April 18, 2018

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: EB-2017-0306/ EB-2017-0307 – Enbridge Gas Distribution Inc. and Union Gas Limited – Interrogatories to OEB Staff

In accordance with Decision and Procedural Order No. 3, the Applicants are seeking information with respect to evidence filed by OEB Staff on April 11, 2018. The Applicants' interrogatories for this evidence are enclosed.

If you have any questions on this matter, please contact me at 519-436-5334.

Sincerely,

[*original signed by*]

Vanessa Innis
Manager, Regulatory Applications

cc: Andrew Mandyam, EGD
Mark Kitchen, Union
Fred Cass, Aird & Berlis
EB-2017-0306/EB-2017-0307 Intervenors

NERA Interrogatories to Pacific Economics Group Research LLC

EGD/Union.1 – Workpapers

Reference: PEG Evidence, April 11, 2018

Preamble: In its report, PEG provides a number of quantitative results and 6 tables to support its analysis. The companies seek to fully understand PEG's calculations.

Questions:

a. Please provide the calculations in native format with all formulas intact. If not provided, explain why.

b. Please provide the source data, in spreadsheet format if available, and references for the data sources. If not provided, explain why.

EGD/Union.2 – Stretch Factor

References:

a. PEG Evidence, April 11, 2018, page 3:

"We disagree with Dr. Makholm's 0% stretch factor recommendation, which is based on the premise that stretch factors are only appropriate in first generation IRMs. The Board is correct to reconsider stretch factors for all utilities on a regular basis using statistical benchmarking. A utility is no more certain to be efficient after one or even several terms of IR than firms in unregulated markets are certain to be efficient. Several other regulators have approved stretch factors after the first generation of IR."

b. Makholm Direct Evidence,EB-2017-0307, Exhibit B, Tab 2, p. 12:

"The consensus among a broad cross-section of economists, as reflected by the AUC's discussion in that case, is that the foundation for the stretch factor lies in the *transition* to a PBR regime and away from cost-of-service regulation."

c. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 13, May 2, 2012, pp. 2563, lines 24-25 to 2564, lines 1-6:

Question from Mr. B. McNulty, Board Commission Counsel: "Sir, turning to the stretch factor, could we stat by explaining to me in a concise way, if you can, sir, the rationale you see for including a stretch factor in a PBR plan?"

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: "The rationale is to share some of the expected acceleration in productivity growth as you go from a cost-of-service ratemaking system to a performance-based ratemaking system."

d. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 13, May 2, 2012, pp. 2564, lines 18-25:

Question from Mr. B. McNulty, Board Commission Counsel: "And can you elaborate a bit, sir, on how long that customer dividend, if you will, should be reflected in the PBR plan?"

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: "In my opinion, it should be continue until a credible levels benchmarking study has shown that the utility is a superior performer, and that's a fairly tall order. I don't know that any such study has ever been performed for an Alberta utility of any sort."

e. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraph 473:

"473. The CCA and its expert, Dr. Lowry, indicated that both the operating efficiency of the company and the difference between the incentive power of the current regulation and the PBR plan should form part of the consideration as to whether to add a stretch factor."

f. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraphs 479-480:

"479. The Commission agrees with the rationale for a stretch factor put forward by EPCOR, NERA, AltaGas, the UCA and Calgary. The purpose of a stretch factor is to share between the companies and customers the immediate expected increase in productivity growth as companies transition from cost of service regulation to a PBR regime."

"480. The ATCO companies and the CCA agreed that this reasoning forms part of the consideration when adding a stretch factor. As such, the Commission observes that this definition of stretch factor has been accepted by all parties to this proceeding, except Fortis."

g. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraphs 271 and 279.

"271. In contrast, because TFP (total factor productivity) studies (such as the one prepared by NERA in this proceeding) focus on rates of change in productivity within an industry, not levels, the unique cost features of any particular company cancel out in the process. In other words, these productivity studies do not examine whether one firm has a greater level of output for the same inputs levels as another firm. Rather, the focus is to study how the ratio of outputs to inputs changes over time for the industry as a whole."

"279. Given the approach approved above, the starting point for determining the X factor is to estimate the underlying industry TFP growth for the services included in the companies' PBR plans. Then, it is necessary to consider any adjustments to the industry TFP that may be required to arrive at an X factor for Alberta gas and electric distribution companies. And finally, the Commission will consider whether a stretch factor is justified and if so, the size of a stretch factor. Sections 6.3 to 6.5 below deal with each of these steps."

h. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraph 481.

"481. In Fortis' view, a stretch factor should be added if a particular company were found to be less efficient than the industry as a whole. The ATCO companies and the CCA also noted that this rationale should be considered when determining the need for a stretch factor. However, as set out in Section 6.2 of this decision, the Commission does not wish to engage in this type of analysis for the purposes of PBR in Alberta because of the practical and theoretical problems associated with comparing efficiency levels among companies. Therefore, the Commission did not include the consideration of the companies' comparative levels of efficiency in its determination on the need for a stretch factor."

Preamble: The companies would like to clarify Dr. Lowry's view on stretch factors.

