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*via Regulatory Electronic Submission System (RESS)*

May 15, 2024

Ms. Nancy Marconi, Registrar  
Ontario Energy Board  
PO Box 2319  
2300 Yonge Street, 27th floor  
Toronto, ON M4P 1E4


Dear Ms. Marconi:

**Re: OEB File No. EB-2023-0195, Toronto Hydro-Electric System Limited (“Toronto Hydro”)  
2025-2029 Custom Rate Application for Electricity Distribution Rates and Charges –  
Interrogatories for Pacific Economics Group May 6, 2024 Report (Exhibit M3)**

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In accordance with Procedural Order No. 5, please find enclosed Toronto Hydro’s interrogatories on Exhibit M3 prepared by Pacific Economics Group Research LLC (“PEG”) entitled “Statistical Cost Research for THESL’s New CIR Plan” on behalf of OEB Staff.

Sincerely,

**Daliana  
Coban**  Digitally signed by Daliana Coban  
DN: cn=Daliana Coban, c=CA,  
email=dcoban@torontohydro.com  
Date: 2024.05.15 17:16:29 -04'00'

Daliana Coban  
Director, Regulatory Applications & Business Support  
Toronto Hydro-Electric System Limited

Cc: Charles Keizer and Arlen Sternberg, Torys LLP; all intervenors

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

**AND IN THE MATTER OF** an Application by Toronto Hydro-  
Electric System Limited for an Order or Orders approving just and  
reasonable distribution rates and other service charges for the  
distribution of electricity, effective January 1, 2025.

**INTERROGATORIES FROM  
TORONTO HYDRO-ELECTRIC SYSTEM LIMITED (“Toronto Hydro”)**

**M3-TH-001** *Reference: PEG Clearspring Report, p. 6 “Pacific Economics Group Research LLC (“PEG”) is North America’s leading consultancy on incentive ratemaking and the benchmarking and price and productivity trend research that supports it. In addition to Ontario, we have provided research and testimony in these areas in numerous other North American jurisdictions.”*

- a) For all of PEG’s electric utility work in the last ten years, please provide a table that shows the target utility, industry (G, T, D, or combination thereof), PEG’s client in the proceeding, PEG’s TFP industry trend finding, PEG’s benchmark finding, PEG’s recommended productivity factor, inflation factor recommendation, and PEG’s recommended stretch factor. In cases where PEG only provided some but not all the elements above, please leave blank only those elements that PEG did not perform.
- b) Please provide all reports within the last ten years produced by PEG in these cited areas.

**M3-TH-002** *Reference: PEG Clearspring Report, p. 6 “Pacific Economics Group Research LLC (“PEG”) is North America’s leading consultancy on incentive ratemaking and the benchmarking and price and productivity trend research that supports it. In addition to Ontario, we have provided research and testimony in these areas in numerous other North American jurisdictions.”*

In a recent report conducted on behalf of Hawaiian Electric Company (“HECO”) in Docket No. 2018-0088, PEG filed a report on May 13, 2020 titled, “New X Factor Research for HECO”. This research involved vertically integrated utilities (G, T, and D). PEG recommended a -1.41% X factor and a 0.22% consumer dividend on behalf of HECO.

- a) Please confirm the 0.22% consumer dividend was based on PEG’s statement on p. 29 of that report when PEG states that the average of approved consumer dividends in current plans approved by North American energy regulators is 0.22%.

