

**DEMANDE DE RENSEIGNEMENTS N° 2 DE LA RÉGIE DE L'ÉNERGIE (LA RÉGIE)
À L'AQCIE-CIFQ
SUR LA DEMANDE RELATIVE AUX TARIFS D'ÉLECTRICITÉ DE L'ANNÉE TARIFAIRE 2018-2019**

IMPLANTATION D'UN MÉCANISME DE RÉGLEMENTATION INCITATIVE (MRI)

Facteur d'inflation (I)

- 1. Références :**
- (i) Pièce [B-0177](#), p. 9;
 - (ii) Pièce [B-0177](#), p. 13;
 - (iii) Décision [D-2017-043](#); par. 383;
 - (iv) Pièce [B-0177](#), p. 16.

Préambule :

(i) « Bien que l'utilisation de l'IPC Québec, taux global d'inflation, offre l'avantage d'être factuel, non controversé, fiable et simple à calculer, il comporte d'importantes lacunes. Certes, l'IPC Québec est représentatif de l'évolution des prix des biens à la consommation, mais il n'est pas représentatif de l'évolution de l'ensemble des coûts relatifs aux biens et services consommés par le Distributeur maintenant inclus dans la Formule d'indexation déterminée par la Régie. [...].

Bien que le Distributeur consomme un certain nombre de biens et services composant le panier de consommation des ménages, une majorité des composantes de ce panier ne font pas partie des biens consommés par le Distributeur. A contrario, certains biens acquis par le Distributeur ne se retrouvent pas dans le panier des ménages, comme par exemple, les achats de matériel qui sont capitalisés aux investissements. De plus, les biens qui composent le panier de l'IPC Québec sont calculés aux prix de détail alors que la majorité des achats d'Hydro-Québec se font aux prix de gros.

La composition du panier de consommation des ménages qui sert de base pour mesurer l'évolution des prix des biens et services de l'IPC provient des données de l'Enquête sur les dépenses des ménages (EDM) de Statistique Canada et est disponible au tableau 326-0031.

L'analyse des données de ce tableau permet de constater que plus de 80 % des dépenses des ménages proviennent essentiellement de sept catégories de biens et services, soit : l'alimentation, le logement, le transport (incluant l'essence), les soins de santé et personnels, les loisirs, les produits du tabac et boissons alcooliques et les jeux de hasard.

Autre biais, la consommation de combustible (mazout et essence), qui représente environ 5

% des dépenses des ménages québécois, a un impact important sur les fluctuations de l'IPC. À titre d'exemple, en 2015, l'inflation au Québec a été de 1,1 %, mais la hausse de l'IPC sans l'essence a été de 2,1 %. En 2016, le même phénomène s'est reproduit de sorte que la baisse du prix de l'essence a réduit l'inflation au Québec de près de la moitié sur deux ans.

Partant des constats de la faible représentativité de l'IPC Québec pour l'évolution de l'ensemble des autres coûts relatifs aux acquisitions de biens et services et de l'ajout dans la Formule d'indexation de nouveaux éléments de coûts liés aux actifs, le Distributeur propose le recours à deux indices, l'un pour les coûts liés aux actifs, l'autre pour les coûts des autres biens et services. » [références omises]

(ii) « Le Distributeur adhère à l'utilisation de la moyenne mobile des trois dernières années pour le facteur d'indexation des salaires. Toutefois, plutôt que de recourir à la variation annuelle de l'indice moyen d'ensemble pour les autres charges, il préconise d'étendre l'utilisation de la moyenne mobile sur trois ans aux deux autres indices composant le Facteur I qui montrent également une certaine volatilité dans le temps. De façon générale, les indices de prix fluctuent autant que les indices de la rémunération, mais vont représenter plus de 80 % du Facteur I, en raison de la pondération des composantes. » [références omises]

(iii) « [383] Pour l'ensemble de ces motifs, la Régie détermine que les coûts de combustible doivent être couverts par la Formule d'indexation. »

