

BURLINGTON HYDRO RESPONSES TO ENVIRONMENTAL DEFENCE INTERROGATORIES

ED-1**Transmission Losses**

1. Reference: Exhibit 8, Attachment 2, Tab Appendix 2-R Loss Factors

Preamble: Hydro Ottawa's Conservation and Demand Management Annual Reports for 2006 and 2007 describe a project relating to Distribution Loss Reduction as follows:

Description:

The Distribution Loss Reduction Program is a broad network based initiative to drive greater efficiencies within the distribution grid. This program will identify opportunities for system enhancements. Next steps will be to complete the engineering analysis and feasibility studies. Items to be addressed may include the following:

Power Factor Correction - A power factor assessment will be completed which will identify locations for the installation of power factor correction capacitor banks.

Voltage Conversion - Voltage upgrades can save up to 90% of the losses associated with a feeder as higher voltages and lower current results in lower losses. This study will ascertain the locations and value of voltage conversions.

Power System Load Balancing - This program is designed to ascertain where load shifting can occur to improve system efficiency. It is estimated that approximately 5% - 10% of system losses could be saved.

Voltage Profile Management - Changing voltage profiles at the distribution station level can result in a peak reduction at the controllable distribution stations.

Line Loss Reductions - Replacement of conductors can reduce line losses. An evaluation of where such opportunities exist may be undertaken.

Target users

The results of this program will positively impact all of Hydro Ottawa's customers.

Benefits

Reducing electricity distribution system delivery losses will have a number of positive impacts including reducing system demand, relieving network capacity to accommodate

growth and reducing the requirement for new generating capacity in the Province. Costs associated with distribution system delivery losses are recovered through electricity distribution charges. Reductions in these costs will therefore benefit all customers

The plan can be found here: EB-2019-0261, Technical Conference Undertakings, Undertaking TC-JT 3.15, Attachment A.

The most recent update can be found here: EB-2019-0261, Interrogatory Response, IRR ED-1, Attachment A.

Questions:

- a) Please review the work completed by Hydro Ottawa with respect to losses and create a chart detailing which items Burlington Hydro has and has not also completed. Please separately include each of the following areas:
 - a. Power Factor Correction
 - b. Voltage Conversion
 - c. Power System Load Balancing
 - d. Voltage Profile Management
 - e. Line Loss Reductions
- b) If there were three areas that Burlington Hydro could explore to find the most cost-effective opportunities to reduce losses, what would those be?

Response:

- a) BHI has no specific knowledge about Hydro Ottawa regarding line losses or their relationship to BHI's distribution system. This request seeks information that is irrelevant to the Application and that is beyond the permitted scope for interrogatories established by the OEB in its Rules and in this proceeding. Specifically, the reference does not align with the Application, the preamble is derived from an unrelated application by a different utility and the request is to provide fresh analysis relative to the activities of that other utility which would require a level of effort that is unreasonable for interrogatories. Moreover, this request is not consistent with the directions in Procedural Order #1 dated December 11, 2020, where the OEB identifies the specific aspects that parties should examine in this proceeding and specifies that "parties should not engage in detailed exploration of items that do not appear to be material". Nevertheless, in an effort to be responsive, BHI provides the following information in relation to this request.
 - a. BHI's system power factor status is above 0.9 and does not require correction. There are no power factor correction capacitors installed on BHI's distribution system. If, and when, power factor becomes an issue, BHI will take action to correct it.

- b. BHI limits growth on its legacy voltage systems and is not pursuing large scale voltage conversions at this time.
 - c. Power system load balancing is an integral part of design and operation of BHI's distribution system and is monitored 24/7/365. All voltage systems are operated and maintained in well balanced condition and all loads are supplied optimally from the distribution system.
 - d. BHI manages voltage profiles across all voltage systems and maintains voltage within CSA voltage limits at all times. There are no voltage regulators installed or required on BHI's distribution system. If future voltage issues were to arise, BHI is aware of the technical solutions available and will employ them as needed.
 - e. Line losses are considered as part of each project during system analysis and design and kept as low as practicable.
- b) BHI already pursues every practical, cost effective opportunity for loss reduction as a regular activity during the design phase of projects. This includes projects within its legacy 13.8kV and 4.16kV systems. BHI does not allow these voltage footprints to expand, and instead employs its 27.6kV system for load growth on their peripheries which is a means of avoiding line losses that would otherwise be incurred. The only additional step BHI could take is widespread voltage conversion of its legacy voltage areas, however, this would be extremely costly and the loss improvements alone could not justify it. Instead, BHI is taking advantage of incremental opportunities to improve losses in these areas.

ED-2**Transmission Losses**

2. Reference: Exhibit 8, Attachment 2, Tab Appendix 2-R Loss Factors

Questions:

- a) How does Burlington Hydro's rate of distribution system energy losses compare to other leading LDCs inside and outside of Ontario?
- b) How does Burlington Hydro compare to other LDCs in terms of its efforts to reduce distribution system energy losses? In what ways is or isn't Burlington Hydro a leader in this regard?

Response:

- a) This request seeks information that is irrelevant to the Application and that is beyond the permitted scope for interrogatories established by the OEB in its Rules and in this proceeding (please see BHI's response to ED-1). There is no material issue relating to energy losses in this proceeding and the energy losses of other LDCs inside and beyond Ontario are not relevant. Moreover, the requested analysis cannot be provided with reasonable effort in the context of an interrogatory process and, in any event, would depend on the information being available.

BHI has not undertaken a comparison of distribution system losses and is not aware of any studies or information in other OEB proceedings in regards to distribution system losses for utilities outside of Ontario.

- b) Please see BHI's response to ED-2 a) above.

