L1.INTERROGATORY EP-2

References: Exhibit M1 Page 7 and Figure 2 and Page 43; Exhibit 1B Tab 4 Schedule 2 PSE Report Pages 4 and 15/16; Exhibit 1B Tab 4 Schedule 3 PEG Benchmarking Data

a) Please confirm that PSE's results show Toronto Hydro Total Costs are 18.7% below the Peer Group Benchmark moving to 6% below in 2024 compared to the PEG Benchmark showing Toronto Hydro Cost Performance is 54% of above peer group.

b) PEG concludes that during the term of the proposed plan, the Company's projected/proposed OM&A expenses would be about 12.1% *below* the model's predictions whereas the Company's capital cost would be about 43.0% *above* the predictions and capex would be about 21.7% above predictions. The results of these studies are summarized in Figures 1 and 2. Why is the result materially different from that presented in Exhibit 1B,Tab 4, Schedule 3 and from PSE? Please list and discuss the key points similar those on Page 43.

c) Discuss which result (PEG or PSE) should ratepayers and the OEB use in setting the CIR rate plan and the X/stretch factor and list all of the reasons why the Board should adopt the PEG recommendation rather than PSE.

Response to EP-2: The following response was provided by PEG.

a) PSE reported Toronto Hydro's total cost performance to be 18.6% below its model's prediction during the last three years for which historical data were available (2015-2017). The Company's total cost would be 6% below the model's prediction on average during the five years of the proposed IRM (2020-2024). Using the revised total cost model that PEG reports in response to Exhibit L1/Tab 1/Schedule 26 (d), Toronto Hydro's total cost was essentially equal to the model's predictions, on average, from 2015-2017. The Company's proposed total cost would be 15.6% above the revised model's predictions on average during the 2020-24 period.

b) Results of PEG's OM&A and capital cost benchmarking can, in principle, vary considerably from total cost benchmarking results that are produced using PEG or PSE models. During the five years of the proposed plan, Toronto Hydro's OM&A expenses would be 12.1% *below* the PEG OM&A model's prediction on average. Using the revised capital cost and capex models that PEG presents in its response to Exhibit L1/Tab 1/Schedule 26 (d), Toronto Hydro's proposed capital cost would be 35.7% *above* the model's predictions on average during these years, while proposed capex would be 14.9% above the model's predictions on average. These results are not inconsistent with a total cost that is 15.6% above the revised model's predictions.

Exhibit 1B/Tab 4/Schedule 3 is based on Toronto Hydro's recent and forecasted total cost benchmarking scores under the IRM-4 Ratemaking Framework. These scores are generated from

annual updates of PEG's 2013 benchmarking study[1] and are different than the results from PEG's revised total cost model. Key differences, expanded upon in the table below, are the companies in the econometric study sample, sample periods, price indexes, cost definitions, estimation procedures, and model specifications. "IRM-4" refers to the 2013 PEG study (and its annual updates) and Exhibit M1 refers to the PEG's revised benchmarking study of Toronto Hydro submitted in response to M1-TH-026. The table also lists differences found between the latter study and PSE's study in Exhibit 1B Tab 4 Schedule 2.

		IRM-4	Exhibit M1 (Revised)	PSE
Sample	Region of sampled Utilities	Ontario	U.S., Ontario (THESL only)	U.S., Ontario (6 utilities)
	Sample Size	73	84	90
	Sample Period	2002-2012	1995-2017	2002-2016
Cost Definition	Distribution O&M	Included	Included	Included
	Sales Expenses	Included	Included	Included
	Customer Accounts (less uncollectible)	Included	Included	Included
	Customer Service and Information	Included	Excluded	Excluded
	Pensions and Benefits	Included	Excluded	Included
	Capital Benchmark Year	1989 or 2002	1964 (U.S.), 1989 (THESL)[2]	1989 (U.S.), 2002 (Ontario)
	Contributions in Aid of Construction	Included	Excluded	Excluded
	High Voltage Expenses	Excluded	Included	Included
Price Indexes	Labor Price Index	Ontario AWE	Regionalized ECI[4] (US), Ontario AWE (THESL)	ECI (US), ECI*PPP[6] (Ontario)
	Materials Price Index	Canada GDP-IPI	Canada GDP-PI (US), GDP-IPI (THESL)	GDP-PI (US), GDP-PI*PPP (Ontario)
	Construction Cost Trend Index	EUCPI[3]	HW (US), Custom[5] (THESL)	HW (US), HW*PPP (Ontario)
	O&M Cost Share Weights	Fixed	Varied	Fixed
Function	Translog Treatment of Scale Variables	Yes	Yes	Yes
Estimation Procedure	Cost-share equations, SUR[7]	Yes	No	No
	Composite price index, one equation	No	Yes	Yes
	Correction for Autocorrelation	Yes	Yes	No
	Correction for Heteroskedasticity	Yes	Yes	Yes
Total Cost Model Variables	Number of Customers	Yes	Yes	Yes
	Ratcheted Maximum Peak Demand	Yes	Yes	Yes
	Retail Deliveries	Yes	No	No
	Average Line Length	Yes	No	No
	Customer Growth over 10 Years	Yes	No	No
	Percent Congested Urban	Yes	Yes	Yes
	Percent of Plant Underground	Yes	No	Yes
	Area Not Congested Urban	No	Yes	No
	Percent Forested	No	Yes	Yes
	Percent of Customers Electric	No	Yes	Yes
	Percent of Customers with AMI	No	Yes	Yes
	Elevation Deviation	No	Yes	Yes
	Trend	Yes	Yes	Yes
	Ontario Binary Variable	No	No	Yes
	%UG*%CU	No	No	Yes
	Percent Plant Overhead	No	Yes	No