- b) On p. 10 of that report, please confirm or correct as necessary that PEG listed three recent X Factor precedents and these are:
  - i. The average itemized MFP growth target in U.S. multi-year rate or revenue cap indexes is about -0.30%.
  - ii. The average X factor in the three current U.S. multi-year rate plans is about -1.50%.
  - iii. Several recent PBR plans in Ontario have featured a 0% MFP growth target.
- c) Please list any new X factor precedents in North America since 2020 that would modify part b.
- d) Regarding the X factor average of -1.50% that PEG cited in part b, in PEG's view, why is the X Factor so much lower in the three current plans than the productivity growth target of -0.30%?
- e) Please confirm or correct that PEG on p. 26, Table 7 of its HECO report, found an MFP growth trend from 2008-2017 of -0.87% and an input price inflation differential from GDPPI of -1.37%.
- f) Did PEG undertake similar input price differential research in the current application? If so, please provide. If not, please explain why PEG did not undertake this research.
- g) Does PEG believe a properly calibrated inflation factor and/or an input price differential is an important element in a multi-year revenue plan?
- h) Does PEG have evidence that the inflation factor in Ontario is reflective of industry input price inflation for Toronto Hydro? If so, please provide.
- i) Please provide the 2008-2017 TFP trend for electric distribution from PEG's HECO model and research.
- j) On page 34 of the HECO report, PEG states, "Using established cost theory and econometric methods, we identified drivers of VIEU productivity growth and estimated their productivity impacts. The need for T&D repex was found to be an important driver of MFP growth of sampled VIEUs in recent years." Does the identified need for T&D repex (replacement capital expenditures) within the U.S. sample, mean that PEG is citing this as a reason for its negative TFP finding?

**M3-TH-003** *Reference: PEG Clearspring Report, p. 31, "The following methods that we used in model development differed from Clearspring's."*

In EB-2021-0110, Hydro One's most recent rate application, PEG and Clearspring issued a Joint Report in June 2022. In that report, PEG produced a total cost benchmarking

model and reported distribution total cost benchmarking results that were very similar to Clearspring's. In the current case, Clearspring continued the benchmarking progress made in that conferral process and Joint Report by retaining all the methodologies agreed upon and only added two variables and refined the percent congested urban variable that both Clearspring and PEG put in their models for all CIR benchmarking research including the last Toronto Hydro application and both consultants agreed should be included in the model. Unlike Clearspring, PEG has now made several significant departures in methodology and the variables included within the models from that conferral process.

- a) Please separately list all variable differences and other methodological differences between PEG's Joint Report total cost benchmarking study and PEG's research in the current study.
- b) Did PEG produce and examine model runs that replicated the Joint Report model specification during the course of its research in this application?
- c) Please provide the Toronto Hydro benchmarking results using PEG's model specification used by PEG in the Hydro One Joint Report.
- d) Did PEG translog the service territory area in its Joint Report study?
- e) Did PEG produce and examine model runs with the area variables translogged in the model during the course of its research in this application?
- f) Please provide the Toronto Hydro results if the area variables are translogged with all other variables and methodologies remaining the same. For the area congested urban variable, interact it with the other output variables and take a quadratic without taking the natural log since many of the observations are zero and cannot be logged.
- g) Please confirm that PEG treated the total service area as a scale or output variable in its Joint Report study.
- h) Please provide the Toronto Hydro results if the two area variables in PEG's model are replaced with the percent congested urban variable and the total area variable used by PEG in its Joint Report with all other variables and methodologies remaining the same.
- i) Please confirm that PEG has modified its sample period start year from 2002 in the Joint Report to 2007.
- j) Did PEG examine model runs with the 2002 start year used by PEG in the Joint Report and/or any other start years during the course of its research? If so, please

list the start years examined by PEG.

- k) Please provide the PEG model results if PEG moved the start year to 2002 as it used in the Joint Report with all other variables and methodologies remaining the same.
- l) Please confirm that PEG has changed the forestation variable from being interacted with overhead in the Joint Report to now being a standalone variable.
- m) Please provide the PEG Toronto Hydro results if PEG used the same forestation and overhead variable as it used in the Joint Report with all other variables and methodologies remaining the same.
- n) Please confirm that PEG changed how it constructed the percent overhead variable relative to its treatment of it in the Joint Report.
- o) Please confirm PEG uses a different standard error correction in the current research relative to what it used in the Joint Report.
- p) Does PEG believe that a distribution substation count variable and/or a capacity variable is sensible and would potentially improve the model assuming the data was not problematic?
- q) Did PEG produce and examine model runs with these variables in the model during the course of its research?
- r) Please include the two substation variables in PEG's model and report the Toronto Hydro results with all other variables and methodologies remaining the same.