(iv) « De plus, puisque les rubriques pour ces trois catégories de dépenses ne seront plus présentées de façon spécifique dans les revenus requis des années 2, 3 et 4 du MRI, 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 1 du MRI, excluant les éléments traités en Facteur Y et en Facteur Z une fois ceux-ci déterminés. »

Demandes :

- 1.1 En regard de la décision D-2017-043 de la Régie concernant l'inclusion des coûts de combustible dans la Formule d'indexation (référence (iii)), veuillez commenter la position du Distributeur d'exclure l'IPC-Québec en raison de sa fluctuation attribuable à la volatilité des combustibles (mazout et essence) (référence (i)).
- 1.2 Veuillez commenter la proposition du Distributeur d'avoir recours à deux indices pour les dépenses autres que la masse salariale, c'est-à-dire un indice pour les coûts liés aux actifs et un autre indice pour les coûts des autres biens et services (référence (i)).

- 1.3 Veuillez commenter la proposition du Distributeur d'étendre l'utilisation de la moyenne mobile sur l'ensemble des sous-indices (référence (ii)). Notamment, veuillez indiquer si cette pratique s'inscrit dans la tendance observée lors de l'implantation de MRI dans les autres juridictions étudiées par les experts de PEG.
- 1.4 Veuillez commenter la proposition du Distributeur de fixer, pour la durée du MRI, les poids relatifs des trois catégories de dépenses (référence (iv)).

Réponse de AQCIE-CIFQ / PEG :

- 1.1 PEG believes that the risk of managing *combustible* used in the *reseaux autonomes* can be reasonably contained by a combination of a high volumetric charge and the choice of an inflation measure that captures fluctuations in *combustible* prices. The IPC^{Québec} and the gross domestic product implicit price index for final domestic demand (“GDPIPIFDD”)^{Québec} both contain a substantial weight on the price of gasoline in Québec. The weight in the IPC^{Québec} is currently about 4%.

Attachment Régie-AQCIE-CIFQ 1.1 presents results of alternative indexes of petroleum product prices in Canada. It is evident that the price of gasoline in Québec is highly correlated with the price of diesel fuel in the province but not with the price of heavy fuel oil. Inflation in gasoline and diesel fuel prices in Québec and Canada are similar in the long run but not from year to year. Inflation in Québec and Canada heavy fuel oil prices is much less similar.

- 1.2 PEG is not opposed to a revenue cap index inflation measure that better reflects inflation in input prices that HQD faces. This is a means of reducing HQD's operating risk which does not weaken its performance incentives. However, the design of a more sophisticated inflation measure can be complex and controversial, and the Régie has not sanctioned extensive empirical research by intervenor witnesses to develop and appraise alternative complex inflation measures. It is also noteworthy that inflation measures that consider trends in labor prices as well as macroeconomic price trends are already on the table. As well, Dr. Lowry has recommended consideration of the GDPIPIFDD for Canada as an alternative to IPC^{Québec} as the inflation measure to address prices of capital and material and service (“M&S”) inputs. The GDPIPIFDD is used in price cap indexes in Ontario.

It is nonetheless reasonable to have subindexes that separately address inflation in prices of capital and M&S inputs. However, PEG has concerns about the specific subindexes that HQD proposes for these input categories.

- Under the cost of service approach to accounting which the Régie uses in rate cases, utility plant is valued in historical dollars. The implicit price of capital inputs in this ratemaking system is a complex function of the rate of return on capital and of prices utilities have confronted when acquiring capital in many past years. The trend in this capital price

reflects the trends in the prices of constructing and acquiring assets which are one year, two years, three years, and even forty years old. The average trend in these prices can be fairly different from the trend in a moving average of recent growth in a capital asset price index. Additionally, it is difficult to identify a deflator that is pertinent for HQD. Statistique Canada used to calculate construction cost indexes for power distribution lines and substations, but these were suspended after 2014.