ED-3**Transmission Losses**

3. Reference: Exhibit 8, Attachment 2, Tab Appendix 2-R Loss Factors

Questions:

- a) What are the most important steps that Burlington Hydro has taken in the past 20 years to reduce distribution system energy losses?
- b) Where does Burlington Hydro believe the greatest opportunities are to make additional reductions in distribution losses in the next 20 years?
- c) Does Burlington Hydro quantify and consider the potential value of distribution loss reductions for different options when procuring equipment (e.g. transformers) and deciding on the details of demand-driven capital projects (e.g. the type and sizing of conductors)? If yes, please explain how and provide documentation detailing the methodology used.
- d) If Burlington Hydro is considering the value to its customers of distribution loss reductions for planning purposes, how does it calculate the dollar value (\$) of said loss reductions (kWh)? Is the value calculated based only on the HOEP or on all-in cost of electricity (e.g. including the GA)?
- e) Please list and describe the operational measures that Burlington Hydro takes to cost-effectively reduce distribution losses.
- f) Please provide a table listing the technically available measures to cost-effectively reduce distribution losses and describe for each the respective responsibilities of Burlington Hydro, the IESO, and Hydro One.

Response:

The following requests seek information that is irrelevant to the Application and that is beyond the permitted scope for interrogatories established by the OEB in its Rules and in this proceeding (please see BHI's response to ED-1). There is no material issue relating to energy losses in this proceeding. Nevertheless, in an effort to be responsive, BHI offers the following information in relation to these requests.

- a) The issue before the OEB is the determination of rates for the rebasing year. Activities undertaken in the past 20-year period are irrelevant to the OEB's inquiry. The activities that BHI has pursued are set out in BHI's response to ED-1.
- b) The issue before the OEB is the determination of rates for the rebasing year. Activities that may or may not be undertaken outside the rate period are irrelevant to the OEB's determination in this proceeding.

- c) BHI uses an engineering analysis as part of the design process to provide the best technical solutions. One consideration in this regard is to achieve the lowest practical losses for the overall project, having regard to the equipment purchased and deployed and to the objective of providing the greatest customer value. Although loss considerations are an inherent part of these analyses, they do not alone drive the decision-making process.
- d) The value of the distribution losses is considered based on the all-in cost of electricity, which includes the cost of the global adjustment.
- e) BHI performs power system load balancing as an operational measure to reduce distribution losses. BHI monitors system loading via its 24/7/365 Control Room.
- f) BHI holds all of the responsibilities for distribution losses on its system. In addition to these, BHI has worked with its 14 GridSmartCity ("GSC") LDC partners and commercial partners to create common transformer standards that include efforts to reduce both transformer no-load and full-load losses. Any responsibilities that the IESO and Hydro One may have in relation to line losses are irrelevant to this proceeding.

ED-4

Transmission Losses

4. Reference: Exhibit 8, p. 20-21; Exhibit 8, Attachment 2, Tab Appendix 2-R Loss Factors

Questions:

a) Please complete the below table.

Value of Burlington Hydro's Distribution System Energy Losses – Historic						
	2015	2016	2017	2018	2019	Total
Electricity Purchases (MWh)						
Electricity Sales (MWh)						
Losses (MWh)						
Losses %						
All-In Cost of Electricity in BHI (\$/MWh) – Annual Average						
Cost of Losses (\$)						

b) Does Burlington Hydro anticipate the value of losses on its system to be materially higher or lower over the next five years? Please explain.

c) Please complete the following table:

GHG's from Burlington's Forecast Distribution System Energy Losses						
	2021	2022	2023	2024	2025	Total
Forecast Losses (MWh) ¹						
Carbon Intensity of Electricity ² (CO ₂ e/MWh)						
GHGs (CO ₂ e)						

¹ If no better numbers are available, the losses from 2019 or the average over 2015 to 2019 could be used for the purpose of this row of this response.

² Please base this figure on the IESO's January 2020 Annual Planning Outlook - <http://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/apo/Annual-Planning-Outlook-Jan2020.pdf?la=en>; see also the data tables at <http://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/apo/Annual-Planning-Outlook-Data-Tables-Jan2020.xlsx?la=en>.

- d) Is Burlington Hydro willing to review its operational measures, investment planning, and other practices to consider whether it could be taking additional measures to cost-effectively reduce the energy losses occurring in its distribution system?

Response:

The following requests seek information that is beyond the permitted scope for interrogatories established by the OEB in this proceeding (see BHI's response to ED-1). There is no material issue relating to energy losses in this proceeding. Nevertheless, in an effort to be responsive, BHI offers the following information in relation to these requests.

- a) BHI provides the requested information in Table 1 below.

Table 1

	2015	2016	2017	2018	2019	2015-2019 Total
Electricity Purchases (MWh)	1,673,684	1,699,864	1,615,885	1,660,115	1,595,967	8,245,514
Electricity Sales (MWh)	1,616,124	1,641,754	1,557,033	1,596,764	1,530,474	7,942,149
Losses (MWh)	57,560	58,110	58,852	63,351	65,493	303,365
Losses %	3.4%	3.4%	3.6%	3.8%	4.1%	3.7%
All-In Cost of Electricity in BHI (\$/MWh) - Annual Average	\$ 118.14	\$ 130.11	\$ 119.00	\$ 113.65	\$ 120.03	\$ 120.19
Cost of Losses \$	\$6,800,094	\$7,560,701	\$7,003,363	\$7,199,830	\$7,861,088	\$36,460,236

- b) Assuming that there are no material changes in the cost of electricity, which is entirely outside of BHI's control, BHI does not anticipate the value of losses on its system to be materially higher or lower over the next five years.
- c) This request seeks information that is not relevant to the Application or in the possession of the applicant. Specifically, the levels of GHGs that may be associated with the volumes of energy losses on BHI's system are not relevant to the setting of distribution rates in this proceeding, nor are they in the control of BHI as BHI does not generate electricity and is not responsible for the overall supply mix in Ontario.
- d) BHI reviews its operational measures, investment planning, and other practices to consider cost-effective reductions to the energy losses occurring on its distribution system as part of its Asset Management processes.

ED-5**Transmission Losses**

5. Reference: Exhibit 8, Attachment 2, Tab Appendix 2-R Loss Factors

Preamble: In EB-2019-0261, Hydro Ottawa agreed to, and the Board approved, the following:

Between 2021 and 2025, Hydro Ottawa shall endeavour to maintain its five-year average total system losses below the target of 3.02% set by the OEB in EB-2005-0381 through cost-effective measures.