**M3-TH-004**

*Reference: PEG Clearspring Report, p. 5 "CIR proceedings are opportunities for Ontario's regulatory community to reconsider how statistical cost research should be used in energy rate regulation."*

PEG produced a study of the U.S. TFP trend and put forth a new productivity factor ("PF") that differs from the decided upon productivity factor in the 4th Generation IR generic proceeding and that differs from the 0.00% PF used in all other CIR applications.

- a) Is PEG of the view that an input price differential is a key component of calibrating an appropriate X-Factor in a multi-year revenue plan?
- b) Did PEG examine what the appropriate input price differential should be in the case of a utility serving Toronto? If yes, please provide any study details and findings. If no, please explain why the component was not examined.

- c) In PEG's view, is it possible and/or likely that the City of Toronto has had or will have higher input price inflation than what the OEB calculated inflation factor measures?
- d) If input price inflation for Toronto Hydro is higher than the OEB calculated inflation factor, in PEG's view, should this lower the X-factor accordingly?
- e) Would PEG be of the view that the input price inflation factor and/or an input price differential should be part of a fuller investigation of incentive regulation conducted by the OEB for the distributors in the Province?

**M3-TH-005** *Reference: PEG Clearspring Report, p. 7 "Clearspring's modified congested urban variable is overly sensitive to observations for a handful of urban utilities. The variable has other flaws that reduce its suitability, one of which is Clearspring's choice to use a 2012-2022 average growth in the number of Toronto skyscrapers to forecast a 7.1% annual growth rate in the congested urban area. Alternative and sensible treatments of the urban congestion challenge also receive strong statistical support but yield far less favorable benchmarking results for THESL."*

- a) Please confirm that PEG used the time invariant percentage congested urban variable in its cost benchmarking research in the prior Toronto Hydro application, the last Hydro Ottawa application, and the last Hydro One application.
- b) Please confirm that PEG applied Clearspring's methodology unchanged in escalating the congested urban area in PEG's new congested urban area variable.
- c) In 2021, Commonwealth Edison and Pacific Gas & Electric have more congested urban area than Toronto Hydro (over 13 square km). Yet both utilities serve huge suburban and rural areas that encompass large parts of the state of Illinois and California. Does PEG consider that Commonwealth Edison and Pacific Gas and Electric have higher urban characteristics than Toronto Hydro?
- d) Please confirm that PEG's model assumes that if Commonwealth Edison increased its congested urban area by one and Toronto Hydro increased its congested urban area by one square km, PEG's model would assume the same percentage increase in total costs for both utilities (2.67%).
- e) Please confirm that since Commonwealth Edison has total costs around triple that of Toronto Hydro, that adding one sq. km of congested urban would, therefore, add triple the total costs to Commonwealth Edison than it would to Toronto Hydro.

**M3-TH-006** *Reference: PEG Clearspring Report, p. 7 "The area variable should not be translogged..."*

- a) Please confirm that PEG translogged the area variable in its own total cost model in the Hydro One Joint Report.

- b) Please confirm that PEG did not raise any concerns in the Joint Report regarding translogging the area variable.

**M3-TH-007** *Reference: PEG Clearspring Report, p. 7 “The substation and substation capacity data used in the study were extensively flawed.”*

- a) Please confirm that PEG included substation variables in its transmission total cost model in the Hydro One Joint Report.
- b) Did PEG conduct a similar analysis of the data issues of its own substation variables in its transmission total cost research? If so, please provide the analysis and findings. If not, why not?
- c) Does PEG believe that a substation and/or a substation capacity variable has merit assuming data issues are not a concern?