[1] Kaufmann, Lawrence, Hovde, Kalfayan, Rebane. *Productivity and Benchmarking Research in Support of Incentive Rate Setting: Final Report to the Ontario Energy Board.* November 5, 2013.

[2] Exceptions are Toronto Hydro and Northern States Power – WI, which both received a 1989 benchmark year.

[3] Electric utility construction price index for distribution systems (Statistics Canada).

[4] Regionalized Utility Salaries and Wages ECIs (Employment Cost Indexes from the U.S. Bureau of Labor and Statistics). Note that PSE uses the salaries and wages version of ECI too even though pensions and benefits are included in their cost.

[5] PEG's preferred Ontario LDC plant additions deflator originates from Statistics Canada Stock and Consumption of Fixed Non-Residential Capital ("SCFNRC") program. The annual survey collects data on utility-business capital expenditure on over 140 different types of machinery, equipment, and construction assets, which is then used to construct an annual index of deflated capital investment. Since deflated investment is provided in both constant (2012) and current prices, the ratio of the two implicitly yields capital asset price change over time. The indexes are constructed by industry and region and in particular, are available for the utility business in Ontario. Handy-Whitman (HW) regional power distribution construction cost indexes are used for the U.S. companies.

[6] Utility Employment Cost Index (U.S. Bureau of Labor Statistics). Purchasing Power Parity between U.S. and Canada.

Transcript Volume 9 July 14 2019 Pages 126 -132

Page 126 Line 20

DR. HIGGIN: Just to be clear, this table was produced by PEG in response to another IR.

MR. FENRICK: Okay.

DR. HIGGIN: Okay? Then I am asking here for PSE to make comments with respect to those aspects of the differences between PEG and PSE. That's what I am going to go to.

So we asked you to add a column, hopefully that would make it simple. But anyway, your response, which is on

Page 127

page 15, okay. You picked on several of the items. You chose these ones to comment on. Am I correct?

MR. FENRICK: I believe these were the differences -- we commented that when we saw a difference between what PEG did and what PSE did, those are the ones we commented on. We didn't comment on the ones where it was similar or the same.

DR. HIGGIN: So let's just go through those briefly. The important thing is, what is the directional impact of the differences? That was the question. We actually asked you to put arrows on them, but anyway, to make it simple.

So the first one is, you said adding the distributors to the sample decreased Toronto Hydro's total cost benchmark. So would you just please explain briefly what that means?

MR. FENRICK: Sure. What that means is -- and keep in mind above that we didn't necessarily run all of these through a model. There wasn't time for that. So this is basically my impression of what would happen, just to try to be as helpful --

DR. HIGGIN: It was an intelligent guess by you?

MR. FENRICK: An estimate of what I think the directional change would be, just to be as helpful as possible.

What that means is that adding the Ontario distributors, those six distributors with congested urban territory, decreased -- likely decreased Toronto Hydro's total cost benchmark, meaning it made the score worse for

Page 128

Toronto Hydro.

So adding the Ontario distributors worsened the score for Toronto Hydro, or made it higher, which is why I didn't put the arrows because I knew that would be very confusing. **If it decreases the benchmark costs, that actually increases the benchmark score and makes things worse for the company, the score.**

So that is what that means; adding the Ontario distributors worsened the benchmarking score.

DR. HIGGIN: Okay. Can we quickly go through and if you

have any comments on the other ones and particularly, I think important is pensions and benefits.