Question:

- a) Is Burlington Hydro willing to agree to the same terms? If not, what commitments can Burlington Hydro make to the Board in this regard? In particular, please indicate what target Burlington Hydro is willing to meet.

Response:

- a) It is improper for ED to attempt to negotiate the terms of a potential settlement proposal with BHI through its interrogatory requests. BHI also notes that the terms agreed upon by another utility in a settlement proposal are not relevant to BHI's Application. As stated in the preamble to Hydro Ottawa's settlement agreement, the issues addressed therein are intricately interrelated and the settlement was proposed as a package. As such, any trade-offs that may have been made in return for Hydro Ottawa agreeing to the particular term relating to line losses are not disclosed and the parties to that proceeding are bound to treat those negotiations as confidential. As such, what Hydro Ottawa did or did not agree to in its settlement negotiations has no bearing on BHI in this proceeding whatsoever.

Nevertheless, BHI advises that BHI will continue its current practice of reviewing its operational measures, investment planning, and other practices to consider whether it could be taking additional measures to cost-effectively reduce the energy losses occurring on its distribution system as part of its Asset Management processes.

ED-6**Transmission Losses**

6. Reference: Exhibit 8, Attachment 2, Tab Appendix 2-R Loss Factors

Preamble: In EB-2019-0261, Hydro Ottawa agreed to, and the Board approved, the following:

In addition, over the course of 2020-2021, Hydro Ottawa shall prepare a plan to reduce distribution losses as much as possible through cost-effective measures. The utility shall file the plan with the OEB when complete. In 2022-2025, Hydro Ottawa shall implement as many of the cost-effective measures set out in its plan as possible (e.g. any changes to planning and procurement processes to better mitigate losses, investments that can be made within current budgets, operational measures, etc.). All other cost-effective measures will be incorporated into the utility's next rebasing application and DSP.

Question:

- a) Is Burlington Hydro willing to agree to the same terms? If not, what commitments can Burlington Hydro make to the Board in this regard? In particular, please indicate what target Burlington Hydro is willing to meet.

Response:

- a) Please see BHI's response to ED-5. BHI uses engineering analysis for the best technical solutions including the lowest practical losses for every project it designs and constructs.

ED-7**Transmission Losses**

7. Reference: Exhibit 8, Attachment 2, Tab Appendix 2-R Loss Factors

Preamble: In EB-2019-0261, Hydro Ottawa agreed to, and the Board approved, the following:

Finally, as described in Hydro Ottawa's response to undertaking JT 3.10, a pilot of a Grid Edge Volt/VAr Control ("VVC") solution will be complete by the end of 2020. If this pilot is successful, Hydro Ottawa shall increase the deployment of these (or equivalent) units by conducting an analysis in 2021 to identify potential suitable locations and by deploying these units in a subset of locations which are deemed to be suitable and cost-effective, with an estimated investment of up to \$1.0M over the five-year test period. The cost of these investments will be accommodated within the overall approved capital budget.

Question:

- a) Is Burlington Hydro willing to agree to implement similar technology through an equivalent commitment? If not, what commitments can Burlington Hydro make to the Board in this regard?

Response:

- a) Please see BHI's response to ED-5. As mentioned in BHI's response to ED-1 d), BHI does not have voltage issues on its distribution system. All voltages are monitored and maintained within CSA limits throughout the year without the need for voltage regulators on its system. Given this, BHI has no need to commit to such an implementation.

ED-8

Fixed Versus Variable Charges

8. Reference: Exhibit 7, Attachment 19, Cost Allocation Model, Sheet O2 Monthly Fixed Charge|Floor|Ceiling

Questions:

- Please confirm that no proposed fixed charges exceed the maximum fixed charge set by the Board.
- Most utilities set fixed charges above the maximum levels prescribed by the Board. Why has Burlington Hydro not done the same?
- Please provide a table of Burlington Hydro's fixed monthly charges for its commercial and industrial customers for each year back to 2005.
- Please describe the basis for Burlington Hydro's fixed monthly charges.

Response:

- As confirmed in Table 6 on page 8 of Exhibit 8 of the Application, there are no proposed fixed charges that exceed the maximum fixed charge set by the OEB with the exception of the residential class which is 100% fully fixed.
- BHI cannot speak to what other utilities do or do not do.
- BHI provides the fixed monthly charges in Table 1 below for its GS<50 kW and GS>50 kW rate classifications for 2005-2020.

Table 1

Rate Classification	2020	2019	2018	2017	2016	2015	2014	2013
General Service < 50 kW	27.06	26.57	26.22	25.95	25.54	25.09	24.77	25.53
General Service > 50 kW	63.44	62.29	61.46	60.82	59.86	58.80	58.05	72.77

Rate Classification	2012	2011	2010	2009	2008	2007	2006	2005
General Service < 50 kW	25.41	25.19	25.24	21.98	21.19	21.34	21.16	21.65
General Service > 50 kW	72.42	71.79	71.66	66.82	65.90	66.36	65.81	50.55

- BHI's existing fixed charges for the GS<50 kW and GS>50 kW classes fell within the minimum and maximum values as per tab O2 of the cost allocation model so it is proposing to maintain the same fixed/variable revenue split, resulting in a similar percentage increase to its variable and fixed rates.

ED-9**Integrated Resource Planning****9. Reference: Distribution System Plan****Questions:**