- Attachment Régie-AQCIE-CIFQ 1.2a presents alternative candidates for use as a capital asset price index in the HQD revenue cap index. They include the implicit price index for the gross fixed capital formation of Québec's business sector, a Statistique Canada calculation which has been proposed by HQD. Also included are indexes analogous to HQD's proposed index for Canada and Ontario. Utility industry capital stock deflators are available for Canada and by province which come from the fixed non-residential capital stock work of Statistique Canada. The utility industry includes electric, water, and sewer utilities and natural gas distributors. Our table also includes the electric utility construction price indexes ("EUCPIs") for power distribution lines and substations. Statistique Canada discontinued these indexes in 2014.

The implicit price index for the gross fixed capital formation of the Québec business sector has the advantage of being more geographically relevant to HQD, but less relevant with respect to power distributor operations. An alternative would be to choose a *national* capital stock deflator for the *utility* industry at the cost of being less geographically relevant. Another alternative would be the capital stock deflators for the utility industry from nearby provinces such as Ontario. Due to the size of HQD relative to the entirety of Québec's utility industry, it would not be appropriate to choose the utilities capital stock deflator for Québec.

Our table shows that the trend in the utilities capital stock deflator for Canada, Ontario, and Québec have been very similar to the corresponding trends for *all* non-residential capital in the longer run. However, for both Ontario and Québec growth in the capital stock deflator for the utilities sector has been modestly more rapid than for all non-residential capital in the last ten years. It is also notable that the trends in the utilities capital stock deflators in Québec, Ontario, and Canada have been similar. The trend in the implicit price index for Québec business gross fixed capital formation has not been that similar to the trend in the capital stock deflator for Québec utilities.

It is also constructive to compare the national asset price indexes to the power distribution EUCPI for years in which both were available. Over the 1990-2014 period, the utilities capital stock deflators had trends similar to the EUCPI for distribution. The implicit price index for Québec business gross fixed capital formation did not.

The $IPC^{\text{Québec}}$ and the $GDPIPIFDD$ have also been discussed in this proceeding as inflation measures that would apply to capital cost. Over the full 1990-2016 period considered, the $GDPIPIFDD$ and the $IPC^{\text{Québec}}$ both averaged 1.9% growth. This was similar to trend in

the utilities capital stock deflator for Québec. However, the utilities capital stock deflator has grown more rapidly in the last ten years. The long term trends in the GDPIPIFDD, IPC^{Québec}, and EUCPI for distribution were also similar. Given the similarity of these trends, it is reasonable to question the value of the extra complexity added by using a capital asset price index.

The standard deviations of the various indexes also merit attention. It can be seen that the variability in the implicit price index for Québec gross fixed capital formation, the implicit utility capital stock deflators, and the EUCPIs was well above those of the IPC^{Québec} or the GDPIPIFDD^{Canada}. The variability of HQD's proposed asset price index was in the middle.

- PEG is also concerned with the proposal to use the price index for consumer services to address material and service price inflation. This proposal seems self-serving since services are more labor-intensive products than materials so that their prices tend to rise more rapidly. Attachment Régie-AQCIE-CIFQ 1.2b illustrates this point and provides the Régie with some useful information on material and service price inflation. As well, it is not clear how similar the trend in prices of consumer services such as restaurants is to the trends in prices of services utilities purchase.
- 1.3 The use of moving averages for the inflation measures of attrition relief mechanisms is not common in PEG's experience. PEG is aware of only one precedent. This was the first PBR plan for EPCOR in Alberta (2002-2005). EPCOR's inflation measure was a weighted average of the CPI for Alberta and a five-year rolling average of the industrial product price index for industrial electrical equipment. The three-year moving average would smooth revenue growth but not clearly produce a better input price adjustment.
- 1.4 When the rate or revenue cap index of an MRI has a complex inflation measure, the weights for the inflation subindexes typically are fixed for the duration of an MRI. PEG supports the use of fixed weights in HQD's inflation measure.