**M3-TH-008** *Reference: PEG Clearspring Report, p. 9 “The OEB has not authorized a new study of Ontario productivity trends in more than a decade. The latest U.S. evidence suggests that a small base cost efficiency growth factor of 0.10% is reasonable for both the OM&A and capital revenue of THESL.”*

- a) Is PEG of the view that a new study of Ontario productivity trends would be helpful in determining the appropriate productivity factor for Ontario distributors?
- b) Is PEG’s recommendation of a 0.10% efficiency factor based on its finding that the ten-year cost-weighted TFP growth for the U.S. industry of 0.10%?
- c) What is the difference in how PEG is using the definitions between an “efficiency growth factor” and the “productivity factor”?
- d) Would PEG characterize Toronto Hydro as being a “medium” utility relative to PEG’s TFP dataset? Please provide a comparison to the sample average of how Toronto Hydro compares in terms of the components of TFP trends which are the number of customers served, peak demand, capital quantity, and OM&A quantity.
- e) Would PEG be of the view that it would be a reasonable alternative to use the average-weighted TFP trends as the basis for the cost efficiency trend?
- f) Please confirm that PEG in its 4th Generation IR productivity research threw out the two largest distributors from the calculations because of the large impact they had on the industry TFP trend in Ontario.
- g) Is PEG of the view that the Ontario TFP trend may be informative and useful in a proper investigation of revising a new productivity factor?

- h) Has PEG conducted research on the recent Ontario TFP trend within the last ten years? If so, please provide the results and analysis.
- i) Please confirm that PEG has not provided U.S. TFP trend research in prior electric distribution CIR applications. If not confirmed, please provide.
- j) Is PEG of the view that in the case of a negative TFP trend in the industry, a negative productivity factor would be the theoretically correct approach? Would PEG ever support a negative productivity factor? If not, please explain the rationale.

**M3-TH-009** *Reference: PEG Clearspring Report, p. 24 "Table 1 and Figure 5 below illustrate how various reasonable changes to Clearspring's skyscraper growth assumption affect THESL's forecast cost performance scores."*

- a) What assumption between the six changes displayed did PEG make for its new congested urban area variable?
- b) Is PEG of the view that a 0.28% growth rate in 2027 and a 0% growth rate in 2028 skyscrapers in Toronto is reasonable? Please explain.
- c) Is PEG of the view that skyscrapers in Toronto in 2023 increased by only 1.19%? Please explain.
- d) Does PEG agree that Toronto is one of the fastest growing cities in North America? If not, please explain.
- e) Does PEG agree that the congested urban cost challenge for Toronto Hydro is growing every year and that growth should be reflected in a time variant congested urban variable?

**M3-TH-010** *Reference: PEG Clearspring Report, p. 25, Figure 5.*

Please explain why the 2023-2029 growth assumption would impact the 2018 value such that the blue line in the graph is higher than the orange line in 2018, 2019, 2020, 2021, and 2022.

**M3-TH-011** *Reference: PEG Clearspring Report, p. 28 "Clearspring uses the Driscoll-Kraay standard error adjustment to their OLS model, but does not use the "Fixed-b" adjustment version."*

Please confirm that PEG's benchmark scores for Toronto Hydro would be the same if PEG did not use the "Fixed-b" adjustment but, instead used the Driscoll-Kraay estimator without the adjustment as Clearspring did and PEG did in the Hydro One Joint Report. Please provide a comparison of the T-statistics for the total cost model of the two approaches.



**M3-TH-012** *Reference: PEG Clearspring Report, p. 29 “The Company’s customer count was meanwhile 0.77 times the mean while its rolling average ratcheted peak demand was 0.89 times the mean.”*

On Table 5, PEG displays its total cost model and describes the peak demand variable as “10-Year Rolling Avg of Distribution Peak”. On p. 29 the peak demand is described as being ratcheted.