- a) Please describe the processes at Burlington Hydro to implement Integrated Resource Planning, with a particular focus on the consideration of non-wires solutions to system needs. Please file any internal documentation outlining said processes.
- b) How does Burlington Hydro ensure that non-wires options are identified and considered early enough in the planning process to ensure that they can be implemented in lieu of supply-side solutions where cost-effective?
- c) How does Burlington Hydro calculate the net costs/benefits of non-wires solutions when comparing them to supply-side options? Please include all kinds of distributed energy resources in your answer, including energy efficiency, demand response, storage, and distributed generation. Please include a description of how avoided energy costs (e.g. the value of future energy savings from energy efficiency) are considered when comparing wires and non-wires solutions.
- e) Does Burlington Hydro always study potential non-wires solutions to system needs in its capital planning processes? If not, please explain the screening criteria that Burlington Hydro uses to determine whether an assessment of non-wires solutions is warranted.
- f) Does Burlington Hydro agree that it is appropriate in certain circumstances for an LDC to procure or contract for distributed energy resources where doing so would be a more cost-effective alternative in comparison to a traditional supply-wide investment?
- g) Does Burlington Hydro agree that it is appropriate for it to earn a return if it is able to avoid a capital investment in wires or transformers through distributed energy resources such as energy efficiency, demand response, or storage?
- h) Does Burlington Hydro agree that it is important to give LDCs an incentive to adopt non-wires solutions to system needs where those solutions are more cost-effective?
- i) Does Burlington Hydro agree that the difference between the financial returns from wires and non-wires solutions creates a disincentive to implement non-wires solutions?
- j) Has Burlington Hydro sought approval to earn a return for avoiding a capital investment in wires or transformers through distributed energy resources such as energy efficiency, demand response, or storage?
- k) How does Burlington Hydro believe a financial return should be calculated for avoiding a capital investment in traditional supply-side infrastructure through distributed energy resources such as energy efficiency, demand response, or storage?

Response:

- a) BHI does not currently have formal documentation of its processes for implementing Integrated Resource Planning. Integrated Resource Planning does not play a significant role in BHI's overall planning process because BHI has no current system capacity constraints and is confident that supply and capacity levels are adequate to sustain the forecasted load growth to the end of 2025. Should localized constraints occur over time, they are generally driven by a change in customer demand and will be addressed on a case-by-case basis.
- b) BHI works with both new and existing customers whenever there is the potential for a non-wires alternative and assists customers and their engineering teams with their projects from initial concepts through to implementation.
- c) See BHI's response to ED-9 a) above. BHI notes that the extent to which non-wire solutions can be pursued by BHI will depend on whether the activity would fall within its statutory obligations under Section 71(1) of the OEB Act to carry on distribution activities. With respect to non-wire solutions in the customers control, please see ED-9 a) above.
- e) When forming and selecting capital projects, BHI prioritizes those that meet overlapping needs. For example, when possible, BHI attempts to combine capacity upgrades and expansions with depreciated pole line rebuilds to keep the cost of the upgrade portion minimal to the overall cost of the project. The typical case where BHI would assess the viability of non-wires solutions is if there is a localized large demand increase with no existing infrastructure in place to service the increased load, or if the existing infrastructure is in good condition but of insufficient capacity to service the existing load.
- f) The OEB has an ongoing consultation on Distributed Energy Resources (EB-2018-0288) and Utility Remuneration (EB-2018-0287). These consultations are aimed at developing a regulatory framework that facilitates investment and integration of distributed energy resources and how to remunerate utilities to better support their pursuit of least cost solutions. BHI is participating in the OEB Working Group and closely monitoring these consultations for guidance. BHI believes that the OEB consultation is a more appropriate forum for any comments on generic policy issues.
- g) Please see response to ED-9 f).
- h) Please see response to ED-9 f).
- i) Please see the response to ED-9 f).

- j) To date, BHI has not sought approval to earn a return for avoiding a capital investment in wires or transformers through distributed energy resources.
- k) Please see response to ED-9 f).

ED-10**Integrated Resource Planning**

10. Reference: Exhibit 8, Attachment 2, Tab A.2-AA_Capital Projects

Questions:

- a) Of the capital spending identified in the application, please identify which items are candidates for considering whether the need could be addressed most cost-effectively with distribution energy resources or non-wires solutions? For each, please describe the need addressed by the project and the cost of the supply-side solution.
- b) Does Burlington Hydro anticipate that the drop in electricity demand from COVID-19 will defer the need for some of the capital investments outlined in its application? If yes, would this potentially create a window to consider or reconsider non-wires solutions? If not, why not?
- c) If Burlington Hydro determines before the end of 2025 that a certain capital investment could be addressed more cost-effectively through a non-wires solution, what regulatory steps would be required to implement that non-wires solution instead? Please consider a scenario where the non-wires solution is less expensive up-front and a scenario where the non-wires solution is more expensive up-front but is more cost-effective overall (e.g. due to future avoided energy costs).
- d) Is Burlington Hydro proposing to spend on any distributed energy resources (including energy efficiency, storage, etc.) to avoid more costly supply-side investments? If yes, please provide details and cite references to the evidence. If not, why not?

Response:

- a) There are no proposed DER alternatives to capital projects within the timeframe of BHI's Application. Please see BHI's response to ED-9 f).
- b) The impacts of COVID-19 over the 2021-2025 timeframe are unknown at this time, as is whether COVID-19 might reduce or defer the need for some of the capital investments. As such BHI cannot answer whether this would create a window to consider or reconsider non-wires solutions. Please see BHI's response to 1-Staff-6 a) and b) on the impacts of COVID-19 on 2020 and 2021.
- c) The proposition posed by ED is highly speculative and unrelated to the DSP that is before the OEB in this proceeding. It is also unrelated to the OEB's consideration of BHI's rates for its rebasing year. Consequently, the question is not relevant.
- d) There are no proposed projects involving DER within the timeframe covered by BHI's Application. Please see BHI's response to ED-9 f).

ED-11
Integrated Resource Planning

11. Reference: Exhibit 8, Attachment 2, Tab A.2-AA_Capital Projects

Preamble: These questions relate to the planned investments described in Attachment 2, Tab A.2-AA_Capital Projects.

Questions:

- a) For each investment, please quantify and describe the need to be addressed.
- b) For each investment, please discuss (i) the possibility that COVID-19 might reduce or defer the need; and (ii) whether this may provide additional time to consider or implement non-wires solutions.
- c) For each investment, describe the efforts taken so far to consider distributed energy resources as a potentially more cost-effective alternative. Please expressly address (i) energy efficiency; and (ii) a combination of options, such as energy efficiency coupled with storage. Please file any analysis or related documentation that Burlington Hydro has prepared in this regard.
- d) For each investment to be made by HONI in relation to Burlington, please describe whether and how HONI and Burlington Hydro have or will be working together to consider non-wires alternatives.

