%	72.4%
March	60.3%	69.6%	63.9%
April	59.6%	69.2%	64.4%
May	55.6%	64.9%	60.0%
June	58.9%	68.5%	63.8%
July	59.8%	66.5%	60.5%
August	59.1%	67.0%	61.1%
September	58.2%	67.0%	61.5%
October	56.1%	65.7%	61.7%
November	61.1%	71.2%	65.8%
December	60.1%	67.9%	62.5%

APPENDIX B: Historical Load Factor Details

	Six Year Historical Class Load Factors		
	GS 50-999 kW	GS 1000-4999 kW	Large User
Oct-15	56.7%	66.7%	62.2%
Nov-15	61.2%	70.3%	65.4%
Dec-15	59.3%	67.9%	62.9%
Jan-16	60.6%	68.7%	62.1%
Feb-16	64.9%	74.2%	68.3%
Mar-16	59.2%	68.5%	63.3%
Apr-16	60.1%	69.4%	64.6%
May-16	55.5%	64.4%	60.1%
Jun-16	58.3%	67.9%	64.5%
Jul-16	59.7%	66.1%	61.2%
Aug-16	61.8%	68.6%	61.7%
Sep-16	57.6%	66.9%	60.7%
Oct-16	55.9%	65.5%	61.5%
Nov-16	60.2%	71.1%	65.5%
Dec-16	60.5%	68.3%	63.3%
Jan-17	61.0%	69.3%	65.1%
Feb-17	67.4%	76.9%	70.8%
Mar-17	61.4%	70.2%	63.4%
Apr-17	59.6%	68.7%	63.8%
May-17	54.7%	64.9%	60.2%
Jun-17	59.2%	68.7%	63.2%
Jul-17	59.5%	66.4%	60.2%
Aug-17	59.0%	66.9%	61.1%
Sep-17	57.5%	65.8%	61.1%
Oct-17	55.5%	64.9%	61.3%
Nov-17	61.9%	72.2%	66.6%
Dec-17	60.6%	67.5%	61.5%

Three Year Average Class Load Factors		
GS 50-999 kW	GS 1000-4999 kW	Large User

APPENDIX C: CDM Load Factor and Power Factor Detail

GS 50-999

	Cumulative CDM MWh Per Exhibit 3, Tab 1, Schedule 1, Page 14 of 17, Table 4	**Cumulative CDM MW** Per Exhibit 3, Tab 1, Schedule 1, Page 15 of 17, Table 5	**Average Annual Load Factor**	**Three Year Average Power Factor**
	A	**B**	**C=A/(B/12)*8784**	
2020	1,383,783	2,594	72.9%	
2021	1,504,060	2,781	73.9%	
2022	1,624,336	2,969	74.7%	91.9%
2023	1,744,613	3,156	75.5%	
2024	1,864,890	3,344	76.2%	

GS 1000-4999

	Cumulative CDM MWh Per Exhibit 3, Tab 1, Schedule 1, Page 14 of 17, Table 4	**Cumulative CDM MW** Per Exhibit 3, Tab 1, Schedule 1, Page 15 of 17, Table 5	**Average Annual Load Factor**	**Three Year Average Power Factor**
	A	**B**	**C=A/(B/12)*8784**	
2020	790,685	1,379	78.3%	
2021	859,429	1,451	80.9%	
2022	928,173	1,523	83.3%	92.6%
2023	996,916	1,595	85.4%	
2024	1,065,660	1,666	87.4%	

Large User

	Cumulative CDM MWh Per Exhibit 3, Tab 1, Schedule 1, Page 14 of 17, Table 4	**Cumulative CDM MW** Per Exhibit 3, Tab 1, Schedule 1, Page 15 of 17, Table 5	**Average Annual Load Factor**	**Three Year Average Power Factor**
	A	**B**	**C=A/(B/12)*8784**	
2020	624,077	1,354	62.9%	
2021	654,166	1,404	63.6%	
2022	684,255	1,454	64.3%	92.8%
2023	714,344	1,503	64.9%	
2024	744,433	1,553	65.5%	

