ONTARIO ENERGY BOARD

IN THE MATTER OF the Ontario Energy Board Act, 1998, Schedule B to the Energy Competition Act, 1998, S.O. 1998, c.15 (the "**Act**");

AND IN THE MATTER OF an Application by Toronto Hydro-Electric System Limited ("**THESL**") for an Order or Orders approving or setting just and reasonable distribution rates and other charges, effective January 1, 2025 to December 31, 2029 (the **Application**").

EB-2023-0195

INTERROGATORIES

OF

DISTRIBUTED RESOURCE COALITION ("DRC")

February 12, 2024

Question: 1B–DRC–1

Reference:
- Exhibit 1B, Tab 5, Schedule 1, Appendix A
- Exhibit 2B, Section E8.4

Preamble: THESL engaged Innovative Research Group Inc. ("**IRG**") to assist in meeting THESL's customer engagement commitments and develop a comprehensive customer engagement study. The work was carried out in two phases. The first phase assessed customers' needs and preferences in relation to THESL's programs and services for the 2025-2029 rate period. During the second phase, customers provided detailed feedback on the $5.9 billion draft plan and the associated price impacts.

a) Please provide a copy of all written instructions provided by THESL to IRG in relation to IRG's customer engagement mandate for the Application and the report provided in Exhibit 1B, Tab 1, Schedule 1, Appendix A.

b) Please provide a copy of all written instructions provided by THESL to IRG in relation to customer engagement with respect to consumer choice in integrating technologies like distributed energy resources ("**DERs**"), electric vehicles ("**EVs**"), solar power, and battery storage.

c) Please describe all measures undertaken by THESL and IRG to invite and ensure the participation of EV stakeholders and other DER customers (including EV drivers, owners of DERs, EV associations, and DER industry associations) in customer engagement activities.

d) Please provide any and all notes from IRG's customer engagement relating to EVs and DERs that are supplementary to the reports provided in Exhibit 1B, Tab 1, Schedule 1, Appendix A.

e) Please discuss how the outcomes and priorities of customers have changed compared to historical equivalents and discuss any trend lines in customer priorities related to the adoption and integration of technologies like DERs, EVs, solar power, and battery storage.

f) Please discuss how the outcomes and priorities of customers have changed compared to historical equivalents and discuss any trend lines in customer priorities related to the energy transition and THESL's net zero commitments. As part of your answer please discuss any work done by the

THESL or IRG on the substantive knowledge of customers and what they understand their understanding of the energy transition.

Question: 1B–DRC–2

Reference:
- Exhibit 1B, Tab 1, Schedule 1, pp.58-59
- Exhibit 2B, Section E3

Preamble: THESL notes that "[c]ustomers are showing a continued interest in participating in the electricity system as both consumers and producers of power." THESL further notes that "[e]quipment that has a high number of DER connections is more likely to experience unstable conditions that pose significant reliability and safety risks to the system and its users."

a) Please elaborate on what THESL means by customers are interested in participating as both consumers and producers and that reliability and safety risks associated with equipment that has a high number of DER connections.

b) Please provide details as to the areas in THESL's service territory experience the highest reliability and safety risks associated with DER connections (such as neighbourhood, number of DERs connected, overview of risks and reliability issues, customer concerns, etc.). If THESL is unable to provide further details, please explain why not and whether such information may be obtained in this proceeding or subsequent proceedings.

c) What, if any, are factors that THESL believes will influence customer choice as the "key driver of DER demand", in addition to the economic and policy considerations listed, both for the period 2024-2029 and beyond.

d) What are the consequences if DER growth rates exceed THESL's forecasts and more closely approximate the highest projection scenarios from the FES Report? Please include in your response a discussion on what challenges will this present in terms of THESL's ability to meet the higher demand and any consequences it may have on THESL's ability to meet demand past 2030 if demand continues to accelerate more quickly than anticipated.

e) What additional investments beyond those set out in E3.3.1 would THESL propose to accommodate the highest projections from the Future Energy Scenarios Report?

