RÉPONSES D'HYDRO-QUÉBEC DISTRIBUTION À LA DEMANDE DE RENSEIGNEMENTS N° 3 DE L'AQCIE-CIFQ

INTRODUCTION TO CONCENTRIC RESPONSES TO AQCIE-CIFQ

In responding to questions from AQCIE-CIFQ, Concentric is of the view that many questions are beyond the scope of the current proceeding (hereafter "Phase III-A"[1]), and beyond the scope of Concentric's evidence presented in Phase III-A. In its Decision D-2017-043 (Phase I), the Régie agreed with Concentric's and HQD's recommendation to use its informed judgement in setting the X factor for HQD:

> **[164] La Régie retient la méthode basée sur le jugement préconisée par le Distributeur pour déterminer la valeur du Facteur X à inclure dans la Formule d'indexation. À cette fin, le Distributeur devra mettre à la disposition des intervenants les études, analyses et rapports susceptibles d'éclairer la Régie quant à la détermination du Facteur X en phase 3.**

In order to inform the judgment of the Régie, Concentric researched and presented the results from several recent regulatory decisions in North America where productivity factors were examined and considered. Where final decisions were rendered, Concentric relied on the regulatory review of these studies. Where final decisions were not yet rendered, Concentric summarized the Company expert filing. This was not intended to re-create the evidentiary record, or re-litigate the results of these proceedings. To do so would defeat the intent of this proceeding and would negate the efficiency created by this process, which deliberately avoids the contentious debate which often characterizes productivity studies and methodologies.

[1] See Phase III-A's scope as described in HQD-20, document 1 (B-0177), pages 5-6. Other remaining characteristics will be the subject of a subsequent proceeding, in the fall of 2018 (Phase III-B). See also HQD's response to Question 19 a.

DEMANDE DE RENSEIGNEMENTS N^{O} 1 DE L'AQCIE-CIFQ RELATIVE À LA DEMANDE D'ÉTABLISSEMENT D'UN MÉCANISME DE RÉGLEMENTATION INCITATIVE ASSURANT LA RÉALISATION DE GAINS D'EFFICIENCE PAR LE DISTRIBUTEUR D'ÉLECTRICITÉ ET LE TRANSPORTEUR D'ÉLECTRICITÉ

1. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne states on p. 3 of his testimony that "Concentric has been asked by HQD to provide an assessment and recommendation for the X factor."

Demandes :

a) Please detail all empirical studies of the multifactor productivity ("PMF") trend of power distributors which Mr. Coyne has previously undertaken.

Réponse de Concentric :

Please see response to AQCIE-CIFQ's information request n^{o} 2, HQD-15, document 5.2 (B-0104), Question 2.

b) Please detail all proceedings on *mechanismes de reglementation incitatifs* ("MRI") for power distributors which Mr. Coyne has previously participated in.

Réponse de Concentric :

Please see response to AQCIE-CIFQ's information request n^{o} 2, HQD-15, document 5.2 (B-0104), Question 2.

2. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne states on p. 4 of his testimony that

There are alternative ways to derive "X" that range from past observed productivity gains for the specific company to industry benchmarking studies and industry productivity studies. No one method is determinative and ultimately the X factor must be set using informed judgment by the regulator.

Demandes :

a) Are you saying that commissions like the Regie should not rule on the preferred methods for X factor calibration? Should HQD's consultant be free to use any method and eschew any method in the upcoming PMF methodology?

Réponse de Concentric :

Please see response to AQCIE-CIFQ's information request n° 2, HQD-15, Document 5.2 (B-0104), Question 1.

b) Haven't commissions like the Massachusetts Department of Public Utilities in fact done this on several occasions?

Réponse de Concentric :

Concentric has not researched the basis of prior Massachusetts decisions.

c) Is the problem that commissions should not rule on best practices or instead that no one study presented to a commission may use all of the best practices that a commission might prefer?

Réponse de Concentric :

No. The problem for Commissions is that there are no acknowledged "best practices" in the estimation of utility productivity studies. Concentric outlines the scope of the problem in its Phase I Report[2]:

The productivity studies objectively apply data to a valid theoretical model but face several challenges that are widely recognized:

- **selecting a valid comparison group;**
- **determining the study period (beginning and end years);**
- **compiling a vast amount of data, potentially from multiple sources;**

[2] Performance Based Regulation Recommendations Prepared For: Hydro-Québec Distribution And Hydro-Québec TransÉnergie, R-3897-2014, Before The: Régie de l'énergie, October 26, 2015, Revised February 10, 2016, p. 24.

- **comparability of input and output data that is subject to varying accounting and regulatory accounting policies among jurisdictions;**
- **difficulty of controlling for external factors;**
- **need to specify numerous assumptions; and**
- **the specific algorithms that are used to estimate productivity.**

d) Is it generally desirable for a commission to be presented with several PMF methodologies, and tests of the sensitivity of methods to assumptions?

Réponse de Concentric :

Not necessarily. Tests of methodology and assumptions can be accomplished through a single study, as long as it is presented openly, with opportunity for discovery on methodology, data inputs, and sensitivity around results. These study results can also be compared to results of studies submitted in other jurisdictions for consistency and reasonableness.

3. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne states on pp. 4-5 of his testimony that

> **Utility productivity studies are not routinely submitted in North American jurisdictions as these studies are costly and time consuming, and relatively few jurisdictions adhere to an I-X form of utility regulation. As cited by Concentric in its June 30, 2017 Report, there have been recent studies submitted in Alberta and Ontario. Since that time, a more recent study was decided on in Massachusetts. The results of those studies are summarized here. *Concentric is not aware of any other productivity studies that have been submitted since that time.* [italics added]**

Demandes :

a) How recent does a study have to be if the number of customers is used as the output metric? For example, is the 2013-2014 research and testimony of Dr. Lowry in British Columbia too dated to be informative to the Regie?

Réponse de Concentric :

PEG presented study results in the BCUC proceeding for two sample periods, both ending in 2011. PEG has since presented more recent study results in the 2016 Alberta proceeding, which to Concentric, would be more informative to the Régie along with other more recent studies cited in Concentric's evidence.

b) Concentric's report is dated 5 January 2018. Was it not aware of PEG's study of U.S. power distributor productivity trends for Lawrence Berkeley National Laboratory (a unit of the U.S. Department of Energy) released in August 2017, or of the power distributor PMF study filed by Dr. Jeffrey Makholm of National Economic Research Associates ("NERA") on behalf of Enbridge Gas Distribution and Union Gas in Ontario in November 2017?

Réponse de Concentric :

Concentric was aware of the PEG study for Lawrence Berkeley, but did not consider it a recent productivity study equivalent to those presented in litigated regulatory proceedings, and PEG's work on productivity is captured in Concentric's summary of the 2016 and 2012 Alberta proceedings. Concentric was not aware of the NERA study filed on behalf of Enbridge and Union at the time it drafted its report. That report was filed on November 23, 2017. In the NERA study submitted to the OEB, Dr. Makholm concluded with an X factor recommendation of 0.0% based on his analysis of U.S. utilities, the Canadian economy, and Enbridge and Union's specific productivity trends, and a zero stretch factor.

4. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne notes on p. 5 of his testimony that

The current PBR plans for Alberta's electric and gas distributors expire on December 31, 2017. The Commission initiated a proceeding to establish the "next generation of PBR plans" to be implemented for the 2018-2022 period in May 2015. Several experts provided productivity related evidence and studies, including: The Brattle Group ("Brattle"), Christensen Associates

("Christensen"), Pacific Economics Group ("PEG"), PCMG Associates ("PCMG").

Mr. Coyne states on p. 4 of his testimony that

> **The AUC discussed the value of, and the differences in, transparency, objectivity, and consistency of the studies. It considered the considerable differences between the utility studies and the study performed by PEG, but ultimately chose to *give all studies the same weight*. [italics added]**

Demandes :

a) Please confirm the following: Brattle and Christensen used substantially the same PMF methodology as that which Dr. Makholm of NERA used in a study commissioned by the AUC in the prior generic MRI proceeding. The main difference in the methodologies is that Dr. Makholm used a much longer sample period. Since the Commission embraced a longer sample period in the first proceeding, Brattle and Christensen both reported results for a longer sample period in the second generic proceeding that included the early years of the NERA sample, but recommended basing X on results for a truncated sample period in which productivity growth was negative.

Réponse de Concentric :

Concentric is aware that Brattle and Christensen adopted the NERA methodology and examined different time periods using that methodology, and that more recent results included negative productivity trends. Concentric highlighted this issue in its January 5, 2018 Report[3], p. 8.

b) Mr. Coyne on p. 9 quotes the AUC as saying that the range of reasonable values for the base PMF trend was -0.79 and +0.75%. Where did the +0.75 value come from? Please confirm that it was the value from Brattle's updated study for the full (non-truncated) sample period, including the earlier years used by NERA. In other words, the +0.75 upper bound is based on work by Brattle for a longer sample period which CEA did not share with the Regie.