MR. FENRICK: You want me to comment on...

DR. HIGGIN: Yes. There is obviously a difference. Perhaps start with the difference between you and PEG, and then say by you including them in your data set.

MR. FENRICK: Yes. We included pensions and benefits in our data set.

The reason why is the Ontario data, we noticed the pensions and benefits aren't clearly disaggregated in the data set. So it wouldn't have been fair to the other Ontario distributors we're including in the data set to -- if we subtracted out Toronto Hydro's full pension and benefit costs, but the other ones -- you know, it is not properly did Is aggregated.

So we included the pensions and benefits for all of the utilities just to assure we had cost consistency between the sample and Toronto Hydro.

Page 129

DR. HIGGIN: So back to the consistency issue again.

MR. FENRICK: Yes.

DR. HIGGIN: Thank you. Do you wish to comment on any of the others that you would like to -- most of them seem to have little affect when I look at them. Is there one that you think might have some significant affect?

MR. FENRICK: There is a number of these that could have a significant affect. For instance, PEG goes back to 1964 when developing their capital cost series.

DR. HIGGIN: Right.

MR. FENRICK: There is no way for us to verify that data and know -- you know, we can't go back to the raw data sources. We asked PEG for those. They could not or did not provide them.

So there is no way for us to know if that's been done properly, and there is no way for us to know if that is a significant issue or not.

My impression is if all of the data was gathered correctly since 1964, it would have a very -- it would have a negligible or small impact on the results.

But given they're going back 55 years, we don't know if that is having a significant impact on the result or not. So that's one issue.

DR. HIGGIN: What about the percent plant underground? There seemed to be some significance to how that was dealt with.

MR. FENRICK: Right. So that was -- that is also a difference in the model. I believe your compendium -- did it

Page 130

cut off here? One second, sorry; let me go back to the actual interrogatory.

DR. HIGGIN: You read the highlighted bit or the bottom? I was just looking at just the percent plant. Yes, we probably didn't go on and complete it.

You say here including the Ontario binary variable, which you talked about earlier, actually did worsen Toronto Hydro's benchmark score. That is all I am asking, just to confirm that. And then the underground.

MR. FENRICK: Right. That got cut off. The percent plant underground variable, putting that business condition variable in, we believe, improved Toronto Hydro's benchmark if we're correct for that business condition.

So, yes, otherwise we laid out the changes and directional changes for all of these -- the differences between PEG and PSE. And obviously we believe the approaches that we have taken are the best approaches and we've kind of laid out why those were.

DR. HIGGIN: So you didn't mention the ratcheted maximum peak demand, which was in the list in the table, and you also had a brief discussion on that today. Is there anything to add about that, and is there a difference there?

MR. FENRICK: Yeah, the idea behind the variable is the same between PEG and PSE. Both of us include a maximum peak demand variable.

The issue I have with how PEG put that together is since they used the U.S. sample but they went back to 1995 in that

U.S. sample they began calculating the ratcheted peak demand for the U.S. utilities in 1995, and that doesn't -- that's not fair to Toronto Hydro, because they're starting their variable in 2002.

So all of the other sampled utilities, all of the other U.S. utilities, have a seven-year advantage, if you will, in calculating that variable.

DR. HIGGIN: There is a reason for that, and the fact is that amalgamation happened in 2002. And there was four utilities or five utilities prior to that. That is the reason, right?

MR. FENRICK: That's the reason that the data is not available. However, that -- it is still inconsistent in a key variable, which, you know, that's an issue.

DR. HIGGIN: I will ask PEG about the same questions.

MR. FENRICK: Okay.

DR. HIGGIN: That is what we do.

Okay. So can we look at the results now of your benchmark scores. We asked you to present them.

Perhaps just to help us all wrap up this segment of the cross-examination, you could just highlight -- just show what the chart shows with respect to Toronto Hydro benchmark scores.

There is some historic and current and PEG and so on.

MR. FENRICK: Dr. Higgin, you're referring to the graph here, the summary of Toronto Hydro benchmark scores?

DR. HIGGIN: Hmm-hmm.

