RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-274

References: Exhibit 3, Tab 1, Schedule 1, Section 6.1
Load Forecast Guideline for Ontario, Guidance for the Development of Regional Planning Demand Forecasts, Oct 13, 2022

Preamble:

Toronto Hydro has included CDM as a multivariate regression variable as part of its proposed load forecast in an attempt to represent conservation that occurs through formal programming as well as naturally.

QUESTION (A):

a) Please discuss how Toronto Hydro considered guidance from the OEB's Regional Planning Process Advisory Group's Load Forecast Guideline for Ontario, including how it considered how to adjust the gross demand forecast to reflect the forecast impact of non-wires alternative activities (including DERs, CDM and distributed generation).

RESPONSE (A):

Toronto Hydro reviewed but did not incorporate OEB's Regional Planning Process Advisory Group's Load Forecast Guideline for Ontario for its Revenue load forecast. It is Toronto Hydro's understanding that the purpose of the OEB's Regional Planning Process Advisory Group's Load Forecast Guideline for Ontario, is to provide guidance to Ontario LDC's in the preparation of Peak Demand Forecasts used for Regional Planning. Where the proposed revenue load forecast in the Exhibit 3 focuses on projecting distribution electricity consumption and billing demand at the customer level. Thus, Toronto Hydro's view is that the guidance and underlying assumptions are not applicable for the use of the revenue load forecast.

QUESTION (B):

b) Toronto Hydro has based its annual forecasted CDM savings for the 2025 to 2029 period on the assumption that there will be a continuation of the current IESO CDM Framework. Please confirm that should there be any changes to IESO CDM program delivery, including expanded delivery to residential and business customers, that there will be no subsequent changes to Toronto Hydro's proposed 2025-2029 CDM savings after the OEB has approved Toronto Hydro's application.

RESPONSE (B):

Toronto Hydro confirms that should there be any changes to IESO CDM program delivery there will be no subsequent changes to Toronto Hydro's proposed 2025-2029 CDM savings embedded in the load forecast after the OEB has approved Toronto Hydro's application.

QUESTION (C):

c) Please discuss the basis for Toronto Hydro's forecasted 2025-2029 Gross Energy Efficiency and Demand Response savings. In particular, please discuss the basis for the increase in demand savings for the residential class.

RESPONSE (C):

The 2025-2029 CDM savings mirror the final year of the IESO's 2021-2024 CDM Framework for the province, with an extrapolation for Toronto Hydro's portion. Residential demand savings are not used in the CDM variable, and are only shown for display purposes.

QUESTION (D):

d) Please discuss how Toronto Hydro has included any naturally occurring conservation during the 2025 to 2029 period?

RESPONSE (D):

Toronto Hydro has moved towards including CDM as a multivariate regression variable to represent conservation that occurs through CDM program delivery. Naturally occurring conservation may be captured through the CDM variable, as well as the time trend variables used.

QUESTION (E):

e) Please discuss how Toronto Hydro has incorporated information from the IESO's Annual Planning Outlook to inform its CDM forecasts.

RESPONSE (E):

Toronto Hydro reviewed but did not incorporate IESO's Annual Planning Outlook to inform its CDM forecasts.

QUESTION (F-H):

f) On what basis has Toronto Hydro concluded that the impact of heat pumps on overall load and demand is not yet material. Please discuss how, if at all, Toronto Hydro has considered recommendations from the Electrification and Energy Transition Panel and/or OEB findings in Enbridge Gas Inc.'s recent rate proceeding (EB-2022-0200) related to the revenue horizon for new customer connections.

g) Please list and discuss the ways in which the Future Energy Scenarios modelling tool was used to inform and develop the proposed load forecast.

h) Please discuss if Toronto Hydro reviewed either the IESO's Pathways to Decarbonization report (December 15, 2022) and/or the Enbridge Gas Inc. Pathways to Net-Zero Emissions report (revised April 2023) and how these reports were considered in the development of its Future Energy Scenarios model and load forecast, including assumptions related to electrification of buildings, vehicles and commercial and industrial activities.

RESPONSE (F-H):

Toronto Hydro actively monitors regulatory adjudication proceedings and policy consultations in the sector. Through its Future Energy Scenarios work, Toronto Hydro factored in the significant uncertainties with respect to the energy transition, which will play out in many ways, including in adjudication and policy development. To the extent that the future varies from forecast insofar as distribution revenue is concerned, those revenue variance would track to the Demand Related Variance Account (revenue variance subaccount).

With respect to heat pumps in particular, please see the response to 2B-BOMA-02.

With specific reference to the Enbridge Gas Inc's rate proceeding, the decision in EB-2022-0200 came out after the Application was finalized and filed. Similarly, the Electrification and Energy Transition Panel's report was issued following the finalization and filing of the Application.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-275

References: **Exhibit 3, Tab 1, Schedule 1, Page 1**
Ref 2: Exhibit 3 / Tab 1 / Schedule 1 / Appendix A, Appendix B, Appendix H, Appendix I

Preamble:

Toronto Hydro's customer and load forecast filed November 17, 2023, includes 2023 as a bridge year.

QUESTION:

Please provide an updated load forecast where 2023 is provided as a historic actual year and used in the regression equations to forecast 2024 to 2029.

RESPONSE:

The request entails complex modelling to update the load forecast to include 2023 as a historical actual year and the regression equations to forecast 2024 to 2029. Toronto Hydro does not have sufficient time to complete this work within the timelines for responding to interrogatories, but will undertake to provide this information at the Technical Conference.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-276

References: Ref 1: Exhibit 3, Tab 1, Schedule 1, pp. 3-4

Ref 2: EB-2018-0165 Decision and Order, December 19, 2019, p 126.

<u>Preamble:</u>

In its Decision on Toronto Hydro's 2020-2024 rate application, the OEB expected Toronto Hydro to enhance its approach to forecasting customers / connections through the consideration of economic and demographic conditions.

Toronto Hydro states that to forecast customer connections in the GS 1,000-4,999 kW, Large Use, CSMUR, and Street Lighting rate classes it relied on market knowledge of construction as well as expert judgement.

In the CSMUR rate class, customer connections increased from 75,028 in 2018 to 94,391 in 2023, a compound average growth rate of 4.7% and are forecast to grow to 104,994 in 2029, a compound average growth rate of 1.8%.

In the GS 1,000-4,999 kW rate class, customer connections increased from 427 in 2018 to 455 in 2023, a compound average growth rate of 1.3% and are forecast to grow to 461 in 2029, a compound average growth rate of 0.2%.

In the Large Use rate class, customer connections increased from 42 in 2018 to 47 in 2023, a compound average growth rate of 2.3% and are forecast to decrease to 46 in 2029.

QUESTION (A):

a) Please explain how the methodology used for these rate classes was an enhancement of the approach Toronto Hydro used in its 2020-2024 Custom IR application.

RESPONSE (A):

Table 1 below outlines Toronto Hydro's customer count forecast in the previous application and the current application, thereby showing the forecasting enhancements.

Table 1: Enhancements to Customer Count Forecast

Rate Class	Methodology used in 2020-2024 Custom IR application	Enhancements made in 2025-2029 Custom IR application
CSMUR	The forecast was based on forecast of housing starts for multi-unit developments in Toronto, and professional judgement was used to estimate market share that will be serviced by Toronto Hydro.	The forecast was based on historic multi-unit trends reported by developers in Toronto, alongside Toronto Hydro's historical market share trends of Toronto multi-units.
GS 1,000-4,999 & Large Use	The forecast was kept constant at the latest historical value as the trend was fairly flat over the years at the time of filing	The forecast includes customers that have a confirmed feeder request

QUESTION (B):

b) Please explain drivers of the decreasing trend in customer connection additions.

RESPONSE (B):

Customer reclassification contributes to the decreasing trends in the GS 1,000-4,999 kW and Large Use rate classes.

QUESTION (C):

c) Please provide details on Toronto Hydro's market knowledge of construction customer connection additions, aggregated by customer class and year. Please indicate how this translates to the overall forecast for customer connections, and how the later years in the forecast period are derived.

RESPONSE (C):

Please refer to Interrogatory 3-VECC -25 b) and c).

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-277

Reference: Exhibit 3, Tab 1, Schedule 1, p. 1

Preamble:

Toronto Hydro has forecasted one customer for Street Lighting.

OEB staff anticipate that, at a minimum, street lighting would be required on City of Toronto maintained roadways and Ministry of Transportation maintained roadways.

QUESTION (A):

a) Please provide the historical and forecast number of street lighting connections for each year from 2018-2029.

RESPONSE (A):

Please refer to OEB Appendix 2-IB in Exhibit 3, Tab 1, Schedule 2.

QUESTION (B):

b) Please explain the structure that leads to a single street lighting customer for all historic and forecast years.

RESPONSE (B):

The City of Toronto is the sole customer in the Street Lighting rate class for both historic and forecast years. Toronto Hydro does not own street lighting on Ministry of Transportation expressways (e.g. Hwy 401).

QUESTION (C):

c) Please provide the number of end-use customers for street lighting.

RESPONSE (C):

Please refer to part (b) above of Toronto Hydro's response to interrogatory 3-Staff-277.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-278

Reference: Regression Model Statistics - Customers

Preamble:

Toronto Hydro used dummy variables RECLASS1, RECLASS2, and RECLASS3. OEB staff understands that these variables would be intended to capture the impact of reclassification in the GS < 50 kW and GS 50 - 999 kW rate classes.

The RECLASS variables start in June 2020, and are used one at a time, in sequence, until the end of the forecast period.

The residential customer connection forecast relied on population as the only external variable with a trend that varies over time. The same variable was used in the GS < 50 kW rate class. The GS 50-999 kW rate class used a measure of employment instead.

QUESTION (A):

a) Please confirm OEB staff's understanding of the purpose of these variables or explain.

RESPONSE (A):

Toronto Hydro confirms OEB's staff's understanding of the variables.

QUESTION (B):

b) Is Toronto Hydro able to count the number of customers reclassified?

i. If so, please provide the number of customers reclassified in/out each month.

ii. If so, why weren't known values used as a manual adjustment?

RESPONSE (B):

Toronto Hydro is able to count the number of customers reclassified on an annual basis, as per Customer Care processes.

Please refer to Table 1 below for the annual number of customers reclassified between 2020 and 2022 for the GS<50kW and GS 50-999 kW rate classes.

Table 1: Annual number of customers reclassified for GS<50kW and GS 50-999 kW rate classes

Year	GS<50 kW	GS 50-999 kW
2020	106	-206
2021	270	-294
2022	197	-198

i) Toronto Hydro anticipates further reclassification in the future, and believes that RECLASS indicator variable is the appropriate methodology to be used for GS<50 kW and GS 50-999 kW rate classes for the following reasons: it creates a balance of good model fit, appropriate causation and yield coefficient values that make practical and statistical sense as well as provide good predictive value.

QUESTION (C):

c) What steps has Toronto Hydro taken to prevent trends or other causes of connection change from being captured in the RECLASS variables?

RESPONSE (C):

Toronto Hydro established RECLASS variables based on the historical timing of customer reclassification, ensuring the suitability of explanatory variables in the model and minimizing the influence of other factors being captured, as confirmed by the good fit.

QUESTION (D):

d) Please explain the rationale for use of the population variable in the residential and GS < 50 kW rate class, and employment in the GS 50 - 999 kW rate class. Were different variables attempted?

RESPONSE (D):

Toronto Hydro tested several external variables to capture demographic and economic conditions, create a balance of good model fit, and result in coefficient values that make practical and statistical sense. The population and employment variables confirmed the best modeling results for their respective rate classes.

QUESTION (E):

e) To what extent were customer connections impacted by the COVID-19 pandemic?

i. How is this reflected in the customer connection forecast?

RESPONSE (E):

As set out in Exhibit 2B, Section E5.1 Customer Connections, during the COVID-19 pandemic Toronto Hydro's historical trajectory of capital spend was maintained. This was also observed in other data indicators such as the number of new connections, and feeder requests.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-279

Reference: Exhibit 3, Tab 1, Schedule 1, p. 7

Preamble:

Each rate class is forecasted using kWh per day as the dependant variable.

OEB staff understands this to be determined calculating kWh per month divided by the number of days in the month. Other variables that include totals for the month such as heating degree days and cooling degree days are also divided by the number of days in the month.

QUESTION (A):

a) Please confirm OEB staff's understanding or explain.

RESPONSE (A):

Toronto Hydro confirms OEB staff's understanding within the Preamble above.

QUESTION (B):

b) Has Toronto Hydro considered using daily data to forecast daily energy use?

RESPONSE (B):

Toronto Hydro has not considered the use of daily data for forecasting energy use, as there isn't enough available data from all rate classes to support this method.

QUESTION (C):

c) Does Toronto Hydro have enough data available to it to perform a daily regression? If so, how many years are available?

RESPONSE (C):

Please refer to response part (b) above.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-280

References: Exhibit 3, Tab 1, Schedule 1, pp. 9, 17
Regression Model Input Data

Preamble:

A positive dewpoint variable was used in several rate classes, but not residential and large use rate classes.

A Lockdown binary variable was used in the GS < 50 kW, GS 50 - 999 kW and Large Use rate classes. This variable reflects the months April and May 2020, and January, February, April, and May 2021.

QUESTION (A):

a) Did Toronto Hydro consider the positive dewpoint variable for the residential and large use rate classes? If so, why was it rejected? If not, why not?

RESPONSE (A):

The positive dew point temperature variable in the Residential model resulted in a coefficient value with the incorrect sign (i.e., a negative coefficient – suggesting an increase in a positive dew point leads to a decrease in loads).

Toronto Hydro confirms that positive dew point temperature was used as an explanatory variable for the Large Use class. Please refer to Appendix B in Exhibit 3, Tab 1, Schedule 1.

QUESTION (B):

b) Does Toronto Hydro believe that the COVID-19 pandemic impacted load in the Residential, CSMUR, or GS 1,000 - 4,999 kW rate classes? If so, how is this reflected in the explanatory variables?

RESPONSE (B):

Toronto Hydro understands that the Residential, CSMUR, or GS 1,000 - 4,999 kW rate classes were impacted by the COVID-19 pandemic. The lockdown variable was found to be statistically insignificant in these rate classes. Additional load impacts from the pandemic are captured through the economic variables used in the model, such as GDP and unemployment rate.

QUESTION (C):

c) Does Toronto Hydro believe that the COVID-19 pandemic impacted load in months not subject to a complete lockdown? If so, how was this reflected in the remaining explanatory variables?

RESPONSE (C):

Yes, additional load impacts from the pandemic are captured through the economic variables used in the model, such as GDP and unemployment rate as explained on page 15 of 28, Exhibit 3, Tab 1, Schedule 1.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-281

Reference: Exhibit 3, Tab 1, Schedule 1, pp. 15-16

Preamble:

Toronto Hydro used linear spline time trends in several rate classes when forecasting energy consumption.

QUESTION (A):

a) Please explain how the time periods were selected for the time trend variables.

RESPONSE (A):

Please refer to Toronto Hydro's response to Interrogatory 3-VECC-30.

QUESTION (B):

b) Please indicate how the trend variables are continued into the forecast period.

RESPONSE (B):

Please refer to Toronto Hydro's response to interrogatory 3-VECC-30 parts b), d) and f).

QUESTION (C):

c) Please explain whether the historic period of over 20 years necessitated the use of spline time trend variables, and how the use of 20-year-old data in combination with spline time trends aids in forecasting the test years.

RESPONSE (C):

Please refer to Toronto Hydro's response to interrogatory 3-VECC-30.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-282

Reference: Exhibit 3, Tab 1, Schedule 1, p. 7

Preamble:

Toronto Hydro states that for rate classes whose billing units are monthly peak demand, the forecasted monthly non-coincident peak by class is forecasted based on historical relationships between energy and demand.

QUESTION:

a) Please provide the derivation of the monthly peak demand forecasts, indicating which historic years were used to establish the relationship between energy and demand as well as any equations used such as averages or time trends, etc.

RESPONSE:

Please refer to Toronto Hydro's response and appendix to 3-VECC-39.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-283

References: **Ref 1: Exhibit 3, Tab 1, Schedule 1**

Ref 2: Exhibit 9, Tab 1, Schedule 1, section 9.2

Ref 3: EB-2010-0060: Review of Distribution Revenue Decoupling Mechanisms, Pacific Economics Group Research, LLC, March 2010

Ref 4: EB-2018-0165: Decision and Order, December 2019, Findings under Issue 4.0, Load and Other Revenue Forecast

<u>Preamble:</u>

Table 1 of Reference 1 is reproduced below:

		Total Normalized GWh	Total Normalized MVA	Total Distribution Revenue ($Million)	Total Customers
2018	Actual	24,701.0	39,823.2	736.6	770,333
2019	Actual	24,429.6	39,126.0	766.2	777,369
2020	Actual	23,674.7	36,813.7	727.8	781,374
2021	Actual	23,575.0	36,638.0	761.8	786,258
2022	Actual	23,990.1	37,648.0	786.5	790,699
2023	Bridge	23,678.6	37,199.3	834.3	794,025
2024	Bridge	23,676.2	36,993.9	874.3	797,318
2025	Forecast	23,458.7	36,384.5	972.4	800,374
2026	Forecast	23,416.5	36,063.4	1,019.7	803,344
2027	Forecast	23,389.6	35,698.8	1,059.1	806,017
2028	Forecast	23,498.8	35,507.1	1,151.0	808,731
2029	Forecast	23,458.5	35,093.4	1,185.1	811,245

Note 1 that accompanies the table states:

Total Normalized GWh are purchased GWh (before losses) and are weather normalized to the Test Year heating and cooling degree day assumptions.

Note 2 that accompanies the table states:

Total Normalized MVA are weather normalized MVA.

QUESTION (A):

a) Please provide a forecast of base distribution revenue for each year of 2025 to 2029 assuming values at the 5th, 25th, 75th and 95th percentiles of the probability distribution of forecast consumption given expected variability in weather.

RESPONSE (A):

The methodology of using percentiles of the probability distribution that is proposed in this question does not represent likely scenarios due to unrealistic weather patterns (e.g., an extremely mild winter and extremely mild summer may not occur within the same year). By contrast, Toronto Hydro's Application proposes a methodology that presents realistic variabilities in weather based on historic weather-related revenue variances. Toronto Hydro's methodology uses the historic weather impacts on revenue for the past seven years (2016-2022) and selects the year with the largest variance impacted by weather (2018) to create the most extreme positive and negative variances from weather. The weather impacts are calculated as the variance between the non-weather normalized and weather-normalized actual billing determinants. Toronto Hydro's weather normalization methodology is described in Exhibit 3, Tab 1, Schedule 1, Section 5.1.

The revenue variances are then extrapolated to the 2025-2029 equivalents to represent the 0^{th} and 100^{th} percentiles. Assuming the 50^{th} percentile is zero (i.e., no variability in weather), the 5^{th}, 25^{th}, 75^{th}, and 95^{th} percentiles were developed by calculating the range in which they would fit between the 50^{th} percentile, versus the 0^{th} and 100^{th} percentiles. Please refer to Table 1 for the resulting distribution revenue forecasts by percentile.