Réponse de Concentric :

Concentric relied upon the "Final" TFP Growth Study Findings reported by the AUC in its final decision on Table 1.

[3] HQD-20, document 2 (B-0178).

Table 1. TFP growth study findings

Study	Output measure	Recommended data period	Number of firms	TFP growth calculation	
				Initial	Final
NERA 2012	Volume (MWh)	1972-2009	72	-	0.96
Brattle	Volume (MWh)	2000-2014	67	-0.89%	-0.79%
Meitzen	Volume (MWh)	Average of last 15 (2000-2014) and last 10 (2005-2014) years	68-72	-1.11% [Note 1]	-1.11% [Note 1]
Lowry	Number of customers	1997-2014	88 21	+0.48% +0.80%	+0.43% +0.78%

In reference to the specific quote in question from the AUC's Decision, the Commission notes in footnote 198 on p. 42:

> **"In response to Commission IRs, Exhibit 20414-X0256, PDF page 41, the 0.75 per cent TFP growth number was calculated by Dr. Meitzen based on Brattle's sample and balanced panel."**

Dr. Meitzen is an expert for Christensen Associates, and as seen above in Table 1, his TFP calculation was -1.11%. It was not Concentric's intent to recreate the entire AUC evidentiary record for the Régie. It was our intent to provide a summary of the expert results, and the AUC's decision based on that evidence.

c) Please substantiate your claim that the AUC gave all studies the same weight. Didn't the AUC in fact give the Christensen study zero weight? Which results were assigned equal weight to produce an X factor of 0.3%?

Réponse de Concentric :

According to the AUC's decision:

> **Based on the criteria of objectivity, consistency and transparency, the Commission finds, in Section 5.2.1, that equal weights should be applied to the Brattle and Meitzen studies, and to the Lowry study that was provided in direct evidence. Further, since the effect of input data modifications made in the studies is minimal, as discussed in Section 5.2.2, the Commission also will not weight the studies differently due to the use or non-use of such modifications. Decision 20414-D01-2016 (December 16, 2016), at 157. (Dr. Meitzen was the expert for Christensen.)**

And:

> **As a result of the above analysis, the Commission considers that the range of TFP growth values is defined by three remaining values: -0.79 for the Brattle study, and +0.43 for the Lowry study, both from Table 1, and approximately +0.75 for the full 1972-2014 time period. In addition, based on the analysis in sections 5.2.3 to 5.2.5, additional information about the variability of these TFP**

> **values to changes in assumptions and hence, the possible range of values that TFP growth might take, is available. Decision 20414-D01-2016 (December 16, 2016) at 162.**

And concludes:

> **The Commission has determined an X factor, using its judgement and expertise in weighing the evidence and in taking into account the multitude of considerations set out above, in particular evidence demonstrating that the TFP growth value cannot with certainty be identified as a single number, but rather, in view of the variability resulting from the assumptions employed, must be considered as falling within a reasonable range of values, between -0.79 and +0.75. The Commission finds that a reasonable X factor for the next generation PBR plans for electric and gas distribution utilities in Alberta, inclusive of a stretch factor, will be 0.3 per cent. Decision 20414-D01-2016 (December 16, 2016) at 169.**

It is not clear from the above statements by the Commission how it weighed specific results in the range to arrive at 0.3%.

5. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne notes on p. 5 of his testimony that

> **All of the [recent Alberta] the studies show an industry trend in productivity converging at or below zero over this two-decade period, indicating negative productivity growth... A contributing factor has been the decline in electric demand growth without offsetting declines in labor, capital and other operational costs required to maintain and upgrade these utility systems.**

Demandes :

a) Please confirm that PEG's Alberta study does not display a marked slowdown in PMF growth or a negative productivity trend.

Réponse de Concentric :

As illustrated in Figure 1 of Concentric's January 5, 2018 Report[4], PEG's TFP estimate approaches and then falls below zero in the last two years of its study, but its average TFP estimate remains positive, in contrast to those of Brattle and Christensen.

b) Why is the slowdown in volume growth which the volumetric indexes in the Brattle and Christensen studies reflect pertinent in the design of an X factor for a revenue cap index with a customer growth escalator?

Réponse de Concentric :

The AUC, in considering the different output measures used by the experts, found that the use of volume or customer growth as the output measure was not determinative in its findings. It specifically found: [t]he Commission is not prepared to discount TFP growth studies developed using either volume or number of customers as the output measure simply because of the particular output measure that was chosen. Decision 20414-D01-2016 (December 16, 2016) at 130.

The Christensen study presented in Eversource utilized customers as the output measure, which was accepted by the Massachusetts Department of Public Utilities (MDPU or Department), and provides another data point using customers.

Concentric believes that the specific choice of output measures, and their implications, is beyond the scope of this Phase III-A proceeding.

6. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

[4] HQD-20, document 2, page 7 (B-0178).

Mr. Coyne states on p. 8 of his testimony that "the AUC noted it was unwilling to state a preference for the *set of assumptions* used by any one TFP study over another." [italics added]

Demande :

Was the AUC unwilling to rule on any methodological issue or was it unwilling to embrace the full methodological package contained in any single study?

Réponse de Concentric :

The full quote from the AUC's decision is:

> **In the Commission's view, there is no overwhelming new evidence in this proceeding that any of these assumptions are correct or incorrect. The assumptions chosen reflects 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. Decision 20414-D01-2016 (December 16, 2016) at 120.**

Concentric takes this finding as the AUC's unwillingness to accept a single set of assumptions, and its decision did not accept the result from any single witness, but it did provide assessment of methodological issues in its decision.

7. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne states on p. 8 of his testimony that

> **the AUC acknowledged that with the prevalence of both fixed and variable revenue components for distribution utilities, the number of customers (the**

output measure used by PEG) is a relevant output measure along with volume (the output measure used by Brattle and Christensen), where the relative weights assigned to these two output measures would ideally reflect the proportion of revenues generated through fixed versus variable (volumetric) charges.

Demandes :

a) Is this not an instance of the AUC exhibiting a preference for a specific PMF method?

Réponse de Concentric :

No. The AUC suggested this would be a useful sensitivity analysis.

b) Please confirm that power distributors in Alberta operate under *price* caps rather than a *revenue* cap with a customer growth escalator, such as the Regie has chosen for HQD. Wasn't this a reason why the Commission made this comment?

Réponse de Concentric :

According to the Commission, that was one consideration, but it rejected Dr. Lowry's argument on this issue. The broader context is found in this paragraph which precedes the quote:

> **The Lowry study uses number of customers as the output measure for a number of reasons, including its applicability with a revenue-per-customer cap. Dr. Lowry also pointed to the use of econometric modelling that shows the number of customers to be a more important driver of the costs of energy distributors than delivery volumes. An additional reason is that the number of customers is much more stable (that is, less variable) than the trend in delivery volumes. <u>The Commission does not find these reasons to be particularly persuasive in terms of attaching higher weight to studies that use the number of customers as the output variable rather than a volumetric measure</u>. First, only gas distribution utilities will be under a revenue cap plan in the next generation PBR plans (electric distribution utilities remain under a price cap) and, in any event, as Dr. Carpenter and Dr. Meitzen pointed out, what is more relevant is the type of index that applies to the U.S. electric distribution firms in the sample, an issue on which no evidence has been adduced. Second, the evidence provided was insufficient to explain why, finding that the number of customers is a more important driver of the costs of energy distributors than delivery volumes, means that the number of customers is a better measure of output than delivery volumes. Finally, while a lack of variability of an output measure appears to**

have some advantages in terms of ease of numerical calculation and updating, expert evidence was not provided as to why in and of itself, this characteristic is particularly desirable in terms of deciding which output measure is more relevant. Decision 20414-D01-2016 (December 16, 2016) at 129. (emphasis added)

c) Do you believe that a revenue-weighted index of billing determinants like that with the AUC discusses is appropriate in a PMF study intended to calibrate the X factor for a revenue cap index that has a customer growth escalator? If so, why?

Réponse de Concentric :

See response at HQD-21, Document 4, Question 1.1.

8. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne states on p. 11 of his testimony that

Hydro One, [Ontario's] largest electric distributor, has submitted a proposal for a five-year rate plan, covering the 2018-2022 rate period. The company's proposal is supported by a productivity study conducted by Power System Engineering ("PSE"). The study incorporates… an estimate based on updates to a study previously performed by PEG, the Board's consultant, for the entire Ontario electric industry.