Facteur X

2. **Références :**
- (i) Pièce [B-0177](#), p. 18;
 - (ii) Pièce [B-0177](#), p. 21;
 - (iii) Pièce [B-0178](#), p. 22;
 - (iv) Pièce [C-AHQ-ARQ-0013](#), p. 16;
 - (v) Pièce [C-FCEI-0016](#), p. 15;
 - (vi) Pièce [C-SÉ-0019](#), p. vii.

Préambule :

- (i) Le Distributeur indique que « *en regard de l'efficacité déjà réalisée par le Distributeur*

ainsi que des récentes tendances en ce qui a trait aux études de productivité multifactorielle au Canada et aux États-Unis, Concentric recommande pour le premier MRI du Distributeur un facteur de productivité de -0,75 % et un stretch factor de 0,25 %, ramenant le Facteur X à -0,5 %. Le Distributeur adopte la recommandation de Concentric ».

(ii) Le Distributeur ajoute que « à la lumière des études de productivité récentes dont Concentric fait état dans sa preuve, on ne peut que constater que le taux de productivité moyen de 1,51 % auquel la Régie fait référence dans sa décision D-2017-043 ne reflète pas le contexte 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 % ». [...] « En conclusion, compte tenu de ce qui précède, le Distributeur est d'avis que la proposition d'un Facteur X de -0,50 %, inclusif d'un stretch factor de 0,25 %, est pleinement justifiée ».

(iii) « Concentric is of the view that the recent TFP studies submitted in Alberta, Ontario and Massachusetts provide a reasonable basis for informing the Régie's determination of an X factor for HQD's initial MRI program. [...] These studies cover the most recent periods for which data was available, incorporating data back to 1997 and up through 2015, depending on the study. The range of results is summarized below ».

Table 5: Recent Productivity Study Ranges

Study	Range	Midpoint
Brattle (Alberta)	-0.37% to -1.37%	-0.87
Christensen (Alberta)	-1.11%	-1.11
PEG (Alberta)	0.36% to 1.03%	0.70
PSE (Ontario)	-0.90%	-0.90
Christensen (Massachusetts) ¹	-0.41% to -0.46%	-0.44
Median		-0.87
Mean		-0.52

¹ The Christensen TFP results are unadjusted for input price differentials.

(iv) L'AHQ-ARQ recommande à la Régie de « retenir un bénéfice client (Facteur s) de 1,2 % pour la première génération du MRI du Distributeur ».

(v) Selon la FCEI, « si l'on suppose que la formule d'indexation couvre une enveloppe de 2 700 M\$, l'efficience anticipée par la FCEI correspondrait à 2,4%. Lorsque réparti sur trois ans, cela suppose un facteur X de 0,8% ». La FCEI indique ne pas avoir évalué le dividende client. Toutefois, « elle est d'avis que le dividende client devrait être corrélé positivement avec le niveau d'incitatif que procure le mécanisme ».

(vi) Compte tenu qu'une étude complète du facteur de productivité (facteur X) sera entreprise

dans les premières années du mécanisme, S.É. recommande « *de conserver pour l'instant le facteur X de 1,5% qui existe présentement dans la formule paramétrique* ».

Demandes :

La question suivante s'adresse à l'AQCIE-CIFQ et à *Pacific Economic Group Research LLC* (PEG) :

- 2.1 Veuillez commenter la position du Distributeur et de Concentric à l'égard du Facteur X et du « *stretch factor* ».
- 2.2 Veuillez également commenter les propositions des intervenants à l'égard du Facteur X et du « *stretch factor* » telles que présentées en préambule des références (iv), (v) et (vi).

Réponse de AQCIE-CIFQ / PEG :

- 2.1 PEG's proposal concerning the stretch factor is similar to HQD's. On the other hand, PEG believes that Concentric's evidence has provided the Régie with a poor basis for choosing an X factor for HQD. Their narrative is biased in favor of results suggesting that X should be well below zero. In addition, Concentric's narrative glosses over important methodological issues that reduce the weight that should be placed on some of the productivity studies that they emphasize. An understanding of key methodological issues is also needed for the Régie to guide development of the prospective productivity study that it has ordered.