Table 1: Distribution Revenue by Percentile (Weather-driven)

Year	5th Percentile	25th Percentile	Proposed Revenue	75th Percentile	95th Percentile
2025	961	967	972	978	984
2026	1,008	1,014	1,020	1,025	1,032
2027	1,047	1,053	1,059	1,065	1,071

2028	1,138	1,145	1,151	1,157	1,164
2029	1,171	1,179	1,185	1,191	1,199

QUESTION (B):

b) For each revenue forecast using these weather-driven consumption inputs, identify the amount to be recorded in the revenue variance subaccount of the proposed revenue variance subaccount of the proposed demand related variance account given the proposed revenue forecast in Reference 1.

RESPONSE (B):

Given DRVA Revenue Variance Sub-Account will be based on weather normal values, there will be no weather driven entries into the DRVA.

QUESTION (C):

c) On page 4 of Reference 1, Toronto Hydro states its forecast of customer count is the product of "model statistics and expert judgment" (Ex 3-1-1 p4).

i. Please provide an estimate of the customer count at the 5th, 25th, 75th and 95th percentiles of a probability distribution, or reasonable equivalent, reflecting the potential range of change in customer count over the period.

ii. Please estimate the base distribution revenues associated with each of these different customer forecast inputs, holding all other inputs equal, by rate class.

iii. Please identify the amount to be recorded in the DRVA for each revenue forecast under different forecast customer count levels, by rate class.

RESPONSE (C):

i) Please refer to Table 2 below for a total customer estimate assuming values at the 5th, 25th, 75th, and 95th percentiles. The percentiles were calculated based on 10-years of customer counts where applicable, and the customer forecasts used in proposed distribution revenue forecast were adjusted for each percentile. While Toronto Hydro has provided the requested data, the relevance of the data is unclear.

Table 2: Total Customer Number Estimates

Year	5th Percentile	25th Percentile	Proposed Forecast	75th Percentile	95th Percentile
2025	785,974	793,943	800,374	808,151	814,598
2026	788,943	796,913	803,344	811,120	817,567
2027	791,617	799,586	806,017	813,794	820,240
2028	794,331	802,300	808,731	816,507	822,954
2029	796,845	804,814	811,245	819,022	825,469

ii) Please refer to Table 3 below for a distribution revenue forecasts assuming values at the 5th, 25th, 75th, and 95th percentiles, as well as the proposed distribution revenue. All other components of the revenue load forecast were held constant. While Toronto Hydro has provided the requested data, the relevance of the data is unclear.

Table 3: Distribution Revenue Estimate (Customer-driven),

	Total Revenue ($M)				
Year	5th Percentile	25th Percentile	Proposed Revenue	75th Percentile	95th Percentile
2025	954.4	963.4	972.4	980.7	986.1
2026	1,000.9	1,010.3	1,019.7	1,028.3	1,033.9
2027	1,039.6	1,049.4	1,059.1	1,068.1	1,073.9
2028	1,129.9	1,140.5	1,151.0	1,160.7	1,167.0
2029	1,163.4	1,174.3	1,185.1	1,195.1	1,201.6

iii) Please refer to Table 4 below for the amount that would be recorded in the revenue variance subaccount with the circumstances given in part c), ii). While Toronto Hydro has provided the requested data, the relevance of the data is unclear.

Table 4: Distribution Revenue Variance (Customer-driven)

	DRVA ($M)			
Year	5th Percentile	25th Percentile	75th Percentile	95th Percentile
2025	(18.0)	(9.0)	8.3	13.7
2026	(18.8)	(9.3)	8.6	14.3
2027	(19.5)	(9.7)	9.0	14.8
2028	(21.1)	(10.5)	9.7	16.1
2029	(21.6)	(10.8)	10.0	16.6

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-284

References: **Exhibit 1C, Tab 3, Schedule 3, Appendix B, Page 28**
Exhibit 1C, Tab 3, Schedule 3, Appendix C, Page 29
Exhibit 3, Tab 2. Appendix 2-H
EB-2018-0165, THESL_APPL_U_T3_S02_App A_OEB Appendix 2-H Other Operating Revenue_20190430

Preamble:

Since the completion of the transactions in EB-2009-0180/1/2/3 Toronto Hydro has owned streetlighting assets in the City of Toronto and Toronto Hydro Energy has owned expressway lighting assets as well as all the light fixtures.

Toronto Hydro's 2021 Financial Statements and Notes state revenues from street lighting services was $7.8M in 2021 and $6.9M in 2020. Toronto Hydro's 2022 Financial Statements and Notes state revenues from street lighting services was $8.3M in 2022. These values match the entries for line 4220 Other Electric Revenues in reference 3.

OEB staff have compiled the following table from Appendix 2-H found in both reference 3 and reference 4.

Table 3-1: USoA 4220

	Actual				Bridge	Actual / Forecast	actual		bridge		Forecast				
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Ref 3						6.9	7.8	8.2	6.1	6.4	6.8	6.9	7.0	7.2	7.3
Ref 4	7.0	8.2	9.2	8.0	8.5	8.1									

Question (A):

a) Please review and either verify or correct the information in the preamble.

RESPONSE (A):

Since the completion of the transactions in EB-2009-0180/1/2/3, Toronto Hydro has owned certain street lighting assets in the city of Toronto that were deemed by the OEB to serve a distribution purpose and Toronto Hydro Energy has owned other street lighting and expressway lighting assets that were deemed not to serve a distribution purpose.

Please see the corrected Table 3-1 below, 2020 Forecast was updated to reflect Toronto Hydro's DRO Reply Submission and DRO Update[1].

Table 3-1-1 – Account 4220 Balance (Ref 4) (In $ millions)

	Actual				Bridge	Forecast
	2015	2016	2017	2018	2019	2020
Ref 4	7.1	8.2	9.2	8.0	8.5	7.7

Table 3-1-2 – Account 4220 Balance (Ref 3) (In $ millions)

	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Ref 3	6.9	7.8	8.3	6.1	6.4	6.8	6.9	7.0	7.2	7.3

QUESTION (B):

b) Is it correct to state that in reference 3, the entries in account 4220 Other Electric Revenues are exclusively for streetlighting?

[1] EB-2018-0165, Toronto Hydro-Electric System Limited ("Toronto Hydro"), 2020-2024 Custom Incentive Rate-setting ("Custom IR") Application – DRO Reply Submission & DRO Update, February 12, 2020, Schedule 11

RESPONSE (B):

Confirmed.

QUESTION (C):

c) Please explain the reasons for the revenue decreases in 2018, 2020 and 2023.

RESPONSE (C):

2017-2018 Variance Explanation

The historical variance between 2017 and 2018 actuals from $9.2 million to $8.0 million is primarily due to lower streetlighting maintenance costs ($1.9 million) and higher revenue offsets e.g., accident claims, relocations related to Streetlighting assets ($0.2 million), which was partially offset by higher depreciation expenses ($0.7 million) and higher PILs ($0.2 million).

2019-2020 Variance Explanation

The historical variance between 2019 and 2020 actuals from $6.5 million to $6.9 million is primarily due to higher streetlighting maintenance costs ($0.7 million), which was partially offset by lower PILs ($0.2 million) and lower depreciation expenses ($0.1 million).

2022-2023 Variance Explanation

Forecasted variance between 2022 actuals and 2023 bridge from $8.3 million to $6.1 million is primarily due to lower depreciation expense ($0.9 million) due to a change in useful life, lower streetlighting maintenance costs ($0.8 million), lower PILs ($0.4 million) and higher revenue offsets e.g., accident claims and relocations related to Streetlighting assets ($0.1 million).

QUESTION (D):

d) What is the actual revenue for 2019?

RESPONSE (D):

Actual revenue for 2019 was $6.5 million.

QUESTION (E):

e) Please explain the reason for the variance between the forecast and actual revenue in 2020.

RESPONSE (E):

The historical variance between 2020 board approved and 2020 actuals from $7.7 million to $6.9 million is primarily due to higher revenue offsets e.g., accident claims and relocations related to Streetlighting assets ($0.8 million.)

QUESTION (F):

f) Please provide the revenue requirement calculations for those assets that were previously referred to as streetlighting assets, for each year from 2020 to 2025.

RESPONSE (F):

In $ millions	**Actuals**			**Bridge**		**Forecast**
	2020	2021	2022	2023	2024	2025
ROE	1.5	1.5	1.5	1.6	1.7	1.9
Interest	0.9	1.0	1.0	1.0	1.1	1.2
Depreciation	3.0	2.9	3.2	2.3	2.4	2.5
PILs	0.6	0.6	0.5	0.1	0.3	0.4
Capital-related revenue requirement	**6.0**	**6.0**	**6.2**	**5.0**	**5.5**	**6.0**
OM&A	3.1	3.0	3.8	3.0	2.8	2.8
Revenue Offsets	(2.2)	(1.2)	(1.7)	(1.9)	(1.9)	(2.0)
Non-capital-related revenue requirement	**0.9**	**1.8**	**2.1**	**1.1**	**0.9**	**0.8**
Base Revenue Requirement	**6.9**	**7.8**	**8.3**	**6.1**	**6.4**	**6.8**

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-285

References: Exhibit 3, Tab 2. pages 1, 4
Exhibit 3, Tab 2, Appendix 2-H
Exhibit 4, Tab 5, Appendix 2-N

Preamble:

OEB staff have compiled the following table showing costs allocated from Toronto Hydro-Electric System Limited to Toronto Hydro Energy Services Inc. from the information in Appendix 2-N.

Table 3-2: Streetlighting Costs Allocated from THESL to THESI

Row Labels	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Streetlighting Design	-	-	-	300	270	250	260	260	270	280
Streetlighting Support	650	540	280	740	740	760	800	840	880	1,130
Grand Total	**650**	**540**	**280**	**1,040**	**1,010**	**1,010**	**1,060**	**1,100**	**1,150**	**1,410**

QUESTION (A):

a) Please review and either verify or correct the information in the preamble.

RESPONSE (A):

Table 3-2 prepared by the OEB staff does not include the total shared services costs allocated from THESL to THESI. Toronto Hydro has corrected the Table 3-2 below to include total costs of shared services provided by THESL to THESI as presented in Appendix 2-N and summarized in Exhibit 4, Tab 5, Schedule 1, Table 3 at page 6.

In responding to this question, it is Toronto Hydro's understanding that by Streetlighting Design the OEB staff meant Engineering Design costs allocated to THESI as presented in the OEB Appendix 2-N, Shared Services and Corporate Cost Allocation.

Table 3-2: Shared Services Provided by THESL to THESI as presented in Appendix 2-N (In $ '000)

	Actual			Bridge		Forecast				
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Engineering Design	80	850	910	300	270	250	260	260	270	280
Streetlighting Support	650	540	280	740	740	760	800	840	880	1,130
Corporate Costs Allocation	900	1,210	910	1,270	1,340	1,430	1,510	1,580	1,670	1,750
Total	**1,630**	**2,600**	**2,100**	**2,310**	**2,350**	**2,440**	**2,570**	**2,680**	**2,820**	**3,160**

QUESTION (B) AND (C):

b) Do the amounts in the table reflect the total cost for providing streetlighting services to THESI?

i. If not, what are the other costs per year and where are they captured?

ii. Please describe what activities are included in streetlighting support.

c) Please confirm that their HR, IT, and facilities services are not provided by THESL to THESI.

RESPONSE (B) AND (C):

Yes, the amounts provided in response to part (a) above reflect the total cost for providing streetlighting to THESI. Streetlighting support includes followings costs related to Toronto Hydro's employees dedicated to streetlighting: (a) administrative and support costs, (b) costs related to IT usage, (c) costs related to Human Resources, Environment and Safety, (d) facilities services and costs associated with other functions such as: payroll processing, account payable, legal costs incurred to support streetlighting activities in THESI.

QUESTION (D):

d) Please outline THESL's involvement THESI's material procurement, accounts payable, warehousing and site delivery are handled, and accounted for.

RESPONSE (D):

Toronto Hydro provides supply chain services to THESI including but not limited to contract negotiation and administration, procurement of contracted services. These costs are allocated to THESI based on number of purchase orders issued in a year. Similarly, Toronto Hydro provides accounts payable services to THESI which is recovered based on the number of invoices processed during the year (see Exhibit 4, Tab 5, Schedule 1) .

Toronto Hydro does not provide warehousing and site delivery services to THESI, these costs are outsourced and are paid for directly by THESI.

QUESTION (E):

e) How does THESI pay for energy consumed by streetlights; is there an allocation as in Appendix 2-N, other revenue as in Appendix 2-H or through a formal billing account as with other third-party unmetered loads?

RESPONSE (E):

City of Toronto pays for energy consumed by streetlights through a formal billing account.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-286

Reference: Exhibit 3, Tab 2, Appendix 2-H

QUESTION (A):

a) In Appendix 2-H, the table for Account 4330 - Costs and Expenses of Merchandising, the first row containing values is labelled "Reporting Basis". What is the correct description for this line item?

RESPONSE (A):

Please see Toronto Hydro's response to interrogatory 1B-SEC-01, subpart f.

QUESTION (B):

b) The historic average over 2020-2024 for the net of 4325 Revenues from Merchandise and 4330 Costs and Expenses of Merchandising is $7.8M. Why is the net of the cost and revenues in 2025 of $10M forecast to be higher than the historic average?

RESPONSE (B):

It is Toronto Hydro's understanding that in the question, OEB Staff made a calculation error in calculating the historic average over 2020-2024 for the net of 4325 Revenues from Merchandise and 4330 Cost and Expenses of Merchandising. In responding to this interrogatory Toronto Hydro believes the correct average should be $8.1 million.

As noted in Exhibit 3, Tab 2, Schedule 1, Section 5.1 in net revenues from Merchandise and Jobbing vary significantly from year to year, depending on the number and type of activities requested by customers. For reclaimed materials, any revenue depends on the strength of the market commodity prices at the time of disposition and the volume of reclaimed material that is available for processing.

Between the 2025 forecast of $10.1 million and the 2020-2024 historical average of $8.1 million, Toronto Hydro is forecasting higher revenues primarily from customer and temp services driven by higher demand related to transit projects, higher revenues from reclaimed materials driven by expected strength of commodity prices and volume of reclaimed materials, and higher demand for Hydro Make-Ready and Permit review work for Pole and Duct rentals.

RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES

INTERROGATORY 3-STAFF-287

References: Exhibit 3, Tab 2, Appendix 2-H

Exhibit 9, Tab 1, Schedule 1, Page 17

Preamble:

Table 9 in reference 2 shows that the revenue built into rates for pole attachments for 2020 to 2024 is $5.1M.

QUESTION (A):

a) Please provided an updated forecast for the number of pole attachments for 2025.

RESPONSE (A):

Toronto Hydro assumes that this question meant to refer to Table 10, Exhibit 9, Tab 1, Schedule 1 which deals with Wireline Pole Attachment Rate Variances. Toronto Hydro made a data entry error when populating that table, the corrected version is reproduced below as a response to this interrogatory. Toronto Hydro also confirms that this error did not have any impact on Exhibit 3, Tab 2, Schedule 2, Appendix 2-H. The corrected table shows that the revenue built into rates for pole attachments row reference (c).

The forecasted number of pole attachments for 2025 is 121,400.

Table 10: **Account 1508 - subaccount - Wireline Pole Attachment Revenue Variance Account**

Wireline Pole Attachment	Actual				Forecast	Total	
	2020	2021	2022	2023	2024		
Number of Attachment Embedded in Rates (a)	113,630	113,630	113,630	113,630	113,630		
Pole Attachment Charge Embedded in Rates (b)	$44.50	$45.12	$46.43	$47.87	$49.88		/C

Wireline Pole Attachment	**Actual**				**Forecast**	**Total**	
	2020	**2021**	**2022**	**2023**	**2024**		
Wireline Pole Attachment revenue embedded in Rates ($ Millions) (c = a x b)	$5.1	$5.1	$5.3	$5.4	$5.7	$26.6	/C
Actual/Forecast Pole Attachment Charge (d)	$44.50	$45.12	$34.76	$36.05	$37.78		/C
Actual/Forecast Wireline Pole Attachment revenue embedded in Rates ($ Millions) (e = a x d)	$5.1	$5.1	$4.0	$4.1	$4.3	$22.6	/C
Variance ($ Millions) (c – e)	-	-	**$1.3**	**$1.3**	**$1.4**	**$4.0**	/C
Carrying Charges ($ Millions)	-	-	-	**$0.1**	**$0.2**	**$0.3**	/C
Total Forecast for Clearance ($ Millions)						**$4.3**	/C

QUESTION (B):

b) What items generate the revenues in the remainder of account 4210 as shown in appendix 2-H? Please break out by year for 2020 through 2025.

RESPONSE (B):

Please refer to Toronto Hydro’s response to interrogatory 3-VECC-55.

RESPONSES TO BUILIDING AND OPERATORS MAINTENANCE ASSOCIATION INTERROGATORIES

INTERROGATORY 3-BOMA-3

References: Exhibit 3, Tab 1, Schedule 1, Pages 1 to 2, Table 1

<u>Preamble:</u>

In the referenced evidence, Toronto Hydro's 2018 to 2029 total Normalized GWh and MVAs are provided.

QUESTION(A):

A. Please provide Toronto Hydro's actual total distribution system load shapes (24 hourly MVAs) on both the winter peak day and the summer peak day in 2019.

RESPONSE (A):

Please refer to 3-BOMA-3, Appendix A for Toronto Hydro's hourly MW loads for its winter and summer peaks in 2019.

QUESTIONS (B-D)

B. Please provide Toronto Hydro's forecast total distribution system load shapes (24 hourly MVAs) on both the winter peak day and the summer peak day in 2025 and in 2029.

C. Please further break down your responses to part A and part B into 5 categories:

i. CSMUR rate class
ii. Residential rate class
iii. Commercial sector
iv. Industrial sector
v. Other sector

D. Please further break down your response to part C iii (i.e. commercial sector) into commercial building types (e.g. office buildings, retail, hospitals, schools kindergarten to grade 12 schools, college and university, etc.).

RESPONSE B-D:

Toronto Hydro does not have the detailed load information and categorizations that would be required to perform this analysis. This type of analysis, which requires granular and real-time monitoring of electricity consumption, is going to be enabled by the deployment of smart meters and advanced metering infrastructure (AMI) as proposed in Exhibit 2B. AMI data can be used to identify patterns, forecast peak demand, and implement targeted strategies for demand management. Toronto Hydro is investing in this technology in the next rate period. Please see Exhibit 2B, Sections D5.2.2 and D5.3.1 for more information regarding these proposed investments.

RESPONSES TO BUILIDING AND OPERATORS MAINTENANCE ASSOCIATION INTERROGATORIES

INTERROGATORY 3-BOMA-4

Reference: Exhibit 3, Tab 1, Schedule 2 (OEB Appendix 2-IB)

Preamble:

Toronto Hydro's load forecast, including number of customers, annual kWh consumption and demand by rate class are provided in Exhibit 3-1-2.

QUESTIONS (A-D):

Further break down of commercial sector information in Exhibit 3-1-2:

A. For the rate classes "GS 50-999 kW", "GS 1000-4999 kW" and "Large User", please further break down 2017 to 2029 annual number of customers, weather normalized annual consumption kWh and weather normalized annual demand kW by residential (if applicable), commercial and industrial sectors.