Questions:

a. Please identify all of Dr. Lowry's written work including testimony, reports, published articles, and presentations on stretch factor. Provide active links or copies of that work.

b. Confirm Dr. Lowry's statement in **reference d.** If not confirmed, explain why.

c. Confirm that the consensus among parties with the exception of Fortis, including Dr. Lowry, involved in AUC Proceeding 566 was that "The purpose of a stretch factor is to share between the companies and customers the immediate expected increase in productivity growth as companies transition from cost of service regulation to a PBR regime." (see **references b and f**). If not confirmed, explain why.

d. Is Dr. Lowry aware of any "credible levels benchmarking" studies outside of Alberta (see **reference d**)? If so, please identify, describe, and provide those studies.

e. Confirm that the AUC agreed with Dr. Makholm in **references g and h**, that it is appropriate to look at TFP growth not levels for the purpose of calculating an X factor. If not confirmed, explain why.

f. Confirm that the AUC disagreed with Dr. Lowry's view that it is appropriate to compare efficiency levels among utilities for the purpose of calculating a stretch factor (see **references d-h**). If not confirmed, explain why.

EGD/Union.3 – Stretch Factor

References:

a. PEG Evidence, April 11, 2018, page 3:

"We disagree with Dr. Makholm's 0% stretch factor recommendation, which is based on the premise that stretch factors are only appropriate in first generation IRMs."

b. Makholm Direct Evidence, EB-2017-0307, Exhibit B, Tab 2, p. 12:

"The AUC made three important determinations regarding the stretch factor that I conclude are reasonable: (1) it does not have a "definitive analytical source" like a TFP growth study, but relies on a regulators' judgment and regulatory precedent; (2) it has no influence by itself on the incentives for regulated companies to reduce costs; and (3) it serves to reflect the "immediate expected increase in productivity growth as companies transition from cost of service regulation to a PBR regime."[footnote omitted]

c. Alberta Utilities Commission 2018-2022 Performance-Based Regulation Plans for Alberta Electric and Gas Distribution Utilities, Decision 20414-D01-2016 and Errata, February 6, 2017, paragraph 148.

"148. Among other arguments, the interveners submitted that a stretch factor is necessary as it strengthens the incentives under PBR. On this point, the Commission disagrees. As indicated in Decision 2012-237, while the size of a stretch factor affects a utility's earnings, it has no influence on the incentives for the utility to reduce costs. PBR plans derive their incentives from the decoupling of a utility's revenues from its costs as well as from the length of time between rate cases and not from the magnitude of the X factor (to which the stretch factor contributes)." [footnotes omitted]

d. Alberta Utilities Commission 2018-2022 Performance-Based Regulation Plans for Alberta Electric and Gas Distribution Utilities, Decision 20414-D01-2016 and Errata, February 6, 2017, paragraph 152-153.

"152. Parties in this proceeding pointed out that because expenditures under the capital tracker mechanism in the 2013-2017 PBR plans were largely treated on a COS basis, they were not subject to the same high-powered incentives to control costs as the expenditures under I-X.The Commission agrees. In Section 6 of this decision, the Commission approves the K-bar mechanism, which, as Dr. Weisman put it, is "a lot more high powered in terms of incentives," compared to capital trackers. Mr. Baraniecki for EPCOR agreed with the logic that if capital is moved from a low-powered incentive regime, such as capital trackers, to a higher-powered incentive regime, such as K-bar, there may be a need for a stretch factor." [footnotes omitted]

"153. Given that current generation PBR plans include a COS-based capital trackers mechanism, which will be mostly replaced in the next generation PBR plans by the K-bar mechanism, the Commission expects that next generation PBR plans will be largely devoid of any significant COS elements. Therefore, the Commission finds merit in including a

stretch factor component in the X factor for the next generation PBR plans for all distribution utilities. In a similar vein, because ENMAX was regulated under COS in 2014, the commencement of the 2015-2017 PBR plan warrants inclusion of a stretch factor in the X factor for the ENMAX 2015-2017 PBR plan as well."

e. PEG Evidence, April 11, 2018, page 43:

"Dr. Makholm maintained in his direct evidence that stretch factors are appropriate only for first generation IRMs. The AUC embraced this principle in its decision in its first generic IRM proceeding. However, the AUC in in its second generation IRM decision seemed to include a stretch factor in its 0.30% X factor decision." [footnotes omitted]

Preamble: The companies would like to clarify Dr. Lowry's view on stretch factors.

Questions:

a. Confirm that Dr. Makholm stated in **reference b** that he agrees with the AUC's view that the stretch factor "serves to reflect the "immediate expected increase in productivity growth as companies transition from cost of service regulation to a PBR regime." If not confirmed, explain why.

b. Given the **references c and d**, confirm that the second generation PBR plan adopted by the AUC contained an incentive formula element that did not appear in its first generation plan. If not confirmed, explain why.

c. Please confirm that given the additional I-X element in its second generation plan, it is not correct to imply as Dr. Lowry did in his testimony in **reference e**, that the use of a stretch factor in its second generation PBR plan contradicted Dr. Makholm's statements in **reference b**. If not confirmed, explain why.

d. Please confirm that the AUC never made any finding, in either of its two PBR proceedings, that the stretch factor had a permanent role in PBR plans rather than a role related solely to the transition to a new PBR regime. If not confirmed, explain why.

EGD/Union.4 – Transparency, Objectivity, and Consistency and Stretch

References:

a. PEG Evidence, April 11, 2018, page 3:

"We disagree with Dr. Makholm's 0% stretch factor recommendation, which is based on the premise that stretch factors are only appropriate in first generation IRMs. The Board is correct to reconsider stretch factors for all utilities on a regular basis using statistical benchmarking. A utility is no more certain to be efficient after one or even several terms of IR than firms in unregulated markets are certain to be efficient. Several other regulators have approved stretch factors after the first generation of IR."

b. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraph 353.

