Distributed Resource Coalition

Question: M-DRC-1

Reference: Exhibit M, pp. 24-62.

Preamble: Pacific Economics Group Research LLC (**PEG**) performed analysis of Clearspring Energy Advisors' calculated multifactor productivity (**MFP**) trend and stretch factor (including underlying benchmarking analysis).

Interrogatories:

a) How, if at all, does PEG's analysis and research on cost benchmarking and productivity include any adjustments for the role that distributed energy resources (**DERs**) (including energy storage, electric vehicles (**EV**s), and grid modernization) may play in achieving total cost savings, reliability improvements, improved peak load management, or other benefits? Please explain.

b) How would you expect more widespread DERs (including energy storage, EVs, and grid modernization) to impact HONI's:

   (i) MFP trend; and

   (ii) stretch factor.

c) what assumptions have you used for load growth resulting from electrification generally and transportation electrification specifically?

Responses:

The following response was provided by PEG.

a) PEG's cost benchmarking research considers the impact of input prices, important measurable outputs (peak demand, line, length, and the number

of customers served), and some other measurable business conditions (e.g. forestation) on utility cost when fashioning cost benchmarks. Productivity indexes are a less sophisticated measure of cost efficiency trends that only controls for the effect of input prices and important measurable outputs. The focus of both exercises is the efficiency with which utilities manage their own costs.

It is not common in such studies to itemize the impact of specific inputs or outputs. One reason is that data for a large number of utilities may not be available. Another is that it is not customary in such studiesto explore what strategies utilities employed to boost efficiency.

PEG's econometric cost benchmarking research DID include a variable that measures the prevalence of advanced metering infrastructure ("AMI"). This research found that AMI has significantly raised power distribution OM&A expenses as well as capital cost and total cost.

Demand-side management ("DSM") expenses are customarily excluded from studies of this kind and have been excluded by PEG as well as Clearspring in this proceeding. One reason is that DSM costs are usually subject to tracker treatment and thereby irrelevant to the design of the revenue cap indexes. The impact of DSM and distributed generation and storage ("DGS") on peak demand is captured and has doubtless been one reason for slow peak demand growth in recent years. This triggered a debate between Clearspring and PEG concerning the right way to measure peak demand growth. The impact of these DERs on delivery volume has not been considered since volumes are not a major driver of transmission and distribution ("T&D") cost.

Reliability was not considered in either the productivity or cost

benchmarking research since standardized data of good quality on reliability are unavailable.

b) DSM will tend to lower Hydro One's peak demand and thereby tend to slow multifactor productivity growth and cost efficiency scores until and unless it produces offsetting savings in the cost of base rate inputs. Containment of peak demand may not have much of a cost efficiency impact until and unless electrification of transportation and space heating advances.

c) PEG used Hydro One's load growth forecasts in this proceeding.

Question: M-DRC-2

Reference: Exhibit M, pp. 78-79.

Preamble: The evidence notes that a study on the productivity trends of US power distributors was published in 2017 by Lawrence Berkeley National Laboratory (the **Berkeley Study**).

In the Berkeley Study, PEG calculated multifactor productivity index (**MFP**) trends of a large sample of US power distributors. The Berkeley Study demonstrated that the "incentive power of regulatory systems can be increased by efficiency carryover mechanisms and less frequent rate cases and reduced by earnings sharing mechanisms."

Interrogatories:

a) Please file a copy of the Berkeley Study and any available updates to the 2017 data used. In the event that updated data is readily available, please provide your assessment of the data trends (increase, decrease, remains same) for each material data factor.

b) Based on the conclusions of the Berkeley Study, please provide your best directional estimate of the impacts of EV and DER trends and projections on:

   (i) HONI's X factor (base MFP trend and stretch factor), if any; and
   (ii) any alternative capital factor approach.
   Please explain your response.

Responses:

The following response was provided by PEG.

a) The Berkeley Study is attached as Exhibit N/Tab 3/Schedule 2/Attachment 1

to this interrogatory response. PEG has not updated this study.

b) The Berkeley Study was not forward looking and did not consider the impact of EV and DER trends on future power distribution productivity growth.

Question: M-DRC-3

Reference: International Energy Agency (**IEA**), *"Net Zero by 2050: A Roadmap for the Global Energy Sector"*[1] (the **Report**)

Preamble: The Report notes that getting to net zero emissions will require a significant expansion of the electricity sector with global electricity generation rising to 26 8000 TWh in 2020 to over 50 000 TWh in 2050.[2] (p 45) The Report's roadmap to achieve net zero emissions suggests that "electricity demand increases more than two-and-half times" and that total electricity supply costs will triple from 2020 to 2050.[3] In addition, operating and maintaining power plants worldwide is estimated to "cost close to USD 1 trillion in the [Net-Zero Emissions by 2050 scenario], two-and-a-half times the level in 2020." By 2050, the cost of operating and maintaining renewables is expected to reach USD 780 billion.[4]

Interrogatories:

a) Please provide your understanding of how the above trends, including the increased demand of electricity and the transition to low- and/or zero-emitting sources, may affect:

   (i) North American electricity utilities

   (ii) Canadian electricity utilities

   (iii) HONI

   (iv) HONI's current and future productivity and load (or MFP trend).

b) Based on the above and the Report, please provide your estimate of the

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[1] (May 2021)

[2] International Energy Agency (**IEA**) Report, *"Net Zero by 2050: A Roadmap for the Global Energy Sector"* (May 2021), p. 45, available online at <https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf>; see also Attachment A.

[3] *Ibid.*, p. 163.

[4] *Ibid.*, p. 165.

impact of widespread DER adoption on reliability, demand, and productivity (or MFP trend).

Responses:

The following response was provided by PEG.

a) PEG believes that aggressive decarbonization of the economy is desirable and recognizes that it will greatly increase the use of electricity in transportation, space heating, and other applications where fossil fuels are currently used. Notwithstanding some growth in DGS, the need for grid services is likely to grow substantially, particularly in areas where electricity is relatively inexpensive. DSM will have a critically important role to play in limiting the need for costly new grid capacity and facilitating reliance on intermittent renewable resources for power generation.

b) PEG has not undertaken this work, which is not very germane to development of revenue cap indexes for power T&D that will be applicable to the next five years. However, PEG believe that regulation of T&D in Ontario should increasingly encourage beneficial electrification, efficient DGS, and demand response programs.