B. Please further break down your response to part A by commercial building types (e.g. office buildings, retail, hospitals, kindergarten to grade 12 schools, college and university, etc.). Please note that this question is on the commercial sector only and therefore there is no need to further break down the residential and industrial figures provided in part A.

C. Please further break down the weather normalized annual consumption kWh and weather normalized annual demand kW given in your response in part B by month.

D. Please further break down the weather normalized annual consumption kWh and weather normalized annual demand kW given in your response in part B by the following two categories:

i. Buildings built after January 2017
ii. Buildings built prior to January 2017

RESPONSE (A-D):

Toronto Hydro does not have the detailed load information and categorizations that would be required to perform this analysis.

QUESTION (E):

E. Please further break down the weather normalized annual consumption kWh and weather normalized annual demand kW given in your response in part B by the following two categories:
   i. Class A customers
   ii. Class B customers

RESPONSE (E):

Please refer to Table 1 with the historical Class A and B breakdown of weather-normalized annual consumption and billing demand for GS 50-999 kW, GS 1000-4999 kW and Large Use for 2017-2022. Toronto Hydro does not have Class A and Class B projections for the forecasted period, nor does it have detailed load information based on the Part B split to complete the requested analysis.

Table 1: Annual Class A and Class B consumption and demand for GS > 50 kW classes.

YEAR		Class A		Class B	
		GWh	**MVA**	**GWh**	**MVA**
2017	Actual	3,705.6	7,769.1	20,173.9	31,855.0
2018	Actual	5,175.1	10,909.9	18,842.3	28,309.4
2019	Actual	5,479.9	11,537.6	18,272.5	26,999.7
2020	Actual	5,199.8	10,794.2	17,817.9	25,444.8
2021	Actual	5,290.6	11,205.3	17,628.8	24,888.8
2022	Actual	5,625.9	11,986.1	17,697.0	25,110.8

GWh is electricity consumption after losses.

QUESTION (F):

F. Please provide the floor space or square footage associated with the responses given for each category in part D.

RESPONSE (F):

Please refer to response 3-BOMA-4, B-D.

QUESTION (G):

G. For the rate class "CSMUR", please provide 2017 to 2029 weather normalized monthly consumption kWh and weather normalized monthly demand kW (based on smart meter data).

RESPONSE (G):

Please refer to Appendix A for the rate class "CSMUR," which contains weather-normalized monthly consumption kWh data from 2017 to 2029. Kindly note that Toronto Hydro is unable to provide the requested weather-normalized monthly demand kW for the "CSMUR" class, as Toronto Hydro does not have that detailed load information.

QUESTION (H-I):

H. Please further break down the "CSMUR" 2017 to 2029 weather normalized annual consumption kWh by the following two categories:
   i. Buildings built after January 2017
   ii. Buildings built prior to January 2017

I. Please provide the floor space or square footage associated with the responses given for each category in part H.

RESPONSE (H–I):

Toronto Hydro does not have the detailed load information necessary to perform this analysis.

QUESTION (J):

J. Please provide individually, the annual impact of CDM, the annual impact of electrification (e.g. switching from natural gas heating to electric heating such as air source heat pump), the annual impact of EV charging and the annual impact of customer owned DER on the weather normalized annual consumption kWh and weather normalized annual demand kW given in your response in part B. To be specific, does the impact of CDM include the adoption of building ventilation heat recovery, heat recovery chillers and the service provided by district energy companies (e.g. Enwave Energy Corporation)? If yes, please quantify the impact of these adoptions.

RESPONSE (J):

Please refer to Appendix B for 2023-2029 total annual impacts of EV and customer owner DER by billed kWh and billed kVA for rate classes GS 50-999 kW, GS 1000-4999 kW and Large User that were used in Toronto Hydro's revenue load forecast. Toronto Hydro does not have incremental CDM impacts as it is embedded as the independent variable within its load forecast. Further, the utility does not have the requested load details on heat pumps and adoption of building ventilation heat recovery necessary to perform this analysis.

QUESTION (K):

K. For the rate class "CSMUR", please provide individually, the annual impact of CDM, the annual impact of electrification (e.g. switching from natural gas heating to electric heating such as air source heat pump), the annual impact of EV charging and the annual impact of customer owned DER on the weather normalized annual consumption kWh from 2017 to 2029. To be specific, does the impact of CDM include the adoption of building ventilation heat recovery, heat recovery chillers and the service provided by district energy companies (e.g. Enwave Energy Corporation)? If yes, can you quantify the impact of these adoptions?

RESPONSE (K):

Please refer to Appendix C for 2023-2029 CSMUR annual impacts of EV by billed kWh that were used in Toronto Hydro's revenue load forecast. Toronto Hydro does not have incremental CDM impacts as it is embedded as the independent variable within its load forecast. Further, the utility does not have the requested load details on heat pumps and adoption of building ventilation heat recovery necessary to perform this analysis.

RESPONSES TO CONSUMERS COUNCIL OF CANADA INTERROGATORIES

INTERROGATORY 3-CCC-54

Reference : Exhibit 3, Tab 1, Page. 24

QUESTION:

Please provide the annual impact on the load forecast and the forecast of revenue related to EV adoption for each year 2024-2029.

RESPONSE:

Please refer to Exhibit 3, Tab 1, Schedule 1, Tables 7 and 8 for the annual impact on the load forecast and Table 1 below for related revenue forecast tied to EV adoption for each year 2024-2029.

Table 1: Revenue forecast related to EV adoption

	Revenue Impact ($ M)
2024	2.14
2025	4.36
2026	7.04
2027	10.46
2028	14.86
2029	19.08

RESPONSES TO CONSUMERS COUNCIL OF CANADA INTERROGATORIES

INTERROGATORY 3-CCC-55

Reference: Exhibit 3, Tab 2, Schedule 1, Page 2, Table 1 - Other Revenue Summary

For the years 2020-2024 please provide the forecast for all categories of Other Revenue.

RESPONSE:

Toronto Hydro's OEB approved Other Revenues for 2020 was $42.3 million after adjusting for shared services costs (USoA 4380)[1]. Toronto Hydro has used OEB approved Custom Incentive Rate-Setting approach[2] to forecast Other Revenues for 2021-2024 in Table 1 below.

Table 1: 2020-2024 Other Revenue Forecast

Segment	Board Approved			Forecast			
	2020	USoA Reclass[3]	2020 Adjusted	2021	2022	2023	2024
Specific Service Charges	3.7	-	3.7	3.8	3.8	3.9	3.9
Late Payment Charges	3.8	-	3.8	3.8	3.9	3.9	4.0
Other Operating Revenues	11.9	16.4	28.3	28.8	29.3	29.7	30.2
Other Income or Deductions	22.9	(16.4)	6.5	6.6	6.7	6.8	6.9
Total	**42.3**	**-**	**42.3**	**43.0**	**43.7**	**44.3**	**45.0**

[1] Please refer to Toronto Hydro's response to 1B-SEC-08 for detailed reconciliation
[2] EB-2018-0165, Decision and Order (December 19, 2019) at page 19
[3] Toronto Hydro corrected the presentation of pole and duct rental from USoA 4325 to USoA 4210.

RESPONSES TO COALITION OF CONCERNED MANUFACTURERS AND BUSINESSES OF CANADA INTERROGATORIES

INTERROGATORY 3-CCMBC-9

Reference: **Exhibit 3, Tab 1, Schedule 1, Appendix J, 2.4 Estimate Monthly Billing Demand Impact, Page 7**

Preamble:

"Three of Toronto Hydro's rate classes are billed on peak demand which is calculated as the highest kVA demand for that customer in each month (Footnote 6). Billing demand times and amounts will vary from customer to customer and from month to month. The presence of EV charging will put upward pressure on billing demand and that pressure is a function of the number of EVs being charged at the premise, the load profiles of those EVs, and the base load profile for that customer. A load profile that estimates the hourly charging requirements (or production expectations) of an EV/DER at the general service customer premise is necessary for the analysis.

> Footnote 6: These rate classes are GS 50-999, GS 1-5MW, and Large Users. The remaining rate classes do not have a billing demand rate component.

> Footnote 7: Since only the three general service rate classes have a billing demand component, it is only a general service load profile that needs to be calculated. Residential home charging can be ignored when estimating billing demand impacts."

QUESTION (A):

Please explain why residential home charging can be ignored. Would that not result in customers in GS 50-999, GS 1-5MW, and Large Users rate classes subsidizing residential customers who have Level 2 chargers? Please discuss.

RESPONSE (A) – PREPARED BY CLEARSPRING:

Residential home charging is only ignored in the Integration Model for forecasting billing demand since the residential customer class does not have a demand component to bills. Residential home charging is not ignored for forecasting energy. Furthermore, demand from forecasted EVs is included when adjusting the cost allocation model load profiles found in Section 9 of the Clearspring Report. This approach does not cause a subsidization between the customer classes.

RESPONSES TO COALITION OF CONCERNED MANUFACTURERS AND BUSINESSES OF CANADA INTERROGATORIES

INTERROGATORY 3-CCMBC-10

Reference: Exhibit 3, Tab 1, Schedule 1, Appendix J, 3.2 LDEV Billing Demand Forecast, Page 14

Preamble:

"A load profile that estimates the hourly charging requirements of an LDEV at the general service customer premise is necessary to forecast the impact of LDEVs on billing demand. Most of this charging will be from commuters who are working at the place of business."

QUESTION (A):

a) What percentage of Toronto Hydro general service customers have EV chargers at the place of business?

RESPONSE (A):

Given the limited visibility into customers' behind-the-meter technologies, Toronto Hydro cannot ascertain the percentage of general service customers who have EV chargers at the place of business.

QUESTION (B):

b) Do businesses with EV chargers have a different load profile than businesses that do not have them?

RESPONSE (B) – PREPARED BY CLEARSPRING:

A business that experiences EV charging at its place of business will have a modified load profile compared to if the business did not have EV charging being conducted.

QUESTION (C):

c) What could be done to prevent cross-subsidies between businesses with EV chargers and businesses without EV chargers?

RESPONSE (C):

Toronto Hydro does not typically have visibility into the equipment that customers have behind the meter, be that EV chargers or otherwise. Accordingly, establishing rates based on behind-the-meter technologies, including EV chargers, continues to be impractical.

RESPONSES TO COALITION OF CONCERNED MANUFACTURERS AND BUSINESSES OF CANADA INTERROGATORIES

INTERROGATORY 3-CCMBC-11

Reference: Exhibit 3, Tab 1, Schedule 1, Appendix J, 4.2 MDEV & HDEV Billing Demand Forecast, Page 21

Preamble:

"MDEVs and HDEVs will put upward pressure on Toronto Hydro's three rate classes with billing demand, and that pressure is a function of the number of EVs being charged at the premise, the load profiles of those EVs, and the base load profile for that customer."

QUESTIONS (A)

a) Please confirm that customers with chargers for MDEVs and HDEVs, not the vehicles, will put upward pressure on Toronto Hydro's three rate classes.

RESPONSE (A)– PREPARED BY CLEASPRING:

Confirmed. It will be the customers with chargers and that have active charging of MDEVs and HDEVs that will put upward pressure on billing demand.

QUESTIONS (B)

b) What could be done to prevent cross-subsidies between customers with chargers for these electric vehicles and customers without such chargers?

RESPONSE (B):

Please refer to Toronto Hydro's response for 3-CCMBC-10, c).

RESPONSES TO DISTRIBUTED RESOURCE COALITION INTERROGATORIES

INTERROGATORY 3-DRC-14

Reference(s): **Exhibit 3, Tab 1, Schedule 1**
Exhibit 3, Tab 1, Schedule 1, Appendix J

<u>Preamble:</u>

THESL engaged Clearspring Energy Advisors, LLC ("Clearspring") to help develop an approach and integration model for including the expected impacts of EVs and DERs into the 2025 to 2029 period. THESL indicated that the EV forecast was developed to be consistent with the City of Toronto's 2019 EV Strategy targets. Clearspring noted that is research did not focus on EV and DER forecasts but on building a model that estimates the impacts of the forecasts onto the billing determinants of energy and demand.

QUESTION (A):

a) Please provide any and all related analysis, working papers, and/or reports produced as part of Clearspring's integration model and the integration of EVs and DERs.

SUPPLEMENTARY RESPONSE (A) PREPARED BY TORONTO HYDRO:

Clearspring's working papers have been filed confidentially as an appendix to this response.

RESPONSE (A) PREPARED BY CLEARSPRING:

Clearspring's working papers are being provided on a confidential basis, pursuant to the OEB Practice Direction on Confidential Filings.

QUESTION (B):

b) What are the estimated total and annual capital expenditures and operating expenditures regarding EV charging infrastructure that THESL has included in the Application during the 2025-2029 period?

RESPONSE (B) PREPARED BY TORONTO HYDRO:

Proactive and responsive investments to support the connection of EV-charing infrastructure are enabled by various programs including Customer Connections (Exhibit 2B, Section E5.1), Load Demand (E5.3), Stations Expansion (E7.4) and Customer Operations (Exhibit 4, Tab 2, Schedule 8). However, Toronto Hydro is unable to disaggregate EV charging infrastructure-specific costs from other cost drivers in these capital and operation demand-related programs.

QUESTION (C):

c) What capital expenditure and operating expenditure funding (federal, provincial, or otherwise) is available to THESL specific to EVs and DERs?

RESPONSE (C) PREPARED BY TORONTO HYDRO:

Toronto Hydro continues to identify and apply for government funding as opportunities become available in relation to EVs and DERs; now and into the future. In the 2020-2024 rate period, Toronto Hydro leveraged $2 million from the IESO's Grid Innovation Fund and the Ontario Energy Board's (OEB's) Innovation Sandbox to support the Benefit Stacking Transmission and Distribution Pilot ("Benefit Stacking Pilot"). For more information about this work please see Exhibit 2B, Section E7.2.

In the 2020-2024 rate period, Toronto Hydro received a Natural Resources Canada ("NRCAN") contribution of $255,000 related to the installation of EV charging infrastructure for Fleet and employee vehicles. Toronto Hydro has also participated in the "Incentives for Zero-Emission Vehicle (iZEV) program" and the "Medium-and Heavy-duty Zero-Emission Vehicles (iMHZEV) program". Capital expenditures presented are net of these respective incentives.

QUESTION (D):

d) Please place the City of Toronto's EV Strategy on the record in this proceeding and discuss whether the targets, assumptions, and estimates relied upon by THESL and Clearsping related to the strategy targets continue to be consistent with evolving federal and provincial policies developed since 2019 such as the federal EV mandate.

RESPONSE (D) PREPARED BY TORONTO HYDRO:

The City of Toronto's EV Strategy can be found here: https://www.toronto.ca/wp-content/uploads/2020/02/8c46-City-of-Toronto-Electric-Vehicle-Strategy.pdf , as well as through other public sources. Toronto Hydro continues to be of the opinion that these forecasts are reasonable, given future uncertainties in load materializing. Toronto Hydro has proposed a Revenue cap and Demand-Related DVA to address this concern.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 3-EP-30

Reference: Exhibit 3, Tab 1, Schedule 1, Page 27, 11. Heat Pumps

Preamble:

"In preparing the revenue load forecast for the 2025-2029 7 period, Toronto Hydro determined that the impact of heat pumps on overall load and demand is not yet material."

QUESTIONS (A):

a) How many Toronto Hydro customers have a heat pump and how many have a hybrid system that uses a heat pump and a gas furnace?

RESPONSE (A):

Given the limited visibility into customer's behind-the-meter technologies, Toronto Hydro cannot ascertain the number or type of heat pump systems used by its customers.

QUESTIONS (B):

b) What is the average load and peak load for a heat pump?

RESPONSE (B):

Please refer to Toronto Hydro's response in 3-EP-30 a).

QUESTIONS (C):

c) Please file the numerical analysis that supports the quoted statement.

RESPONSE (C):

Toronto Hydro through its Future Energy Scenarios work did have regard for advancements in electrified heating (e.g. heat pump) policies, technologies, and deployment. Toronto Hydro conducted qualitative analysis to assess the impacts from heat pumps during the 2025-2029 period. The market for heat pumps has barriers to short-term market transformation due to the installation requirements and costs, particularly in existing building and homes.[1] Government policies have shown direction towards reducing overall GHG emissions from buildings and homes through heat pump installations. However, there are no specific targets or incentives for heat pump installations. The policies reviewed include TransformTO[2], City of Toronto's Net Zero Existing Buildings Strategy[3], Toronto Green Standard[4], and the Federal Government's Green Building Strategy[5]. To the extent that those technological developments and related policies lead to a variance in distribution revenue due to greater building electrification or greater energy efficiency, those revenue variance would track to the Demand Related Variance Account (revenue variance subaccount).

QUESTIONS (D):

d) How many multi-unit residential buildings in Toronto are heated and cooled with heat pumps?

RESPONSE (D):

Please refer to Toronto Hydro’s response in 3-EP-30 a).

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[1] https://www.electricity.ca/knowledge-centre/journal/we-are-so-close-to-affording-zero-carbon-electric-home-heating/
[2] https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/
[3] https://www.toronto.ca/wp-content/uploads/2021/10/907c-Net-Zero-Existing-Buildings-Strategy-2021.pdf
[4] https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/toronto-green-standard/
[5] https://natural-resources.canada.ca/sites/nrcan/files/engagements/green-building-strategy/CGBS%20Discussion%20Paper%20-%20EN.pdf

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 3-EP-31

Reference: Exhibit 3, Tab 1, Schedule 1, Appendix J, 2.4 Estimate Monthly Billing Demand Impact, Page 7

Preamble: "Three of Toronto Hydro's rate classes are billed on peak demand which is calculated as the highest kVA demand for that customer in each month (Footnote 6). Billing demand times and amounts will vary from customer to customer and from month to month. The presence of EV charging will put upward pressure on billing demand and that pressure is a function of the number of EVs being charged at the premise, the load profiles of those EVs, and the base load profile for that customer. A load profile that estimates the hourly charging requirements (or production expectations) of an EV/DER at the general service customer premise is necessary for the analysis. Residential home charging can be ignored when estimating billing demand impacts."

Footnote 6: These rate classes are GS 50-999, GS 1-5MW, and Large Users. The remaining rate classes do not have a billing demand rate component.

Footnote 7: Since only the three general service rate classes have a billing demand component, it is only a general service load profile that needs to be calculated.

Residential home charging can be ignored when estimating billing demand impacts."

QUESTION (A):

a) Does a residential customer with a Level 2 charger have higher peak demand when charging than residential customers without chargers? If the answer is yes, please provide an estimate of how much higher, such as 100 times higher. If the answer is no, please explain why not.

RESPONSE (A) – PREPARED BY CLEASPRING:

All else being equal, yes. Level 2 charging can vary considerably regarding the kW power output from around 7 kW to 19 kW according to this U.S. Department of Transportation source: Charger Types and Speeds | US Department of Transportation. Residential peak demands are also variable and Clearspring has not investigated this issue. Coincidence of the load profile and the EV charging profile also impacts this. However, as a rough estimate, if we assume a non-charging household has a peak of 5 kW, then a household with Level 2 charging is likely to be 2 to 5 times higher.