Question: 1B–DRC–3

Reference:
- Exhibit 1B, Tab 1, Schedule 1, p.50
- Exhibit 2B, Section 5.5

Preamble: THESL notes that its "investment plan makes the minimum investments necessary (the "least regrets investments" to maintain key outcomes in the near-term while also making paced and deliberate progress in readying the grid and utility operations of the future, regardless of the path the energy transition takes."

a) Please discuss the time horizon considered by THESL in its investment plan to support its "least regrets investments" approach and explain what is meant by "near-term" and "readying the grid and utility operations of the future".

b) Please discuss the disadvantages and downside risks to THESL's distribution system, customers, investments in DERs, infrastructure, and/or workforce of underinvesting in electric vehicle infrastructure and DER connection and adoption infrastructure if a higher electrification scenario materializes compared to the one relied upon in the Application and THESL's investment plan. Please also discuss the implications of underinvestment over the rebasing period (2025-2029), mid-term (2030-2040), and long-term (2040 onwards).

c) Similarly, please discuss any disadvantages where a lower electrification scenario materializes.

Question: 1B–DRC–4

Reference:
- Exhibit 1B, Tab 1, Schedule 1, pp. 12-13

Preamble: THESL is seeking to grow its workforce by approximately 25 percent "to have the required resourcing capacity and capabilities to sustain foundations of a safe and reliable grid and meet the imperatives of an urban city and customers who are increasingly relying on electricity to expand, digitize and decarbonize their footprint."

a) Please identify in the record THESL provides details of how technological advancement will require training their workforce over the course of years to ensure THESL is able to sustain a safe and reliable grid as the energy transition accelerates.

b) Please confirm and comment on whether the anticipated widespread adoption of DERs and EVs over the next five years and beyond will require investments in THESL's workforce and please discuss what will be involved in training the workforce for your proposed approach (timeframes, new approaches, etc.)

c) Please comment on what training, programs, and investments will be needed if a more ambitious energy transition and DER adoption scenario occurs over the next five years and beyond. In your response, please comment on what training and upgrading of workforce skills will be needed to ensure that THESL's workforce is able to meet the challenges of an accelerated energy transition in this and the next decade and how does this compare to THESL's current approach and the approach proposed in the Application.

Question: **1B–DRC–5**

Reference:
- Exhibit 1B, Tabs 2-4
- Exhibit 2B, Section E7.2

Preamble: THESL notes that the Investment Plan optimizes near-term system capacity through, among others, the targeted use of non-wires solutions including grid-side technologies such as renewable enabling energy storage systems.

THESL notes that for the proposed Non-Wires Solutions Program will focus on developing a scalable, demand-driven, energy storage system ("**ESS**") strategy that is responsive to distribution system needs and supports THESL's pathway to renewable integration and electrification.

a) Please indicate whether EV batteries are expressly and/or implicitly, included in THESL's definition of ESS and, if so, how?

b) Please explain how THESL proposes to optimize efficiencies from the many EV batteries and charging infrastructure in its systems?

c) Please itemize all of the benefits that an EV ESS may have and provide THESL's rationale for not pursuing any specific EV ESS projects at this time given the stated benefits.

Question: 1B–DRC–6

Reference:
- Exhibit 1B, Tab 4, Schedule 1
- Exhibit 1B, Tab 4, Schedule 2

Preamble: THESL indicates that its innovation activities include integrating DERs, preparing for electrification by augmenting the capacity planning process with new scenarios-based modelling, launching an internal sandbox initiative, conducting an EV "smart charging" pilot with both Plug 'n' Drive and Elocity.

THESL is also proposing to establish a $16 million Innovation Fund to support the design and execution of innovative pilot projects over the 2025-2029 rate period.

a) Please comment on whether the Innovation Fund will be dedicated solely to DER-related projects and whether there will be opportunities for further stakeholder participation regarding the allocation of funding for projects under the Innovation Fund.

b) How does the proposed allocation of $16 million the Innovation Fund compare with total dollar amount funding in comparable jurisdictions?

c) What types of projects will be eligible for funding under the Innovation Fund and what types of project will be unable to access funding as a result of allocating only 0.3% of revenue as opposed to up to 1%?

d) Please provide any and all analysis, reports, studies, presentations, data or other documentation with respect to developing the proposal for the Innovation Fund, including all THESL's research regarding utility investments across comparable innovation initiatives and research and development activities (i.e., the range from 0.3 to 1 percent of revenues).

e) Please discuss the findings of THESL's research regarding comparable innovation investments including which jurisdictions were considered, the types of projects that received funding, and any lessons learned from these projects and broader innovation funding and investments.

f) When selecting projects to fund through the Innovation Fund, will THESL look at what pilots and program successfully implemented by comparable utilities and then propose pilots that potential partners could assist with as part of THESL's services? If not, why not.