Response:

- a) Please refer to pages 141-154 of section 5.4.2.2 of the DSP for a quantification and description of the need to be addressed for each investment. Additional information on the need to be addressed regarding projects >\$180,000 can be found in the Material Investment Summary Documents filed in Appendix 1 of the DSP.
- b) Please see BHI's response to ED-10 b).
- c) BHI has not proposed capital investments within the timeframe of its COS Application for which DER would be an alternative. Please see BHI's response to ED-9 f).
- d) There are no investments by HONI on behalf of BHI during the timeframe of BHI's COS Application.

ED-12

Burlington's Climate Change Action Plan

12. Reference: Exhibit 1, Page 27; Exhibit 1, Appendix B, pp. 8, 26

Questions:

- a) Please file a copy of Burlington's Climate Change Action Plan and its declaration regarding a climate emergency.
- b) Please confirm Burlington's GHG reduction targets.
- c) Please provide Burlington's planned reductions in GHGs from electricity to meet its overall GHG targets.
- d) What are Burlington Hydro's roles and responsibilities in relation to Burlington's Climate Change Action Plan and related climate change policies?
- e) Please provide the information used in the Climate Change Action Plan modelling of the "business as usual" scenario for electricity use, electricity carbon intensity, and GHG's arising from electricity use.

Burlington's Electricity Demand and GHGs Per Climate Planning Documents					
	2020	2021	...	2049	2050
Annual Electricity Demand (kWh)					
Carbon Intensity of Electricity (CO ₂ e/kWh)					
GHGs from Electricity Use (CO ₂ e)					

- f) According to the IESO's January 2020 Annual Planning Outlook¹, the carbon intensity of electricity is forecast to increase significantly between now and 2040 under the reference case. Please calculate the impact of this increase on the GHG emissions arising from Burlington's electricity usage in the following table:

Burlington's Carbon Emissions from Electricity – Impact of Increased Carbon Intensity					
	2020	2021	...	2040	Total

¹ <http://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/apo/Annual-Planning-Outlook-Jan2020.pdf?la=en>; see also the data tables at <http://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/apo/Annual-Planning-Outlook-Data-Tables-Jan2020.xlsx?la=en>.

Annual Electricity Demand – Burlington (kWh)					
Scenario 1 – Carbon Intensity Remains at 2019 Levels					
Carbon Intensity of Electricity (CO ₂ e/kWh) -					
GHGs from Electricity Use (CO ₂ e)					
Scenario 2 – Carbon Intensity Increases per IESO Annual Planning Outlook Reference Case					
Carbon Intensity of Electricity (CO ₂ e/kWh) -					
GHGs from Electricity Use (CO ₂ e)					
Percent Difference in GHG Levels Between Scenario 1 and 2					

- g) Please confirm that the forecast increase in carbon intensity of electricity is due to forecast increases in gas-fired electricity generation.
- h) Has Burlington Hydro provided the City of Burlington with an updated forecast of GHG emissions arising from electricity use in the City as a result the forecast increases in gas-fired electricity generation? If yes, when was that provided?

For each of the above, please make assumptions as necessary and state all assumptions. If the calculations are a challenge, please answer the question on a best-efforts basis and with any caveats as necessary. If certain parts of the answer cannot be estimated, please explain why and complete as much of the answer as possible. If an answer cannot be provided for the complete period, please provide an answer for as far into the future as feasible. If Burlington's electricity demand cannot be forecast beyond 2025, please assume that demand remains at 2025 levels.

Response:

- a) Please refer to BHI's response to 1-DRC-5 a) for a copy of Burlington's Climate Action Plan. The City of Burlington's declaration regarding a climate emergency can be found here:
<https://www.burlington.ca/en/live-and-play/resources/Environment/Climate-Emergency/Final-Burlington-Climate-Emergency-Declaration-12-pt-font.pdf>
- b) The request seeks information that is irrelevant and beyond the permitted scope for interrogatories established by the OEB in this proceeding (please see BHI's response to ED-1). The City of Burlington's Climate Action Plan is not at issue in this proceeding, BHI is not the party responsible for that plan, and there are no material issues in this proceeding relating to BHI's rebasing or DSP which arise directly from Burlington's plan. It is also notable that, as the City of Burlington is a customer of BHI, information regarding the City of Burlington's electricity usage or planned electricity usage is

confidential. Moreover, ED's detailed questions in this section of its interrogatories are not consistent with the OEB's direction in Procedural Order #1 to not engage in detailed exploration of items that do not appear to be material. The questions are also inconsistent with the intended purposes for interrogatories, which include clarifying evidence that has been filed, simplifying the issues or expediting the proceeding.

- c) Please see BHI's response to ED-12 b) above.
- d) BHI is a member of the Stakeholders Advisory Committee for the City's Climate Action Plan.
- e) As BHI is not the author or sponsor of the Climate Action Plan, nor the party responsible for that plan, BHI does not have the requested information which, in any event, is not relevant to its Application.
- f) The impact of the IESO's forecast of the carbon intensity of electricity on the GHG emissions arising from the City of Burlington's forecast electricity usage between now and 2040 is not relevant to the Application.
- g) This question is not relevant to the Application and is better directed to the IESO as the author of the report which forecasts the referenced increase in the carbon intensity of electricity.
- h) Please see BHI's response to ED-12 b) above.

ED-13**Energy Efficiency**

13. Reference: Exhibit 1, pp. 79-81.

Questions:

- a) What are the total avoided energy costs that have been achieved through Burlington Hydro's CDM programs to-date?
- b) What are the total net benefits (calculated per the TRC) that have been achieved through Burlington Hydro's CDM programs to-date?
- c) What was the TRC benefit-cost ratio for Burlington Hydro's CDM programs for the latest year of data available for (i) residential customers; and (ii) commercial / industrial customers? Please indicate the year of data provided.
- d) Is Burlington Hydro prevented by the OEB rules or other rules to implement a non-wires alternative to a capital project that involves an energy efficiency program? If yes, please identify the rules and provide excerpts.
- e) Is Burlington Hydro prevented by the OEB rules or other rules from filing an application with the OEB seeking approval of an energy efficiency program akin to the applications filed by gas utilities for their DSM programs? If yes, please identify the rules and provide excerpts.
- f) Could the City of Burlington ask Burlington Hydro through a unanimous shareholder resolution (or otherwise) to apply to the OEB for approval of an energy efficiency program to be funded via distribution rates (e.g. as part of its efforts to meet its GHG reduction targets)? If not, please explain why not.
- g) Aside from any regulatory questions, does Burlington Hydro believe it could develop an energy efficiency program that would save more for consumers (via avoided future energy costs) than it cost (via administration and the incremental costs of the efficiency measures)? Please explain.
- h) If Burlington Hydro were to propose an energy efficiency program, what areas would it focus on?
- i) If Burlington Hydro were to finance the cost of an energy efficiency program to ensure the benefits (avoided energy costs) match the costs over time, what, approximately, is the lowest interest it could obtain to do so?