QUESTION (B):

b) Please explain why residential home charging can be ignored. Would that not result in residential customers who do not have Level 2 chargers subsidizing residential customers who have Level 2 chargers? Please discuss.

RESPONSE (B) – PREPARED BY CLEASPRING:

Please see the response to 3-CCMBC-9 where this same quote in Footnote 7 was addressed.

QUESTION (C):

c) What can be done to prevent cross-subsidies between customers who have EV chargers and customers who do not?

RESPONSE (C):

Please refer to Toronto Hydro's response in 3-CCMBC-10, c).

QUESTION (D):

d) Do some North American jurisdictions have a rate for customers with EV chargers?

RESPONSE (D):

Yes, some North America jurisdictions have rates for customers with EV chargers. Power Advisor's report to the OEB on electric delivery rates[1] provided a North American jurisdictional overview. The reviewed jurisdictions with EV-specific rates included British Columbia, Quebec, California, and Colorado. The OEB is considering that jurisdictional information, and other considerations, on a sector-wide basis in EB-2023-0071.

[1] Electric Delivery Rates for Electric Vehicle Charging, Power Advisory, prepared for the OEB as part of its Electric Vehicle Integration (EVI) initiative, April 13 2023

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 3-EP-32

Reference: Exhibit 3, Tab 1, Schedule 1, Page 10, Appendix J, Footnote 11

Preamble: Footnote 11: "The more EVs or DER capacity at a given customer site, the more likely it will be that the presence of the technology will shift the billing peak time to a different time that day or to a separate day. The Integration Model accounts for this by adding more EVs and more DER capacity for the larger rate class customers (GS 15 MW and Large Use) who are likely to have a higher number of EVs or DERs on site than those customers GS 50-999 kW."

QUESTION (A):

a) The quoted text refers to a potential shift in billing time. Please explain from what time of the day to what other time of the day would this shift take place.

RESPONSE (A) – PREPARED BY CLEASPRING:

This would be different for each different customer being examined. The Integration Model examines all customers and estimates this potential shift for the GS 1 – 5 MW and LU classes and for a sample of 197 customers in the GS 50-999 kW customer class. The response to 3-VECC-45 (b) further describes how the model examines specific customer data for all 8,760 hourly observations in the year for the specific customers within each customer class.

QUESTION (B):

b) Considering that some large institutional and industrial customers use gas powered generators to avoid GA charges during peak periods under the Industrial Conservation Initiative program, is it possible that these customers would be burning more natural gas in order to charge EVs?

RESPONSE (B) – PREPARED BY CLEASPRING:

If that is occurring, then yes it is possible.

RESPONSES TO POLLUTION PROBE INTERROGATORIES

INTERROGATORY 3-PP-40

Please explain THESL's expectations related to OM&A costs over time as it makes progress on migrating to modern grid assets.

RESPONSE:

As detailed in Exhibit 2B, Section D5, Toronto Hydro has proposed a number of least-regret investments to modernize the grid where benefits are focused on improving OM&A costs; for example, reducing crew visits to perform inspections (Network Condition Monitoring and Control, Exhibit 2B, Section E7.3), providing greater and more accurate level of insights on assets that are difficult or costly to inspect (Online Cable Monitoring, Exhibit 2B, Section E7.1) and utilizing asset analytics and decision-making capabilities to leverage distribution system data and intelligence. Over the rate period, Toronto Hydro will evaluate and assess modernization initiatives for operational efficiencies. In order to execute the proposed modernization initiatives, Exhibit 4A, Tab 4, Schedule 3, outlines Toronto Hydro's resource needs. Central to the modernization strategy is acquiring and developing talent with skills in advanced data analytics, data science, and artificial intelligence that can efficiently and cost-effectively carry out modernization initiatives while responding to cybersecurity risks, managing a bi-directional grid, providing proactive information to improve customer experience, and responding to fast-changing regulatory policy developments.

RESPONSES TO POLLUTION PROBE INTERROGATORIES

INTERROGATORY 3-PP-41

Reference: Exhibit 3 Tab 1 Schedule 1, Page 6 - Since 2006, Toronto Hydro has experienced a significant decrease in total energy consumption

QUESTION (A):

a) Please explain the correlation and/or discrepancy between declining energy consumption and forecasted increasing peak demand.

RESPONSE (A):

As described in Exhibit 3, Tab 1, Schedule 1, Toronto Hydro's Distribution Revenue Forecast provides a view of electricity consumption over the coming rate period, throughout the service area, in respect of each customer class. The forecast utilizes multivariate regression modelling, an advanced statistical technique that uses historical information to identify variables that explain and drive historical variances in consumption and quantify the strength of their correlation. The main drivers of changes in consumption over time continue to be weather and conservation activities (both program-specific and naturally occurring), as well as calendar, economic, and demographic conditions. Since 2006, Toronto Hydro has experienced a significant decrease in total consumption, including due to conservation activities – both program-driven and naturally occurring. In the early stages of the energy transition, electricity consumption is forecasted to continue to decline, then plateau, and then rise.

The System Peak Demand forecast is described in detail in Exhibit 2B, Section D4.1 starting on page 2 of the evidence. The historical demand values utilized in the System Peak Demand forecast account for behavioral energy usage (e.g., conservation and demand management), enabling Toronto Hydro to capture and account for the persistence of CDM and energy efficiency measures and Distributed Energy Resources undertaken by existing customers. However, unlike the Distribution Revenue Forecast, the System Peak Demand growth rates are reflected on a gross basis and thus do not include assumptions about future provincially-led conservation and energy efficiency efforts. This is because the impacts of provincially-led conservation and energy efficiency are expected to have less influence at a localized station and bus level in the next rate period relative to the demand outlooks/scenarios in the next decade as the energy transition unfolds. In the near-term, these impacts are also subject to varying degrees of uncertainty, as the results of future programs are contingent on customer behaviour, policy considerations and technology solutions. Toronto Hydro does consider the impacts of its own demand-side management programs (i.e., LDR) in its peak demand forecast, as these programs target specific stations and busses within its service territory. Furthermore, Toronto Hydro will continue to evolve its System Peak Demand forecast to include the impact of peak demand management programs where and when it is appropriate to do so.

QUESTION (B):

b) Please explain if THESL has assessed opportunities to leverage the tools/factors enabling lower total consumption (e.g. CDM, technology, rates, behavior, etc.) to be leveraged in parallel for mitigating peak demand. If not, why not. If yes, please provide a copy of the analysis and findings.

RESPONSE (B):

Please see Toronto Hydro’s response to interrogatory 1B-Staff-40.

RESPONSES TO POLLUTION PROBE INTERROGATORIES

INTERROGATORY 3-PP-42

QUESTION (A):

a) Please provide the following data points and underlying references from Toronto Hydro for the Clearspring integration model used to forecast the impacts onto the billing components of energy and demand:

- Customer-owned renewable DERs ("Renewables"),
- Customer-owned non-renewable DERs ("Non-Renewables"), and
- Customer-owned energy storage resources

RESPONSE (A):

Please refer to Exhibit 3, Tab 1, Schedule 1 and Exhibit 2B, Section E5.1 for the data points and underlying references.

QUESTION (B):

b) Please provide the breakdown for energy storage resources if EVs are not included as an energy storage resource, or simply confirm if they were excluded.

RESPONSE PROVIDED BY CLEARSPRING (B):

Clearspring confirms that EV's are excluded from the energy storage resources detailed in the Clearspring Integration Model.

RESPONSES TO POLLUTION PROBE INTERROGATORIES

INTERROGATORY 3-PP-43

Reference: Table 11: DER Billed Demand (kVA) by Technology Type

The % of Total Billed Demand Forecast related to DERs out to 2029 is -1.6%. This value seems really low, particularly in relation to expected DER penetration and the Toronto Net Zero 2040 objective. Please provide any relevant benchmark information THESL has related to this and explain why THESL believes -1.6% is an adequate goal for aggressive DER development.

RESPONSE:

Toronto Hydro considered various external sources in developing its DER forecast as set out in [insert relevant exhibit references]. DER forecasts were developed by Toronto Hydro and provided to Clearspring as an input to the integration model[1]. Toronto Hydro's DER forecast is separated into renewable, energy storage and non-renewable segments. For each segment, forecast DER capacity was approximated using a mathematical model that best represented recent and anticipated growth patterns, considering a combination of historical trends, project pipeline, economic environment and the current energy policies at the time of forecast.

ADDITIONAL RESPONSE – PREPARED BY CLEASPRING:

The Integration Model examines the reduction in billing demand resulting from DERs. Billing demand is calculated based on the non-coincident peaks of individual customers. Billing demand will tend to be less sensitive to DER penetration levels, especially from solar generation, because of the intermittency of the resource and the fact that new peak times for each customer are likely to be created which will lessen the calculated billing demand reductions substantially. Most likely, new peak times will be created during hours with less sunlight. This will dampen the estimated

[1] Exhibit 3, Tab 1, Schedule 1, page 24

billing demand reductions relative to what the solar impact may be from either a capacity perspective or on system peak demands.

RESPONSES TO POLLUTION PROBE INTERROGATORIES

INTERROGATORY 3-PP-44

QUESTION:

Please provide what penetration THESL has forecasted for the IESO funded ASHP program in its forecast.

RESPONSE:

This appears to be a reference to the IESO program that it was launched in December 2023. If that is the program being referred to, it was launched after the Application was finalized and filed.

RESPONSES TO POLLUTION PROBE INTERROGATORIES

INTERROGATORY 3-PP-45

Reference: **Exhibit 3, Tab 1, Schedule 1, Appendix J - Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts - There is a balancing of impacts between the technologies as EVs will increase energy and billing demand, whereas DERs will lower energy and billing demand.**

QUESTION (A):

a) Please explain how the Ultra Low Overnight Rate implemented in Ontario was included in the Clearspring modeling and results.

RESPONSE (A) – PREPARED BY CLEASPRING:

Please see page 37 of the Clearspring Integration Report, which includes a description of how the Ultra Low Overnight Rate is implemented in the load profiles produced for the cost allocation model.

QUESTION (B):

b) Please explain what the impact would be if the Ultra Low Overnight Rate was excluded.

RESPONSE (B) – PREPARED BY CLEASPRING:

If the EV load profiles assumed normal charging rather than smart charging because of the Ultra Low Overnight Rate then the Residential customer class NCPs and CPs in the cost allocation model would be higher.

RESPONSES TO POLLUTION PROBE INTERROGATORIES

INTERROGATORY 3-PP-46

Reference: Exhibit 3 Tab 1 Schedule 1 Appendix J - Clearspring Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts.

QUESTION (A):

a) Was the Clearspring Report peer reviewed. If yes, please provide a list of participants and their feedback.

RESPONSE (A) – PREPARED BY CLEASPRING:

No, the Clearspring Report and model was developed solely by Clearspring and reviewed internally within Clearspring.

QUESTION (B):

b) Please provide a list of the stakeholders consulted or stakeholders otherwise part of the information input, modeling inputs and/or report development process.

RESPONSE (B) – PREPARED BY CLEASPRING:

Please see the response to part (a). Toronto Hydro provided the EV and DER forecasts and other information inputs as cited in the Clearspring Report.

QUESTION (C):

c) Please indicate if/how the modeling was validated against the City of Toronto energy and emissions plan information, modeling and data.

RESPONSE (C) – PREPARED BY CLEASPRING:

Clearspring did not compare the model inputs or results against the City of Toronto plan. This was not necessary for purposes of Clearspring's Integration Model.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-79

Reference: [Appendix 2-IB]

QUESTION (A):

With respect to Appendix 2-IB:

a. Please provide a spreadsheet that breakdown the 2025-2029 forecasts by class for Weather Normalized consumption and demand into the base revenue load forecast, the adjustment for CDM, the adjustments for EVs and the adjustments for DERs, such that the totals for each of the three adjustments reconcile to those shown in Exhibit 3-1-1, Appendix C, and Exhibit 3-1-1, Appendix J Tables 41 and 42 and Exhibit 3-1-1 Tables 10 & 11.

RESPONSE (A):

Please refer to Appendix A for a working spreadsheet with the 2025-2029 forecasts by class. Note that Toronto Hydro does not manually adjust its load forecast for CDM. Please refer to Exhibit 3, Tab 1, Schedule 1, p. 10 for a description of Toronto Hydro's forecasting enhancement to include CDM impacts.

QUESTION (B):

b. For the GS 1000-4999 kW and Large Use classes, did Toronto Hydro test using stepwise regression techniques to forecast customer #s for 2025-2029? If not, why not? If so, please provide results and why this methodology was rejected.

RESPONSE (B):

Toronto Hydro did not use step-wise regression techniques to forecast the customer count in GS 1000-4999 kW and Large Use classes because it was not suitable for these rate classes. The GS

1000-4999 kW and Large Use class customer count forecasts were developed with a combination of 1) customer counts from new connections during this period, and 2) forecasted changes in customer counts due to reclassification. Please refer to interrogatory 3-VECC-25, part b) for planning/construction lead times for these rate classes.

QUESTION (C):

c. Toronto Hydro used market knowledge of construction and expert judgement to forecast customer #s for the GS 1000-4999 kW and Large Use classes. For each class, please provide the changes which were made to each class, each year and the reason for each of them.

RESPONSE (C):

Please refer to part b).

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-80

Reference: Exhibit 3, Page.19

Please provide the historical information on the relationship between energy and demand for each of the rate classes listed and the five-year average which was used for forecasting purposes.

RESPONSE:

Please refer to Toronto Hydro's response and appendix to interrogatory 3-VECC-39.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-81

Reference: Ex.3-1-1, p.14, Appendix C

Appendix C shows no Demand Response savings for Business for 2025-2029. Ex. 1B-2-1, p. 37 refers to “technology market advancements providing customers and/or the utility access to new or more cost-effective demand-management tools.” Please identify any adjustments to the load forecast for 2025-2029, by class, for demand-management not captured in other adjustments, including Toronto Hydro’s Local Demand Response program.

RESPONSE:

There are no additional adjustments for demand-management not already captured. Toronto Hydro relied on the IESO’s 2021-2024 CDM Framework to develop its CDM forecast. The framework included programs for both energy efficiency and demand response. Please refer to Exhibit 3, Tab 1, Schedule 1 for a description of Toronto Hydro’s forecasting to include CDM impacts.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-82

Reference : Ex.3-1-1, Appendix J Tables 6-11, Appendix J, p.2

The Clearspring Integration of Revenue Forecast With Electric Vehicle and Distributed Energy Resource Forecast Report lists six forecast inputs that were used to forecast the impacts of EVs and DERs on the billing components of energy and demand.

QUESTION (A) AND (B) :

a. Does Toronto Hydro currently track the actual number of customer-owned electric vehicles, 'renewables' and 'non-renewables' generation?

b. If not, does Toronto Hydro plan to track this data? If not, how does it propose to reconcile impacts of these technologies in order to record entries in the variance account?

RESPONSE (A) AND (B):

Toronto Hydro tracks renewable and non-renewable generation connections submitted through the DER connections process and periodically monitors the Ministry of Transportation electric vehicle registration data to assess the uptake of electric vehicles in the City of Toronto. However, the utility is unable to isolate the impacts of these demand drivers separate from other drivers that can drive cost and revenue variance (with the exception of weather normalization which is an established practice). For more information please see the response to 9-SEC-129.

To protect both ratepayers and the utility from structural unknowns in forecasted costs and revenues related to demand growth in a time of unprecedented change in the economy and energy system, Toronto Hydro proposes to reconcile all the demand-related program and revenue variances as part of the DRVA.

QUESTION (C):

For each of these six inputs, please provide further details on what assumptions were made to arrive at the data in Tables 6-11 and how the data was tested.

RESPONSE (C)– PREPARED BY CLEASPRING:

The assumptions underpinning the analysis for Tables 6-11 are provided in Sections 2, 3, and 4 of the report.

QUESTION (D) :

What is the relationship between the data provided in Tables 6-11 and the Future Energy Scenarios report in Exhibit 2B-D4, Appendix B? Please reconcile the two.

RESPONSE (D):

Please refer to Toronto Hydro's response 3-Staff-274(g).

QUESTION (E) :

Were alternative scenarios considered for the data in Tables 6-11, such as more aggressive, more conservative? If not, why not? If so, please provide the results.

RESPONSE (E) – PREPARED BY CLEASPRING:

The Integration Model considers one scenario, one that reflects a 50/50 scenario. The purposes of the Integration Model is to add incremental EV/DER loads to the base revenue load forecast, which is also a 50/50 forecast, and to modify the 2025 test year cost allocators to account for EV/DER incremental loads.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-83

Reference: Exhibit 3, Appendix J, Tables 42, 44, & 45

Table 42 shows the annual incremental net billing demand by rate class. Tables 44 & 45 show the NCPs and CPs for the GS 50-999 kW, GS 1-5 MW and LU classes being lower after consideration of the 2025 technology impacts.

QUESTION (A):

a) Please confirm that Table 42 is kW or KVA, not kWh as shown.

RESPONSE (A) – PREPARED BY CLEASPRING:

Confirmed, the table displays kVA billing demand.

QUESTION (B):

b) Please provide an explanation of why in Table 42 the incremental billing demand for the GS 50-999 kW class is increasing by 67,656, however the 1NCP for the class is decreasing by 6,141 kVA.

RESPONSE (B) – PREPARED BY CLEASPRING:

The primary driver of this is what each result is measuring. In Table 42, this is the expected change in the billing demand which is calculated from individual customers load profiles. Whereas, for the 1NCP found on Table 44 this is the change in the rate class load shape. Given this difference, the intermittency of solar plays a significant role in modifying these load shapes. Given the higher disaggregation of load shapes at the customer level for Table 42 and when calculating billing demand, there is more flexibility for the customer profile to shift the peak time to new hours where solar is not producing. However, when you look at the analysis for the purposes of rate allocation and what solar's impact will be on the rate class load profile as a whole there is less ability to shift to new hours because the levels of EV/DER impacts are proportionally smaller relative to the aggregated load profile. Clearspring investigated the GS 50-999 kW class. The original rate class load profile's annual peak occurred on July 19th around noon. After layering on the 2025 expected impacts of EVs and DERs in every hour of that load profile, the peak remained at that same hour on July 19th. Since solar is producing at one of its highest levels then, this reduces the 1NCP. This contrasts with the analysis in Table 42, where individual customers in the GS 50-999 kW rate class have varied peak times that will not always coincide with solar production. This fact combined with the smaller load levels of individual customers are more likely to shift peak times away from high solar production times and more towards high EV consumption times.

QUESTION (C):

c) Using the same methodology as was done for Table 44 & 45, please calculate the impacts by rate class before and after for 2026, 2027, 2028 and 2029 technologies.

RESPONSE (C):

Toronto Hydro declines to answer this question, as 2026 to 2029 load profiles have not been incorporated into Toronto Hydro's proposed cost allocation in this application, and thus have no relevance to its requested relief.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-84

References: Exhibit 3. Tab 2, Schedule 1, Page 2

Preamble:

With respect to Other Revenue, please explain:

QUESTION (A):

a) Why Toronto Hydro's revenue from specific service charges is not increasing in 2025, and from 2025-2029 is only increasing at a Compounded Annual Growth Rate (CAGR) of 1.4%, "in accordance with the growth of Toronto Hydro's customer base and concomitant growth in the volume of services" when costs (OM&A) to provide these services are increasing by a CAGR of 4.2% for the same period?