"353. Because the parameters of the PBR formula will be used to determine customer rates in a contested regulatory process and those rates will be in place for a number of years, the significance of the objectivity, consistency, and transparency of the TFP analysis to be employed in calculating the X factor cannot be understated."

c. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraph 479.

"479. The Commission agrees with the rationale for a stretch factor put forward by EPCOR, NERA, AltaGas, the UCA and Calgary. The purpose of a stretch factor is to share between the companies and customers the immediate expected increase in productivity growth as companies transition from cost of service regulation to a PBR regime."

Preamble: The companies wish to understand Dr. Lowry's position on stretch factors.

Questions:

a. Confirm that the AUC emphasized transparency, objectivity and consistency as parameters for the TFP analysis used to calculate X factors. If not confirmed, explain why.

b. Confirm that the AUC's position on transparency, objectivity and consistency in TFP growth studies was consistent with its findings on the source of the stretch factor. If not confirmed, explain why.

c. Confirm that the AUC's position is contrary to Dr. Lowry's statements about the stretch factor having a foundation as a permanent part of a multi-generation PBR regime. If not confirmed, explain why.

EGD/Union.5 - Calculating Capital

References:

a. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 13, May 12, 2012, p. 2590, lines 8-17:

Dr. Lowry: "You haven't noticed, but I don't think Dr. Makholm or any other party using their approach to capital costing to shed light on the proper design of the inflation measure, because those other approaches to capital costing like the geometric decay that Dr. Schoech often favours and that I've used in the past and the one hoss shay that Dr. Makholm uses, the input prices that go along with those don't remotely resemble the way input prices affect costs growth under regulatory accounting, whereas my approach is expressly designed to be relevant for that purpose."

b. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 13, May 12, 2012, p. 2744, line 5 to p. 2745, line 24:

Question from Mr. L. Smith, Q.C., Counsel for ATCO Electric Ltd. and ATCO Gas: "Okay. Now, when I look at the TFP growth rates for 1999 -- and then I think what I'm going to ask you to do, Dr. Lowry and Mr. Chairman and members, is just sort of focus on '99 to 2004, which is the period in which TFP -- now, this is U.S. national gas industry total factor productivity growth rates, are reproduced from the four studies which Dr. Lowry has prepared. We see from '99 through 2004 what I would put to you to be widely varying results, sir.

Would you agree? Let's go through it."

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: "No, I can respond to that. The year-to-year results are sometimes quite different. The trends are much more similar. We -- I think I've got this calculated right. We looked at the trends over the common periods and found that the one in this proceeding was 1.21 percent. The more recent San Diego study was 1.08. The Ontario study before that was 1.08, and the only one that was more of an outlier was the SoCalGas study over that period.

As for those year-to-year differences, I said before they were -- a big part of that is due to -- a lot of reasons. I've already given you a lot of reasons why they could be different, but the biggest thing to take note of is the difference between the studies that used the geometric decay approach and the one that used the cost of service approach to capital costing and which of the two yields numbers that raise the eyebrow a little bit, like TFP declining by 1 percent in a few years, why that would be the geometric decay approach.

And that's an example of the greater instability of the geometric decay approach because the cost shares on capital vary wildly under geometric decay.

And why? Because they include capital gains, which, obviously, are not a consideration under traditional regulation, but they can really swing a result in a year. Some years

capital has surprisingly little weight because of capital gains and then other years it will be a much bigger amount.

Well, this is one of the reasons that I stepped away from using geometric decay except in a context where people really appreciate the tradition of having always done it that way. The cost of service approach on a year-to-year basis -- well, in the long run the trends are similar. On a year-to-year basis everything is a little more sensible, and that goes for the input price index as well as the productivity index. I think this is what you're seeing here."

c. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 13, May 12, 2012, p. 2746, lines 2-21:

Question from Mr. L. Smith, Q.C., Counsel for ATCO Electric Ltd. and ATCO Gas: "I have the evidence you filed in this proceeding with a TFP of .21 and a SoCalGas negative 1.19, and I have San Diego results which are a negative .65 and the Ontario results which are a positive .52.

Now, we're supposed to be measuring the same thing, aren't we?"

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: "Well, these indexes are designed to measure trends in the longer term, and as I just tried to explain, with the geometric decay approach, you can expect to see more volatility than you will with a cost of service approach.

And I think that's what you're looking at. I mean, you're going from a COS to a geometric decay and then to a COS and then back to a geometric decay, and the two geometric decay ones are not so different from each other.

And also, as I have just said, the trends over this period actually are pretty similar, excepting the SoCalGas study which uses those regional weights and has the maximum number of differences from the present. There are a lot of things done differently in that study."

d. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 13, May 2, 2012, p. 2748, lines 8-25:

Question from Mr. L. Smith, Q.C., Counsel for ATCO Electric Ltd. and ATCO Gas: "So five years from now, when we have to revisit all this and see if we got the right TFP growth rates and so on, which one do we go back to?"

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: "We'll do -- if I'm involved, we'll do whatever makes the most sense at the time."

Question from Mr. L. Smith, Q.C., Counsel for ATCO Electric Ltd. and ATCO Gas: "For whom?"