Response:

- a) By total avoided energy costs, BHI has assumed that ED means \$/kWh and \$/kW. BHI provides the total avoided energy costs that have been achieved through BHI's CDM programs to-date in Table 1.

Table 1

Sector	Program	Program Year	Levelized Cost (\$/kWh)	Levelized Cost (\$/kW)
Business	All Programs	All Program Years	0.028	91.34
Consumer	All Programs	All Program Years	0.037	203.81
Total	All Programs	All Program Years	0.030	107.54

- b) The total net benefits (calculated per the TRC) that will be achieved through BHI's CDM programs is estimated to be \$23,123,089 over the 2015-2020 Conservation First Framework.
- c) BHI provides the TRC benefit-cost ratio for BHI's CDM programs for 2017 in Table 2.

Table 2

PROGRAM YEAR 2017	
Sector	TRC Benefit-Cost Ratio
Business	1.15
Residential	7.74
Industrial	0.03
Total	2.73

- d) Subject to the restrictions set out in Section 71 of the OEB Act related to the activity of distribution of electricity and the investment being reasonable and prudent, to BHI's knowledge, no.
- e) Subject to the restrictions set out in Section 71 of the OEB Act related to the activity of distribution of electricity and the investment being reasonable and prudent, to BHI's knowledge, no. However, there is a distinction between BHI and that applicable to natural gas. Enbridge Gas serves almost all gas consumers in Ontario and a DSM program would reflect OEB policy across nearly all consumers. BHI is one of many LDCs. The provision of a program would likely better established through provincial policy (as currently proposed by the IESO) or through a fulsome consultation by the OEB.

- f) The City of Burlington is the sole shareholder of the holding company of BHI. BHI itself operates separately from the City of Burlington with its own independent Board of Directors and a governance structure adopted from the recommendations of the OEB to ensure independence from the City of Burlington.
- g) BHI cannot comment on whether it could develop a hypothetical energy efficiency program that would save more for consumers than it would cost without more information and further analysis. Moreover, while the question expressly sets aside any regulatory considerations, such considerations would be expected to be an important part of any such analysis. Due to the speculative nature of the question, it is not relevant.
- h) BHI cannot speculate as to the areas of focus for any hypothetical energy efficiency program other than to note that it would need to address a specific customer or distribution system need in the City of Burlington. Due to the speculative nature of the question, it is not relevant.
- i) The interest rate for the financing of a hypothetical energy efficiency program would be dependent on the amount of the financing required from time to time during the operation of the program, the dates of the drawdowns over that period, the term, the amortization, the risk appetite of the lender(s), the security available and the prevailing economic conditions in the market at the time the financing arrangements are established. Due to the speculative nature of the question, it is not relevant.

ED-14
Energy Efficiency

14. Reference: Distribution System Plan, Section 5.4.1.1, p. 132

Preamble: "BHI is not currently engaged in any demand response, energy storage programs or other capacity relief programs."

Question:

- a) Please explain why Burlington Hydro is not currently engaged in any demand response, energy storage or other capacity relief programs.

Response:

- a) BHI has ample capacity available through the timeframe covered by its COS Application, and therefore, has not included projects intended for capacity relief. Also, please see BHI's response to ED-9 f).

ED-15
Energy Efficiency

15. Reference: Exhibit 4, pp 214-216

Preamble: On September 30, 2020, MENDM directed the IESO to implement a 2021-2024 Conservation and Demand Management Framework launching January 1, 2021. The new framework will be centrally-delivered by the IESO under the Save on Energy brand and will include incentive programs targeted to those who need them most, including opportunities for commercial, industrial, institutional, on-reserve First Nations, and income-eligible electricity consumers. The implications of this new framework have not been contemplated in this Application. The details of programs to be offered under the new framework, and their estimated energy and demand savings are not available to BHI. Several IESO reports suggest the anticipated savings may be significant, and will result in reductions to BHI's load and revenues. As of this filing, the OEB has not provided guidance on how to incorporate the impact of this new framework in BHI's forecast loads.

Questions:

- a) Please provide any updated information that is now currently available in relation to this topic.
- b) Please assess and describe the degree to which any demand reductions would impact infrastructure investments planned or under consideration by Burlington Hydro. Please provide a response on a project-by-project basis.

Response:

- a) The most recent information on the new framework is available here:
<https://www.saveonenergy.ca/en/Overview/CDM-Framework-Program-Details>

The OEB has not yet provided guidance to LDCs on how to incorporate the impact of this new framework in forecasted loads.

- b) BHI does not have enough information on the new framework to assess and describe the degree to which any demand reductions would impact infrastructure investments planned or under consideration by BHI. Furthermore, since CDM has been centrally-delivered by the IESO since March 2019, BHI does not have access to customer uptake or conservation savings within its service territory to forecast any demand reductions.