RESPONSE (A):

It is Toronto Hydro's understanding that in the question, SEC made a computational error in calculating the CAGR from 2025-2029 for specific service charges and OM&A. In responding to this interrogatory Toronto Hydro believes the correct CAGR from 2025-2029 for specific service charges should be 2% and for total OM&A over the same period should be 3.9%.

For this rate application Toronto Hydro has proposed to leave its specific service charges unchanged (Exhibit 8, Tab 2, Schedule 1). Despite that, revenues from specific service charges are increasing from 2025-2029 at the CAGR of 2% to reflect the growth of Toronto Hydro's customer base and concomitant growth in the volume of services.

QUESTION (B):

b) Why Toronto Hydro's Other Revenue is decreasing in 2025-2029 from 2024 when it is also affected by the growth of customer base and volume of services and the cost to produce the services.

RESPONSE (B):

Toronto Hydro's Other Revenues are not decreasing in 2025-2029 when compared with 2024, please refer to Exhibit 3, Tab 2, Schedule 1, Table 1.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-85

References: Exhibit 3, Tab 2, Schedule 2, Appendix 2-H

Exhibit 9, Tab 1, Schedule 1, Table 8

With respect to Other Revenue:

QUESTION (A):

a) Please update Appendix 2-H to include 2023 actuals.

RESPONSE (A):

Please refer to Toronto Hydro's response to 1B-SEC-1, subpart (f).

QUESTION (B):

b) For Account 4355, Toronto Hydro's evidence shows the following:

	2020A	2021A	2022A	2023F	2024F
Forecast from Decision $M	$1.0	$1.0	$1.0	$1.0	$1.0
2-H $M	$0.49	$2.71	$0.38	$1.80	$1.80
Ex. 9 Table 8 $M	$0.0	$1.6	$0	$0	$0

Please explain how the entries for each year in 2-H and Table 8 were determined.

RESPONSE (B):

Toronto Hydro identified a correction to Table 8 on Exhibit 9, Tab 1, Schedule 1 at page 12, the corrected version is reproduced below as a response to this interrogatory. Toronto Hydro will update the evidence as noted in 1A-Staff-01.

Table 8: **Account 1508 - subaccount Gain on Sale of Property Variance ($ Millions)**

	Actual				Forecast	Total	
	2020	**2021**	**2022**	**2023**	**2024**		
Gain on Sale embedded in rates	1.0	1.0	1.0	1.0	1.0	5.0	
Actual/Forecast Gain on Sale[1]	0.5	2.6	0.4	1.6	1.8	6.9	/C
Variance	**0.5**	**(1.6)**	**0.6**	**(0.6)**	**(0.8)**	**(1.9)**	/C
Carrying Charges	**-**	**-**	**-**	**-**	**(0.1)**	**(0.1)**	/C
Total Proposed for Clearance						**(2.0)**	/C

[1] Actual/Forecast Gain on Sale presented net of taxes.

Toronto Hydro confirms that the original error did not have any impact on Exhibit 3, Tab 2, Schedule 2, Appendix 2-H, where the entries derived from the sale of properties match the values in the corrected Table 8.

QUESTION (C):

c) Please provide the pole attachment revenues that Toronto Hydro has included in its revenue offset forecast for 2025-2029 and compare it to the 2020-2024 period. Please advise where that revenue is included in Appendix 2-H.

RESPONSE (C):

Please refer to Toronto Hydro's response to 3-VECC-55.

QUESTION (D):

d) Please explain how the pole attachment revenue forecast.

RESPONSE (D):

Please refer to Toronto Hydro's response to 3-VECC-55 and 3-Staff-287.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-86

Reference: Ex.3-1-1;
Ex.1C-3-9, p. 4

Toronto Hydro's 2022 Annual Report indicates the goals of the climate advisory services for 2023-2040 include: 60,000+ Air source heat pumps + electric hot water heaters and 50,000 EV Chargers.

QUESTIONS (A):

a. Please provide details for each of these goals for each year 2023-2029.

RESPONSE (A):

Climate Advisory Services are non-rate regulated business activities, which do not form part of this application.

For further information on Climate Advisory Services, please refer to the latest update for the Climate Action Status Report[1].

QUESTIONS (B):

b. Please explain how these goals are incorporated into the load forecast provided.

RESPONSE (B):

These goals were not incorporated into the load forecast. However, these technologies are reflected in the Future Energy Scenarios, in that they are in keeping with the efforts to help the City

[1] https://www.torontohydro.com/documents/20143/74105431/climate-action-plan-2023-status-report.pdf/d724e49b-e4ee-d8f2-f51b-915fb3622231?t=1688486791957

of Toronto achieve its Net Zero 2040 Strategy. To the extent that Toronto Hydro's efforts result in greater electrification during the 2025-2029 period, that will factor into the balance of the Demand-Related Variance Account.

RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES

INTERROGATORY 3-SEC-87

Reference: **Exhibit 3, Tab 1, Schedule 1, Appendix J, Table 24**
Exhibit 1B, Section 2.3.1

QUESTION:

Toronto Hydro states that "By the end of the decade, Toronto Hydro expects to have over 4,400 DER connection projects representing a total installed capacity of approximately 517 MW." Please reconcile that statement with the information provided in Table 24.

RESPONSE:

The information provided in table 24 excludes existing biogas and wind turbine generation from the integration model as growth from renewables is not expected to be driven by these generation types. The amounts for biogas and wind turbine generation were subtracted from the renewables forecast in Exhibit 2B, Section E5.1 to create the information in Table 24. Please see Table 1 below for the excluded amounts:.

Table 1: Biogas and Wind Turbine Installed Capacity, removed from the Renewables forecast for the Integration Model

Generation Type	Installed Capacity (MW)
Biogas	15.1
Wind Turbine	0.8

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3.0-VECC -21

Reference: Exhibit 3, Tab 1, Schedule 1, pages 1-2

Preamble:

The footnotes to Table 1 state:

"Total Customers are an annual average and exclude street lighting devices and unmetered load connections."

QUESTION (A):

a) Please confirm that by "annual average" THESL means the average of the 12 monthly values for each year.

RESPONSE (A):

Toronto Hydro confirms the statement above.

QUESTION (B):

b) Please confirm that the annual totals reported in Table 1 include the Street Lighting and USL classes based on the number of customers (not connections) for each of these classes.

RESPONSE (B):

Toronto Hydro confirms the statement above.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC -22

Reference: Exhibit 3, Tab 1, Schedule 1, page 4
Exhibit 3, Tab 1, Schedule 1, Appendices H and I

QUESTION (A):

a) Please explain why the regression model used to forecast the Residential customer count was developed using historic data starting in April 2013 and did not use any data for the months prior to that.

RESPONSE (A):

Toronto Hydro used historical data starting in April 2013 to ensure no CSMUR customers that were Residential customers prior to the introduction of the CSMUR class were included.

QUESTION (B):

b) With respect to the Residential customer count model, please explain the basis for the Seasonality variable and the rationale for its inclusion.

RESPONSE (B):

Toronto Hydro used the Seasonality variable to account for monthly trends throughout a year. The Residential class averages a month-to-month decrease in customers between May and August. The variable was used to capture these trends.

QUESTION (C):

c) With respect to the Residential customer count model, please provide a schedule that compares the actual average annual customer count for each of the years 2013-2022 with the predicted values based on THESL's regression model.

(Note: For 2013 please use the actual vs. predicted average monthly values for April through December).

RESPONSE (C):

Please refer to Table 1 below for a comparison between the actual average annual Residential customer count and the predicted values based on Toronto Hydro's regression model for the years 2013-2022.

Table 1: Average Annual Residential Customer Count - Actual vs Predicted

Year	Actual	Predicted
2013	608,340	608,436
2014	610,125	610,093
2015	610,971	610,879
2016	611,150	611,205
2017	611,575	611,606
2018	612,262	612,302
2019	614,206	614,068
2020	614,229	614,262
2021	614,181	614,182
2022	614,926	614,956

QUESTION (D):

d) What is the source of the historic monthly population data used to develop the Residential and GS<50 customer count models?

RESPONSE (D):

Toronto Hydro sources its population data 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.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC -23

References: Exhibit 3, Tab 1, Schedule 1, Page 4
Exhibit 3, Tab 1, Schedule 1, Appendices A, H and I

QUESTION (A):

a) Please explain why the regression models used to forecast the GS<50 and GS 50-999 customer counts were developed using historic data starting in February 2015 and did not use any data for the months prior to that.

RESPONSE (A):

As part of the forecast development process, Toronto Hydro assessed historical customer count patterns and identified a notable shift in customers in 2015 within GS<50 kW and GS 50-999 kW rate classes. After testing several regression models to forecast the GS <50kW and GS 50-999 kW customer counts, Toronto Hydro determined that historical starting point of 2015 yielded the best modeling result.

QUESTION (B):

b) With respect to the GS<50 customer count model, please provide a schedule that compares the actual average annual customer count for each of the years 2015-2022 with the predicted values based on THESL' regression model. (Note: For 2015 please use the actual vs. predicted average monthly values for February through December).

RESPONSE (B):

Please refer to Table 1 below for a comparison between the actual average annual GS<50 customer count and the predicted values based on Toronto Hydro's regression model for the years 2015-2022.

Table 1: Average Annual GS<50 kW Customer Count - Actual vs Predicted

Year	Actual	Predicted
2015	70,564	70,558
2016	70,534	70,586
2017	71,035	70,981
2018	71,266	71,266
2019	71,515	71,520
2020	71,899	71,894
2021	72,408	72,405
2022	72,614	72,625

QUESTION (C):

c) With respect to the GS 50-999 customer count model, please provide a schedule that compares the actual average annual customer count for each of the years 2015-2022 with the predicted values based on THESL's regression model. (Note: For 2015 please use the actual vs. predicted average monthly values for February through December).

RESPONSE (C):

Please refer to Table 2 below for a comparison between the actual average annual GS 50-999 customer count and the predicted values based on Toronto Hydro's regression model for the years 2015-2022.

Table 2: Average Annual GS 50-999 Customer Count – Actual vs Predicted

Year	Actual	Predicted
2015	10,421	10,415
2016	10,418	10,422
2017	10,411	10,414
2018	10,470	10,457
2019	10,444	10,456
2020	10,213	10,218
2021	9,846	9,853
2022	9,731	9,718

QUESTION (D):

d) What is the source of the historic monthly employment data used to develop the GS 50-999 customer count model?

RESPONSE (D):

Toronto Hydro sources its employment data 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.

QUESTION (E):

e) Please provide the Conference Board of Canada (CboC) document with the forecast monthly employment and population values used by THESL and demonstrate that the historic employment and population data used in the development of the models are consistent with the CboC's forecasts for these variables.

RESPONSE (E):

Toronto Hydro uses information from the Conference Board of Canada, which includes forecast and historical values. The information is provided as quarterly reports, and Toronto Hydro calendarizes as monthly. Please refer to Appendix A for the Conference Board of Canada document for the quarterly reports, as well as a monthly formatted report with linear trend extension which Toronto Hydro has derived from these reports.

QUESTION (F):

f) Does the City of Toronto develop/produce population forecasts for use in its planning processes? If yes, please provide the City of Toronto's most recent population forecast and the associated reference document.

RESPONSE (F):

Toronto Hydro has reviewed City of Toronto data sets, but has not found a population forecast data set that is suitable for Toronto Hydro's revenue load forecasting purposes.

QUESTION (G):

g) In Appendix A (Columns S and U), are the GDP and Employment values meant to be those for the City of Toronto?

RESPONSE (G):

Yes, Toronto Hydro sources its GDP and employment data from the Conference Board of Canada, which represent the Toronto Census Metropolitan area.

QUESTION (H):

h) For the GS 50-999 customer count model, were population and GDP also tested as explanatory variables? If yes, why were they rejected? If not, please provide the resulting regression model and statistics where population or GDP are used as an explanatory variable as opposed to employment.

RESPONSE (H):

Toronto Hydro tested population and GDP as explanatory variables for GS 50-999 kW customer count model. These variables did not result in satisfactory model fit or predictive value and were therefore rejected.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-24

REFERENCES: Exhibit 3, Tab 1, Schedule 1, Page 4
Exhibit 3, Tab 1, Schedule 1, Appendices A, H And I

QUESTION (A):

a) For each of the Residential, GS<50 and GS 50-999 customer classes please provide a schedule (i.e., a working excel file) that sets out the calculation of the 2023 to 2029 monthly (and resulting annual) customer count forecast using the forecast values for each class model's explanatory variables and the coefficients from the regression models in Appendix I.

RESPONSE (A):

Please refer to the included Appendix A, Tab "2023-2029 Customer Forecast".

QUESTION (B):

b) For each of the Residential, GS<50 and GS 50-999 customer classes please provide a schedule that sets out the predicted monthly customer count values for 2023 versus the actual monthly customer counts for all months where actual data is available.

RESPONSE (B):

Please refer to 3-VECC -24, Appendix A, Tab "2013-2022 Predicted Values".

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC -25

Reference: **Exhibit 3, Tab 1, Schedule 1, page 4**
EB-2018-0165, Exhibit 3, Tab 1, Schedule 1, page 16

Preamble:

The current Application states:

"The customer forecast for GS 1000-4999 kW, Large Use, CSMUR, and Street Lighting rate classes are based on market knowledge of construction in Toronto Hydro's service area, as well as an application of expert judgement. Toronto Hydro regularly communicates with developers, municipal representatives and commercial and residential associations to identify new larger connection projects and their expected connection years.

The EB-2018-0165 Application stated:

"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."

QUESTION (A):

a) Please provide a schedule that sets out: i) THESL's forecast average customer count for the CSMUR class for each of the years 2018-2022 per EB-2018-0165 and ii) the actual average annual customer count for the CSMUR class for the same years.

RESPONSE (A):

Please refer to Table 1 below for a table that sets out THESL's forecast average customer count for the CSMUR class for each of the year's 2018-2022 per EB-2018-0165 and the actual average annual customer count for the CSMUR class for the same years.

Table 1: Average Annual CSMUR Customer Count – Actual vs Forecast as per EB-2018-0165

Year	Actual*	Forecast*
2018	75,028	75,028
2019	79,882	80,370
2020	83,686	85,981
2021	88,478	91,294
2022	92,126	97,687

* Customer counts presented in EB-2018-0165 are mid-year numbers, while those in EB-2023-0195 reflect the annual average.

QUESTION (B):

b) Please describe the typical planning/construction lead times for customers in each of the GS 1000-4999 kW, Large Use, CSMUR, and Street Lighting rate classes.

RESPONSE (B):

Please refer to Table 2 below for typically planning /construction lead times for these customers

Table 2: Planning/Construction lead times for the listed rate classes

Rate Class	Lead Times
GS 1,000-4,999 kW	Within 1 to 5 years after receiving and confirming a feeder request.
Large Use	
CSMUR	
Street Lighting	For planned capital projects the time from planning to construction is typically 1 year.

QUESTION (C):

c) For each of these customer classes, please comment on whether planning/construction lead times are sufficiently long that THESL can rely on current "market intelligence/knowledge" to predict new customer additions out to 2029 (i.e., how far into the future can current market knowledge be expected to provide a reasonable estimate of future customer additions for each of these classes)? If not, how has THESL addressed this issue in developing the customer count forecasts for these classes?

RESPONSE (C):

Toronto Hydro acknowledges the potential for uncertainty within these customer count forecasts. However, as the lead times are between 1 to 5 years, Toronto Hydro believes that the information included in its forecast is the reasonable as it is based on the best information available to predict out to 2029.

QUESTION (D):

d) Please explain the reason for the decline in the GS 1,000-4,999 customer count in 2022 (e.g., is it the result of customer reclassification?).

RESPONSE (D):

The decline in the GS 1,000-4,999 customer count in 2022 is the result of customer reclassification.

QUESTION (E):

e) Please explain why THESL expects the GS 1,000-4,999 customer count to continue to decline annually in 2023, 2024 and 2025.

RESPONSE (E):

The GS 1,000-4,999 customer count forecast declines between 2023 and 2025 due to forecasted impacts from reclassification. The forecasted reclassification was based on a 10-year average reclass (prior to the COVID-19 pandemic).

QUESTION (F):

f) Please explain the annual change in the Large Use customer count (relative to the preceding year) for each of the years 2023 to 2029 as the values fluctuate up and down during this period.

RESPONSE (F):

The forecast for the customer count of Large Use comprises two factors: the projected rise in Large Use customer numbers resulting from anticipated new connections, offset by the change in customer counts due to reclassification. For instance, while six new customers are forecasted to be added in 2023, offset by one reclassification, resulting in a net total of 47.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-26

Reference: Exhibit 3, Tab 1, Schedule 1, page 9

<u>Preamble:</u>

The Application states:

> "All of Toronto Hydro's regression models use monthly kWh per day as the dependent variable and monthly values of independent variables from July 2002 through to the latest actual values (December 2022) to determine the monthly regression coefficients."

QUESTION (A):

a) Please explain why July 2022 was used as the starting point for the data used to estimate THESL's regression models.

RESPONSE (A):

Toronto Hydro presumes interrogatory a) above should state 'July 2002', rather than as stated ' 'July 2022'.

Toronto Hydro used July 2002 as the starting point for the data used because it is consistent with previous methodology.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3.0-VECC -27

Reference: Exhibit 3, Tab 1, Schedule 1, pages 9-10, 17 (Table 4) and Appendix B

Preamble:

The Application states:

> "Positive dew point temperature is another type of weather factor included as an explanatory variable for the CSMUR, GS <50 kW, GS 50-999 kW, and GS 1000-4999 kW customer classes." (pg.9)
>
> "The forecast for heating and cooling degree-days, and positive dew point temperature inputs is based on a ten-year historical average of HDD, CDD, and positive dew point."

QUESTION (A):

a) Please explain why "positive dew point temperature" was not used as an explanatory variable for the Residential model.

RESPONSE (A):

The positive dew point temperature variable in the Residential model resulted in a coefficient value with the incorrect sign (i.e., a negative coefficient – suggesting an increase in a positive dew point leads to a decrease in loads).

QUESTION (B):

b) At page 9 the Application states that positive dew point temperature was used as an explanatory variable for the GS<50 class. However, positive dew point temperature is not identified as an explanatory variable for the GS<50 class in either Table 4 or Appendix B. Please reconcile.

RESPONSE (B):

Toronto Hydro confirms that positive dew point temperature was not used as an explanatory variable for the GS<50 class. The inclusion of "GS <50 kW" within the sentence quoted above was inadvertent.

QUESTION (C):

c) At page 9 the Application does not identify positive dew point temperature as an explanatory variable for the Large Use class. However, positive dew point temperature is identified as an explanatory variable for the Large Use class in either Table 4 or Appendix B. Please reconcile.