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: "For the calibration of an X factor in Alberta. Likely will include the COS because I've been using the COS consistently in regulatory applications that produce X factors. The one exception is California, but that's not used for X factor calibration. It's just an informational aid to the Commission. And by the way, the other two big utilities in California have gotten out of filing these studies. They say it's a waste of time because it's not even used in the regulatory arena, which is true.

I mean, it's not used to set their rates, and so they say, 'Why do we even have to do these studies?' And they've been given permission to stop doing them."

e. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Interrogatory NERA-CCA-2:

Reference: PBR Plans for Alberta Energy Distributors – Pacific Economics Group Research LLC – Index Research and Incentive Regulation, Price and Productivity Indexes, Calculating Capital Costs, Section 2.1.4, p. 14

Preamble: PEG states that
"The cost of service ("COS") approach to calculating capital cost, prices, and quantities is designed to approximate the way that capital cost is calculated in utility regulation. This approach is based on the assumption of straight line depreciation and the historic (book) valuation of capital. The capital price is a function not simply of the *current* construction price but, rather, of a weighted average of current and past prices. The intuition is that inflation in the rate base results from the fact that the cost of constructing plant that is two, four, and twenty years old is higher than it was last year. The weight for a given year is larger the larger is its representation in the current value of the rate base. Weights tend to be larger for more recent years than for earlier years. The COS capital price also depends on the weighted average cost of acquiring funds in capital markets."

Request:
a) Please describe and explain PEG's views on what drives "the way that capital cost is calculated in utility regulation" in the United States and Canada.

b) Does the calculation of capital costs for productivity measurement purposes differ in a fundamental way from the way that capital costs are derived by regulators and courts of law for ratemaking purposes? Please fully explain your response.

Response:
a) Dr. Lowry has not considered what "drives" the way that capital cost is calculated in utility regulation in the United States and Canada.

b) There are numerous ways to calculate capital cost for use in productivity measurement. The recommended approach depends upon the use of the study. When the study is for use in the selection of an X factor for a multi-year rate plan, Dr. Lowry believes that it is

advantageous to use a methodology that mirrors how capital cost is calculated in rate cases.

Preamble: The companies would like to understand Dr. Lowry's use of geometric decay and cost of service for measuring capital quantity.

Questions:

a. Confirm that in AUC Proceeding 566, Dr. Lowry used the "cost of service" or "COS" method for measuring capital quantity. If not confirmed, explain why.

b. Confirm that in this proceeding, Dr. Lowry used the "geometric decay" or "GD" method for measuring capital quantity. If not confirmed, explain why.

c. Confirm that in **references b and c**, Dr. Lowry provided examples of results with greater instability because of the geometric decay approach and that he steps away from using that approach except in situations where people appreciate the tradition of having always used such an approach. If not confirmed, explain why.

d. Confirm that in **reference d**, Dr. Lowry stated that he would likely use COS because he has used that method consistently in regulatory applications that produce X factors. If not confirmed, explain why.

e. Confirm that Dr. Lowry believes that it is advantageous in a multi-year rate plan to use a methodology that mirrors how capital cost is calculated in rate cases. If not confirmed, explain why.

f. Confirm that Dr. Lowry understands that the current proceeding involves setting a rate mechanism for multiple years. If not confirmed, explain why.

g. Explain the discrepancy between Dr. Lowry's use of COS in AUC Proceeding 566 and GD in this proceeding. If not confirmed, explain why.

EGD/Union.6 - Calculating Capital

References:

a. PEG evidence, page 20-21

> "For example, GD [Geometric Decay] is used to calculate capital quantities in the National Income and Product Accounts of the US and Canada. Statistics Canada also uses GD in its multifactor productivity studies for sectors of the economy."

Preamble: The companies would like to confirm Dr. Lowry's understanding of capital specification in productivity growth studies.

Questions:

a. Confirm that data used to calculate data in the examples listed in **reference b** is not collected in the same manner as FERC Form 1. If not confirmed, explain why.

b. Describe the difficulties associated with data used to calculate capital quantities and multifactor productivity studies described in **reference b**.

c. Confirm that FERC Form 1 data does not encounter the same difficulties described in part b. If not confirmed, explain why.

EGD/Union.7 – Electric v. Gas

References:

a. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 13, May 2, 2012, p. 2448, line 4 to p. 2449, line, 8:

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: "Well, I was, as I understand it, retained to provide commentary on an appropriate X factor for Alberta utilities, and one of the parties to the proceeding, Dr. Makholm, alleged that the -- that his research on the productivity trend of US power distributors would be suitable for use in an application to the gas companies. So that has drawn me into the issue of the strengths and weakness of his research.

…

"Well, I, among other things, have spent quite a bit of time going through Dr. Makholm's study to see whether it could possibly be appropriate for a gas distributor, and along the way because Dr. Makholm has elected to use a volumetric output appendix that is highly volatile, we have gone a couple steps further to try to get down to the underlying cost based productivity trends to see – for example, to evaluate a contention such as that the alleged productivity slowdown is due to restructuring.

It's hard to assess that when you're just looking at the volumetric output indexes that Dr. Makholm has provided because they're so -- they have eccentricities. For example, perhaps the utilities that are subject to restructuring also had larger DSM programs, so their volumes grew more slowly, so it might seem that their productivity growth was slower, when in actuality the underlying cost based productivity has actually been more rapid."

b. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraphs 373-375:

"Based on the evidence in this proceeding, and because of the similarities in the institutional framework, business environment and regulatory requirements between the gas and electric distribution industries, the Commission finds that TFP research from one industry can be used to estimate productivity growth for firms in the other industry when transparent and robust data for both industries are not available.