He states on p. 14 that

The Hydro One rate filing remains under review. According to the OEB's procedural schedule, OEB staff and any intervenors permitted to file expert evidence will file evidence with the OEB on December 14, 2017

Demandes :

a) Please confirm that the Hydro One proceeding has been delayed and that neither OEB staff and its consultant nor other stakeholders have as yet filed evidence.

Réponse de Concentric :

Concentric is not a participant in this proceeding, but understands the current procedural schedule calls for submission of OEB staff and expert evidence on April 6, 2018. EB-2017-0049 Procedural Order, January 10, 2018.

b) When choosing an X factor for HQD, should the Regie consider productivity studies like the cited Fenrick study which have been submitted in MRI proceedings but have not been vetted or challenged by other parties to the proceeding? If so, why should the Regie not also consider the productivity research discussed in Dr. Lowry's reply evidence submitted in the second Alberta MRI proceeding that you discuss?

Réponse de Concentric :

See Concentric's introductory remarks on page 3.

To the extent Dr. Lowry's reply evidence in Alberta merited consideration in the AUC's proceeding, its weight is already reflected in the AUC's final decision.

9. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne notes on p. 13 of his testimony that the revenue cap index proposed by Hydro One includes a Custom Capital factor "determined to recover the incremental revenue in each test year necessary to support Hydro One's proposed Distribution System Plan, beyond the amount of revenue recovered in rates."

Elsewhere on p. 13 he notes that

> **The projected impact of the capital factor is seen below, where the impact ranges from 1.64% to 2.86% above the revenue requirement that would otherwise be set by I-X. In effect, the nominal X factor of 0.6% is negative, ranging from -1.04 to -2.26% when the capital factor is considered.**

Demande :

Please confirm that the proposed revenue cap index does not include a growth factor, and that this *raises* the implicit X factor.

Réponse de Concentric :

Concentric is not aware of a growth factor beyond that included in the revenue cap in HydroOne's proposal. If one were to assume a growth factor in one model vs. another without it as a comparator, directionally that would increase the implied X of the program without growth. Concentric has only relied upon the base X in weighting the studies in its recommended X factor for HQD. As noted in response to OC's information request n° 2, HQD-21, Document 5, Question 3.2, each of the programs Concentric cited in its comparisons accommodates growth, but the mechanisms vary.

10. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne notes on p. 14 of his testimony in Massachusetts a witness for Eversource Energy filed a study of U.S. power distributor TFP in which "the data covered the 2001-2015 period, and relied on the number of customers as the measure of output, and standard measures of labor, materials, and capital measures of inputs."

He notes on p. 16 of his testimony that the Massachusetts DPU "found the use of customers as the sole output measure to be appropriate, and better reflected changes in the industry's distribution system investment requirements."

Demandes :

a) Please confirm that this study, by Dr. Meitzen of Christensen Associates, uses a more up to date sample period than his Alberta study and an output metric that is more appropriate for a revenue cap index with a customer growth escalator than the entirely volumetric index he and the Brattle Group used in their recent Alberta studies.

Réponse de Concentric :

Confirmed that Dr. Meitzen used a more up to date sample (he added 2015). Confirmed that he used customers as his output measure, but cannot confirm it is "more appropriate" based on the considerations cited in response to Question 5.b.

b) Please confirm that Dr. Meitzen, like Brattle and Dr. Makholm, used a "one hoss shay" approach to measuring capital cost that is very different from the geometric decay approach that Dr. Lowry and Mr. Fenrick used and that Mr. Coyne used in gas utility productivity research and Ontario testimony for Enbridge Gas Distribution.

Réponse de Concentric :

Confirmed that Dr. Meitzen used the "one hoss shay" method in his Eversource study, and that is a different method than that used by some experts, including Mr. Coyne in his Enbridge study, but it is one of the three methods employed by experts for such purposes. The MDPU found:

> **While the gradual depreciation of capital assets is necessary for accounting and cost recovery purposes, a capital asset's contribution to a company's productivity remains relatively constant until it is retired (Tr. 3, at 554-558). As Eversource correctly notes, the BLS relies on a method similar to the one hoss shay method for its multifactor productivity studies (Exh. ES-PBRM-1, at 69; Tr. 3, at 554-558). For these reasons, the Department finds that Eversource's use of the one hoss shay method to calculate the capital quantity index is appropriate. MDPU Eversource Decision, DPU 17-05, p. 390.**

c) Please acknowledge that the Massachusetts DPU explicitly ruled on preferred output metrics and several other PMF methodological issues in the recent Eversource proceeding.

Réponse de Concentric :

Concentric would not characterize the MDPU's Eversource decision in that manner. Rather, we observe the MDPU in its decision is evaluating the reasonableness and appropriateness of the analysis and key parameters, rather than expressing a methodological preference.

11. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

On pp. 14-15 of his testimony Mr. Coyne notes that "Eversource's expert calculated a productivity offset (X factor) of -2.56% for the national sample and -2.47% for the Northeast sample. The company also proposed the use of a national measure of inflation, the Gross Domestic Product Price Index (GDP-PI)."

He notes on p. 24 of his testimony that :

> **Considering the resulting X factor determined by the AUC of 0.3%, including a stretch factor, this would be an upper-end target for HQD in its first-generation MRI. The Mass DPU's adopted -1.31%, with a 0.25% stretch factor**

Demandes :

a) Please confirm that the -1.31% chosen by the DPU reflected a productivity *differential* and an input price *differential.* Both are sensitive to the use of a macroeconomic inflation measure.

Réponse de Concentric :

Confirmed.

b) Please confirm that, since the inflation measure for HQD is likely to be industry-specific, and HQD is based in Canada, where the multifactor productivity trend of the

economy has been slower than in the U.S., it is inappropriate to compare the 0.3% chosen by the AUC to the -1.31% X factor chosen by the DPU. This would be an "apples to oranges" comparison.

Réponse de Concentric :

Concentric believes it is most appropriate to compare the results of studies relied upon by the AUC to the -0.41 to -0.46% Industry TFP results in the Eversource study. These results do not include adjustments for economy-wide productivity or input price differentials. That is the comparison shown in Table 5 of Concentric's January 5, 2018 Report[5]

12. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne's X factor recommendation reflects the -0.87% average PMF growth rate from recent studies by Brattle, PEG, and PSE as well as two by Christensen Associates.

Demandes :

a) Please confirm that four of these five studies were funded by utilities seeking low X factors in MRI proceedings.

Réponse de Concentric :

The -0.87% is the median, not average, of the studies compiled in Table 5 of Concentric's report[6]. The rules for experts in Canada require the expert to provide fair, objective and non-partisan opinion evidence regardless of who has retained the expert. Concentric has no basis to question the integrity of these experts.

[5] HQD-20, document 2, page 22 (B-0178).
[6] Ibid.

b) Why were *two* Christensen studies and the Brattle study included in this average when the second Meitzen study is more up to date and used a more pertinent output measure and the input quantity treatments in the Brattle and Christensen studies are quite similar?

Réponse de Concentric :

See Concentric's introductory remarks on page 3.

c) Why were the Brattle and Christensen results for the full sample period not considered in this average?

Réponse de Concentric :

These results were not reported by the AUC as the Final Results considered by each of the experts in Table 1 of its Decision.

d) Why are productivity studies from recent MRI proceedings more pertinent than the studies sponsored by government agencies, Commission rulings in these proceedings, or the base productivity trends proposed by utilities themselves?

Réponse de Concentric :

Please see response to Question 8 b. Concentric believes that specific industry productivity studies are most relevant to the setting of a productivity factor. Commission rulings provide insight into how these studies have been critiqued and evaluated. Government agency sponsored studies are not subject to the same levels of scrutiny, and would not typically be designed for determination of a regulatory parameter, but may provide additional perspective.

e) Why did you include the productivity study by Dr. Meitzen for Eversource Energy and not the counterstudy prepared in the same proceeding for the Office of the Attorney General by Dr. David Dismukes, a PhD energy economics professor at Louisiana State University?

Réponse de Concentric :

Concentric can find no evidence in the MDPU's decision that it placed any weight on Dr. Dismukes' evidence, and it seems the Attorney General did not either. The MDPU noted in its decision that "The Companies argue that, after correcting mistakes, the Attorney General's witness changed his calculation of the X factor from 0.73 percent to -1.36 percent (Companies Brief at 343)." The Department goes on to note: Eversource calculated a proposed productivity offset in the instant case equal to -2.64 percent (RR-DPU-8). Although she does not argue on brief that the Department should adopt it, the Attorney General's witness calculates a productivity offset of -1.36 percent for her nationwide LDC sample and -0.95 percent for her regional LDC sample (Exh. AG/DED-Surrebuttal-1, Sch. DED-Surrebuttal-1, at 1). MDPU Decision 17-05, p. 364, footnote 182, and Decision p. 381.

13. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne notes on p. 22 of his testimony that

Statistics Canada estimates a utility productivity trend of -1.1% over the 2000-2015 period, and -2.1% over the more recent 2011-2015 period.