RESPONSE (C):

Toronto Hydro confirms that positive dew point temperature was used as an explanatory variable for the Large Use class. The omission of "Large Use" within the sentence quoted above was inadvertent.

QUESTION (D):

d) What 10 year period was used to determine the weather normal values for HDD, CDD, and positive dew point?

RESPONSE (D):

Toronto Hydro used 2013 to 2022 to determine the weather normal values for HDD, CDD and positive dew point for the 10-year period.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-28

Reference: Exhibit 3, Tab 1, Schedule 1, Table 4, Page. 17 / Appendix B

Table 4 and Appendix A indicate that the Residential and GS 50-999 class models are the only ones that employ a "blackout binary" variable. Please explain why this variable was not used for the other customer classes.

RESPONSE:

Toronto Hydro tested the blackout binary variable in GS<50, GS 1-5MW, and Large Use. The blackout binary variable did not fit the GS <50 and Large Use class models, and was therefore rejected. The variable fit the GS1-5MW model, but did not provide statistical significance to the model. The blackout event took place before the CSMUR class existed, and was therefore not used in the model.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-29

Reference: Exhibit 3, Tab 1, Schedule 1, Table 4, Pages 15, 17, and Appendices A & B

Preamble:

The Application states:

"Load impacts from the COVID-19 pandemic are captured through a lockdown binary variable. This variable is based on the provincial lockdown periods announced during the pandemic in 2020-2021. Additional load impacts from the pandemic are captured through the economic variables used in the model, such as GDP. The lockdown binary variable was found to be statistically significant in the Residential, GS <50 kW, GS 50-999 kW, and Large Use class models."

QUESTION (A):

a) Please confirm that, per Appendix A, the lockdown periods used were April & May 2020; January & February 2021 and April & May 2021.

RESPONSE (A):

Toronto Hydro confirms the lockdown periods used were April & May 2020; January & February 2021 and April & May 2021.

QUESTION (B):

b) Please explain the basis on which these "lockdown" months were identified.

RESPONSE (B):

The provincial lockdown period was identified by months where the provincial government declared full lockdowns as part of the state of emergency order.

QUESTION (C):

c) At page 15 the Application identifies the Residential class model as using a lockdown binary variable. However, neither Table 4 nor Appendix B do so. Please reconcile.

RESPONSE (C):

Toronto Hydro confirms that the Residential Class does not use the lockdown binary variable.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-30

Reference: Exhibit 3, Tab 1, Schedule 1, Table 4, Pages 15-16, 17, and Appendices A & B

Preamble:

The Application states (pages 15-16):

> "The time trend variables used in the model are designed to capture trends which are not otherwise explained by the other driver variables, as well as to improve the overall model fit over the period. The Residential, GS<50 kW, and Large Use classes use a linear spline time trend in the 2012 to 2022 period, the General Service 1,000-4,999 kW class uses a linear spline time trend in the 2018 to 2022 period, and the GS 50-999 kW uses a simple time trend over historical period 2018 to 2022."

QUESTION (A):

a) To what factors does THESL attribute the statistical significance in the models for the Residential, GS<50 and Large Use classes of a time trend variable that increases monthly over the period 2002 to 2011 but is then constant for the period 2012 - 2022?

RESPONSE (A):

Toronto Hydro used time series trends in this instance to increase the strength of fit and predictive accuracy in all models. These time trends were developed after noting unexplained annual increases in 2012 and 2018, and may possibly capture unexplained changes in trends. This approach is consistent with its prior rate application EB-2018-0165.

QUESTION (B):

b) Why is it reasonable to use constant value for the 2023-2029 monthly value for the time trend variable in the Residential, GS<50 and Large Use class models?

RESPONSE (B):

Please refer to response 3-VECC-30, a).

QUESTION (C):

c) To what factors does THESL attribute the statistical significance in the GS 1,000-4,999 class model of a time trend variable that is constant over the period 2002 to 2017 but then increases monthly over the period 2018 - 2022?

RESPONSE (C):

Toronto Hydro used time series trends in this instance to increase the fit and predictive accuracy in all models. These time trends were developed after noting unexplained annual increases in 2012 and 2018, and may possibly capture unexplained trends. 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. Toronto Hydro tested several time trend variables, and choose a linear spline time trend in the 2012 to 2022 period because it resulted the best modeling result. Toronto Hydro tested several time trend variables, and choose a linear spline time trend in the 2018 to 2022 period because it yielded the best modeling result. This approach is consistent with its prior rate application EB-2018-0165.

QUESTION (D):

d) Why is it reasonable to assume the time trend variable for the GS 1,000-4,999 class will continue to increase over the 2023-2029 period?

RESPONSE (D):

Please refer to response 3-VECC-30, c).

QUESTION (E):

e) To what factors does THESL attribute the statistical significance in the GS 50-999 class model of a time trend variable that increases monthly over the period 2002 to 2017 but is then constant for the period 2018 - 2022?

RESPONSE (E):

Toronto Hydro used time series trends in this instance to increase the goodness of fit and predictive accuracy in all models. These time trends were developed after noting unexplained annual increases in 2012 and 2018, and may possibly capture unexplained trends. 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. Toronto Hydro tested several time trend variables, and choose a linear spline time trend in the 2012 to 2022 period because it resulted the best modeling result. Toronto Hydro tested several time trend variables, and choose a simple time trend over historical period 2018 to 2022 because it yielded the best modeling result. This approach is consistent with its prior rate application EB-2018-0165.

QUESTION (F):

f) Why is it reasonable to use a constant value for the 2023-2029 monthly values for the time trend variable in the GS 50-999 class model?

RESPONSE (F):

Please refer to response 3-VECC-30, e).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-31

Reference: Exhibit 3, Tab 1, Schedule 1, Page 12, and Appendices A & C
EB-2018-0165, 3-VECC-25 b) & d)

<u>Preamble:</u>

The Application states:

> "Toronto Hydro incorporated CDM variables into the multivariate regression: a residential CDM variable for the Residential class, and a business CDM variable for the General Service classes.
> Both variables are based on the cumulative historical and forecast level of savings from 2006 to 2029, and separated by residential and business program savings for each variable respectively."

QUESTION (A):

a) Please confirm that, for purposes of the load forecast models, THESL assumed that there was no reduction in the persistence of CDM savings after the first year (i.e. the first years saving continue on in perpetuate). If confirmed, please explain why this is reasonable assumption for DR programs.

RESPONSE (A):

Toronto Hydro confirms that it has assumed no reduction in the persistence of CDM savings after the first year, with the exception of savings related to the DR programs. Please refer to Exhibit 3, Tab 1, Schedule 1, Appendix C for the full calculations.

QUESTION (B):

b) Please confirm that the savings reported/verified by the IESO are full year savings for each project aggregated to a total and, as such, do not account for the implementation of projects throughout their first year (per VECC 25 d)).

RESPONSE (B):

Toronto Hydro confirms the above statement.

QUESTION (C):

c) Please confirm that, unlike in EB-2018-0165, THESL has not made any adjustments to account for the fact that in the first year the CDM savings realized will be less than the annualized value.

RESPONSE (C):

Toronto Hydro used a 5-year average monthly distribution of consumption to account for the fact that in the first year the CDM savings realized will be less than the annualized value. Please refer to Exhibit 3, Tab 1, Schedule 1, Appendix C for the full calculations.

QUESTION (D):

d) If part c) is confirmed, please revise the values for the CDM variables used to reflect this fact, re-estimate the regression models and provide a revised forecast by customer class for 2023-2029.

RESPONSE (D):

Please refer to the response 3-VECC-31, c).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-32

Reference: Exhibit 3, Tab 1, Schedule 1, Page 12, and Appendix C

QUESTION (A):

a) In Appendix C - Monthly Savings Tab, for 2008 the sum of the Residential monthly values up to December 2008 (Sum of D3 through D80 and F3 though F80) is 249,714.87. However, the cumulative December 2008 value for Residential in Column H is 249,521.8 (Cell H80). Please reconcile.

RESPONSE (A):

Toronto Hydro confirms that the amounts in cumulative monthly savings (Column H) do not reconcile with monthly energy efficiency savings (Column D) and demand response savings (Column F) because demand response savings are event-based, and should not be included in the cumulative savings.

QUESTION (B):

b) There appear to be similar issues in terms of discrepancies in 2009 and subsequent years through to 2022 for both Residential and Business CDM savings as between the sum of the individual monthly values (columns D and F for Residential and columns E and G for Business) and the reported cumulative values in columns H and I respectively. Please reconcile.

RESPONSE (B):

Please refer to response 3-VECC-32, a).

QUESTION (C):

c) Based on the above please revise the CDM inputs to the regression models as necessary, re-estimate the regression models and provide a revised forecast by customer class for 2023-2029.

RESPONSE (C):

Please refer to response 3-VECC-32, a).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-33

Reference: Exhibit 3, Tab 1, Schedule 1, Page 13 and Appendices C & D

<u>Preamble:</u>

Appendix C reports the following THESL annual savings for 2015-2017:

		Gross Energy Savings - EE		Gross Energy Savings - DR		
Year	Source(s)	Residential	Business	Residential	Business	TOTAL
2015	2015-2017 Final Verified CDM	31,680,379	374,016,196	-	-	405,696,576
2016	Results and Post-CFF Actual	82,342,286	315,948,154	-	-	398,290,440
2017	Savings	149,075,375	300,270,827	-	-	449,346,201

QUESTION (A):

a) Are the results reported in Appendix D meant to reflect the savings described in the third bullet on page 13 as set out below:

i. "for savings to December 31, 2022 that are related to CFF programs, project-level savings for projects that were completed within the 2015-2022 period which a distributor is contractually obligated to finish. For the Retrofit Projects, energy savings and demand reductions are based on the list of projects for which Toronto Hydro paid incentives to customers and which had their status updated to "Project Closed" in CDM-IS system post March 1, 2019. For non-Retrofit CFF Projects, savings are based on the list of projects for which Toronto Hydro has paid incentives and submitted project-level details to the IESO"?

RESPONSE (A):

Toronto Hydro confirms that the results reported in Appendix D are meant to reflect the savings described in the third bullet on page 13.

QUESTION (B):

b) If not, please indicate how the savings reported in Appendix D relate to the various savings sources outlined in the four bullets on page 13.

RESPONSE (B):

Please refer to 3-VECC-33, a).

QUESTION (C):

c) Are the savings reported in Appendix D for the province overall or for THESL? If for the province overall, please provide a schedule that sets out the amounts attributable to THESL and how they were determined for 2015-2017.

RESPONSE (C):

The savings reported in Appendix D are for Toronto Hydro.

QUESTION (D):

d) For each of the years 2015-2017 please provide a schedule that shows the savings reported from each of the sources referenced on pages 12 and 13 such that they total the annual values set out in Appendix C - Annual Savings Tab as provided in the Preamble. If the relevant reference document has already been filed please indicate where in the document the values provided in the requested schedule can be found. If the relevant reference document has not been provided already, please provide and indicate where in the document the values provided in the requested schedule can be found.

RESPONSE (D):

Please refer to Appendix A for a schedule that shows the 2015-2017 savings reported from each of the sources referenced on pages 12 and 13. Please refer to Appendix B for the 2015-2017 Final Verified Results for Toronto Hydro.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-34

Reference: Exhibit 3, Tab 1, Schedule 1, Page 13 and Appendices E & F

Preamble:

Appendix F reports the 2019-2020 Interim Framework provincial results. Appendix E extrapolates those results to THESL.

QUESTION (A):

a) Are the 2019-2020 Interim Framework results based entirely on savings achieved by customers of Ontario's electricity distributors or do they also include savings by commercial/industrial customers directly connected to the transmission system?

RESPONSE (A):

Toronto Hydro cannot confirm that the savings in the IESO's 2019-2020 Interim Framework results include or exclude savings by commercial/industrial customers directly connected to the transmission system as the data is unavailable.

QUESTION (B):

b) With respect to Appendix E, please provide the source of the 2015-2017 THESL savings and total provincial savings by program area (Cells E3 to H8) used in the 2019-2020 IF Est. Tab.

RESPONSE (B):

Please refer to Appendix A for THESL's 2015-2017 Final Verified Results.

QUESTION (C):

c) Please provide schedule that sets out THESL's and total provincial Residential sales for each of the years 2015-2018 along with THESL's Residential sales as percent of total provincial Residential sales for each of these years.

RESPONSE (C):

Toronto Hydro does not agree with using Residential sales to calculate its portion of CDM savings as a percentage of total province CDM savings. Toronto Hydro's methodology involves calculating savings by CDM program. Toronto Hydro's methodology better represents the CDM program activity within its service area, as opposed to Residential sales that include fixed and variable revenues.

QUESTION (D):

d) What would be THESL's share of the 2019-2020 Residential Interim Framework savings if the average percentage per part (c) was used to determine THESL's share?

RESPONSE (D):

Please refer to the response to 3-VECC-34, c).

QUESTION (E):

e) Please provide schedule that sets out THESL' and total provincial Commercial and Industrial sales for each of the years 2015-2018 along with THESL's Commercial and Industrial sales as percent of total provincial Commercial and Industrial sales for each of these years.

RESPONSE (E):

Toronto Hydro does not agree with using Commercial and Industrial sales to calculate its portion of CDM savings as a percentage of total province CDM savings. Toronto Hydro's methodology involves calculating savings by CDM program. Toronto Hydro's methodology better represents the CDM program activity within its service area, as opposed to Commercial and Industrial sales that include fixed and variable revenues.

QUESTION (F):

f) What would be THESL' share of the 2019-2020 Business (i.e. Commercial and Industrial) Interim Framework savings if the average percentage per part (e) was used to determine THESL's share?

RESPONSE (F):

Please refer to the response to 3-VECC-34, e).

QUESTION (G):

g) With respect to Appendix E, 2019-2020 IF Est. Tab, please provide the source of the Net to Gross Ratio values by program area (Cells G14-H19).

RESPONSE (G):

Please refer to the response to 3-VECC-34, b).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-35

Reference: Exhibit 3, Tab 1, Schedule 1, Page 13 and Appendices G & F

Preamble:

Appendix G reports the planned 2021-2024 CDM Framework results. Appendix E extrapolates those results to THESL.

QUESTION (A):

a) The 2021-2024 CDM Framework includes savings of 61 GWh in 2022 from Local Initiatives. Did THESL undertake any Local Initiatives in 2022 that would contribute to the 61 GWh result? If yes, what specifically were they and what are the estimated annual savings.

RESPONSE (A):

Toronto Hydro did not undertake any Local Initiatives in 2022. However, the IESO's local initiatives program was developed to deliver CDM savings in targeted areas of the province[1]. Part of Toronto was identified as one of the first four targeted areas.

QUESTION (B):

b) The 2021-2024 CDM Framework includes savings of 161 GWh in 2023 from Local Initiatives. Did THESL undertake any Local Initiatives in 2023 that would contribute to the 161 GWh result? If yes, what specifically were they and what are the estimated annual savings.

---

[1] Local Initiatives to Deliver CDM Savings in Targeted Areas https://www.ieso.ca/en/Sector-Participants/IESO-News/2021/04/Local-Initiatives-to-Deliver-CDM-Savings-in-Targeted-Areas

RESPONSE (B):

Toronto Hydro did not undertake any Local Initiatives in 2023. Please refer to the explanation in 3-VECC-35, a) referring to the IESO's program delivery.

QUESTION (C):

c) The 2021-2024 CDM Framework includes savings of 181 GWh in 2024 from Local Initiatives. Is THESL currently planning to undertake any Local Initiatives in 2024 that would contribute to the 181 GWh result? If yes, what specifically are they and what are the estimated annual savings.

RESPONSE (C):

Toronto Hydro is not currently planning to undertake any Local Initiatives in 2024. Please refer to the explanation in 3-VECC-35, a) referring to the IESO's program delivery.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-36

Reference: Exhibit 3, Tab 1, Schedule 1, Page 14 and Appendices G & F
IESO, 2022 Planning Outlook (December 2022)

Preamble:

The Application states:

> "Toronto Hydro's annual forecasted savings for 2025 to 2029 were developed based on the assumption that there will be a continuation of CDM program delivery by the IESO. In the absence of a new framework, the projected impact is based on
> the anticipated "status quo" CDM delivery objectives and expectations assigned for the post-2024 conservation planning period. Toronto Hydro has determined this to be the best estimate at this time given the absence of conservation planning detail for this period."

The IESO's 2022 Planning Outlook includes the following cumulative savings from Future Frameworks for 2025 and after (https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook):

Figure 19: Conservation - Future Program Framework Assumption - Annual Energy Demand Savings

Data Annual Energy Demand Savings (TWh)

Data	Annual Energy Demand Savings (TWh)						
	Year						
	1	2	3	4	5	6	7
	2024	2025	2026	2027	2028	2029	2030
Future Frameworks	-	0.18	0.73	1.53	2.34	3.15	3.97

QUESTION (A):

a) Please confirm that in the Application THESL assumes that the post-2024 Framework will include annual provincial savings of 1,575 GWh, equivalent to the results targeted for 2024. If not confirmed, what annual provincial savings post-2024 does the THESL application assume?

RESPONSE (A):

Toronto Hydro confirms the above statement.

QUESTION (B):

b) What would be the annual savings attributable to THESL for 2025 through 2029 based on the Future Framework savings set out in the IESO's 2022 Planning Outlook? (Note: Please assume split between Residential and Business is the same as that in the 2021-2024 Framework)

RESPONSE (B):

The IESO's 2022 APO Conservation - Annual Energy Demand Savings (TWh)[1] does not disclose underlying data to accurately incorporate the figures into the load forecast. Most notably, Toronto Hydro would require insight into assumptions regarding the wind-down of the 2021-2024 framework, the ramp-up of future framework savings and the degree to which they incorporate continuation of existing programs, and the methodologies pertaining to CDM persistence.

QUESTION (C):

c) Please provide a revised Load Forecast for 2025-2029 using the results from part (b) to derive the Residential and Business CDM variables for 2025-2029.

[1] Figures 19 and 20, 2022 Annual Planning Outlook https://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/apo/Dec2022/Demand-Forecast-Module-Data.xlsb

RESPONSE (C):

Please refer to the response 3-VECC-36, b).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-37

Reference: Exhibit 3, Tab 1, Schedule 1, Table 4, Pages 7 and 17 and Appendices A & B

QUESTION (A):

a) For each of the six customer classes that uses a regression model to forecast energy usage, please provide a schedule (i.e., a working excel file) that sets out the calculation of the 2023 to 2029 monthly (and resulting annual) energy usage forecast using the forecast values for each class model's explanatory variables and the coefficients from the regression models in Appendix B.

RESPONSE (A):

Please refer to 3-VECC-37 Appendix A, Tab "2023-2029 Load Forecast".

QUESTION (B):

b) For each of these customer classes please provide a schedule that sets out the predicted monthly energy usage for 2023 versus the actual monthly energy usage for all months where actual data is available.

RESPONSE (B):

Please refer to 3-VECC-37 Appendix A, Tab "2013-2022 Predicted Values".

QUESTION (C):

c) For the Street Lighting class, please provide a schedule that set outs: i) the calculation of the average use per device used to forecast energy usage and ii) the calculation of the resulting energy usage forecast for 2023-2029.