However, parties could not agree on whether the TFP estimates from PEG's study and various other studies on the productivity trends of Canadian and the U.S. gas distributors used by other regulators, as well as Statistics Canada's MFP indexes, represent a superior indicator of TFP for gas distribution companies as compared to the TFP estimate from NERA's study of the electric distribution industry.

As set out in Section 6.3.7 of this decision, because the Statistics Canada MFP indexes include power generation and transmission in the electric sector and water systems in the natural gas sector, these indexes are not suitable for estimating the TFP for distribution companies. With respect to the TFP studies of Canadian gas distributors prepared for other regulators (such as the Ontario Energy Board and the Gaz Métro Task Force) that PEG discussed, the Commission considers that while this productivity research can provide a useful reference for determining the general reasonableness and direction of a productivity estimate for the gas distribution companies, these studies cannot be viewed as substitutes for NERA's TFP study."

c. PEG Evidence, April 11, 2018, page 24:

"Our first concern is that the Applicants, who will run one of North America's largest gas utilities, would submit a study of power distribution industry TFP in this proceeding but not a study of gas utility industry productivity. While there are admittedly similarities, power and natural gas distribution have noteworthy differences, and the Amalco IRM would apply to gas transmission and storage services of the Amalco as well as its distributor services."

Preamble:

The companies want to confirm Dr. Lowry's view on electric and gas distribution data.

Question:

When Dr. Makholm and Dr. Lowry both appeared in the AUC Proceeding 566, confirm that in AUC Decision 2012-237, the AUC agreed that Dr. Makholm's study of TFP growth for the electric distribution industry was applicable to the gas distribution industry. If not confirmed, explain why.

EGD/Union.8 – TFP output measure

References:

a. PEG Evidence, April 11, 2018, page 33:

"Finally, we replaced NERA's volumetric output index with the number of customers served."

b. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraphs 378:

"378. Accordingly, the Commission finds that, in the absence of superior TFP data for the gas distribution industry, NERA's TFP study is an acceptable starting point for determining a productivity estimate for Alberta gas distribution companies."

Preamble:

The companies want to confirm Dr. Lowry's view on output specification.

Question:

When Dr. Makholm and Dr. Lowry both appeared in the AUC Proceeding 566, confirm that in AUC Decision 2012-237, the AUC agreed that the use of a volumetric output index was appropriate for measuring productivity for the gas distribution industry. If not confirmed, explain why.

EGD/Union.9 – Dr. Makholm's Evidence

Reference:

a. Makholm Direct Evidence EB-2017-0307, Exhibit B, Tab 2, p. 22:

Q28. What is this section of your testimony about?

A28. I briefly describe my methods for computing TFP growth for the regulated distribution component of local utility operations. Those methods include isolating the distribution component of such utilities and then measuring the various inputs and outputs that result in TFP growth measures. For a longer and more comprehensive explanation of my methodology, please see my report in Alberta Proceeding 566, attached as Exhibit JDM-2. I provide a list of all documents I relied upon as Exhibit JDM-5.

Q29. Please briefly explain your TFP methodology.

A29. My TFP studies for EGD, Union and the distribution industry all utilize the Tornqvist/Theil index methodology to construct output, input and TFP indexes using the various components of outputs and inputs. For my study of the distribution industry I use a population of 65 US electric and combination electric and gas distributors over the time period 1973-2016.[footnote omitted] I create individual TFP indexes and growth rates for each company and year and then take a weighted average of these growth rates to calculate average TFP growth over the time period. [footnote omitted] For EGD and Union, I use their own company-specific data to calculate average TFP growth for each company. The EGD study spans the years 1993-2016, while the Union study covers the time period 2001-2016.

b. Answer to Interrogatory from Ontario Energy Board Staff ("Staff"), Exhibit C.STAFF.34, part b):

Question: b) Is the report filed in Exhibit JDM-2 the first or the second NERA report? If it is the first report, please file the second report.

Response: b) Please see Atachment 2 for the NERA second report in Alberta Proceeding 566.

c. PEG Evidence, April 11, 2018, p. 32:

> "We are also concerned that NERA's documentation of their research for the Applicants in his direct evidence is substandard for an IRM filing in Ontario. For example, he did not discuss his methods for calculating the TFP trends of Enbridge and Union. To describe NERA's US power distribution productivity research, Enbridge attached his first report in the 2012 Alberta proceeding even though NERA revised their methodology during the proceeding and presented new results."

Preamble: The companies wish to confirm Dr. Lowry's understanding of Dr. Makholm's evidence.

Questions:

a. Confirm that in **reference a**, Dr, Makholm states that "My TFP studies for EGD, Union and the distribution industry all utilize the Tornqvist/Theil index methodology to construct output, input and TFP indexes using the various components of outputs and inputs." If not confirmed, explain why.

b. Confirm that Dr. Makholm attached his first report in Alberta Proceeding 566 as Exhibit JDM-2 to his evidence provided in this proceeding. If not confirmed, explain why.

c. Confirm that Dr. Makholm attached his first report in Alberta Proceeding 566 as Exhibit JDM-2 to his evidence provided in this proceeding to provide "…a longer and more comprehensive explanation of [his] methodology (**reference a**). If not confirmed, explain why.

d. Confirm that Dr. Makholm provided his second report in Alberta Proceeding 566 in response to Exhibit C.STAFF.34 part b) (**reference b**). If not confirmed, explain why.