Demandes :

a) What utility operations in addition to power distribution are covered by this Statistics Canada index?

Réponse de Concentric :

Statistics Canada defines sub-sectors based on North American Industry Classification System (NAICS) 2007, and the "Utilities" sub-sector is comprised of establishments primarily engaged in operating electric, gas and

water utilities. These establishments generate, transmit, control and distribute electric power; distribute natural gas; treat and distribute water; operate sewer systems and sewage treatment facilities; and provide related services, generally through a permanent infrastructure of lines, pipes and treatment and processing facilities.

b) What output measure is used in the computation of this index?

Réponse de Concentric :

The Statistics Canada multifactor productivity measures the efficiency with which all inputs are used in production. It is the ratio of real gross domestic product (GDP) to combined labor and capital inputs.

The labor input is obtained by chained-Fisher aggregation of hours worked of all workers, classified by education, work experience, and class of workers (paid workers versus self-employed and unpaid family workers) using hourly compensation as weights.

The capital input measures the services derived from the stock of fixed reproducible business assets (equipment and structures), inventories, and land. It is obtained by chained-Fisher aggregation of capital stocks using the cost of capital to determine weights. Combined labor and capital inputs are obtained by chained-Tornqivst aggregation of labor and capital input using cost shares of labor and capital as weights.

c) Please confirm that this is a "value-added" index that excludes the trend in the quantities of materials and services that utilities use.

Réponse de Concentric :

Confirmed that is a value added index, but not confirmed that it excludes quantities of materials and services. Those input quantities are expressed as intermediate values. According to Statistics Canada:

> **Gross Domestic Product (GDP) by industry measures the value of output of an industry less the value of intermediate inputs required in the production process. In this sense, it is an output-based measure of economic activity and is commonly referred to as the "value-added" of an industry. http://www.opic.ic.gc.ca/eic/site/cis-sic.nsf/eng/h_00005.html**

d) Were the burgeoning conservation and demand management expenses of many Canadian utilities excluded from this calculation?

Réponse de Concentric :

Concentric is not aware of the treatment of conservation and demand side management expenses in the Statistics Canada index.

14. Références : Témoignage de M. James Coyne sur le Facteur X (HQD-20, document 2)

Préambule :

Mr. Coyne notes on p. 24 of his testimony that

> **The DPU explicitly ruled that grid modernization investments proposed by the company would be considered outside of PBR, indicating the potential for significant investments outside the I-X revenue cap. The AUC's PBR also includes significant adjustments for capital investments outside of the formula, for which the Régie formula does not. Hydro One's proposal includes capital additions outside I-X that would place its effective X in the -1.04 to -2.26% range. A separate proceeding will be used in Massachusetts to determine how incremental grid modernization investment will be handled. For HQD, all capital investments, other than those excluded for a Z factor, are included in the formula. This creates a greater challenge in that regard than the Alberta utilities, Eversource or Hydro One face under their PBR plans.**

Demandes :

a) Please confirm that dozens of power distributors in Ontario operate under MRIs with price cap indexes without requesting supplemental capital revenue.

Réponse de Concentric :

Concentric cannot confirm.

b) Please confirm that, in Alberta and Ontario regulation, no reduction is made for the X factor to reflect the opportunity utilities have for supplemental capital revenue.

Réponse de Concentric :

Concentric is not aware of any explicit reduction in X for capital provisions. Concentric's point is that with the opportunity for capital cost recovery beyond I-X, the implicit X factor is lower (or more negative).

c) Do you believe the Massachusetts model should be followed and the X factor should be reduced if HQD obtains significant supplemental revenue for capex through the Z factor?

Réponse de Concentric :

No. The Massachusetts plan for Eversource included a Z factor, that would cover either operating or capital costs beyond the company's control, and in addition the MDPU is considering Eversource's proposal for $400 million in grid modernization. There is no reduction (or increase in the negative) X for Z factor exclusions which are beyond the control of management.

15. Références : James M. Coyne, James D. Simpson, and Melissa Bartos, *Incentive Ratemaking Report prepared for Enbridge Gas Distribution*, 28 June 2013, 2013-06-28, EB-2012-0459, Exhibit A2, Table 2

Préambule :

Mr. Coyne discusses alternative approaches to measuring capital cost and quantities in PMF research and his preference for the geometric decay approach in 2013 testimony for Enbridge Gas Distribution. Here are pertinent remarks from pp. B-8 to B-13.

D. Capital

1. Capital Approach

Measuring Capital quantity is less straightforward than measuring Labour or Materials quantity. In recent utility TFP analyses, three approaches to quantifying capital have been used, referred to as "Geometric Decay", "Cost of Service" and "One Hoss Shay".

Geometric Decay: In the geometric decay model, capital quantity reflects the concept that the plant additions of each vintage become less productive, or efficient, over time, and that the pattern of the decline in productivity is geometric. The geometric decay capital price, which is also called the user cost or service price, represents the price of employing a unit of net capital for one year. The capital price is based on the relationship between the price of new capital and the present value of future services of current capital; the Geometric Decay capital price incorporates financial costs and economic depreciation. The economic depreciation component in the price calculation measures the decline in the price of the capital asset as it ages. Capital cost is calculated by multiplying the Geometric Decay capital quantity and capital price. The geometric decay approach has been promoted extensively in academic literature.

Cost of Service: The cost of service approach to calculating capital cost reflects the way capital cost is determined in utility regulation. Cost of Service capital quantity is determined based on the assumption that the efficiency of each vintage of plant additions declines in accordance with a straight line pattern. The Cost of Service capital price is determined by a weighted average of current and past construction or asset prices. As a result, the Cost of Service capital price is an implicit price determined by the deflated sum of financial costs and accounting depreciation. The financial costs and accounting depreciation are both based on the historic (book) value of the plant.

One Hoss Shay: The One Hoss Shay approach to determining capital cost assumes that an asset retains full efficiency until the end of its service life. The One Hoss Shay Capital quantity is measured by gross plant; total gross plant is determined by summing plant additions by vintage. The One Hoss Shay Capital price is computed by incorporating financial costs and economic depreciation; economic depreciation must be estimated using several factors, including the real rate of interest (discount factor).

The simplicity of the geometric model provides several advantages over the cost of service and One Hoss Shay models, including: economic depreciation equals efficiency decline, no system of vintage accounting needs to be maintained because of the constant rate of depreciation, and depreciation is independent of the real rate of interest. The geometric decay model is the only model where the economic depreciation equals the efficiency decay. This simplifies the calculation because it avoids the tedious task of estimating the economic depreciation. In addition, if the two are not equal, the depreciation function can take on several forms due to its sensitivity

to factors such as the real interest rate. For example, in the case of One Hoss Shay, if the interest rate is zero, we can conclude that the depreciation will exhibit a straight line pattern; however, if the real interest rate is positive, the depreciation function will exhibit a concave pattern. The geometric decay model eliminates the necessity of a depreciation calculation. Furthermore, the geometric decay model does not require a system of vintage accounting due to the constant rate of depreciation. The capital price does not depend on the historical pattern of past asset prices; it only depends on the current price of used assets, which can be expressed in terms of a new asset's price. This greatly reduces the data demands associated with the geometric decay model.

The geometric decay model has been applied empirically on numerous occasions. One highly cited empirical study was developed by Hulten and Wykoff (1981). Hulten and Wykoff estimated the capital price index (age/price profile) by using prices of used capital assets. The study examined three common models: One Hoss Shay, straight line and geometric decay. Hulten and Wykoff concluded that geometric decay was the most appropriate method for estimating the age/price profile. Due to the dual property discussed above (economic depreciation equals efficiency decay), we can also assume that geometric decay would be the most accurate efficiency profile. Other studies using alternative approaches to estimating efficiency schedules have also been conducted. For example, Doms (1992) estimated efficiency schedules within production functions which resulted in relative efficiencies that declined geometrically.

The cost of service model, while trying to more accurately reflect the way capital cost is determined in utility regulation, has not been extensively studied in scholarly literature; therefore, there is no independent evaluation of the approach. In addition, to our knowledge, the model has only been used empirically by Pacific Economics Group. These factors make the cost of service approach difficult to evaluate. In addition, the model contains theoretical inconsistencies. Hulten (1990) showed that economic depreciation and efficiency decay are not independent concepts. One cannot select an efficiency pattern independent of the depreciation pattern and one cannot select a depreciation pattern independent of an efficiency pattern. Hulten used the example of straight line efficiency decay and showed that if one selects straight line efficiency decay then one has committed to using a non-straight line pattern of depreciation. The cost of service model uses straight line efficiency decay and depreciation, which is in direct violation of the theoretical framework developed by Hulten. In addition, accounting depreciation is being incorrectly used a proxy for economic depreciation.