g) Please discuss and elaborate on why pilots specific to THESL are necessary or helpful as opposed to considering the outcomes of innovation projects by comparable utilities (Ontario or otherwise) then applying the outcomes and learnings to THESL's services.

h) Why were these specific attributes for DERs selected?

i) Please identify the senior utility leaders who will oversee the Innovation Fund and the selection of projects and discuss how interested stakeholders will be able to assist with generating creative and innovative projects and whether funding will be available to ensure adequate stakeholder participation?

j) Please discuss and provide further examples of what the ideas and projects put forward through the Sandbox and what information and data are being shared with THESL employees overseeing the operation and implementation of the Sandbox. Please also discuss how the outcomes of the Sandbox are being communicated and shared with relevant and interested stakeholders. If information is not readily available or shared with stakeholder, please explain why not and what mechanisms exist (or should exist) to share such information in a timely and meaningful way.

Question: Exhibit 2B–DRC–7

Reference:
- Exhibit 2B, Section E5.1 (Customer Connection program)

Preamble: THESL's investment plan and Capital Expenditure Plan provide that the connection of DER facilities under the Customer Connection program supports the achievement of the public objectives with respect to facilitating innovation and supporting DER integration within Ontario's electricity system.

a) Please provide any and all analysis, reports, studies, presentations, data or other documentation with respect to past and forecast (2023-2029) DER uptake in THESL's service territory.

b) Do you accept that the services THESL provides to support the adoption and integration of DERs and EVs influence customer behaviour and adoption of these technologies. If yes, please discuss how THESL perceives its impact on customer demand in relation to the services THESL provides related to DERs and EVs. If not, please discuss why THESL does not believe that its DER- and EV-related services and programs do not influence customer behaviour and adoption.

c) Please indicate whether THESL considers EVs to be DERs and discuss the related implications for THESL's distribution system and system capacity.

d) Please provide any and all analysis, reports, studies, presentations, data or other documentation with respect integrating DERs as a driver of THESL's investment plan.

e) Please list any other common constraints to DER installation and comment on any improvements THESL has implemented over the past five years to address these constraints.

f) Please comment on whether there are areas within THESL's larger distribution system that are worse for the constraints listed in d) above than in other areas.

g) Please indicate the areas in THESL's service territory that are expected to be areas of significant DER growth over the next five years.

h) Please indicate and provide comment on areas of THESL's service territory that have are currently unable to meet DER installation demand and comment whether these areas will continue to be unable to meet demand or whether there are new areas anticipated to be unable to meet demand over the next five years and beyond. In your response, please comment on how this is expected to vary by neighbourhood.

i) Please comment on known barriers to EV adoption in THESL's service territory, including for multi-unit rental residential, and how the Application seeks to address these barriers and ensure equitable access to charging infrastructure for all customers.

j) Does THESL have any programs to support the upgrading of supply infrastructure to enable EV charging infrastructure when THESL is planning expansion or upgrades? If yes, please provide details. If no, please discuss what types of programs could be developed to support proactive and future infrastructure upgrades to enable equitable access to EV charging infrastructure.

k) Please provide THESL's views on any barriers to EV adoption for residents of multi-unit complexes in THESL's service area. Among any other views, please provide specific comment on whether multi-unit residential complexes represent one of the more challenging venues for EV adoption, and whether THESL agrees that addressing those challenges should be prioritized. Please explain THESL's position on each of these points.

l) Please describe any ongoing activities or initiatives proposed by THESL that can help to address challenges specific to EV transition in multi-unit residences by way of proactive infrastructure upgrades or future upgrades. Please include any planned or anticipated initiatives at the system-wide level in addition to any more localized initiatives.

Question: 2B–DRC–8

Reference:
- Exhibit 2B, E8.3
- Exhibit 4, Tab 2, Schedule 18

Preamble: THESL indicates that it is seeking to transition its commercial fleet to low or zero emission technology, including increasing the rate of EVs.

a) Please provide any and all reports, working papers, analysis or other materials that have been prepared (in draft or in final form) in connection with the transitioning of THESL's commercial fleet to low or zero emission technology.

b) The federal government provides financial incentives for qualified zero emission vehicles purchased or enhanced capital cost allowance deductions.

(i) Please advise whether THESL's planned fleet renewal investments qualify for any federal financial incentives and/or enhanced capital cost allowance deductions.