Two methodological issues are paramount in a productivity study designed to calibrate the X factor of a revenue cap index for HQD: the choice of a scale metric and the capital cost specification. PEG discussed both of these issues at considerable length in its January 5 report. Both issues loom large when considering the productivity studies Concentric highlighted in the January 5 narrative supporting their **-0.75%** X factor proposal.

Concentric did not explain in this narrative that three of the five productivity studies detailed in Table 5 were based on a methodology developed by Dr. Jeff Makhholm of the Boston office of National Economic Research Associates (NERA). Makhholm was chosen by the Alberta Utilities Commission in its first generic MRI proceeding to prepare a U.S. power distribution productivity study. His methodology was criticized by Dr. Lowry and other witnesses in both Alberta proceedings. Makhholm made corrections for some problems with his work but denied other problems and/or argued that they were unimportant. His scale and capital cost specifications are particularly controversial.

Makhholm used a volumetric scale index. PEG explained in their Alberta testimony and their January 5 report for AQCIE that the number of customers served was the appropriate metric for an industry productivity study intended to calibrate the X factor of a revenue cap index with a customer growth escalator.¹ Suppose, instead, that multifactor productivity (PMF) is

¹ If revenue cap indexes apply to individual service categories, a revenue-weighted average of the customer growth in these

measured using a volumetric scale index (*Volumes*). Then

$$\begin{aligned}
 \text{growth PMF} &= \text{growth Volumes} - \text{growth Inputs} \\
 &= \text{growth Customers} - \text{growth Inputs} + (\text{growth Volumes} - \text{growth Customers}) \\
 &= \text{growth Customers} - \text{growth Inputs} + \text{growth Volumes/Customer} \\
 &= \text{growth Customers} - \text{growth Inputs} + \text{growth Average Use.}^2 \quad [1]
 \end{aligned}$$

The growth in PMF using Makhholm's methodology is thus sensitive to the growth in average use of electricity. Dr. Lowry showed in Table 1 of his Jan. 5 report that annual growth in the average use of electricity by U.S. residential and commercial customers slowed markedly after 2000 and has been more than 100 basis points slower in recent years.³ This is the main source of the productivity slowdown after 2000 (using Makhholm's methodology) which Concentric emphasizes in its narrative but is irrelevant to the choice of an X factor for HQD.

Consider next Makhholm's simple one-hoss shay approach to measuring the capital quantity trend. Under one hoss shay, the quantity of capital at the end of each year t (XK_{t-1}) is the sum of the quantity at the end of the prior year plus the quantity of plant additions (XKA_t) minus the quantity of retirements (XKR_t).

$$XK_t = XK_{t-1} + XKA_t - XKR_t \quad [2]$$

The U.S. utilities that Dr. Makhholm sampled report data only on the *value* of their plant additions (VKA_t) and retirements (VKR_t), and these data must be deflated to estimate the corresponding *quantities*. The date of plant *additions* is known exactly. Given an index of the cost of plant additions (WKA_t), it is then straightforward to calculate their quantity as

$$XKA_t = VKA_t / WKA_t \quad [3]$$

The date of *retirements*, on the other hand, is not at all clear.

$$XKR_t = VKR_t / WKR_{???} \quad [4]$$

The older the utility plant is judged to be, the larger is the quantity of retirements and the faster is PMF growth.

Dr. Makhholm deflates the value of plant retirements in each year of his sample by WKA_{t-N} , where WKA is an electric utility construction cost index and N is his assumption concerning the average service life of distribution assets. Dr. Lowry argued in the second Alberta proceeding

service categories is also a sensible scale metric.

² These results are obtained using logarithmic growth rates.

³ Industrial volumes are less pertinent in a power distribution productivity study because many large-volume customers receive power directly from the transmission system.

that Makhholm's 33-year average service life assumption is unreasonably low and poorly substantiated. When asked in an Alberta information request why a 33-year average service life was chosen, Makhholm stated only that "The 33 year service life is a more updated average of the lifetimes of utility capital."⁴ He did not even state that 33 years is specifically appropriate for power distribution assets.