EGD/Union.10 – Length of TFP Growth Study

References**:**

a. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraphs 302-304:

"302. PEG agreed that there is some value in a shorter period because even long term drivers of TFP growth such as technological change can vary over a period of several decades. Dr. Lowry noted that in the past he often advocated a period of at least 10 years, but recent empirical results and NERA's testimony persuaded him that a minimum of 15 years is typically more desirable."[footnote omitted]

"303. In reviewing NERA's TFP estimate, PEG submitted that the relevant time period should essentially focus on the concept of a business cycle. As Dr. Lowry explained, because NERA's study used delivery volumes as an output measure, the resulting TFP is highly sensitive to changes in economic conditions. Therefore, Dr. Lowry advocated that when choosing the relevant time period, it is necessary to choose a start and end date that are at a similar point with respect to the business cycle, so that the key demand drivers are at the same levels."

"304. In that regard, Dr. Lowry observed that the last two years in NERA's sample, 2008 to 2009, were characterized by a deep recession and he recommended excluding these years to avoid distorting the long-run TFP trend. As a result, the CCA expert recommended a sample period for NERA's TFP study that ends in 2007 (avoiding the two recession years) and begins in 1988, a year with similar values for two key volume driver variables, cooling degree days and the unemployment rate.[319] For the purpose of its MFP study of U.S. gas distribution companies, PEG used the sample period of 14 years from 1996 to 2009 based on Dr. Lowry' judgment and experience. PEG noted that this was the longest period available for the dataset on which PEG relied.[321] The CCA's expert explained that a 2009 sample end date was acceptable in this case, since his study did not use a volumetric output index and therefore would not be subject to volume related impacts of the 2008 to 2009 recession."

b. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraphs 312, 316-317:

"312. The Commission agrees with NERA's view that a deviation from reliance on the longest period of available data requires support that a structural break in the industry has occurred. The Commission also agrees that the determination of whether a structural break has occurred demands the scrutiny of academic experts, peer review and testing by parties independent of the current proceeding."

"316. In that regard, the Commission considers that Dr. Lowry's approach to determining the relevant time period to capture the entire business cycle in the sample period represents an improvement over the companies' approach of focusing on the most recent 10 to 15 years of data. However, PEG's method is also not entirely devoid of subjectivity, as judgement has to be applied as to what start and end points

> to use. For example, PEG offered that cooling degree days and the unemployment rate be used to select similar levels of a business cycle. Building on this logic, PEG recommended that recession years 2008 and 2009 be excluded from the analysis, because in this period the volumetric output indexes were extraordinarily depressed.The gas companies did not agree with PEG‘s choice of start and end dates and submitted that this method resulted in biased and subjective estimates of TFP trends. In AltaGas‘ view, it was vital that years 2008 and 2009 be included in the study to arrive at a balanced assessment of TF. [footnotes omitted]
>
> “317. In the Commission‘s view, NERA‘s approach of using the longest time period available allows a smoothing out of the effects of variations in economic conditions on the estimate of TFP growth, without engaging in a subjective exercise of picking the start and end points of a business cycle. Notably, the CCA seemed to reach a similar conclusion and indicated that if the years 2008 and 2009 were to be included in the study, the length of a sample period would have to be considerably longer than 10 to15 years and NERA‘s use of the full set of 1972 to 2009 data becomes reasonable, subject to certain other reservations about NERA‘s analysis.”

Preamble**:** The companies would like to understand Dr. Lowry’s study time-period.

Question**:**

When Dr. Makholm and Dr. Lowry both appeared in the AUC Proceeding 566, confirm that in AUC Decision 2012-237, the AUC agreed with Dr. Makholm’s approach of using the longest time-period available for a TFP growth study.

EGD/Union.11 – Customer Care Costs

References:

a. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 14, May 3, 2012, p. 2894, line 24 – p.2885, line 16:

Question from the Chair: "So what are customer care expenses? What do you mean by that? Things like -- well, you tell me."

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: Well, it's pretty much anything you can think of. We left the metering in because with the understand that the utilities still did the metering here, so we left that part in.

But customer account expenses, customer service and information, which would include DSM. That's out. And then a little bit for sales. I mean, in the United States there's a small category for sales.

Question from the Chair: So really what you're talking about is the stuff that's done on the retail level?

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: Yes.

Question from the Chair: So it wouldn't be billing, for example, because even a wholesale company has to do some billing?

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta:No. It includes the billing. The billing is out.

Question from the Chair: Okay.

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: Of both of our indexes.

b. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Transcript Volume 14, May 3, 2012, p. 2814, lines 2-9.

Question from Ms. N. McKenzie, Counsel for AltaGas. What intermediate inputs included in the gross output productivity index were excluded from your gas distribution MFP study?

Answer from Dr. Mark Lowry, witness for Consumers Coalition of Alberta: The customer care expenses were the main category that's relevant to our study. We also excluded gas and upstream transmission costs. But in terms of those that are subject to base rate inputs, it would be the customer care and the customer service and information expenses.

c. PEG Evidence, April 11, 2018, pp.38-39:

> "We calculated indexes of trends in the OM&A, capital, and total factor productivity of each sampled utility in the provision of gas transmission, storage, and distributor services. Costs of administrative and general functions and many customer services (e.g., billing and collection) were included in the study. The costs considered also encompassed taxes and pension and other benefit expenses."
>
> …
>
> "We also excluded customer service and information expenses. These costs grew briskly during the sample period for many utilities due to the growth in utility CDM programs. The cost of these programs is not itemized in the U.S. data for easy removal. CDM programs are not covered by the indexing provisions of the Applicants' proposed IRM."