(ii) Please advise whether the capital expenditure figures reported reflect federal financial incentives and/or enhanced capital cost allowance deductions.

c) Please complete the following chart indicating the breakdown of vehicle type in THESL's current vehicle fleet:

Vehicle Type	Fully Electric	Hybrid	Non-EV/Hybrid	Total
Heavy Duty Vehicles				
Medium Duty Vehicles				
Light Duty Vehicles				

d) What proportion of THSEL's planned fleet renewal investment will involve fully electric and/or hybrid vehicles? Please complete the following chart indicating THESL's anticipated breakdown of vehicle type in THESL's planned fleet renewal investment (2025 to 2029):

Vehicle Type	Fully Electric	Hybrid	Non-EV/Hybrid	2025-2029 Total
Heavy Duty Vehicles				
Medium Duty Vehicles				
Light Duty Vehicles				

e) Please indicate the estimated quantum of efficiency savings (including fuel cost savings and greenhouse gas emission reductions) that THESL anticipates it will achieve by utilizing hybrid vehicles and EVs rather than traditional internal combustion engine vehicles over the rebasing period (2025-2029).

Question: 2B–DRC–9

Reference:
- Exhibit 2B, Section D8
- Exhibit 2B, Section E8.4

Preamble: THESL proposes an Information Technology Investment Strategy, which includes an identification of and response to certain threats relating to cybersecurity.

a) Please describe THESL's perspective on cybersecurity risks over the proposed rate term and beyond as they apply to the integration of DERs.

b) Please describe THESL's perspective on cybersecurity risks over the proposed rate term and beyond as they apply to the adoption of smart grid or similar technologies used in support of the integration of DERs.

c) Please describe any efforts THESL has undertaken or will undertake to identify the full extent of risks to cybersecurity in the context of DERs and use of smart grid technology.

d) Please identify any portions of the record that THESL believes address these (or generally related) issues.

Question: 2B–DRC–10

Reference: Exhibit 2B, Section A

Preamble: THESL states that customers are showing a continued interest in participating in the electricity system as both consumers and producers of power and that DER connections have grown in recent years as result of government policies and declining costs of technologies such as solar panels.

a) Please elaborate on customer interest related to solar power since the last rebasing period.

b) Please provide any other common constraints to DER installation and comment on (i) any improvements THESL has implemented over the past five years to address these constraints and (ii) whether there are areas within THESL's larger system that are worse for these constraints than others.

c) Please indicate where there are expected areas of DER growth in THESL's service territory.

d) Please indicate the areas of THESL's service territory that THESL has been unable to meet DER installation demand and indicate whether there are any other areas where installation demand will not be met over the rebasing period and beyond.

e) Please provide any comments and insights from THESL's perspective on the adoption and integration of DERs at a more granular level, such as at the neighbourhood level (which neighbourhoods are seeing a significant increase in DER and EV adoption, which neighbourhoods are not seeing any or an increase in demand for DERs and EVs, etc.). If known, please discuss the characteristics of THESL's customers that are adopting these technologies (age, income, location, residential type etc.).

f) Please discuss the downside risks of underinvesting and inadequate capital expenditures on EVs and DERs servicing and system infrastructure over the rebasing period and the implications for the 2030-2040 period.

Question: 2B–DRC–11

Reference:
- Exhibit 2B, Section D4, Appendix B
- TransformTO Net Zero Strategy ("**TransformTO**")

Preamble: THESL engaged Element Energy ("**EE**") to develop the Future Energy Scenarios model report (the "**FES Report**") to offer a range of plausible trajectories on the path toward decarbonization.

a) Please place the TransformTO Net Zero Strategy materials on the record in this proceeding.

b) Please explain why THESL and/or EE chose the TransformTO scenarios and any advantages or disadvantages in terms of the reliability of these scenarios for THESL over the next five years.

c) Please discuss the implications of the four central scenarios in the FES Report specifically for DERs, EVs, storage.

d) Please explain what the drivers are for EV transition in the steady progression scenario and whether it's a gradual or concentrated transition.

e) Please explain how THESL's assumed EV adoption is aligned with TransformTO and why that is the standard that TH adopted. As part of your response, please also discuss whether any other metrics were considered by THESL and whether there are any disadvantages to relying on a plan that was developed in 2020.