Dr. Lowry showed in his reply evidence in the second Alberta MRI proceeding that results using Makhholm's methodology are quite sensitive to the assumption concerning average service life. Using a more realistic average service life estimate (e.g., 38 years), for example, he showed that the PMF trend is much more rapid and similar to that using Dr. Lowry's methodology.⁵ The Alberta commission did not consider this damaging evidence in its decision, ostensibly on the grounds that no supportive working papers were provided.⁶

Attachment Régie-AQCIE-CIFQ-2.1a details information PEG has gathered on the average service lives of power distribution assets. The table suggests that an average service life exceeding 40 years is appropriate for a PMF study.

The negative PMF trend since 2000 that results from using Makhholm's method thus results from the dissipation of growth in average use of electricity and an inappropriate average service life assumption. In other words, after 2000 (irrelevant) growth in the average use of power no longer offset the impact of an inappropriate average service life assumption. The appropriate sample period was therefore a hotly-contested issue in both Alberta proceedings. In the first proceeding Makhholm argued for the use of a 1973-2009 sample period during which PMF growth averaged **+0.96%**, and the Commission agreed. Over this long period, brisk growth in average use during the *early* years offset the tendency of an inappropriate service life assumption to slow PMF growth in *all* years.

In the second Alberta proceeding, which Concentric featured in its narrative, Dr. Makhholm didn't testify. The Brattle Group and Christensen Associates were witnesses for Alberta utilities and each used a PMF methodology very similar to Makhholm's since the Régie had based its X factor on Makhholm's work in the first proceeding. Both firms reported results for a sample period beginning in 1973 but recommended basing X on results for a *truncated* sample period, starting around 2000, during which productivity growth was materially negative. The Alberta Commission stated in its decision that the appropriate productivity trend lay in the **-0.79%** to **+0.75%** range, where +0.75% was the trend for the full sample period and -0.79% was the trend for a truncated period. The +0.30% X factor that it chose included an (implicit) stretch factor.

⁴ Alberta Utilities Commission, Proceeding 566, Exhibit 194.01 (CCA-NERA-11f), pp. 12-14.

⁵The Alberta commission did not consider this evidence in making its X factor decision.

⁶ The reply evidence was submitted in the rebuttal phase of the proceeding, shortly before hearings. Work was commenced on working papers but they were never requested. The Alberta decision approving the new X factor never mentioned Dr. Lowry's empirical reply evidence in its decision but did mention the lack of working papers in disallowing costs of PEG's reply evidence empirical work.

Another study Concentric cites in its January 5 narrative was prepared by Christensen Associates on behalf of Eversource Energy, the Massachusetts power distributor serving Boston, and submitted in a 2017 MRI proceeding. Christensen used NERA's one hoss shay approach to measure the capital quantity but used the number of customers as the scale metric on the grounds that this specification was more appropriate for a revenue cap index, which Eversource was proposing. Christensen reported results only for a truncated 2001-2015 sample period and the Massachusetts Department of Public Utilities accepted the resultant **-0.46%** PMF trend estimate for the national sample. Thus, Eversource hired Christensen to use a variant of Makhholm's methodology which produced a negative productivity trend instead of hiring their home town productivity expert.

These are not the only problems with the Makhholm/Brattle/Christensen methodology that Concentric features. Makhholm did not report partial factor productivity trends for operation and maintenance and capital inputs and denied their relevance. The benchmark year adjustment to the capital quantity index was inconsistent with the one hoss shay and service life assumptions.⁷ In an application to HQD, another notable problem is that customer service and administrative and general expenses and the cost of general plant were excluded from all of these studies. These are important costs of power distributors which will for the most part be addressed by HQD's revenue cap index.