- a) Is PEG’s peak demand variable in its econometric total cost model ratcheted or is it a 10-Year rolling average of the annual system peaks? Please describe if its neither one of these options.

**M3-TH-013** *Reference: PEG Clearspring Report, p. 29 “The TFP level result is clearly unfavorable to the Company”.*

- a) Please confirm that PEG’s TFP level finding in 2021 does not account for the several cost challenges that PEG cites after this statement.
- b) In PEG’s total cost model the share of overhead distribution assets has a negative parameter estimate, implying that the higher share of overhead the lower the costs are. Since PEG states that Toronto Hydro’s share is 0.42 times the mean, should this also be listed as a cost challenge rather than PEG implying in its report that it is a cost advantage for the Company?

**M3-TH-014** *Reference: PEG Clearspring Report, p. 31 “The Company’s service territory area outside of the urban core was a tiny 0.03 times the mean.”*

- a) Would PEG consider Toronto Hydro to be an outlier in terms of this variable since its value is 0.03 times the mean?
- b) Please list the possible variable or model specification alternatives to capturing network density that PEG considered when developing its total cost model.

**M3-TH-015** *Reference: PEG Clearspring Report, p. 31 “The following methods that we used in model development differed from Clearspring’s.”*

After this statement, PEG then lists eleven differences from Clearspring’s methods. Most of these also differed from the methods in the Hydro One Joint Report.

- a) Please confirm that PEG did treat service territory area as a scale variable and translogged it in the Joint Report.

- b) Please confirm that PEG did not raise any concerns about treating service territory as a scale variable in the Joint Report.
- c) Please confirm that mean-scaling all variables has no impact on the results.
- d) Please confirm that PEG used a percentage congested urban variable in the Joint Report.
- e) Please confirm that PEG did not raise any concerns about using a percent congested urban variable in the Joint Report.
- f) Please confirm that PEG used a start year of 2002 in the Joint Report and not 2007.
- g) Please confirm that PEG did not raise any concerns about the start year in the Joint Report.
- h) Please confirm that PEG used an interaction variable of overhead x forestation in the Joint Report.
- i) Please confirm that PEG did not raise any concerns about the interaction variable of overhead x forestation in the Joint Report.
- j) Please confirm that PEG did not use a distribution construction standards index in its OM&A cost model in the Joint Report.
- k) Please confirm that it was PEG that put forward the scope variable during the Joint Report conferral process but did not state that corrections should be made to the reported data.
- l) Did PEG make these same corrections to its scope variable in the Joint Report that it made in this application?
- m) Please confirm that PEG used Clearspring's overhead variable construction in the Joint Report.
- n) Please confirm that PEG did not raise any concerns about Clearspring's overhead variable construction in the Joint Report.
- o) Please confirm that PEG used the same estimation process of Driscoll-Kraay as Clearspring did in the Joint Report.
- p) Please confirm that PEG did not raise any concerns about Clearspring's estimation process of using Driscoll-Kraay in the Joint Report.

- q) Please confirm that PEG examined and made some corrections but then included substation variables in the Joint Report for transmission total cost benchmarking.
- r) Please confirm that PEG did not raise any concerns about including substation variables in the transmission total cost model in the Joint Report.
- s) Did PEG also change how the OM&A input price is constructed relative to its research in the Joint Report?

**M3-TH-016** *Reference: PEG Clearspring Report, p. 32 “We added a distribution construction standards index variable developed by Power Systems Engineering to the OM&A cost model.”*

- a) Did PEG attempt to include this variable in the total cost model?
- b) Please provide the total cost results for Toronto Hydro of including this variable with no other variable or methods changed.
- c) It would seem that a construction standards index should impact capital and total costs but have a lesser or no impact on OM&A costs. Why did PEG only include this variable in its OM&A model? On what theoretical basis is it included for OM&A but not total or capital cost?
- d) Please provide details on the construction of this variable and how it was developed.
- e) Did Power Systems Engineering develop this variable for PEG? Did PEG subcontract with Power Systems Engineering? If so, please provide the retainer or engagement agreement/confirmation with PSE and all written instructions provided to it.