The One Hoss Shay method assumes that assets retain full efficiency until the asset reaches the end of its service life. However, OECD (2001) states that there are

relatively few assets that will actually maintain full efficiency throughout their useful lives. As noted above, Hulten (1990) showed that economic depreciation and efficiency decay are not independent concepts and therefore, cannot be chosen independently of one another. In the case of One Hoss Shay efficiency decline, the depreciation function often takes on a concave pattern. However, a concave depreciation function is often at odds with empirical research. As Hulten and Wykoff (1981) show, depreciation generally exhibits a convex or geometric pattern. Furthermore, if a One Hoss Shay pattern of efficiency for an aggregation of capital assets is used, it is assumed that the useful life of all those assets are the same and that the efficiency decay of each asset is One Hoss Shay. Both assumptions are implausible.

Therefore, Concentric used the geometric decay approach to estimate capital cost and capital price, based on the following considerations:

(a) The geometric decay approach has been studied extensively in the literature and applied empirically in academic studies, including studies of utility regulation.

(b) The geometric approach is (relatively) straightforward.

(c) The Geometric Decay approach is consistent with the theoretical framework for determining capital cost. In capital theory, the price of an asset in a competitive market must be equal to the present discounted value of the expected annual rental rates of that asset over its entire service life with each expected rental rate being weighted by the corresponding annual productive efficiency.

2. Capital Quantity

Capital Quantity is a measure of a utility's distribution capital stock in any year. Capital Quantity reflects the value of the plant that is available to be used in a year, accounting for the value of plant additions in each earlier year and the remaining useful portion of that vintage of plant additions and plant retirements. Ideally Capital Quantity would be measured by compiling the annual additions and retirements, measured in real dollars, starting at a company's inception. However, because published plant data of this nature is not available for the companies in the Industry Study Group, Concentric estimated the Capital Quantity for a "baseline" year. For the industry study group analysis, the baseline year was 1995; 112 the baseline Capital Quantity was estimated by dividing (1) 1995 book Net Utility Plant, excluding production plant by (2) a composite plant deflator that Concentric developed to reflect the vintages of plant that were in service in 1995. The composite plant deflator is based on the regional Handy-Whitman Index of Cost Trends of Gas Utility Construction ("Handy-Whitman Index"). The formula for calculating the 1995 capital quantity is shown below:

K**1995 =** $Net\ Plant$**1995/** $\sum i \sum j$ **30** j**=1** $* HandyWhitmanIndex$**1965+**i**- 30** i**=1 ...**

A similar methodology was used for the EGD capital quantity, except that: 1) the baseline year was 2000, and 2) the composite plant deflator was based on the implicit price index for natural gas distribution investments in Canada obtained from StatsCan.

For each company, the Capital Quantity for each year after the baseline year was calculated by summing, for each year, (a) real plant additions; (b) minus real plant retirements; and (c) Capital Quantity in the prior year. Plant additions were obtained from the Company for the EGD analysis, and from the Annual LDC Filings for each utility in the industry study group analysis. Plant additions were converted to real dollar terms using the appropriate utility plant deflator in that year. Because annual retirement data was not readily available, annual retirements for each company were calculated by applying a common depreciation rate to the Capital Quantity in the prior year for consistency. Enbridge's depreciation rate of 4.14% was used for all companies. The formula for calculating capital quantities after the start year is shown below:

Kt **=** Kt**−1 +** $Plant\ Additionst / UtilityPlantDeflatort$ **−** $[Depreciation\ Rate * Kt$**−1]**

The earliest year for which plant data was available for the U.S. natural gas utilities was 1995.

3. Capital Price

As discussed previously, the geometric decay capital price represents the price of employing a unit of capital for one year and is based on the relationship between the price of new capital and the present value of future services of current capital. The price of capital is based on the cost of capital, depreciation, and capital gains. The cost of debt for EGD is the cost of debt reflected in EGD's base rates, and the cost of debt for the industry study group is taken from the Moody's A Utility Bond Index for each applicable year, representing year-toyear fluctuations in utility debt costs. The annual cost of equity for EGD is the Board approved ROE, and the cost of equity for the industry study group is determined from the average allowed return for all US natural gas utilities in each year, as reported by SNL Financial. In order to determine the annual weighted cost of capital, EGD's equity weighting is set at the Board-authorized average equity share for each year and the equity weighting for the industry study group is the average equity weighting for all US natural gas utilities in each year, obtained from SNL Financial. Annual construction costs for EGD are based on a Canadian implicit price index for natural gas distribution investments, and the HandyWhitman index for the US industry study group. Capital price for all companies is also adjusted for depreciation, based on Enbridge's depreciation rate of 4.14%. The summation of the cost of capital and depreciation applied to the applicable annual construction cost, and reductions for applicable capital gains determine the capital price for each year. Resulting capital prices are smoothed by calculating a four-year rolling average to reduce volatility, prior to application in the capital cost calculation.

4. Capital Cost

Annual capital cost is calculated as annual capital quantity multiplied by capital price for both EGD and the industry study group

Demandes :

a) In view of your extensive and persuasive arguments in favor of the geometric decay approach, would you agree that results should be presented using a geometric decay approach to measuring capital cost (even if other methods are also considered) in the upcoming PMF study for HQD?

Réponse de Concentric :

No. It is premature to determine, and beyond the scope of this proceeding, the approach to measurement of capital cost. Expert(s) providing that evidence, when submitted, should provide sufficient support for their methodologies to allow the Régie and stakeholders to assess its reasonableness.

b) To calculate an initial value of the capital quantity index you state above that you took the ratio of *net* plant value to a weighted average of past values of an asset price index. In other words, you deflated net plant value. In your discussion of the alternative one hoss shay approach to measuring capital cost and quantity, you explain that "the One Hoss Shay Capital quantity is measured by gross plant".

In two Alberta proceedings, Dr. Lowry has criticized the one hoss shay approach used by Makholm and mimicked by Brattle and Christensen on the grounds that they calculated the initial value of the capital quantity index by deflating *net* plant value rather than *gross* plant value. Based on the quoted commentary above, would you agree that this is a legitimate methodological concern and that the initial capital quantity in the Brattle, Christensen, and NERA studies may be understated? Would you also agree that, if one hoss shay were used in some calculations in the PMF study for HQD, that results should be presented using deflated *gross* plant value?

Réponse de Concentric :

Please see the response to Question 15.a. The appropriate determination of capital cost in a productivity study is subject to considerable debate where such studies are presented, and is beyond the scope of this proceeding.

16. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD states on p. 11 of its *Preuve Complémentaire* that

> **Le Distributeur propose d'utiliser la variation de l'indice implicite des investissements des entreprises pour représenter l'évolution des coûts liés aux actifs.**
>
> **Cet indice est disponible dans les publications de l'Institut de la statistique du Québec, organisme public officiel. En effet, celui-ci publie régulièrement les comptes économiques trimestriels du Québec sur son site internet, sous forme de publication et de tableurs électroniques. L'information sur l'investissement des entreprises y est disponible aux tableaux 2 et 3.**

Demandes :

a) Please confirm that the proposed price index is equal to the ratio of the values described on table 2 to those on table 3.

Réponse :

1 **Le Distributeur le confirme.**

b) Please also confirm that the proposed index is equivalent to that presented on line 10 of the Implicit Price Indexes for Gross Domestic Product found here: http://www.stat.gouv.qc.ca/statistiques/economie/comptes-economiques/comptes-revenus-depenses/cea2_5.htm

Réponse :

2 **Le Distributeur le confirme.**

c) If not confirmed, please provide the data and any calculations associated with the proposed index.

Réponse :

3 **Sans objet.**

d) HQD reports an average service life of more than thirty years. Doesn't the capital cost of HQD reflect construction and equipment costs incurred over the full service life?

Réponse :

Le Distributeur tient à souligner qu'il est inapproprié de lier un indice d'évolution des prix avec la durée de vie d'un actif. Il s'agit de deux concepts différents. L'indice implicite des investissements des entreprises proposé par le Distributeur permet de tenir compte de l'évolution du prix des nouveaux investissements. L'objectif du facteur I n'est pas de refléter l'évolution des prix durant toute la durée de vie d'un actif mais plutôt de refléter l'évolution de l'impact des nouveaux investissements.

Complément de réponse de Concentric :

The service life of assets is not a typical consideration in selecting an inflation price index in an MRI program, only in measuring historic cost.

e) What assurance is there that a three year moving average of inflation in this index is sufficient to smooth it? Can you report the outcome of smoothing this variable over the full sample period for which data are available?

Réponse :

Les données de l'indice implicite des prix du PIB (investissement des entreprises) sont disponibles à partir de 1981 sur le site de l'Institut de la Statistique du Québec. Il est donc possible de calculer les variations annuelles à partir de 1982 et la moyenne mobile de 3 ans à partir de 1984.