Preamble: The companies would like to understand Dr. Lowry's approach to customer care costs.

Questions:

a. With regard to **reference a**, please provide Dr. Lowry's definition of "customer care costs."

b. With regard to **reference b**, please confirm that Dr. Lowry excluded "customer care costs" from his TFP growth estimate in AUC Proceeding 566.

c. With regard to **references a and b, and parts a and b of this question**, explain whether Dr. Lowry included "customer care costs" in his TFP growth estimate in AUC Proceeding 566.

d. With regard to **reference c**, describe which customer care costs Dr. Lowry includes in his TFP growth study in the current proceeding and which customer care costs Dr. Lowry excludes from his TFP growth study in the current proceeding. Explain why those costs are included or excluded. Identify and describe any differences between those costs included or excluded in the current proceeding and AUC Proceeding 566.

EGD/Union.12 – Asset Service Life

References:

a. PEG Evidence, April 11, 2018, pp.28-30:

"Table 2 summarizes data we have gathered from utility filings on the average service lives of US power distributors today. It can be seen that they typically exceed 40 years. In response to an undertaking, Enbridge and Union report average service lives of about 38 years and 36 years in 2016, respectively. As explained further in Appendix 1, we calculated an alternative average service life that…"[footnote omitted]

…[Table 2 omitted]…

"is commensurate with retirements using a better formula and detailed retirement data from FERC Form 1. Our alternative estimate was 42 years. We demonstrated in the second Alberta IRM proceeding that,with an average service life of even 37 years, TFP growth using NERA's methodology is much higher."

b. Alberta Utilities Commission 2018-2022 Performance-Based Regulation Plans for Alberta Electric and Gas Distribution Utilities, Decision 20414-D01-2016 and Errata, February 6, 2017, paragraphs 118-120:

"118. More specifically, the differences in the calculation methods pertained to the use of the chain-weighted index in the Lowry study, while the NERA-based studies relied on the multilateral index. As well, NERA's TFP calculations put more weight on larger utilities, whereas the Lowry study averages growth rates across firms in any year, thereby weighting firms equally. The assumptions pertaining to measuring input growth included among others, the depreciation method (one hoss shay, geometric decay or a straight line method), the use of net rather than gross plant in the benchmark year of the TFP growth study, the asset service life, and the choice of price indexes used in calculating such input quantities as labour, materials and services. In addition, while NERA-based studies include only costs labelled as "distribution" in FERC Form 1 accounts, the Lowry study includes a wider range of cost categories by allocating some expenses and wages related to customer accounts, administrative and general, and some general plant."

"119. These issues were for the most part, debated in the PBR Proceeding 566 and in Decision 2012-237, the Commission noted that "Some of these issues reflect an ongoing academic debate on which consensus has not been reached, or for which there is no right or wrong answer." As a result, and contrary to EPCOR's view in this proceeding, in Decision 2012-237, the Commission did not explicitly reject the different assumptions used by different parties. Along the same vein, Drs. Brown and Carpenter were generally neutral about the particular assumptions that were adopted, referring to the debate about the various methodologies as being "within the range of statistical precision of a TFP study," whereas Dr. Meitzen and Dr. Lowry were more adamant that the assumptions each of them had adopted were to be preferred."

> "120. In the Commission's view, there is no overwhelming new evidence in this proceeding that any of these particular assumptions are correct or incorrect. The assumptions chosen reflect the practitioner's decisions and beliefs based on the available choices that can be applied to the data, and there is generally no test presented in evidence that can be applied to determine which assumptions are more applicable to particular data or the purposes for which it is used. It is unlikely that any group of unassociated practitioners will make the same choices for all the assumptions, even with the same universe of data series available to them. For this aspect of the analysis, the Commission is, therefore, unwilling to specify a preference for the set of assumptions used by any particular one of the three TFP growth studies."

Preamble: The companies would like to understand Dr. Lowry's service life calculations.

Questions:

a. Please provide all of Dr. Lowry's filed evidence in AUC Proceeding 20414, including any models used to calculate Dr. Lowry's proposed X factor.

b. Please provide any analysis Dr. Lowry conducted to arrive at an average service life assumption of 37 years in AUC Proceeding 20414.

c. Confirm that in **reference b**, in AUC Proceeding 20414, the AUC declined to adopt the 37-year average service life assumption proposed by Dr. Lowry.

d. Please provide Table 2 on page 29 and the calculations associated with Appendix A.1 , in Microsoft Excel format with formulas intact.