**M3-TH-017** *Reference: PEG Clearspring Report, p. 34, Table 5.*

- a) Does PEG have any engineering explanation for why its total cost model shows that the Area Not Congested Urban has a substantially higher parameter estimate than Area Congested Urban?
- b) Please confirm that the parameter estimate for Area Not Congested Urban is approximately 57% higher than the parameter estimate for Area Congested Urban.
- c) Would PEG agree with the statement that the percentage of total costs of Toronto Hydro driven by congested urban cost challenges is higher than nearly all other utilities in the sample with the possible exception of Consolidated Edison? If not, please explain why not.

- d) Is PEG's congested area variable able to adjust for the fact that the percentage of congested urban costs relative to total costs varies dramatically by utility? For example, Consolidated Edison which only serves New York City will have a far higher percentage of costs driven by its congested urban challenges versus Commonwealth Edison which serves Chicago but also huge areas throughout the state of Illinois.
- e) In PEG's total cost model the percentage of overhead line has a negative parameter estimate. In PEG's capital cost model the variable is positive, which does not align with the theory that it is underground lines that are more capital intensive. In PEG's OM&A model the variable is positive, which does align with theory. Please explain how it makes logical sense that in PEG's models overhead lines increase costs and are statistically significant in PEG's models for both capital and OM&A but then decrease total costs and the variable is statistically significant. Does this imply an error or misspecification in one or multiple of PEG's models?

**M3-TH-018** *Reference: PEG Clearspring Report, p. 46 "Clearspring also updated its previously-presented econometric reliability benchmarking models..."*

Please explain why PEG did not produce reliability benchmarking results in its report.

**M3-TH-019** *Reference: PEG Clearspring Report, p. 55 "The formula for the X factor can then be restated as:*

$$X = [(\overline{Productivity^C} - \overline{MFP}^{Economy}) + (\overline{Input\ Prices}^{Economy} - \overline{Input\ Prices}^{Industry})]. \quad [14]$$

PEG decided to undertake research and provide a recommendation on the "Productivity<sup>C</sup>" term of the equation above. However, PEG does not make recommendations on the remaining components of what cost theory says should be the proper design of the X factor.

- a) Did PEG undertake research on the remaining three components of the X factor for this application? If so, please provide any research or analysis undertaken. If not, please explain why PEG believes only one of the four components of the X-Factor required research.
- b) Please confirm that the OEB inflation factor is comprised of two indexes, which is primarily driven by GDP-IPI and to a lesser extent AWE.
- c) If the input price inflation of the economy is lower than the input price inflation that Toronto Hydro faces, should this be considered in the plan design and lower the X-Factor for Toronto Hydro?
- d) Please confirm that PEG has found that industry input price inflation in the U.S. is substantially higher than GDPPI inflation.

- e) Is PEG of the view that Toronto Hydro faces similar input price inflation as its U.S. peers?
- f) PEG states that the factors above have “contributed to the approval of substantially negative X factors in several American MRPs for energy distributors.” Would PEG support a negative X factor if the empirical data show that the four components above for Toronto Hydro result in a negative X factor?
- g) What are the merits of a negative X-factor in the context of enabling a clean energy transition which necessitates additional funding for prudent investments in the grid and operations?
- h) Please confirm that in Dr. Mark Newton Lowry’s (PEG President) direct testimony on behalf of Puget Sound Energy to the Washington Utilities and Transportation Commission Docket UE-240004 in February 2024, PEG put forth the rationale for a “regional inflation differential” and inserted a 0.35% wage rate growth adjustment for Seattle compared to the U.S.
- i) Please confirm that in that same testimony on behalf of Puget Sound Energy, PEG emphasized the critical importance of examining input price inflation in a multi-year rate plan.
- j) If the input price inflation in Toronto is higher than in Canada or Ontario, would PEG support lowering the X factor accordingly?
- k) Has PEG undertaken an investigation if the input price inflation in Toronto is lower than in Canada/Ontario? If so, please provide the analysis. If not, please explain why not.