Notes:

Average Annual Load Factor assumes equal monthly demand CDM impacts.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 28:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, pages 12-13**
THESL Verified 2017 CDM Results
(http://www.ieso.ca/en/Sector-Participants/Conservation-Delivery-and-Tools/Conservation-Targets-and-Results

a) Please confirm that the THESL's' verified 2017 CDM results are now available from the IESO (per the referenced link) and provide a copy (excel version) of the Report.

b) Please provide a schedule that compares the forecast annualized impact of 2017 CDM programs (through to 2024) as used in the Application (i.e., per the response to 3.0-VECC-26, part (b)) with the actual results as verified by the IESO.

c) How would the input data (Appendix A-1), the load forecast models (Appendix A-2) and the resulting forecasts for 2020-2024 (Appendix C and Exhibit 3, Tab 1, Schedule) change if the actual verified 2017 CDM results were used?

RESPONSE:

a) Toronto Hydro's verified 2017 CDM results are now available at the following website: http://www.ieso.ca/en/Sector-Participants/Conservation-Delivery-and-Tools/Conservation-Targets-and-Results. An excel copy of the verified results is provided as Appendix A to this response.

b) Table 1 shows a comparison of the 2017 CDM Savings used in the rate application (as per Toronto Hydro's response to interrogatory 3-VECC-26, part (b)) and the 2017 IESO Verified Results.

Table 1: Comparison of 2017 Gross Annualized CDM Savings

Total - GROSS ANNUALIZED CDM SAVINGS (MWh)								
Program Year	**Calendar Year**							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
3-VECC-26, part (b)	214,207	403,214	403,214	403,214	403,214	403,214	403,214	403,214
2017 IESO Verified Results	203,177	382,450	382,450	382,450	382,450	382,450	382,450	382,450
Difference	-11,031	-20,764	-20,764	-20,764	-20,764	-20,764	-20,764	-20,764

c) The verified actual results show lower CDM savings than what was originally forecasted. This would lead to lower aggregate 2017 "Purchased Energy per day (by customer class)" used in the forecasting models, and result in a lower overall purchased energy forecast. The reduction would also correlate to lower CDM forecast use for load forecasting (Exhibit 3, Tab 1, Schedule 1, Appendix C), which would subsequently be used to reduce the Purchased Energy load forecast to net of CDM.

The net of these impacts would most likely lead to a marginally different overall kWh load forecast in 2018 to 2024. It is worth noting that the indicated 20,764 MWh difference in CDM verified results represents an impact of approximately 0.09 percent on total 2018 load, and further, would have no impact on residential rates as residential rates will be fully transitioned to fixed rates by 2020.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 29:

Reference(s): **Exhibit 3, Tab 1, Schedule 1, p. 15**
Exhibit 3, Tab 1, Schedule 1, Appendix C

a) Since the CDM values for the years 2017-2019 are all based on assumptions regarding savings that will be achieved (as opposed to verified results) why aren't they also included in the calculation of the LRAMVA thresholds for each customer class?

b) With respect to Table 6, a review of the supporting excel spreadsheet (Appendix C) suggests that the GS 1-5 MW class impacts have not been included. Please review and revise as required.

c) With respect to Appendix C, please explain why the value for the "Cumulative 2019 Persistence" is constant for the years 2020-2024 as opposed to declining over time.

d) Please re-do Appendix C such that each schedule starts with 2017.

e) Please confirm that, for each customer class, the "Cumulative Incremental Gross (for LRAM)" values calculated in part (d) should equal the totals from 3.0-VECC-26 b).
    i) If not confirmed, please explain why?
    ii) If confirmed and the values are not equivalent, please explain why.

f) What is the basis for the Gross to Net Ratios used in Appendix C?