Concentric also discusses a **-0.9%** estimate of the recent productivity trend of Ontario power distributors which was prepared in 2017 for testimony by Power Systems Engineering ("PSE") for Hydro One Networks. Various concerns about Ontario data are discussed in PEG's January 5 report. PSE has not yet issued working papers for this study, so no vetting has been possible, but PEG believes that it should nonetheless be considered by the Régie along with Dr. Lowry's Alberta reply evidence. If the Régie chooses not to consider PEG's reply evidence, consistency would dictate that it also not consider PSE's unvetted evidence.

Let's consider now some implications of this account of the role which controversial PMF methods played in the studies Concentric featured in its X factor narrative.

- Four of the five studies reported on Table 5 by Concentric were prepared by witnesses for utilities, which would benefit from negative X factors.
- Of these five studies, three used methodologies similar to that developed by Dr. Makhholm of NERA. This methodology used a controversial and poorly supported capital cost specification that is not robust with respect to the service life assumption. In all three cases, the witnesses based their X factor recommendations on results for truncated sample periods, during which the PMF trend was negative, even though Dr. Makhholm has consistently opposed this practice and the one Commission given the choice between a lengthy and a truncated sample period twice decided not to embrace the truncated sample. The second Christensen study is the most pertinent of the three studies with "NERA roots" which Concentric discusses since it used an updated sample period and a more appropriate

⁷ We discuss this further in response to HQD question 10.

scale metric. If an additional study based on the Makhholm methodology merits consideration by the Régie, it would be one of Dr. Lowry's runs detailed in Table 2 of his Alberta reply evidence entitled Summary of Corrections and Modifications to NERA/Brattle/LRCA Productivity Calculations.

- In two of these three studies, the witnesses also produced results for a longer sample period during which the PMF trend was positive, but Concentric did not mention this in its narrative.

Concentric's productivity evidence has been biased and uninformative in other respects as well.

- Having highlighted *three* PMF studies with NERA roots, they report only *one* study by Dr. Lowry, ignoring his recent studies for the Commercial Energy Consumers of British Columbia (2013), Central Maine Power (2013), Unitil (2013), the Ontario Energy Board (2016), and Lawrence Berkeley National Laboratory (2017). These studies are also pertinent to the Board's X factor decision since they employed varied samples, cost specifications, and capital cost treatments. For example, most included customer service and A&G expenses, unlike the Brattle and Christensen studies and PEG's Alberta study. Since Dr. Lowry uses the number of customers to measure output, productivity results are much more stable and all of these studies are still quite relevant in 2018.
- Concentric also fails to discuss the PMF research and testimony of Dr. David Dismukes on behalf of the Massachusetts Office of the Attorney General in the Eversource proceeding (or the Unitil proceeding).
- Concentric also failed to mention that Dr. Makhholm filed productivity testimony in November 2017 on behalf of two Ontario gas distributors. Makhholm reported PMF results for U.S. power distributors using his methodology for an updated 1973-2016 sample period. He reported a +0.54% trend for the full sample period but recommended a 0.0% base productivity trend for the MRI due in part to continued negative productivity growth in recent years. Dr. Makhholm has never recommended basing an X factor solely on his results using a truncated sample period.
- Concentric's focus on an imbalanced panel of productivity studies permits it to ignore pertinent but inconvenient *commission* decisions on PMF trend issues. For example, they ignore the fact that the British Columbia Utilities Commission chose a +0.93% PMF trend for electric utilities in 2013 (and a +0.90% trend for gas utilities) or that the Ontario Energy Board chose a 0% base productivity trend for Ontario Power Generation in 2017. The Massachusetts DPU rejected an MRI proposal by Unitil in 2013 which featured a revenue cap index based on a 1.19% PMF trend. Only one North American commission (Massachusetts) has ever acknowledged a negative electric utility industry productivity trend.