**M3-TH-020** *Reference: PEG Clearspring Report, p. 52 “Even weighted averages are more pertinent in X factor studies for medium or smaller-sized utilities.”*

PEG states on page 29 that Toronto Hydro’s customer count and peak demands are below the sample average (0.77 and 0.89 of the sample average, respectively) and its real costs are right at the sample average (1.02). Does PEG consider Toronto Hydro a medium sized utility relative to the U.S. sample? If not, please explain.

**M3-TH-021** *Reference: PEG Clearspring Report, p. 67 “However, recent research by PEG suggests that the GDPPI tends to materially understate the M&S price inflation of U.S. utilities. In this study we use a new proxy M&S price index that is discussed further in Appendix section A.3.”*

- a) Please confirm this is a change from PEG’s Hydro One Joint Report input price assumptions.

- b) Please confirm that PEG's new approach increases U.S. input prices.
- c) Please confirm that PEG's new approach will tend to increase its U.S. TFP trend findings.
- d) Did PEG implement this new input price approach for both its U.S. TFP trend research and its cost benchmarking research?
- e) Did PEG conduct similar research regarding Toronto Hydro's M&S input price inflation as it did for U.S. utilities? If yes, please provide the analysis. If not, please explain why not.
- f) Please calculate and provide a table showing the U.S. sample average annual growth rate for the M&S input price from 2007 to 2022, Toronto Hydro's annual growth rate for the M&S input price from 2007 to 2022, the U.S. sample's average annual growth rate for the OM&A input price from 2007 to 2022, Toronto Hydro's annual growth rate for the OM&A input price from 2007 to 2022, the U.S. sample's average annual growth rate for the total input price used in the econometric model from 2007 to 2022, and Toronto Hydro's annual growth rate for the total input price used in the econometric model from 2007 to 2022.
- g) Assuming Toronto Hydro's input prices are assumed by PEG to grow markedly slower than the U.S. sample, can PEG provide an explanation for the difference in input price assumptions.

**M3-TH-022** *Reference: PEG Clearspring Report, p. 68 "We used only one scale variable in our U.S. power distributor productivity research: the number of customers served."*

- a) Please confirm that cost theory, and PEG itself, states that the output index in a revenue cap plan should be cost elasticity weighted. PEG shows this on p. 49 in Equation 6, p. 51 in Equation 7 and 8b and 9, on p. 53 on 10a, p. 55 in Equation 14. All these indicate that the output index should be cost elasticity weighted.
- b) Please confirm that PEG uses peak demand as an output in its total cost econometric model.
- c) Why has PEG not included peak demand in its U.S. TFP trend research?
- d) Please provide a new table 11a and 11b showing the U.S. TFP trends using the two outputs of customers and the 10-year moving average distribution peak demand variable used by PEG in the benchmarking dataset and cost-elasticity weighting them based on PEG's total cost econometric model.

- e) Please confirm that part d now shows the TFP trend with the same output quantity calculation procedure (cost elasticity weighted with customers and the 10-year moving average of peak demand) as PEG used when calculating Toronto Hydro's productivity trend show on Table 9a.
- f) If PEG's TFP trend research is used with only customers as an output, would PEG then consider it necessary in order to align with cost theory to reduce the stretch factor by the forecasted customer growth average annual growth rate (which is approximately 0.35%)?

**M3-TH-023** *Reference: PEG Clearspring Report, p. 42 "PEG constructed the output quantity index as an elasticity-weighted average of the growth in number of customers and the growth in a 10-year moving average of distribution peak demand."*

- a) Please revise Table 9a using the customer growth as the only output, in the same manner as PEG originally produced the U.S. TFP results.
- b) What is the rationale for using different output definitions for calculating the U.S. TFP and the THESL TFP?