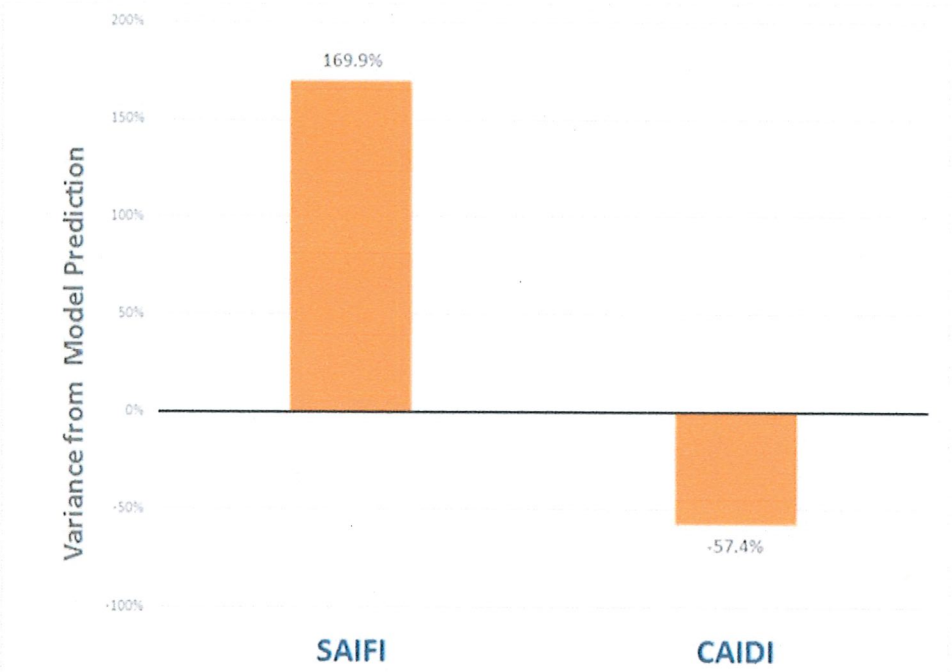
[Reference to Chart Provided by PSE in Response to EP IR L3-EP-73 Part c) Page 7. *Reproduced at page 17 of the EP Compendium] K9.3]*

MR. FENRICK: So if we start at the top one, the black……..

System Reliability Econometric Benchmark

Figure 1

Benchmarking Results for Toronto Hydro's Proposed Reliability (2020-2024)



PSE Reliability Benchmarking

We believe that PSE has, with the Company's sponsorship, done a service to Ontario's regulatory community by making progress in the area of reliability benchmarking. Cost benchmarking should ideally be combined with reliability benchmarking, and reliability performance is germane when considering requests for supplemental capex funding. PSE has gathered a respectable sample of publicly available U.S. data that span the years 2010-2016. Major event days have been excluded, if not with fully consistent definitions.

f) From a directional perspective, both the SAIFI and CAIDI results match for PSE and PEG. The CAIDI results are quite similar; the SAIFI scores are different, due to the differing explanatory variables included in each model.

g) The reliability projections are conducted by Toronto Hydro and given to PSE. PSE hasno opinion on the veracity of the reliability projections.

Figure 2 Toronto Hydro's SAIFI Performance 2005-2024

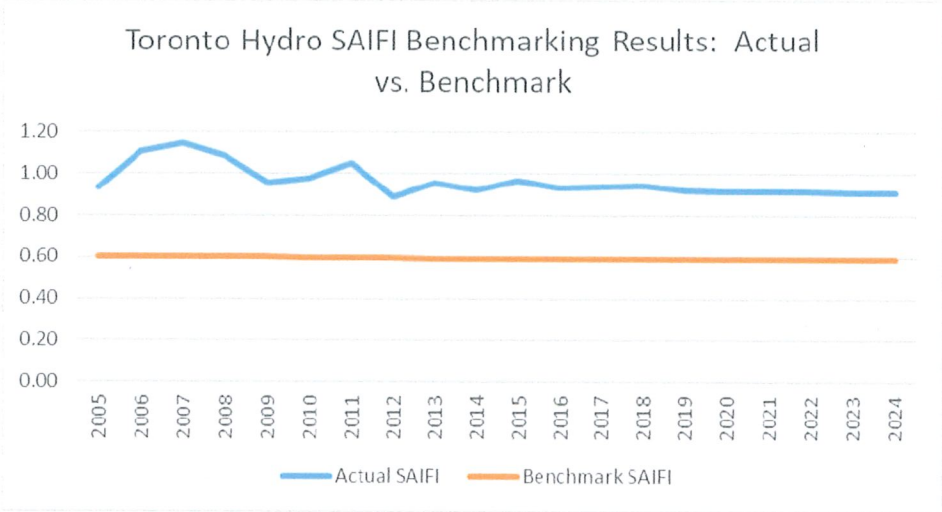


Figure 3 Toronto Hydro's CAIDI Performance 2005-2024