ED-16
Heat Pumps

16. Reference: Distribution System Plan

Preamble: An expert report filed in EB-2016-0004 by Dr. Stanley Reitsma, P. Eng., outlined significant benefits to the electricity system in reducing peak demand.¹ See page 5 to 13. For example, Dr. Reitsma concludes:

“Though geothermal relies on electricity as an input (to power the pump), geothermal system actually reduces electricity demand in the summer, and increases it in the winter, relative to traditional methods of heating and cooling (heating with fossil fuels and cooling with traditional AC systems). For Ontario, a summer peaking jurisdiction, a greater reliance on geothermal would reduce peaking power needs and also reduce surplus baseload generation. Coincidentally, the load profile of a geo system is similar to the production profiles of Ontario wind energy facilities.”²

“For the cooling of buildings, Geo HP’s use about half the electricity to operate compared to air source heat pumps and AC systems, and, geo’s electrical demand doesn’t spike as it gets hot outside, since the ground loop temperature remains relatively unchanged. They can reduce the “heat wave” electricity system demand spikes by up to 75%.”³

Questions:

- a) Does Burlington Hydro agree with the comments in the above-referenced report regarding the benefits that geothermal systems can provide to the electricity system, including a reduction of peak demand? Please explain.
- b) Does Burlington Hydro agree that the expansion of geothermal systems would reduce peak demand on Burlington Hydro’s system, on which distribution system capacity is based?
- c) Does Burlington Hydro agree that geothermal systems have the capacity to provide important benefits to the electricity distribution system, especially in comparison to traditional baseboard heating?

¹ Dr. Stanley Reitsma, P. Eng., *Ontario’s Low Carbon Future: Geothermal Heat Pumps*, March 21, 2016 (<http://www.rds.oeb.ca/HPECMWebDrawer/Record/521626/File/document>).

² *Ibid*, p. 5.

³ *Ibid*, p. 6.

- d) Does Burlington Hydro agree that the benefits of geothermal systems are not reflected in the distribution costs paid by residential consumers because those charges do not vary based on coincident peak demand?
- e) Does Burlington Hydro agree that increases in heat pumps would assist the City of Burlington in achieving its GHG reduction targets?
- f) Would Burlington Hydro agree to study the possibility of offering customers with geothermal systems a reduction in their distribution charges that would approximately reflect the benefits those customers provide to the distribution system? Assume the overall rate structure would continue to make Burlington Hydro whole for its revenue requirement.
- g) Could the City of Burlington ask Burlington Hydro through a unanimous shareholder resolution (or otherwise) to apply to the OEB for approval of a rate structure that provides a discount to customers with geothermal systems to reflect the benefits those customers provide to the distribution system? If not, please explain why not. Assume the rate structure would continue to make Burlington Hydro whole for its revenue requirement.
- h) Please provide Burlington Hydro's best information on the number and proportion of its customers with (i) electrical; (ii) natural gas; (iii) propane; (iv) oil; (v) wood; and (vi) other kind of space heating.

Response:

- a) BHI declines to respond to the following requests in relation to heat pumps. These questions seek information that is irrelevant to the Application which is to establish rates applicable for the rebasing year and that is beyond the permitted scope for interrogatories established by the OEB in its Rules and in this proceeding. Specifically, the preamble is derived from a technical report that was filed in a 2016 generic proceeding on the expansion of natural gas service in Ontario and which BHI is not familiar with. The request is to provide fresh analysis and technical opinions in relation to that report, which would require a level of effort that is unreasonable for interrogatories. Moreover, these requests are not consistent with the directions in Procedural Order #1 dated December 11, 2020, where the OEB identifies the specific aspects that parties should examine in this proceeding and specifies that "parties should not engage in detailed exploration of items that do not appear to be material".
- b) Please see BHI's response to ED-16 a).
- c) Please see BHI's response to ED-16 a).
- d) Please see BHI's response to ED-16 a).
- e) Please see BHI's response to ED-16 a).



- f) No, the costs for such a study have not been included in BHI's budget that underlies its COS Application.
- g) Please see BHI's response to ED-13 f). Regardless of whether BHI could be directed to bring such an application by the shareholder of its holding company, the outcome of any such application would depend on the specifics of any proposal and will ultimately be up to the discretion of the OEB, subject to the constraints on its jurisdiction under the applicable legislation and having regard to accepted ratemaking principles. In BHI's view, this question raises policy issues that may be better suited for consideration by the OEB through a generic proceeding.
- h) BHI does not maintain, or have access to, any data with regards to the heating types used by its customers. There are no obligations for customers to share or disclose such information to BHI.

ED-17**Heat Pumps**

17. Reference: Distribution System Plan

Questions:

- a) Please describe potential roles that Burlington Hydro could play in relation to the implementation of electric heat pumps as an alternative to natural gas heating.
- b) How many new homes and businesses are forecast to be built in Burlington Hydro's coverage area in the next 10 years? If available, please provide an annual breakdown.
- c) How many new customers does Burlington Hydro expect to hook up in the next 10 years? If available, please provide an annual breakdown.
- d) What assistance could Burlington Hydro provide to developers to promote the installation of electric heat pumps instead of natural gas furnaces in new construction?
- e) Would Burlington Hydro benefit from regulatory changes in order to play a greater role in promoting the expansion of electric heat pumps in lieu of natural gas? If yes, what are those potential changes?
- f) Please comment on the report by Ralph Torrie estimating that electricity demand could decline if all heating was converted to electric heat pumps and energy retrofits were increased: <https://www.corporateknights.com/channels/built-environment/recovering-stronger-building-low-carbon-future-green-renovation-wave-15875463/>.

Response:

- a) This question is not relevant to BHI's COS Application. Moreover, BHI notes that its ability to carry on business activities other than distributing electricity is constrained by s. 71 of the *Ontario Energy Board Act, 1998*.
- b) BHI does not have this information.
- c) BHI does not have this information.
- d) BHI does not believe that it is its role, as an electricity distributor, to assist developers in promoting one technology over another in a competitive market for building heating solutions, or that BHI's customers should bear any costs in connection with such a role.
- e) BHI declines to respond. It has not studied this matter, which is not relevant to the review of BHI's proposed rates and charges for 2021 in this proceeding. Furthermore, BHI does not believe it is appropriate or relevant to offer an opinion or speculate on preferred or possible regulatory changes that would facilitate the promotion of a specific

technology or resource over another in a competitive market for building heating solutions.