RESPONSE:

a) LRAMVA amounts recorded for the 2020-2024 period will be based on variances between actual achieved savings and savings included in the load forecast used to determine rates over the 2020-2024 period. Any variances during the 2017 to 2019 period are not relevant for the purposes of calculating 2020-2024 LRAMVA.

b) Yes, GS 1-5 MW was inadvertently omitted from Table 6. The correction was made in the table below.

Table 1: Revised "Table 6", including CDM savings for GS 1-5 MW (MWh)

CDM Forecast Year	2020	2021	2022	2023	2024	Total
2020	196,258					**196,258**
2021	191,949	196,258				**388,206**
2022	191,834	191,949	196,258			**580,040**
2023	191,559	191,834	191,949	196,258		**771,599**
2024	191,038	191,559	191,834	191,949	196,258	**962,637**

c) With respect to the "Cumulative 2019 Persistence" column in Appendix C, the values represent CDM savings that have occurred to the end of 2019 and are embedded in the load forecast. These savings for the load forecast are assumed to continue. Historical CDM savings must be subtracted from the Load Forecast to determine the incremental CDM which will form the basis of the 2020-24 LRAMVA.

d) Please see response to part (a) above.

e) Please see response to part (a) above.

f) The net to gross values used in Appendix C are based on annual gross and net savings at the aggregate portfolio by rate class level.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 30:

Reference(s): Exhibit 3, Tab 2, Schedule 1, pp. 1-2

a) Please provide the 2018 year to date values for the five schedules set out on pages 1-2.

b) Since 2015 has THESL altered its Conditions of Service such that customers are now charged (on a time and materials basis) for services that, at the time of the 2015-2019 Rate Application, were provided at no charge? If so, please provide a schedule that sets out each of these (now) chargeable services and indicate: i) the year the billing for such service commenced, ii) the USOA account the revenues/costs are recorded in and iii) the actual/forecast annual revenue from the date of introduction through to 2020.

c) Is THESL currently proposing/planning any changes to its Conditions of Service such that customers will be charged (on a time and materials basis) for services that are currently provided at no charge? If so, please provide a schedule that set out each of these (now) chargeable services and indicate: i) the year the billing for such services will commence, ii) the USOA account the revenues/costs will be recorded in and iii) the actual/forecast annual revenue from the date of introduction through to 2020.

d) Please explain the decrease in Pole & Duct Rental revenues between 2017 and 2018.

RESPONSE:

a) 2018 actuals will be provided as part of the evidence update in early 2019. Refer to Exhibit 1A, Tab 3, Schedule 1, Appendix B, page 2 to view a comprehensive listing of evidence to be updated.

b) For i) and ii) please see the table below for changes to the Conditions of Service.

Table 1: Conditions of Service Revision Summary

Revision	Year	Section	Service	Summary of Changes to Toronto Hydro's Conditions of Service	USoA Account
16	2017	1.7.3	Tree and Vegetation Management	Revision: when to charge a customer that requires a disconnection of their overhead lines.	Isolations Revenue: 4325 Costs: 4330
16	2017	3.4.1	Electrical Requirement	Revision: customers will be required to pay for an electricity disconnection.	

iii) Please see Exhibit 3, Tab 2, Schedule 2, Appendix 2-H at page 2 for the revenues related to isolations.

c) Please refer to Toronto Hydro's response to interrogatory 4A-GTAA-8 part (b) for the proposed amendment to the Conditions of Service regarding access to Customer Vaults.

i) The proposed amendment is planned to become effective starting February 1, 2019.

ii) USoA account for revenues and costs will be recorded in accounts 4325 and 4330 respectively.

iii) Toronto Hydro forecasts approximately $0.24 million in incremental annual revenues resulting from this change in policy, which will be a 100 percent direct offset to the associated costs.

d) The decrease in 2018 Pole & Duct Rental revenues is due to the recovery of one-time or non-recurring revenues in 2017 related to make-ready costs incurred by Toronto Hydro to accommodate an attachment on its pole. These non-recurring costs depend on the particular circumstances relating to the attachment (i.e. type of attachment and field conditions), and are recovered from the third party through a one-time charge.