f) Please explain what the drivers are for solar power adoption in the steady progression scenario and whether it's a gradual or concentrated transition

g) Please elaborate on the moderate increase anticipated in the System Transformation scenario for distributed renewable generation.

h) Please discuss what would be involved in assessing the probability of any specific outcome taking place.

i) Please elaborate on drivers behind what THESL considers falling technology costs relevant to the distributed renewable generation that was identified as a possibility in the FES Report.

j) Please explain how the scenarios capture “the impact of flexibility options such as energy storage, smart charging and vehicle to grid options for electric vehicles”.

k) Please provide the full list of attributes used in the EE’s “Electric Car Consumer model” and indicate which attributes THESL considers to be the most significant and describe how it affects EV uptake.

l) Please indicate whether THESL accepts that consumer preferences and related consumer behaviour is changing and discuss how this and any such changing attitudes are incorporated into the analysis performed in the FES Report?

m) Did EE consider any other comparable jurisdictions (USA, Europe)? If, yes please indicate which jurisdictions and discuss how this was included in the analysis. If no, please discuss why no other comparable jurisdictions were included in the analysis.

n) Please indicate whether there were any other factors considered for the purposes of allocating BEV and PHEV to neighbourhoods. If yes, please discuss how they were considered? If no other factors were considered, please discuss why not?

o) Please elaborate on what you view as the limitations around the business case for bi-directional chargers. As part of your response, please discuss whether these limitations are changing and the likely outlook bi-directional charging over the next 5 and 10 years? Please also discuss what has changed on these or related points since the study from 2019 cited in the FES Report.

p) Please elaborate on the in-house consumer choice model that EE used to develop solar PV projection and discuss whether or not THESL has analyzed whether solar PV will be evenly distributed across its service territory and how that picture will develop over time.

q) Please discuss what additional measures are necessary for the more aggressive transition pathways. For example, how does this pathway alter what constitutes a safe bet and what are the neighbourhood-by-neighbourhood implications if there is greater uptake of DERs and EVs in some areas as compared to others.

Question: 2B–DRC–12

Reference:
- Exhibit 2B, Section D5

Preamble: THESL acknowledges it is necessary to accelerate strategic investment in specific field and information technologies that will deliver near-term benefits to customers while setting the utility on a path toward sustainable performance and improved efficiency as the pressures of climate change and the energy transition mount and that electrification, DER proliferation, and worsening climate change will place increasingly complex demands on the utility's system assets and operations.

a) Please identify the jurisdictions that THESL believes provide lessons for successful transformation and discuss the lessons that THESL believes should be taken from these examples.

b) Please comment on to what extent, generally, do THESL's 5-year plans take into account the longer-term 2050 net zero scenario trajectories and discuss whether demand for transition will accelerate THESL's ability to accommodate?

c) Under what scenarios does THESL anticipate that it may no longer be cost-effective or possible to connect new DERs in its service territory?

d) Please provide further detail concerning the timing and nature of the additional modeling or analysis that THESL says it will undertake following the completion of the FES and provide details of all anticipated efforts to enhance demand forecasts and scenario analyses

Question: 2B–DRC–13

Reference:
- Exhibit 2B, Section E3

Preamble: THESL is seeking to grow its workforce by approximately 25 percent "to have the required resourcing capacity and capabilities to sustain foundations of a safe and reliable grid and meet the imperatives of an urban city and customers who are increasingly relying on electricity to expand, digitize and decarbonize their footprint."

a) What, if any, are factors that THESL believes will influence customer choice as the "key driver of DER demand", in addition to the economic and policy considerations listed, both for the period 2024-2029 and beyond.

b) What are the consequences if DER growth rates exceed THESL's forecasts and more closely approximate the highest projection scenarios from the FES Report? Please include in your response a discussion on what challenges will this present in terms of THESL's ability to meet the higher demand and any consequences it may have on THESL's ability to meet demand past 2030 if demand continues to accelerate more quickly than anticipated.

c) What additional investments beyond those set out in E3.3.1 would THESL propose to accommodate the highest projections from the Future Energy Scenarios Report?

Question: 3–DRC–14

Reference:
- Exhibit 3, Tab 1, Schedule 1
- Exhibit 3, Tab 1, Schedule 1, Appendix J

Preamble: 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.

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.

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?

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

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.

ALL OF WHICH IS RESPECTFULLY SUBMITTED THIS

12th day of February, 2024

Nicholas Daube
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