EGD/Union.13 – Other Concerns

References:

a. PEG Evidence, April 11, 2018, pp.31-32:

"Recall from Section 3 that the computation of a capital quantity index starts with a benchmark year adjustment. We believe NERA's calculations of capital quantity indexes in their initial benchmark year were also incorrect. OHS is sometimes characterized as a method for calculating the quantity associated with gross plant value. Yet NERA deflated net plant values by an average of past values of a construction cost index. As a consequence, we believe that the initial quantities of capital for each utility in their sample were understated. Their method effectively removed accumulated depreciation associated with older capital twice. It was first removed when calculating net plant value and then removed again when the original value of plant is retired. When an alternative and higher average service life is used to calculate capital quantities, this can result in negative capital quantities for some utilities. Utility witnesses in Alberta used these negative capital quantities as an argument against a higher average service life." [footnote omitted]

…

"A Törnqvist/Thiel multilateral form was used for the productivity indexes. This form is not the best available for measuring productivity trends. Chain-weighted Törnqvist and Fisher Ideal forms are preferable for trend studies. PEG conventionally uses chain-weighted Törnqvist forms for input price and productivity indexes used in productivity trend studies."

b. Alberta Utilities Commission Rate Regulation Initiative, Proceeding 566, Decision 2012-237, September 12, 2012, paragraph 413:

"413. The Commission notes that in addition to the issues discussed in sections 6.3.2 to 6.3.7 above, PEG expressed a number of other concerns with NERA's study relating to the correct index form and the capital quantity index to use, among others. Some of these issues reflect an ongoing academic debate on which consensus has not been reached, or for which there is no right or wrong answer. For instance, PEG advocated the use of a chain-weighted form of a Tornqvist-Theil index, while NERA preferred the use of a multilateral Tornqvist-Theil index. Similarly, PEG indicated that the correct capital quantity measure to use should be the inflation-adjusted value of gross plant, while NERA insisted on using the net plant value.Overall, the Commission considers that PEG's criticisms do not undermine the credibility of NERA's TFP study." [footnotes omitted]

c. Alberta Utilities Commission 2018-2022 Performance-Based Regulation Plans for Alberta Electric and Gas Distribution Utilities, Decision 20414-D01-2016 and Errata, February 6, 2017, paragraphs 118-120:

"118. More specifically, the differences in the calculation methods pertained to the use of the chain-weighted index in the Lowry study, while the NERA-based studies relied on the multilateral index. As well, NERA's TFP calculations put more weight on larger utilities, whereas the Lowry study averages growth rates across firms in any year, thereby weighting firms equally. The assumptions pertaining to measuring input growth included among others, the depreciation method (one hoss shay, geometric decay or a straight line method), the use of net rather than gross plant in the benchmark year of the TFP growth study, the asset service life, and the choice of price indexes used in calculating such input quantities as labour, materials and services. In addition, while NERA-based studies include only costs labelled as "distribution" in FERC Form 1 accounts, the Lowry study includes a wider range of cost categories by allocating some expenses and wages related to customer accounts, administrative and general, and some general plant."

"119. These issues were for the most part, debated in the PBR Proceeding 566 and in Decision 2012-237, the Commission noted that "Some of these issues reflect an ongoing academic debate on which consensus has not been reached, or for which there is no right or wrong answer." As a result, and contrary to EPCOR's view in this proceeding, in Decision 2012-237, the Commission did not explicitly reject the different assumptions used by different parties. Along the same vein, Drs. Brown and Carpenter were generally neutral about the particular assumptions that were adopted, referring to the debate about the various methodologies as being "within the range of statistical precision of a TFP study," whereas Dr. Meitzen and Dr. Lowry were more adamant that the assumptions each of them had adopted were to be preferred."

"120. In the Commission's view, there is no overwhelming new evidence in this proceeding that any of these particular assumptions are correct or incorrect. The assumptions chosen reflect the practitioner's decisions and beliefs based on the available choices that can be applied to the data, and there is generally no test presented in evidence that can be applied to determine which assumptions are more applicable to particular data or the purposes for which it is used. It is unlikely that any group of unassociated practitioners will make the same choices for all the assumptions, even with the same universe of data series available to them. For this aspect of the analysis, the Commission is, therefore, unwilling to specify a preference for the set of assumptions used by any particular one of the three TFP growth studies."

Preamble: The companies would like to understand Dr. Lowry's "other concerns" regarding Dr. Makholm's TFP growth study.

Questions:

a. Please confirm that Dr. Lowry raised the concerns identified in **reference a** in Alberta Proceeding 566 (in which Dr. Makholm also appeared), in Alberta Proceeding 20414 (in which Dr. Makholm did not appear), and in the current proceeding.

b. Please confirm that the AUC found that Dr. Lowry's concerns about NERA's study with regard to net versus gross plant and the use of a chain-weighted form of a Tornqvist-Theil index did not "undermine the credibility of NERA's TFP study" in Alberta Proceeding 566.

c. Confirm that in Alberta Proceeding 20414 (in which Dr. Makholm did not appear), the AUC found that “there is no overwhelming new evidence in this proceeding that any of these particular assumptions are correct or incorrect.”

EGD/Union.14 – Alternative Results

References:

a. PEG Evidence, April 11, 2018, p. 33:

"We next corrected for a small problem with NERA's labor quantity calculation. This raised the estimated TFP trend by about 8 basis points, to -0.83%."

b. PEG Evidence, April 11, 2018, p. 33:

"We next removed some merged companies from the sample. This lowered the estimated TFP trend by 3 basis points, to -0.86%.".

Preamble: The companies would like to understand Dr. Lowry's changes to Dr. Makholm's study.

Questions:

a. Please explain Dr. Lowry's "correction for a small problem with NERA's labor quantity calculation."

b. Please provide all associated calculations in Microsoft Excel format with formulas intact.

c. Please identify the merged companies that Dr. Lowry removed from Dr. Makholm's study.