**M3-TH-024** *Reference: PEG Clearspring Report, p. 82 "We have chosen method 3) for our research in this project. The input price inflation of the U.S. economy is measured each year as the difference between GDPPI growth and a three-year moving average of the MFP growth of the U.S. private business sector."*

- a) In order to assist in understanding this adjustment, please provide a year by year table with each component and showing the calculations for producing the input price inflation index?
- b) Is this adjustment only applied to the M&S input price? Does PEG calculate the OM&A labour input price and capital service price in the same manner as it did in the Hydro One Joint Report?
- c) Why does PEG apply a 50/50 weighting for Toronto Hydro instead of a 2/3 and 1/3 like it does for the U.S. M&S input price?
- d) Did PEG investigate the Canadian MFP to see if an adjustment should be made? If so, please provide the analysis.
- e) Does the Standard & Poor's Power Planner service have estimates for Canada, Ontario, or Toronto? If so, please provide.
- f) Does the M&S input price adjustment for the U.S. sample made by PEG increase the U.S. TFP trend?

- g) Please provide the U.S. TFP trend tables without making this new M&S input price adjustment but rather using GDPPI which was the index used in the Joint Report.
- h) Was this adjustment also applied to the econometric cost benchmarking research of PEG? If so, please provide Toronto Hydro results using only the GDPPI for U.S. distributors to match the method PEG used in the Hydro One Joint Report.
- i) Does PEG believe that Toronto Hydro is facing substantially lower input price inflation than its U.S. peers? If so, please explain the basis for this belief.
- j) If Ontario MFP was positive, would PEG then consider it reasonable to make an M&S input price adjustment for Toronto Hydro similar to what was made for the U.S. utilities? If not, please explain.

**M3-TH-025** *Reference: PEG Working Papers*

- a) In PEG's econometric STATA do-file code titled, "PEG THESL Econometric Models", on line 72, PEG appears to calculate total costs divided by the total cost input price. However, the code is dividing capital cost ("ckd") by the total input price. Please explain why only the capital costs are in the numerator and where in the code the OM&A costs are being added. If this was an error and requires a correction, please provide all tables that may be affected.
- b) It appears that the two area variables are not logged in the model based on our examination of the code. Please confirm or correct this statement.
- c) If verified that the two area variables are not logged, does this imply that the model estimates that adding one km squared of "other" area adds substantially more to total costs than adding one km squared of "congested urban" area? If so, please explain how that aligns with the understanding that congested urban is one of the most costly areas to serve?
- d) Did PEG consider logging the two area variables like it logged the total area in the Hydro One Joint Report research? If so, please provide the results of those models.
- e) Please provide other examples of testimony that PEG has produced in North America where the area variable has not been logged.
- f) Please provide other examples of testimony that PEG has produced in North America where PEG has broken out the area variable into congested and non-congested.
- g) Please provide other examples of testimony that PEG has produced in North America where PEG has not translogged (interacted with the other outputs and



taken the quadratic) the area variable.

- h) Please point us to where in the working papers the new U.S. “wndxus” input price is being calculated and where the raw data is for those calculations for this new input price.
- i) Is PEG using a different rate of return assumption in its U.S. TFP research versus the econometric benchmarking research? If so, please explain why PEG is not using the same assumption.
- j) If PEG is using a different rate of return assumption in its U.S. TFP research, please provide the Table 11a and 11b using the rate of return assumptions used in the econometric benchmarking research which follow the OEB’s approved rate of returns.

**M3-TH-026** *Reference: PEG Clearspring Report, p. 6 “OEB Staff retained PEG to appraise and comment on Clearspring’s benchmarking evidence and the Company’s proposed rate framework.”*

Please provide the engagement letter and all related materials including any RFP and proposal response, and all written instructions provided to PEG, related to the preparation of PEG’s report.