Ainsi, l'écart absolu moyen des variations d'une année à l'autre est de 1,6 % sans moyenne mobile, de 0,6 % en utilisant la moyenne mobile de 3 ans et de 0,4 % en utilisant une moyenne mobile de 5 ans.

En conclusion, l'utilisation d'une moyenne mobile plus longue donne une tendance plus adoucie, mais la moyenne mobile de 3 ans est suffisante pour réduire la variabilité sans perdre le signal de prix, et ce, conformément à la proposition de la Régie.

f) A construction cost index was used in the inflation measure of an MRI for ENMAX. What were the consequences?

Réponse de Concentric :

ENMAX has had three different MRI plans. It is not clear from the question what "consequences" are being sought, but these were the indices.

- **2007-2013 - Electric Utility Construction Price Index (EUCPI) and the Alberta Average Hourly Earnings (AHE) (AUC Decision 2009-35);**
- **2015-2017 - Alberta Average Weekly Earnings and Alberta Consumer Price Index (AUC Decision 21149-D01-2016);**
- **2018-2022- Alberta Average Weekly Earnings and Alberta Consumer Price Index (AUC Decision 20414-D01-2016 (Errata)).**

17. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD states on p. 12 of its Preuve Complémentaire that

> **Pour estimer l'évolution des coûts des autres biens et services, le Distributeur juge approprié d'utiliser les variations annuelles de l'IPC services du Québec, conformément à la recommandation de la Régie. En effet, les services représentant plus de la moitié du panier de biens et services de l'IPC (soit, 55 % en 2015), cet indice couvre un éventail de services suffisamment large pour bien représenter l'évolution des coûts de services au Québec.**

Demandes :

a) Why is HQD proposing an index of (consumer) services to address "autres biens et services" **when these costs also include many materials and other goods?** Approximately what proportion of HQD's total non-labor O&M expenses is purchases of physical goods?

Réponse :

Les coûts liés aux autres biens et services totalisent 625,3 M$[7] en 2018, soit 26,6 % des coûts totaux du Distributeur couverts par la formule d'indexation. Cette part se compose à 90 % de services et à 10 % de matériel et de biens

[7] HQD-20, document 1, tableau 4 (B-0177).

divers. Ainsi, ces derniers ne représentent qu'une faible part des achats d'autres biens et services du Distributeur.

Le Distributeur est d'avis que les achats de matériel et d'autres biens divers devraient être assujettis à l'indice des prix des services, plutôt qu'à l'IPC Québec global qui représente davantage les biens de consommation courante.

b) What evidence can be provided that other goods (e.g., wrenches, carpets, and lubricating oils) that utilities use are inconsequential or have price trends similar to those of consumer services?

Réponse :

Voir la réponse à la question 17a).

c) Wouldn't consumer services tend to have more rapid price trends than materials due to their labor-intensive character?

Réponse :

Le Distributeur ne peut pas confirmer ou infirmer cette hypothèse.

Au cours des dernières années, le prix des biens achetés par les consommateurs au Québec (majoritairement importés) représentés par l'IPC Québec global a été fortement influencé à la baisse par la valeur du dollar canadien, l'émergence des pays asiatiques dans le commerce international et le prix du pétrole.

Selon les données de l'IPC de Statistiques Canada, entre 2002 et 2016, le prix des biens non durables au Québec a augmenté plus rapidement que celui des services. À l'examen des données d'inflation par catégorie de biens (durables, semi-durables et non durables), il est difficile de conclure que l'hypothèse présentée dans la question est exacte.

d) By proposing to narrow the scope of the CPI to just services, the importance of each service in the CPI is magnified. Please provide the weights for each of the major service groups in the proposed index. For example, what is the weight for food and beverage services? Please also identify the major categories of services purchased by HQD.

Réponse :

Les données de l'IPC de Statistique Canada ne fournissent pas de ratio de dépenses dans le panier de consommation par catégories de services.

Les principaux services achetés par le Distributeur sont les services externes et professionnels, la location d'espace de bureau, la gestion de matériel, la gestion des infrastructures de technologie de l'information et des applications, les achats de logiciels et licences, la sécurité informatique, les services financiers, les services de ressources humaines de même que les services de sécurité corporative.

e) What are the precedents for using a consumer services price index in approved MRIs?

Réponse du Distributeur et Concentric:

HQD and Concentric are not aware of specific consumer services price index precedents in approved MRIs.

18. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD states on p. 16 of its *Preuve Complémentaire* that :

Le Distributeur propose que le taux d'indexation combiné soit appliqué au prorata de chacune des trois catégories de dépenses incluses dans la Formule d'indexation, soit la rémunération excluant la portion capitalisable, les coûts liés aux actifs et les coûts des autres biens et services.

Le Distributeur propose de fixer pour la durée du MRI les poids relatifs des trois catégories de dépenses. Ces poids relatifs seront établis formellement en fonction des coûts reconnus pour l'an du MRI, excluant les éléments traités en

Facteur Y et en Facteur Z une fois ceux-ci déterminés. À titre illustratif, le tableau 4 présente pour l'année témoin 2018 le calcul des poids relatifs de la rémunération, des coûts liés aux actifs et les coûts des autres biens et services, soit 16,6 %, 56,8 % et 26,6 % respectivement.

Demandes :

a) In Table 5, does the *masse salariale* include labor expenses associated with vegetation management?

Réponse :

Le Distributeur souligne qu'aucun coût de masse salariale relatif à la maîtrise de la végétation n'est inclus dans la formule d'indexation puisque les coûts de cette activité sont traités en exclusion dans le facteur Y.

b) Please make the same computations assuming that the following costs will be addressed by HQD's revenue cap index.

1) Pensions, vegetation management, combustibles, bad debts
2) Pensions, vegetation management, bad debts
3) Pensions, vegetation management, bad debts
4) Vegetation management, combustibles, bad debts
5) Vegetation management, bad debts

Réponse :

Les tableaux R-18-A à R-18-D présentent l'information demandée.

TABLEAU R-18-A : FACTEUR I – TAUX PONDÉRÉ SCÉNARIO 1 (M$)

	Rémunération	Coûts liés aux actifs	Coûts liés aux autres biens et services	Total
Charges d'exploitation (incluant le rendement des fournisseurs)	464,1		785,8	1 249,9
Masse salariale - Activités de base	*698,8*			
Moins : Portion capitalisable de la Masse salariale	*(234,7)*			
Facturation interne et autres			*785,8*	
Achats de combustible			*97,2*	97,2
Amortissement (excluant IEÉ, TEQ et nivellement)		563,1		563,1
Taxes (excluant TEQ)		60,6		60,6
Autres composantes du coût des avantages sociaux futurs			(103,0)	(103,0)
Frais corporatifs (excluant le coût de retraite et son CER)	17,1		17,1	34,2
Rendement (excluant IEÉ et TEQ)		713,6		713,6
Répartition de la formule d'indexation selon l'année témoin 2018	**481,2**	**1 337,3**	**797,1**	**2 615,6**
Facteur de pondération	**18,4%**	**51,1%**	**30,5%**	**100,0%**

Taux pondéré - Distributeur (moyenne 3 ans - année civile)				**2,17%**
EERH pour le Québec - tableau 281-0039	2,5%			
Indice implicite des investissements des entreprises		2,4%		
IPC Services du Québec			1,6%	

TABLEAU R-18-B : FACTEUR I – TAUX PONDÉRÉ SCÉNARIOS 2 ET 3 (M$)

	Rémunération	Coûts liés aux actifs	Coûts liés aux autres biens et services	Total
Charges d'exploitation (incluant le rendement des fournisseurs)	464,1		785,8	1 249,9
Masse salariale - Activités de base	*698,8*			
Moins : Portion capitalisable de la Masse salariale	*(234,7)*			
Facturation interne et autres			*785,8*	
Amortissement (excluant IEÉ, TEQ et nivellement)		563,1		563,1
Taxes (excluant TEQ)		60,6		60,6
Autres composantes du coût des avantages sociaux futurs			(103,0)	(103,0)
Frais corporatifs (excluant le coût de retraite et son CER)	17,1		17,1	34,2
Rendement (excluant IEÉ et TEQ)		713,6		713,6
Répartition de la formule d'indexation selon l'année témoin 2018	**481,2**	**1 337,3**	**699,9**	**2 518,4**
Facteur de pondération	**19,1%**	**53,1%**	**27,8%**	**100,0%**

Taux pondéré - Distributeur (moyenne 3 ans - année civile)				**2,20%**
EERH pour le Québec - tableau 281-0039	2,5%			
Indice implicite des investissements des entreprises		2,4%		
IPC Services du Québec			1,6%	

TABLEAU R-18-C : FACTEUR I – TAUX PONDÉRÉ SCÉNARIO 4 (M$)