RESPONSE (C):

Please refer to 3-VECC-37 Appendix B for the calculations related to Street Lighting.

QUESTION (D):

d) Please confirm that for the USL class the forecast usage for 2023-2029 was based on actual 2022 usage, adjusted in leap years for the number of days in the year.

RESPONSE (D):

Toronto Hydro confirms the above response.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-38

Reference: Exhibit 3, Tab 1, Schedule 1, Table 4, Pages 7 and 17 and Appendix B

QUESTION (A):

a) For each of the five customer classes that uses a regression model with CDM/day as an explanatory variable to forecast energy usage, please confirm that the coefficient for this variable ranges from -14 to -41, such that a 1 kWh/day increase in CDM leads a decrease in forecast daily usage that is an order or orders of magnitude larger.

RESPONSE (A):

The CDM/day variable is forecasted in MWh. The coefficient for the variable is such that for 1 kWh/day increase in CDM leads to a decrease in forecast daily usage ranges from -0.014 to -0.041 kWh.

QUESTION (B):

b) If confirmed, please explain why, intuitively, this is a reasonable result.

RESPONSE (B):

Please refer to 3-VECC-38, a).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-39

Reference: Exhibit 3, Tab 1, Schedule 1, Page 19

Preamble:

The Application states:

> "Toronto Hydro's forecast of monthly peak demand by customer class, which is used to determine revenue for those customers billed on a demand basis (GS 50-999 kW, GS 1000-4999 kW, Large User, and Street Lighting), is established using historical relationships between energy and demand. The utility uses the latest five-year average growth of this relationship for forecasting purposes. The resulting kW demand forecast is explicitly converted based on average power factors to determine the peak kVA demand forecast."

QUESTION:

For each of the four customer classes billed on a demand basis, please provide a schedule (working excel file) that sets out: i) the calculation of the energy to demand relationship used to forecast kW demand; ii) the calculation of the forecast 2023-2029 kW demand for each class and iii) the conversion of the forecast kW demand to a peak kVA demand forecast.

RESPONSE:

Please refer to 3-VECC-39 Appendix A for a working excel file that sets out the requested calculations for the GS 50-999 kW, GS 1000-4999 kW, Large Use and Street Lighting customer classes.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-40

Reference: Exhibit 3, Tab 1, Schedule 1, Page 21
City of Toronto, Electric Vehicle Strategy, Page 13

Preamble:

The Application states:

> "Toronto Hydro developed the EV forecast as an input to Clearspring's integration model. The forecast was developed in reference to the three vehicle types: LDEV (battery and plug-in electric), MDEV, and HDEV. The EV forecast was developed to be consistent with the City of Toronto's EV Strategy targets:
> • 2025 - 15% of new vehicle sales and 5% of total light duty vehicles be classified as EVs; and
> • 2030 - 40% of new vehicles sales and 20% of total light duty vehicles be classified as EVs, totalling 220,000 LDEVs."
>
> The City of Toronto's Electric Vehicle Strategy states that the interim goals for EV adoption are:
> - By 2025, 5% of registered personal vehicles are EVs;
> - By 2030, 20% of registered personal vehicles are EVs;
> - By 2040, 80% of registered personal vehicles are EVs; and By 2050, 100% of registered personal vehicles are EVs.

QUESTION (A):

a) Are Light-Duty (LD) vehicles as referred to in the Application equivalent to the "personal vehicles" referred to the City of Toronto's strategy?

RESPONSE (A):

Toronto Hydro confirms Light-Duty (LD) vehicles as referred to in the Application is equivalent to the "personal vehicles" referred to the City of Toronto's strategy.

QUESTION (B):

b) The Application indicates that the City of Toronto strategy goal/target is for 220,000 LDEVs by 2030. Please indicate where in the Strategy document the 220,000 goal/target is referenced.

RESPONSE (B):

The strategy target is referenced in the City of Toronto's Report for Action on its Electric Vehicle Strategy on page 1 of 9, paragraph four[1]. The report references the 2030 target as 220,000 LDEVs, approximately 20% of personal vehicles. This is aligned with referenced report in Exhibit 3, Tab 1, Schedule 1.

[1] City of Toronto's Report for Action on its Electric Vehicle Strategy, https://www.toronto.ca/legdocs/mmis/2020/ie/bgrd/backgroundfile-141238.pdf

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-41

Reference: **Exhibit 3, Tab 1, Schedule 1, Page 22**

City of Toronto, Electric Vehicle Strategy, Page 13 (FN #17)

Preamble:

The Application states:

> "The LDEV forecast was developed by using historical Light-Duty Vehicles ("LDV") population in Ontario, as well average annual growth rates, for which an extrapolation for Toronto and LDEV forecasts were created. The number of new LDV and LDEV registrations in Ontario were obtained from StatsCan. The reported values were used to estimate the number of new LDVs and LDEVs registered each year in Toronto. It is estimated that approximately 12.7 percent of new vehicles registered in Ontario each year are registered in Toronto."

QUESTION (A):

a) Please fully explain what data was received from StatsCan and how it was used to estimate the number of new LDVs and LDEVs registered in Toronto each year. Please provide a working excel file setting out the supporting calculations for the forecast LDEVs in Toronto for 2023-2029.

RESPONSE (A):

Toronto Hydro estimated the size and growth of total LDV population in Toronto based on available data on new LDV registrations in Ontario obtained from StatsCan[1], and assumed that the long-term average of new vehicles registrations would be consistent with the levels seen in 2017-2019 (pre-COVID).

Toronto Hydro utilized data from the Ontario Ministry of Transportation to obtain the number of LDEVs in Toronto for 2018 to 2021. Toronto's share of Ontario's new vehicles is assumed to be constant over time at 12.7%. The forecast of new vehicle registration and total vehicles registered each year was built up to achieve 20% of the total LDV fleet in 2030, a target provided by City of Toronto's Electric Vehicles Strategy.

Toronto Hydro estimated that there will be 1.1M LDVs registered in Toronto in 2030 based on the assumption that annual growth in new LDV registrations will average 1% during the forecast period. These assumptions led to an estimation of 220,000 LDEVs in Toronto by 2030, and the 20% LDEV target provided by the City of Toronto. Please refer to 3-VECC-41, Appendix A for the supporting calculations.

QUESTION (B):

b) It is noted the City of Toronto EV Strategy relied on data obtained from the Ontario Ministry of Transportation regarding registered LDVs and LDEV's in Toronto. Did THESL also use data from the source?

RESPONSE (B):

Please refer to Toronto Hydro's response to 3-VECC-41, a).

[1] New motor vehicle registrations: Quarterly data visualization tool, https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2021019-eng.htm

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-42

Reference: **Exhibit 3, Tab 1, Schedule 1, Pages 22 - 23**
City of Toronto, Electric Vehicle Strategy

Preamble:

The Application states:

> "The MDEV and HDEV forecasts were also developed using the historical vehicle population in Ontario, as well average annual growth rates, for which an extrapolation for Toronto and EV forecasts were created. With the annual growth rate of both vehicle classes, a provincial wide population forecast was derived. Toronto accounts for approximately 20% of the provincial medium and heavy-duty vehicle population. The HDEV forecast also includes vehicle growth from the Toronto Transit Commission ("TTC")."

> "An adoption rate was then developed to establish how rapidly MDEVs and HDEVs would need to be adopted to meet the City's EV Strategy Target. A materialization factor was also added to the MDEV and HDEV forecasts as an adjustment to account for delayed adoption. Internal analysis shows that commercial customers typically have delayed completion dates compared to their original estimated completion dates. Internal analysis was based on energization project materialization between estimated and actual completion dates."

QUESTION (A):

a) Does the City of Toronto's EV Strategy include goals/targets for MDEV and HDEV? If yes, what are they and where are they set out in the Strategy document?

RESPONSE (A):

The City of Toronto's EV Strategy did not include specific targets for MDEVs and HDEVs. Toronto Hydro developed adoption rates as a linear trend to meet the City's EV Strategy Target of 100% zero emission transportation by 2050.

QUESTION (B):

b) With respect to the MDEV and HDEV forecasts, please outline: i) what historical data was employed (including sources) and ii) how it was used (in conjunction with the targets) to develop the forecasts for MDEVs and HDEVs in Toronto. Please provide working excel files setting out the supporting calculations of the forecast MDEVs and HDEVs in Toronto for 2023-2029.

RESPONSE (B):

Historical Medium and Heavy-Duty vehicle population counts for 2015-2019 for the province of Ontario were obtained through Stats Canada.[1] With the annual growth rates of both vehicle classes, a provincial wide population forecast was derived. Subsequently, the ratio of the City of Toronto's population of 20% was utilized to assume the provincial medium and heavy-duty vehicle population. The resulting MD and HD vehicles in Toronto were used, in conjunction with the EV adoption rates described in 3-VECC-42, a) to develop the MDEV and HDEV vehicle forecasts. Please refer to Appendix A for supporting calculations.

[1] https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2021019-eng.htm

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-43

References: **Exhibit 3, Tab 1, Schedule 1, Page 22 (Table 6)**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 12-13 and 18-19

<u>Preamble:</u>

Appendix J states:

> "To integrate the LDEV forecasted energy into the revenue forecast, the incremental load of LDEVs for each rate class from their 2022 adoption levels are added to the revenue forecast." (page 13)

> "To integrate the MDEV/HDEV forecasted energy into the revenue forecast, the incremental load of MDEV and HDEVs for each rate class from their 2022 adoption levels are added to the revenue forecast." (page 19)

QUESTION (A):

a) Appendix J provides the number of LDEVs in Toronto dating back to 2019 and the number of MDEVs and HDEVs in Toronto as of 2022. Please provide an estimate as to the number of LDEVs, MDEVs and HDEVs that were registered in Toronto in 2002.

RESPONSE (A):

Toronto Hydro does not have the requested information and cannot obtain this information within the interrogatory response timelines for 2002.

QUESTION (B):

b) Please confirm that: i) the number of registered LDEVs, MDEVs and HDEVs in Toronto have each increased between 2002 and 2022, ii) this increase in registrations will have increased the energy usage in the Residential, CSMUR, GS<50, GS50-999, GS1,000-4,999 and Large Use classes as between 2002 and 2022 and iii) the forecast 2023-2029 energy usage for each of these customer classes will (implicitly) reflect a continuing increase in energy usage by EVs.

RESPONSE (B):

Toronto Hydro confirms the above statements.

QUESTION (C):

c) If part (b) is not confirmed, please explain why.

RESPONSE (C):

Please refer to Toronto Hydro's response in 3-VECC-43, b).

QUESTION (D):

d) If part (b) is confirmed, will the approach used by Clearspring in Appendix J lead to a double counting of some portion of the incremental load attributable to EVs for these classes? If not, why not?

RESPONSE (D) – PREPARED BY CLEARSPRING:

The Integration Model developed by Clearspring addressed the issue of double counting by calculating the incremental number of EVs from the last year of the base load forecast dataset, which is 2022. Only the added EVs from 2022 will add to energy usage in the Integration Model.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-44

Reference(s): **Exhibit 3, Tab 1, Schedule 1, page 24 (Table 7)**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts)

<u>Preamble</u>:

Appendix J states:

"The electric vehicles will mostly be charged at the owner's residence. However, some of the LDEVs will be charged at alternate locations, typically at the place of work. The energy required for home charging will add to residential energy use and the alternate locational charging will add to the general service rate classes. Integration of the LDEVs into the revenue forecast requires an assumption on the rate class split of where charging will occur. The Integration Model assumes 91% of LDEV charging in Toronto will occur at home. The five rate classes based on Toronto Hydro data on the percentage of Level 2 EV chargers in those five rate classes." (page 11)

"Toronto Hydro estimated that an average Toronto LDEV driver will average 40.3 km/day. The EV efficiency factor is estimated by Toronto Hydro at .233 kWh/km. Multiplying these two components together produces the estimate of each LDEV requiring 9.4 kWh per day, which appears reasonable to Clearspring based on our experience and other external sources." (page 12)

"The forecasts are translated into monthly forecasts using the monthly LDEV counts found in Table 4 and multiplying the average daily kWh charging by the number of days in each month. An additional monthly adjustment is made to account for the reality that EV batteries perform worse in cold temperatures. To adjust for this, the Integration Model adds 10 percent to the energy totals in winter months and subtracted 10 percent to the energy totals in summer months." (page 13)

QUESTION (A):

a) With respect to page 12, what is the basis for THESL's estimates that: i) an average Toronto LDEV driver will average 40.3 km/day and ii) the EV efficiency factor is estimated by Toronto Hydro at .233 kWh/km?

RESPONSE (A):

Toronto Hydro relied from USDRIVE's report on EVs at Scale and the U.S. electric power system[1], which assumes an average annual distance of 12,000 miles and 300 Wh/mi. Toronto Hydro made an adjustment to this assumption to reflect the distance travelled by a Toronto driver. A Toronto driver's average annual vehicle kms driven is 14,186kms or 38.9 kms/day, while the Ontario's equivalent is 14,175kms or 40.3 kms/day respectively[2]. Toronto Hydro assumed that EV adopters will convert to electric vehicles because they may be higher mileage drivers, hence relying on the Ontario average driven per day. The combination of these two assumptions led to the estimated EV efficiency factor or 0.233 kWh/km.

QUESTION (B):

b) With respect to page 11, does the assignment of charging requirements to customer classes take into consideration that some charging of LDEVs registered in Toronto will take place outside THESL's service area (e.g., charging during vacation travel). If not, does THESL have any estimate to how this would impact the forecasts set out in Table 5?

RESPONSE (B) - PREPARED BY CLEARSPRING:

No, that consideration does not enter the model. The inverse of the statement will have a balancing effect, that is, there will be some LDEVs that are not registered in Toronto but will be charged in Toronto Hydro's service territory. Clearspring is not aware of any estimates in this regard and is therefore unable, from a data perspective, to adjust for this consideration.

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[1] US Drive: Summary Report on Evs at Scale and the U.S. Electric Power System https://www.energy.gov/eere/vehicles/articles/summary-report-evs-scale-and-us-electric-power-system-2019

[2] https://www.insurancehotline.com/resources/did-ontario-motorists-drive-fewer-kilometres-2020

QUESTION (C):

c) With respect to page 13, given there are only 5 summer months (per Footnote #17), does this adjustment increase the total forecasted kWhs attributed to LDEVs?

RESPONSE (C) - PREPARED BY CLEARSPRING:

Yes, compared to having six summer months, this would slightly increase the forecasted kWhs attributable to LDEVs.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-45

Reference: **Exhibit 3, Tab 1, Schedule 1, Table 8, Page 24**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 14-15

Preamble:

Appendix J states:

> "A load profile that estimates the hourly charging requirements of an LDEV at the general service customer premise is necessary to forecast the impact of LDEVs on billing demand. Most of this
> charging will be from commuters who are working at the place of business. The Integration Model uses a load profile that estimates "at work" charging behavior per LDEV from the U.S. Department of Energy (DOE) Alternative Fuels Data Center. The DOE profile is scaled to match the LDEV energy charging assumptions that were provided to Clearspring by Toronto Hydro. The model scales the profile to match the energy use estimate of 9.4 kWh and adjusts for summer and winter differences in battery efficiency. The winter and summer LDEV load profiles for "at work" charging used in the analysis are provided in the following table." (page 14)

QUESTION (A):

a) Please explain how the differences in winter vs. summer battery efficiency will impact the kW (as opposed to kWh) requirements for a charging.

RESPONSE (A) – PREPARED BY CLEARSPRING:

The EV battery will be further depleted, assuming the same driving distances, during cold weather versus mild or hot weather. This will require more kWhs at charging. The average kWs in each hour will, therefore, increase by a corresponding amount to deliver the energy to the EV battery.

QUESTION (B):

b) For each of the customer classes in Table 8, please indicate which of hourly values in Table 7 (Appendix J) were used to determine the billing demand associated with LDEVs and basis on which that hour was chosen.

RESPONSE (B) – PREPARED BY CLEARSPRING:

All of the hours found on Table 7 are used in determining the billing demand associated with LDEVs. For the customer classes found in Table 8, Clearspring received 8,760 hourly data for a suitable sample size of customers in each of those customer classes. From that data, we calculated the monthly peak hour for each specific customer. We then added to each customer's 8,760 hourly loads the load profile found in Table 7. After adding the LDEV load profile, we can re-examine what the new monthly peak demands will be. This may be in the same hour as the pre-LDEV load profile for the customer or may be in a new hour due to the LDEV load profile changing the peak time. The model remains flexible and uses all hours of the year for this calculation. All three customer classes peak demand are calculated in this way.

QUESTION (C):

c) For each of the customer classes in Table 8, please provide a schedule (i.e., working excel file) that sets out how total billing demands associated with LDEVs were determined for the years 2025-2029.

SUPPLEMENTARY RESPONSE (C) PREPARED BY TORONTO HYDRO:

Clearspring's working papers have been filed confidentially as an appendix to Toronto Hydro's response to 3-DRC-14(a).

RESPONSE (C) – PREPARED BY CLEARSPRING:

Clearspring's working papers are being provided on a confidential basis, pursuant to the OEB Practice Direction on Confidential Filings.

There are four Excel files that comprise the Integration Model. The primary file is titled "Integration Model". This is where the calculations for the billing demand of each rate are aggregated and displayed for both energy and billing demand. The tables found in the report are produced in here.

Three additional files produce the average billing demand impacts per each of the studied technologies that are then inputted into the Integration Model. These average billing demand inputs are pasted into the Integration Model in the worksheet titled "Demand Impacts per unit" in columns C through H in the appropriate month and technology which are all labeled in the worksheet.

The first input file is titled, "Average Demand Calculator GS 1 to 5 MW". This file calculates the average impact of the technology for each customer in the GS 1 to 5 MW customer class. The file includes all the 2019 AMI hourly data for every customer in that class. For each technology on the "Load Shapes" worksheet, the load shape of the technology needs to be put into column B (shaded in green). These load shapes are found in columns D through N in the Load Shapes worksheet. The multiplier cell C2 in the Load Shapes worksheet needs to be put in as the appropriate multiplier for the technology and customer class being examined. These are found in the Integration Model's worksheet titled "inputs" in columns M, N, and P. In the Average Demand GS 1 to 5 MW file once technology load shape is entered and the multiplier, the average demand impact by customer will automatically calculate and be displayed in the worksheet "Results" in column C, rows 28 to 39 for each month. The calculations may take awhile as the file is adding the hourly technology profile to 8,760 observations for every customer in that customer class, calculating what the new billing peak is in each month for that customer, and then subtracting that from the pre-technology billing peak for every customer. All those customer billing demand changes are then averaged to determine the average billing demand impact by customer for the technology being studied. These results in column C of the Results worksheet are the ones that are inputted into the Integration Model in the worksheet titled "Demand Impacts per unit" in columns C through H and then the customer class billing demands are aggregated in the Integration Model based on how much of the incremental technology is forecasted to be present and a power factor adjustment to translate into KVa.