- f) BHI has not reviewed and declines to comment on the referenced report. Not only does the subject matter of the referenced report appear irrelevant to the Application, but also, as an ambiguous request to “comment” on an article (the authoritativeness of which is unknown and which has not been filed as part of the applicant’s evidence), this request is not an acceptable form of interrogatory and is not within the permitted scope for interrogatories established by the OEB in its Rules and in this proceeding. In Procedural Order #1 dated December 11, 2020, the OEB identifies the specific aspects that parties should examine in this proceeding and specifies that “parties should not engage in detailed exploration of items that do not appear to be material”. The request is also inconsistent with the intended purposes for interrogatories, which include clarifying evidence that has been filed, simplifying the issues or expediting the proceeding. Instead, this request imposes an unreasonable burden on the applicant to review, consider and prepare comments on the referenced report within the limited time permitted for responding to interrogatories.

ED-18**Heat Pumps**

18. Reference: Distribution System Plan

Questions:

- a) How many and what percent of Burlington Hydro's customers heat their homes with electricity through resistance heating? Please provide a best efforts estimate.
- b) How many and what percent of Burlington Hydro's customers heat their homes with electricity through air-source and ground-source heat pumps? Please provide a best efforts estimate.
- c) How many and what percent of Burlington Hydro's customers have electric water heaters. Please provide a best efforts estimate.
- d) Please provide a table quantifying the winter peak demand (KW), summer peak demand (KW), and annual energy consumption (KWh) attributable to (i) home heating; and (ii) water heating for Burlington Hydro customers. Please also express this as a percent of the total demand and consumption. Please provide a best efforts estimate.
- e) What role could heat pumps play in reducing energy use?

Response:

The requests below are not relevant to BHI's DSP or to any material issues in this proceeding.

- a) Please see BHI's response to ED-16 h).
- b) Please see BHI's response to ED-16 h).
- c) Please see BHI's response to ED-16 h).
- d) BHI does not track or have access to this information.
- e) This question is not relevant to the Application.

ED-19**Electric Vehicles**

19. Reference: Distribution System Plan

- a) How many electric vehicle charging stations are installed by Burlington Hydro customers now and how many are forecast for each year from 2021 to 2025? Please provide a high-end and low-end estimate.
- b) Is Burlington Hydro confident that it is making all the investments needed to facilitate increases in electric vehicles and electric vehicle charging stations even if its high-end forecasts come to fruition? Please explain.
- c) Have any Burlington Hydro customers been unable to install an electric vehicle charging station (e.g. a level 3 station) due to constraints on Burlington Hydro's distribution system? If yes, how many customers each year?
- d) Have any Burlington Hydro customers been *delayed* in installing an electric vehicle charging station (e.g. a level 3 station) due to constraints on Burlington Hydro's distribution system? If yes, how many customers each year?
- e) Is it Burlington Hydro's goal that all customers will be able to install and use electric vehicle charging stations if they wish to do so? If not, please detail Burlington Hydro's targets in this regard.
- f) Is it Burlington Hydro's goal that all customers will be able to install and use electric vehicle charging stations *without delay of more than one month* if they wish to do so? If not, please detail Burlington Hydro's targets in this regard.
- g) Please list and describe the investments that Burlington Hydro intends to make over 2021-2025 to ensure readiness for electric vehicles.
- h) Please list and describe the ways in which Burlington Hydro is *currently* able to use the battery in electric vehicles as a distributed energy resource to provide a service that benefits the distribution system.
- i) Please list and describe the ways in which it is possible to use the battery in electric vehicles as a distributed energy resource to provide a service that benefits the distribution system, *focusing only on those which Burlington Hydro is not yet capable of undertaking*.
- j) Is Burlington Hydro able to capitalize on the storage capacity of electric vehicles to reduce distribution system costs by: (i) communicating directly with charging stations to reduce load during peak periods; (ii) communicating directly with charging stations to allow power to be drawn from batteries during peak periods; (iii) drawing energy from car batteries connected to charging stations during peak periods; and (iv) communicating directly with charging stations to ensure energy is drawn from the LDC's system at the optimal times? If not, please explain what additional steps Burlington Hydro is willing to commit to take to explore and implement these things.
- k) Is Burlington Hydro willing to offer customers special rates to encourage the expansion of electric vehicles? If not, why not?

- l) Is Burlington Hydro willing to further explore steps it can take to speed up the implementation of charging stations in hard-to-service locations, such as for on-street parking in the City of Burlington?
- m) Could the City of Burlington ask Burlington Hydro through a unanimous shareholder resolution (or otherwise) to apply to the OEB for approval of programs intended to encourage the expansion of electric vehicles? If not, please explain why not.

Response:

- a) BHI does not have any data with regards to the number of electrical vehicle charging stations currently installed by its customers, nor how many are forecast for each year from 2021 to 2025. There are no requirements for customers to report these installations to BHI.
- b) As noted in response to ED-19 a), BHI does not have a forecast for electric vehicle charging stations for 2021 to 2025. As long as electric vehicle charging loads are manageable loads, BHI is confident it has both the available capacity and distribution system capable of facilitating all electric vehicle charging that will occur in Burlington. Electric vehicle charging loads are larger than typical residential loads but are relatively short in duration. With electric vehicles parked at residences for lengthy periods of time, particularly overnight, the energy delivered to these loads can be managed with currently available technology to shift and throttle energy deliveries to levels within the capacity of existing distribution assets while fulfilling the energy requirements of electric vehicle owners for use of their vehicles.
- c) No, not to BHI's knowledge.
- d) No, not to BHI's knowledge.
- e) Please see BHI's response to ED-19 b).
- f) Please see BHI's responses to ED-19 b).
- g) There are no capital investments specifically related to electric vehicles over the 2021 to 2025 time period.
- h) BHI is not currently using the battery in electric vehicles as a distributed energy resource.
- i) The question is not relevant since the consideration of capabilities not available to BHI is irrelevant to the OEB's determination of the COS in this application.

- j) BHI is currently not able to capitalize on the storage capacity of EVs to reduce distribution costs. Please see BHI's response to ED-9 f).
- k) Offering customers special rates to encourage the expansion of electric vehicles is not permitted within the current regulatory framework.
- l) Any steps taken would be in the context of BHI's obligations as a licenced distributor recognizing that some aspects of charging stations are unregulated and not within BHI's regulatory obligations.
- m) Please see BHI's response to ED-13 f) and ED-16 g).