	Rémunération	Coûts liés aux actifs	Coûts liés aux autres biens et services	Total
Charges d'exploitation (incluant le rendement des fournisseurs)	388,1		735,0	1 123,1
Masse salariale - Activités de base	*583,4*			
Moins : Portion capitalisable de la Masse salariale	*(195,3)*			
Facturation interne et autres			*735,0*	
Achats de combustible			*97,2*	97,2
Amortissement (excluant IEÉ, TEQ et nivellement)		563,1		563,1
Taxes (excluant TEQ)		60,6		60,6
Autres composantes du coût des avantages sociaux futurs			18,6	18,6
Frais corporatifs (excluant le coût de retraite et son CER)	15,4		15,4	30,7
Rendement (excluant IEÉ et TEQ)		713,6		713,6
Répartition de la formule d'indexation selon l'année témoin 2018	**403,5**	**1 337,3**	**866,1**	**2 606,9**
Facteur de pondération	**15,5%**	**51,3%**	**33,2%**	**100,0%**

Taux pondéré - Distributeur (moyenne 3 ans - année civile)				**2,15%**
EERH pour le Québec - tableau 281-0039	2,5%			
Indice implicite des investissements des entreprises		2,4%		
IPC Services du Québec			1,6%	

TABLEAU R-18-D : FACTEUR I – TAUX PONDÉRÉ SCÉNARIO 5 (M$)

	Rémunération	Coûts liés aux actifs	Coûts liés aux autres biens et services	Total
Charges d'exploitation (incluant le rendement des fournisseurs)	388,1		735,0	1 123,1
Masse salariale - Activités de base	*583,4*			
Moins : Portion capitalisable de la Masse salariale	*(195,3)*			
Facturation interne et autres			*735,0*	
Amortissement (excluant IEÉ, TEQ et nivellement)		563,1		563,1
Taxes (excluant TEQ)		60,6		60,6
Autres composantes du coût des avantages sociaux futurs			18,6	18,6
Frais corporatifs (excluant le coût de retraite et son CER)	15,4		15,4	30,7
Rendement (excluant IEÉ et TEQ)		713,6		713,6
Répartition de la formule d'indexation selon l'année témoin 2018	**403,5**	**1 337,3**	**768,9**	**2 509,7**
Facteur de pondération	**16,1%**	**53,3%**	**30,6%**	**100,0%**

Taux pondéré - Distributeur (moyenne 3 ans - année civile)				**2,17%**
EERH pour le Québec - tableau 281-0039	2,5%			
Indice implicite des investissements des entreprises		2,4%		
IPC Services du Québec			1,6%	

c) What is the share of combustibles in the revenue requirement under scenarios 1) and 4)?

Réponse :

Les achats de combustible, qui totalisent 97,2 M$ (excluant les comptes d'écarts) en 2018, représentent 0,8 % des revenus requis totaux du Distributeur et un peu moins de 4 % des coûts couverts par la formule d'indexation selon les scénarios 1 et 4 de la réponse à la question 18b).

19. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD states on p. 18 of its *Preuve Complémentaire* that

À la demande de la Régie, le Distributeur devra réaliser une étude de productivité multifactorielle d'ici la fin de la troisième année d'application du MRI. Cette étude aura pour but de valider la valeur du Facteur X retenue en phase 3 et, au besoin, de l'ajuster pour la dernière année du MRI ou autrement de l'utiliser pour le MRI de deuxième génération du Distributeur.

Demandes :

a) What schedule is contemplated for the PMF study? For example, when would it begin and when would the final report be issued?

Réponse :

En accord avec la proposition de la Régie de reporter à l'automne 2018 l'examen de certains sujets, dont la méthodologie et l'échéancier de l'étude de productivité multifactorielle[8], le Distributeur soumettra la méthodologie et l'échéancier de réalisation pour une telle étude en temps opportun.

[8] Lettre de la Régie du 8 juin 2017, page 2 (A-0158, dossier R-3897-2014).

b) How will a consultant for the study be chosen, using what criteria? What would be the minimum number of power distributor productivity studies that the consultant must have completed?

Réponse :

Voir la réponse à la question 19 a).

c) What PMF methodologies will be considered in the study?

Réponse :

Voir la réponse à la question 19 a).

20. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD states on p. 19 of its *Preuve Complémentaire* that

> **l'analyse de Concentric à la pièce HQD-20, document 2 permet de constater que les facteurs de productivité pour les distributeurs d'électricité et de gaz en Amérique du Nord sont généralement à la baisse, passant même au négatif, selon les nouvelles études menées en Alberta, en Ontario et au Massachusetts**

Demandes :

Does the Concentric analysis convincingly document a declining productivity trend for North American *gas* utilities? If so, please recapitulate this evidence and note the output measure employed.

Réponse de Concentric :

The recent studies presented in Alberta included a combination of electric and electric/gas combination utilities (Brattle and Christensen), and the study submitted by PEG was based on a sample of U.S. investor-owned electric

utilities. The AUC determined in its most recent decision, as it did in 2012, that the same X factor derived from these studies would be applicable to both gas and electric distributors. In 2012, it concluded:

> **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. AUC Decision 2012-237 (September 12, 2012) at 378. As noted in Concentric's January 5, 2018 Report, all studies show evidence of declining productivity from the electric and electric/gas combination utilities.**

This point is reinforced by Dr. Makholm in his study presented to the PEB on behalf of Enbridge and Union Gas:

> **Considering the unique quality of the FERC Form 1 data involved, the lack of such data in Canada, the commonality of the distribution tasks for both electricity and gas distributors, and the commonality of the regulatory institutions in Canada and the United States, the AUC accepted the use of that data set over other sources of data for both electricity and gas distributors in the province.**

In this study, Dr. Makholm computes productivity estimates directly for Enbridge Gas and Union Gas of -0.21% and -0.23%, respectively. Expert Report and Direct Testimony Prepared by Jeff D. Makholm, Ph.D., National Economic Research Associates Inc, pp. 24-26.

All of these indicators suggest that gas industry productivity is following the same general trend as the electric sector.

21. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD states on p. 20-1 of its Preuve Complémentaire that

Le positionnement quant au Facteur X de -0.5 % est dépendant du Facteur I proposé à la section 2. Ainsi, toute efficience additionnelle qui serait exigée du Distributeur par le biais d'un Facteur I plus contraignant que celui qu'il propose, aurait un impact à la baisse sur le Facteur X autrement proposé.

Pour établir le Facteur I, la Régie privilégie l'utilisation de données externes qui reflètent l'environnement économique dans lequel le Distributeur évolue. Conséquemment, en ce qui a trait au taux de croissance des dépenses liées à la masse salariale, elle considère que l'utilisation d'un indice externe au Distributeur le responsabilisera davantage dans la gestion de sa masse salariale. Le Distributeur est d'avis que l'utilisation d'un tel indice comporte implicitement un facteur de productivité additionnel.

Demandes :

a) Please provide any and all evidence that the trend in the IPC^{Quebec} is slower than the trend in either utility capital prices or prices of utility materials and services.

Réponse de Concentric :

HQD's point of comparison is not IPC^{Quebec} to utility capital prices or utility materials and services prices, it is that HQD's actual labor costs increase at a faster pace than IPC^{Quebec}, and that creates additional pressure (or stretch") if not accounted for in the X factor. The measurement of utility capital prices or the prices of utility materials and services are better approximated by the indices chosen by HQD than IPC^{Quebec}, which is a very broad measure of general inflation and not a measure of the input prices for the utility, which is the goal.

Complément de réponse du Distributeur :

L'IPC Québec est influencé par des facteurs qui impactent dans une moindre mesure les indices proposés par le Distributeur. De plus, l'évolution des prix des indicateurs diffère dans le temps.

Le Distributeur constate que l'inflation, mesurée avec l'IPC Québec, a chuté au cours des dernières années en raison de l'appréciation du dollar canadien, de l'augmentation de produits fabriqués en Asie et de la baisse du prix du pétrole. Sur la période 2013-2017, l'inflation a donc été inférieure à l'évolution des indices proposés par le Distributeur. Cependant, pour la période 2000 à 2012, le Distributeur constate l'effet inverse.

b) Please confirm that addressing utility salaries and wages via an external inflation index is a conventional part of MRI design. Is there any precedent for lowering X simply because an external inflation index is used?

Réponse de Concentric :

Confirmed. It is common practice to address the determination of X and I together, with consideration of the relationship between the inflation composition and the X factor.

22. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD states on p. 20-21 of its *Preuve Complémentaire* that

le taux de productivité moyen de 1,51 % auquel la Régie fait référence dans sa décision D-2017-043 ne reflète pas le context économique des dernières années dans lequel les entreprises d'électricité évoluent. À cet égard, le Distributeur note que le taux moyen de productivité selon les études récentes de productivité est plutôt de -0,52 %

Demandes :

a) Why is the *multifactor* productivity growth trend of utilities a standard for judging the *O&M* productivity growth target of a utility that was initially inefficient and embarking on the installation of automated metering infrastructure? Does the Concentric report provide any sound basis for establishing an O&M productivity trend?

Réponse de Concentric :

The question is not an accurate characterization of HQD's evidence or the evidence of its experts.

b) Please confirm that -0.52% is the average of a set of productivity studies handpicked by your hired consultant, most studies being commissioned by utilities, and is not the

average of all recent reputable studies of power distributor PMF growth. It does not even include full-sample results for Brattle and Christensen's Alberta studies.

Réponse de Concentric :

See response at Question 22.a.

23. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD discusses on p. 20-25 of its *Preuve Complémentaire* a Y factor for changes in the allowed rate of return on capital.

Demandes :

Why should HQD be entitled to 100% of the variance in the *weighted average cost of capital* (cout moyen pondere du capital) when changes in capital cost also influence price inflation?

Réponse :

Dans sa décision D-2017-043 (phase 1), la Régie a statué sur ce sujet :

> **[260] […] la Régie juge pertinent et opportun d'inclure, à la fois l'amortissement et le rendement de la base de tarification dans la Formule d'indexation […]**
>
> **[263] La Régie juge également nécessaire de neutraliser l'effet de la variation des taux d'intérêt et du TRCP sur le coût moyen pondéré du capital du Distributeur à travers un Facteur Y dont les modalités d'application sont à déterminer en phase 3.**

24. Références : HQD, Preuve Complémentaire relative à d'autres caractéristiques du MRI du Distributeur (HQD-20, document 1)

Préambule :

HQD discusses a method for calculating indexes in Annexe A of its *Preuve Complémentaire*.

Demandes :

What is the formula for calculating each individual growth rate?

Réponse :

Pour éviter toute confusion et pour uniformiser la méthode utilisée pour obtenir le facteur I, le Distributeur a proposé d'appliquer à l'indice de prix de rémunération à pondération fixe (IPF) et à l'indice implicite des prix du PIB (investissement des entreprises) la même méthode de calcul que l'inflation (variation de l'IPC) décrite par Statistique Canada.

Pour obtenir l'inflation, Statistique Canada utilise la variation annuelle (arrondie à une décimale) de l'IPC annuel moyen (arrondi à une décimale). Ainsi, cette approche pourrait être appliquée aux 3 composantes du facteur I.

Pour la moyenne mobile de 3 ans, la méthode officielle est d'utiliser la croissance géométrique moyenne entre les indices des années 1 et 4, au lieu de la moyenne simple des variations des 3 années. L'écart entre les deux approches est très minime, de l'ordre de 0,1 %.

25. Références : Réponses D'Hydro Quebec Distribution à la Demande de Renseignements No. 5 de la Régie (HQD-15, document 1.5)

Préambule :

Concentric Energy Advisors responded to an information request by the Regie to survey Y and Z factors in US and Canadian MRIs. CEA presented a survey of 6 North American jurisdictions: Alberta, British Columbia, Ontario, Massachusetts, Vermont, and Maine.

Demandes :

a) For each instance where a Y or Z factor has a materiality threshold, please explain if the company gets recovery for Y and Z factor costs *below* the materiality threshold once the materiality threshold has been exceeded.

Réponse de Concentric :

Please see response to Régie's information request n° 8 at HQD-20, document 1.2, Question 10.5.

b) Why are bad debts worthy of Y factor treatment in Quebec when they weren't Y factored in any of the jurisdictions Concentric surveyed?

Réponse de Concentric :

Y factors can be considered on a utility specific basis. If bad debt meets the criteria established by the Régie, it is appropriate to include under a Y factor.

Complément de réponse du Distributeur :

Comme mentionné à la pièce HQD-3, document 4 révisée (B-0175), la dépense de mauvaises créances est conditionnée, entre autres, par des facteurs hors de son contrôle ayant un impact sur le niveau des comptes à recevoir, soit les variations de la température, la demande de la clientèle et le contexte économique. À la lumière du tableau R-2.1 de la demande de renseignements n° 7 de la Régie[9], force est de constater que la dépense de mauvaises créances réelle est très volatile, variant de 39,2 M$ à 133,4 M$ sur la période 2004-2018.

De plus, de façon plus spécifique, le Distributeur rappelle qu'il fait face à certaines contraintes en lien avec les conditions de services d'électricité en vigueur comme l'obligation d'alimenter tous les clients québécois et l'impossibilité d'interrompre le service en période hivernale aux clients en défaut de paiement.

Pour l'ensemble de ces raisons, le Distributeur estime que la dépense de mauvaises créances se qualifie à titre de Facteur Y.

26. Références : Réponses D'Hydro Quebec Distribution à la Demande de Renseignements No. 5 de la Régie (HQD-15, document 1.5)

Préambule :

On page 7 Concentric states that

[9] Pièce HQD-21, document 1.1, page 9 (B-0186).

"The AUC identified the types of items that had been proposed as Y factors by the companies, but which should be tested as Z factors because of their unforeseen and infrequent nature through Z applications.
The following accounts fall into this category:

1. **Self-insurance/reserve for injuries and damages;**
2. **Depreciation rate changes;**
3. **International Financial Reporting Standards (IFRS)/accounting changes;**
4. **Acquisitions;**
5. **Pension plans;**
6. **Insurance proceeds."**

Demandes :

a) To the best of Concentric's knowledge, how often have Alberta utilities applied for Z factor treatment of pension costs?

Réponse de Concentric :

ATCO Gas and ATCO Electric Distribution historically had a special payment deferral account for the pension costs, which was discontinued upon implementation of PBR in 2012. To best of Concentric's knowledge, ATCO has not initiated Z Factor treatment since then. The AUC's decision on ATCO's 2017 pension application states:

> **"The Commission notes that the PBR companies (ATCO Gas and ATCO Electric – Distribution) had special payments of $7.15 million and $3.50 million, respectively, included in their PBR going-in rates. These amounts have remained in rates during the first five-year PBR term and have been subject to I-X increases each year. As the actual special payments during the five-year PBR term were lower than the approved special payments included in the going-in rates each year (with the exception of 2013), the differential in special payments dollars accrues to the account of the shareholder on an annual basis. Accordingly, the Commission does not have to make a further direction on the treatment of pension costs under PBR related to the 2012-2017 period as requested by the CCA."**

b) Please confirm that Z factor filings are related only to "special payments" made to the defined benefit pension plans. If the answer is yes, please confirm that these special payments are not the entirety of a distributor's pension costs.

Réponse de Concentric :

In Decision 2012-237, line 696 states that "In the event of a material change to a company's special payment obligations (either positively or negatively), a Z factor application would be available to address this change." Special payments are not the entirety of pension costs.

27. Références : Réponses D'Hydro Quebec Distribution à la Demande de Renseignements No. 5 de la Régie (HQD-15, document 1.5)

Préambule :

On pages 8-13 of their response, Concentric discussed the precedents for Y and Z factors in MRIs approved in the province of Ontario. This included a discussion of Y factors in 4th Generation IR and in the custom IR plans of Toronto Hydro and Horizon Utilities.

Demandes :

a) Please confirm that there have been numerous custom IR plans for Ontario power distributors. How did CEA decide which plans to include in the report?

Réponse de Concentric :

Confirmed. Concentric focused on the largest Ontario electric distributors with approved IR plans.

b) Please explain the rationale behind the Rural or Remote Electricity Rate Protection Tariff. Do Toronto Hydro or Horizon Utilities serve remote areas?

Réponse de Concentric :

According to the OEB, the Rural or Remote Electricity Rate Protection program is designed to reduce costs for eligible customers located in rural or remote areas, where the costs of distributing electricity to these customers are higher. See http://www.ieso.ca/sector-participants/ieso-news/2017/02/rural-and-remote-electricity-rate-protection-charge-increase-for-2017.

28. Références : Réponses D'Hydro Quebec Distribution à la Demande de Renseignements No. 5 de la Régie (HQD-15, document 1.5)

Préambule :

On pages 13-14 of their response, Concentric discussed the Y factors for FortisBC. Their discussion included the following:

"Pass-through items for FBC include:

1. Power purchases;
2. Interest Expense;
3. Return on Equity;
4. Taxes;
5. Pension and OPEB;
6. Electricity Sales Revenue;
7. Insurance (premiums only);
8. Depreciation and Amortization; and
9. Rate Base other than Plant in Service (i.e. working capital, deferred charges)."

Demande :

Please confirm that in British Columbia, ALL costs of *older* plant (which shrinks due to depreciation) are Y factored, whereas several kinds of *capex* are addressed by indexes.

Réponse de Concentric :

Confirmed.