The two other input files work in the exact same manner but for the other two customer classes that have a billing demand component to rates. These files are titled "Average Demand Calculator GS 50 to 999 kW" and "Average Demand Calculator LU". The LU calculator includes all the Large Use customer data in 2019. The GS 50 to 999kW calculator is a sample of 197 customers to enable the file size to be manageable because of the larger number of customers in that customer class.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-46

References: **Exhibit 3, Tab 1, Schedule 1, Page 24 (Table 7)**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 17-19

Preamble:

Appendix J states:

> "The MDEVs and HDEVs count forecasts for Toronto Hydro are allocated to the rate classes. The Integration Model uses the Manufacturing and Warehouse kWh usage percentages by rate class provided by Toronto Hydro to allocate the MDEVs by rate class. For the HDEV rate class allocations, the model uses the same Manufacturing and Warehouse kWh usage percentages plus the Toronto Transit Commission ("TTC") garage kWh usage. The TTC garage usage, which was provided by Toronto Hydro, and was added to the HDEV allocations because of TTC's Green Bus Program, is forecasted to purchase and add several electric buses to its fleet, which would be classified as HDEVs." (page 17)

> "The Integration Model assumes that MDEVs require 103.56 kWh per day and HDEVs require 319.87 kWh of electricity per day. Both of these assumptions were provided from Toronto Hydro." (page 18)

QUESTION (A):

a) Please clarify whether in allocating the MDEVs and HDEVs to rate classes Clearspring uses: i) the total kWh for each rate class as provided by THESL or ii) the HDEV and MDEV charging kWh in Manufacturing and Warehouses as provided by THESL.

RESPONSE (A) PREPARED BY CLEASPRING:

The first one described in i).

QUESTION (B):

b) With respect to page 18, please indicate the basis for: i) the assumed MDEVs requirement of 103.56 kWh per day and ii) the assumed HDEVs requirement of 319.87 kWh of electricity per day.

RESPONSE (B) PREPARED BY TORONTO HYDRO:

Toronto Hydro obtained forecasts of fleet charging profiles from Lawrence Berkeley National Laboratory in California[1]. These fleet forecasts are projections of charging demand profiles for fleets in California in 2030. Toronto Hydro revised the forecast to better fit Toronto's environment by removing off-road vehicles and other non-relevant vehicles.

QUESTION (C):

c) Please explain why the kWh associated with the TTC's Green Bus Program weren't directly estimated and added to the customer class in which TTC load is billed.

RESPONSE (C) PREPARED BY TORONTO HYDRO:

Toronto Hydro was not able to estimate the number of MDEVs and HDEVs associated with the TTC's Green Bus Program after developing the EV adoption rates as defined in interrogatory 3-VECC -42, a), and could not directly estimate the associated kWh.

QUESTION (D):

d) With respect to page 19, does the assignment of charging requirements to customer classes take into consideration that some charging of MDEVs and HDEVs registered in Toronto will take place outside THESL's service area (e.g., charging during deliveries outside

[1] Individual Charging Profile in 2030, California: Lawrence Berkely National Laboratory, 2022

Toronto). If not, does THESL have any estimate to how this would impact the forecasts set out in Tables 13 and 14 (Appendix J)?

RESPONSE (D) PREPARED BY CLEASPRING:

Please see response to 3-VECC-44 (b) as this applies to the MDEVs and HDEVs in the same manner.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-47

Reference: **Exhibit 3, Tab 1, Schedule 1, Table 8, Page 24**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), pages 14-15

Preamble:

Appendix J states:

> "MDEVs and HDEVs will put upward pressure on Toronto Hydro's three rate classes with billing demand, and that pressure is a function of the number of EVs being charged at the premise, the load profiles of those EVs, and the base load profile for that customer. The model accounts for these factors by using hourly load profiles of the MDEV and HDEVs, analyzing smart meter interval data for customers from Toronto Hydro, and then examining how the estimated number of MDEV and HDEVs would impact billing demand for each general service customer." (pages 21-22)

QUESTION (A):

a) For each of the customer classes in Table 20, please indicate which of hourly values in Table 19 (Appendix J) were used to determine the billing demand associated with MDEVs and HDEVs and basis on which that hour was chosen for each class.

RESPONSE (A) – PREPARED BY CLEASPRING:

Please see the response to 3-VECC-45 (b) as the response is the same except applied to MDEVs and HDEVs.

QUESTION (B):

b) For each of the customer classes in Table 19, please provide a schedule (i.e., working excel file) that sets out how total billing demands associated with MDEVs and HDEVs were determined for the years 2025-2029.

RESPONSE (B) – PREPARED BY CLEASPRING:

Please see the response to 3-VECC-45 (c).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC -48

Reference: **Exhibit 3, Tab 1, Schedule 1, pages 24-25 (Tables 9 & 10)**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), pages 24-27

<u>Preamble:</u>

Appendix J states:

> "Toronto Hydro provided the Renewable nameplate capacity forecast, and historical, data to Clearspring. It is Clearspring's understanding that the Renewable forecast is entirely driven by solar. The forecasts appear to be reasonable expectations of near-term technology adoption based on our experience with other clients in forecasting solar resources." (page 24)

> "The Renewable capacity forecasted for Toronto Hydro is allocated to the different rate classes. The Integration Model uses the 2022 participation percentages in Toronto Hydro's net metering program by rate class to estimate the rate class allocations." (page 24)

> "To integrate the Renewable forecasted energy into the revenue forecast, the incremental production of Renewables for each rate class from their 2022 adoption levels are added to the revenue forecast. The incremental production forecasted in each month in 2025 to 2029 is the difference between that month's forecasted production and the same month in 2022. The incremental production is used since the base revenue forecast uses a dataset through 2022 and, therefore, already has the 2022 Renewable production embedded into the forecast."

QUESTION (A):

a) Please provide an estimate at to the renewable (solar) capacity installed in the THESL service area in 2002 and the associated annual energy production.

RESPONSE (A):

In 2002, Toronto Hydro had 2 solar projects connected with a capacity of 2.5 kW.

QUESTION (B):

b) When did THESL' net metering program start? Please provide an estimate of the renewable capacity in place at that time and a breakdown by customer class based on the net metering program's participation.

RESPONSE (B):

The net metering program started in 2005. In 2005 there was 5.4 MW of renewable capacity. There were three net metering projects at that time, all residential customers (micro projects).

QUESTION (C):

c) Please confirm that: i) the renewable capacity in Toronto has increased between 2002 and 2022, ii) this increase in capacity will have increased the behind the meter energy production in the Residential, CSMUR, GS<50, GS50-999 and GS1,000-4,999 classes as between 2002 and 2022 and iii) the forecast 2023-2029 energy usage for each of these customer classes will (implicitly) reflect a continuing increase in renewable energy production for these classes.

RESPONSE (C):

Toronto Hydro confirms statements c) i, ii, iii above.

RESPONSE – PREPARED BY CLEASPRING:

Please see response to 3-VECC-43 (b).

QUESTION (D):

d) If part (c) is not confirmed, please explain why.

RESPONSE (D):

Please refer to Toronto Hydro's response in 3-VECC-48, c).

QUESTION (E):

e) If part (c) is confirmed, will the approach used by Clearspring in Appendix J determine the incremental renewable energy production after 2022 result in a double counting of some portion of the incremental energy production attributed to renewable capacity for these classes? If not, why not?

RESPONSE – PREPARED BY CLEASPRING:

Please see the response to 3-VECC-43 (d) as the same modeling mechanics apply to renewable energy.

QUESTION (F):

f) For 2022 what was energy delivered to THESL by rate class under the net metering program and what does this represent as a portion of the total renewable energy produced in 2022 (per Table 27) for each customer class?

RESPONSE (F):

Please refer to response 3-VECC-45, c).

QUESTION (G):

g) Has the estimation of the load reduction due to renewable capacity in 2022 and also in 2025-2029 been adjusted to account for the fact that not all renewable production leads to a decrease in energy deliveries to THESL' customers (i.e., a portion of the energy is delivered to THESL)? If not, please revise Tables 27 and 28 accordingly.

RESPONSE – PREPARED BY CLEASPRING:

The Integration Model does not adjust for this. Clearspring is not aware of the data being available to make this adjustment.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-49

Reference: **Exhibit 3, Tab 1, Schedule 1, Table 11, Page 26**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 25 & 27

Preamble:

Appendix J states:

> "Renewables will put downward pressure on Toronto Hydro's three rate classes regarding billing demand, and that pressure is a function of the nameplate capacity producing at the premise,
> the production profiles of those Renewables (provided in the table in the prior subsection), and the base load profile for that customer. The Integration Model accounts for these factors by using the hourly Renewable capacity factors, analyzing smart meter interval data for customers from Toronto Hydro, and then examining how the estimated production of the Renewables would impact billing demand for each general service customer." (page 27)

QUESTION:

Using the GS 50-999 class, please demonstrate how the impact of renewable on billing demand was determined and provide a working excel file setting out the calculations.

RESPONSE – PREPARED BY CLEASPRING:

Please see the response to 3-VECC-45 (c).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-50

References: **Exhibit 3, Tab 1, Schedule 1, Page 25 (Tables 9 &10)**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 28-30

Preamble:

Appendix J states:

> "Toronto Hydro provided the behind-the-meter Non-Renewable nameplate capacity forecast and historical data to Clearspring. It is Clearspring's understanding that these Non-Renewable DERs will be actively dispatched by the IESO. The forecasts increase substantially until 2024 and then grow by less than two percent thereafter." (page 28)

> "The Non-Renewable capacity forecasted for Toronto Hydro is then allocated to the different rate classes. The Integration Model uses the current nameplate capacity of non-renewable generation by rate class to estimate the rate class allocations." (page 28)

> "Unlike Renewables, Non-Renewables can continuously and consistently produce the same amount of electricity in any hour of the day and are not significantly impacted by winter/summer conditions. Toronto Hydro provided the capacity factors by hour for the existing Non-Renewable generation on its system that are dispatched by the IESO. These capacity factors are for an average day and are the same for both winter and summer months." (pages 28-29)

QUESTION (A)

a) Can THESL confirm that all of the current (i.e., as of 2022) non-renewable capacity is dispatched by the IESO? If not confirmed, what percentage of the kW capacity is currently dispatched by the IESO and what is the estimated hourly capacity factor for the non-renewable capacity that is not dispatched?

RESPONSE (A):

Toronto Hydro has over 2,500 customer-owned DERs connected to its distribution system. Toronto Hydro does not collect detailed information about the number of DERs that are currently Market Participants (i.e., dispatched by the IESO).

QUESTION (B):

b) Can THESL confirm that all of the incremental non-renewable capacity to be installed post-2022 will be dispatched by the IESO? If not, for each year 2023-2029 what portion of the incremental non-renewable capacity does THESL expect will be dispatched by the IESO?

RESPONSE (B):

Please see the response to 3-VECC-50 part (a).

QUESTION (C):

c) Does all of the current (i.e., 2022) production by non-renewable capacity go towards reducing customer purchases from electricity or is a portion of it delivered to the THESL system? If a portion was delivered to the THESL system in 2022, what percentage of the total production attributed to each rate class (per Table 35) was delivered to the THESL system?

RESPONSE (C):

Correct, all production by non-renewable capacity goes towards reducing customer purchases from the grid. Toronto Hydro does not purchase electricity from customer DERs. Any electricity sold to the grid would be paid for by the IESO.

QUESTION (D):

d) If a portion of non-renewable production is currently (2022) delivered to the THESL system, has the estimation of the load reduction due to non-renewable capacity in 2022 and also in 2025-2029 been adjusted to account for the fact that not all non- renewable production leads to a decrease in energy deliveries to THESL' customers? If not, revise Tables 35 and 36 accordingly.

RESPONSE (D) PREPARED BY CLEASPRING:

The Integration Model does not adjust for this. Clearspring is not aware of the data being available to make this adjustment.

QUESTION (E):

e) Please provide an estimate as to the non-renewable capacity installed in the THESL service area in 2002 and the associated annual energy production.

RESPONSE (E) PREPARED BY TORONTO HYDRO:

As of 2002, Toronto Hydro had 11 non-renewable projects connected with a capacity of 18.9 MW.

QUESTION (F):

f) Please confirm that:

   i. the non-renewable capacity in Toronto has increased between 2002 and 2022,

   ii. this increase in capacity will have increased the behind the meter energy production in the GS<50, GS50-999, GS1,000-4,999 and Large Use classes as between 2002 and 2022 and

iii. the forecast 2023-2029 energy usage for each of these customer classes will (implicitly) reflect a continuing increase in renewable energy production for these classes.

RESPONSE (F):

i) Yes, there has been an increase in non-renewable capacity between 2002 and 2022. In 2002 the non-renewable capacity connected was 18.9 MW and it increased to 169.5 MW in 2022.
ii) Yes, the increase in capacity will have increased behind the meter production in each rate class.
iii) Yes, our forecast projects there will be an increase of renewable energy production for each rate class.

QUESTION (G)

g) If part (f) is not confirmed, please explain why.

RESPONSE (G):

Part (f) is confirmed.

QUESTION (H)

h) If part (f) is confirmed, will the approach used by Clearspring in Appendix J to determine the incremental non-renewable energy production after 2022 result in a double counting of some portion of the incremental energy production attributed to non-renewable capacity for these classes? If not, why not?

RESPONSE (H) PREPARED BY CLEASPRING:

Please see the response to 3-VECC-43 (d) as the same modeling mechanics apply to non-renewable energy production.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-51

Reference: **Exhibit 3, Tab 1, Schedule 1, Table 11, Page 26**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 29 & 31

<u>Preamble:</u>

Appendix J states:

> "Non-Renewables will put downward pressure on billing demand and is a function of the nameplate capacity producing at the premise, the production profiles of those Non-Renewables
> (provided in the table in the prior subsection), and the base load profile for every customer. The Integration Model accounts for these factors by using the hourly Non-Renewable capacity factors provided by Toronto Hydro, receiving smart meter interval data for customers from Toronto Hydro, and then analyzing how the estimated production of the Non-Renewables would impact billing demand for each general service customer.."
> (page 31)

QUESTION:

Using the GS 50-999 class, please demonstrate how the impact of non-renewable on billing demand was determined and provide a working excel file setting out the calculations.

RESPONSE – PREPARED BY CLEASPRING:

Please see the response to 3-VECC-45 (c).

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-52

Reference: **Exhibit 3, Tab 1, Schedule 1, Pages 25 - 26**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 29 & 31

Preamble:

Appendix J states: "Energy storage can be used for multiple purposes. One viable option may be for back-up power when outages are encountered. Another possible purpose is to reduce billing peaks or shift energy use from on peak to off-peak. If energy storage is actively used to reduce billing demands, this could have the impact of reducing demands but increasing energy use at the premise through energy losses that result from the inefficiency in the discharge/charging cycle. Under the back-up option, there would be minimal impacts on demand and energy. It is unclear how energy storage will be used in the future on Toronto Hydro's system. There is no evidence yet that reveals how energy storage may be used on the system and if its presence will result in meaningful energy or billing demand changes. Given this current lack of evidence, it is assumed that energy storage will only be used for back-up power through the forecast period meaning that energy storage is assumed to have zero kWh and zero kW impacts." (page 32)

QUESTION (A):

a) Please provide any insights THESL has as to the use of energy storage by current customers (i.e., is it just used for back-up power in the event of an outage or is also used to reduce billing peaks or shift energy use from on-peak to off-peak)?

RESPONSE (A):

As noted in Exhibit 2B Section E5.1 Table 4, there are only 28 customer-owned energy storage systems connected to Toronto Hydro's service area, representing about 1% of the total number of

DERs connected as of 2022. Toronto Hydro is unable to comment on how these assets are being used as that information is not readily available at this time.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-53

Reference: **Exhibit 3, Tab 1, Schedule 1, Page 17 and 19**
Exhibit 3, Tab 1, Schedule 1, Appendix J (Integration of Revenue Forecast with Electric Vehicle and Distributed Energy Resource Forecasts), Pages 13, 15, 20, 22, 26, 27, 30, 31 and 34, and Appendix 2-IB

QUESTION (A):

a) For each rate class please provide a schedule that set out for the years 2025-2029 the contribution to the forecast kWh and kVA (where applicable) as set out in Appendix 2-IB from each of the following: i) the results of the energy models, ii) LDEVs, iii) MDEVs, iv) HDEVs, v) renewable resources, and vi) non-renewable resources.

RESPONSE (A):

Please refer to Appendix A for the requested schedule.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC -54

References: Exhibit 3, Tab 2, Schedule 1, Pages 1-3
Appendix 2-H

QUESTION :

With respect to Appendix 2-H and the details regarding Account #4235, please explain: i) the negative microFIT revenues in 2020 and 2021 and ii) why microFIT revenues are lower in the 2024-2029 period than in the previous years.

RESPONSE:

i. The MicroFIT line of Account 4235 in Appendix 2-H captures both microFIT service charges and fees for connecting customer-owned generation facilities, with the latter costs typically being the larger driver in this line item. In 2020 and 2021, Toronto Hydro experienced immaterial variances between its generation connection revenues and costs of less than $30,000 and $40,000, respectively, which resulted in negative revenues for those years. These immaterial variances resulted due to unrecovered costs of investigative engineering design and field work associated with customer generation connection requests that never materialized.

ii. The immaterial variance of $20,000 to $50,000 forecasted for generation connection revenues in 2024-2025 compared to 2023 forecast is a result of the variable demand which differs from year to year depending on the number of customer connection requests. Toronto Hydro has forecasted 2025 revenues using trending from 2021-2023 and escalated it by inflation for the 2026-2029 period. These variances would not have a material impact on the revenue requirement for Toronto Hydro.

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC -55

References: Exhibit 3, Tab 2, Schedule 1, Pages 4-5
Appendix 2-H

QUESTION:

Please provide a detailed breakdown as to the sources of the historic and forecast revenue for Account #4210.

RESPONSE:

Please see below the detailed breakdown of the sources of the historic and forecast revenues for Account #4210. For 2025, Toronto Hydro forecasted a revenue of $1.0 million for wireless attachments (Account 1508 – subaccount – Wireless Attachments) and escalated this forecast by inflation for the 2026-2029 period as part of Other Revenue. This approach passes an immediate benefit to ratepayers via a reduction to base Revenue Requirement.

Table 1: Account #4210 Breakdown (in $ million)

Account Details	Actual			Bridge		Forecast				
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Duct Rental	10.5	10.4	10.8	11.0	11.2	11.8	12.0	12.3	12.5	12.7
Pole Rental Wireline	5.2	5.2	5.4	5.5	5.8	4.7	4.8	4.9	5.0	5.1
Pole Rental Wireless	-	-	-	-	-	1.0	1.0	1.0	1.1	1.1
Property Rental	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total	**16.1**	**16.0**	**16.7**	**17.0**	**17.5**	**18.0**	**18.3**	**18.7**	**19.1**	**19.4**

RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

INTERROGATORY 3-VECC-56

References: Exhibit 3, Tab 2, Schedule 1, Page 1
Appendix 2-H

QUESTION (A):

a) Please provide a schedule setting out the actual 2023 Other Revenues at the same level of detail as provided in Appendix 2-H. (Note: If actuals are not available for all of 2023, please provide year-to-date numbers and the year-to-date numbers for the equivalent period in 2022).

RESPONSE (A):

Please refer to Toronto Hydro's response to 1B-SEC-1, subpart (f).