- By excluding several pertinent recent proceedings, Concentric also did not report the base productivity trends that utilities proposed. FortisBC proposed a 0.5% X factor in 2013 while Until proposed a 1.19% base productivity trend in 2013, OPG proposed 0.0% in 2016, and Hydro One proposed a 0.0% trend in 2017.
- The geometric decay approach that Dr. Lowry often uses to measure capital cost was also used in the PSE study. Dr. Mark Meitzen, the Christensen Associates witness, had used geometric decay in several telecommunications PMF studies. Geometric decay was also used by Concentric witness James Coyne in gas utility PMF research and testimony for Enbridge Gas Distribution. Commentary by Mr. Coyne in support of the geometric decay approach to measuring capital cost is found in Attachment Régie-AQCIE-CIFQ-2.1b.
- Mr. Coyne also does not consider the fact that the Régie may permit HQD to obtain supplemental revenue for capex through the Z factor. The Massachusetts DPU recently raised the X factor of Eversource Energy substantially because it intended to address the cost of grid modernization capex through a deferral and variance account.
- In weighing results from the various PMF witnesses it is also pertinent to consider how many studies of energy utility PMF that the witnesses have performed. By our count, Concentric has provided energy utility PMF empirical research and testimony in one proceeding, Brattle and Christensen Associates witness Meitzen in two proceedings, Mr. Fenrick in three proceedings, Dr. Makhholm in four proceedings, and Dr. Lowry in more than twenty proceedings. Additionally, only Dr. Makhholm and Dr. Lowry have the distinction of doing PMF studies for diverse clients.

The best available study on which to base the X factor for HQD is that which PEG recently prepared on the productivity trends of U.S. power distributors for Lawrence Berkeley National Laboratory, a unit of the U.S. Department of Energy.⁸ From a methodological standpoint, this study has several advantages in informing an X factor decision for HQD.

- The number of customers served is the scale metric.
- Customer service and administrative and general expenses are included.
- Partial factor productivity results for O&M expenses and capital are provided.
- A geometric decay approach is used to measuring capital cost.
- Annual results are reported for a fairly lengthy sample period (1980-2014), permitting the Régie to consider various subperiods.

Please note that there is not a marked slowdown in PMF growth using this methodology. For

⁸ Mark Newton Lowry, Matt Makos, and Jeff Deason, *State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities*, Lawrence Berkeley National Laboratory, July 2017.

example, the PMF growth for the full national sample averaged **0.53%** from 1980 to 1995 and **0.42%** from 1997 to 2013.⁹ The modest decline in productivity growth can be attributed to the reduced economies of scale which can be realized with today's somewhat slower customer growth. PEG's most recent PMF growth estimates are somewhat slower than its past estimates, but this is due in part to an expansion of its dataset which it undertook several years ago.¹⁰ PEG continually strives to upgrade its methodology as additional funding becomes available.¹¹

2.2 PEG is widely recognized as an expert on revenue cap index design, and has set forth its opinions on X and S factor issues at great length in this proceeding. It nonetheless believes that other intervenors have provided valid insights on these issues and hopes that the Régie will give their submissions substantial weight. PEG works for a mix of utilities, regulators, and consumer interests and is known for objective statistical cost research. Taking an average of X and S factor recommendations submitted by PEG and HQD could therefore create a biased outcome that is unfair to consumers.

Facteur Y – Coût de retraite

3. **Références :**
- (i) Pièce [C-FCEI-0016](#), p. 17;
 - (ii) Pièce [C-OC-0013](#), p. 11;
 - (iii) Pièce [C-UMQ-0012](#), p. 11.

Préambule :

- (i) Dans sa preuve, la FCEI indique que :

« Cela étant dit, la FCEI voit une similitude entre le coût de retraite et les coûts liés à la base de tarification. Un mécanisme similaire au TRCP pourrait être mis en place pour le coût de retraite qui isolerait le Distributeur des variations exogènes tout en l'incitant à optimiser sa masse salariale.

Quatre hypothèses actuarielles entrent dans la détermination du coût de retraite. La FCEI comprend que les variables exogènes qui engendrent un risque de variation sont le taux d'actualisation du coût des services rendus, le taux d'actualisation des intérêts sur les obligations et le taux de rendement prévu des actifs. La FCEI croit qu'il serait possible de créer un facteur Y qui neutraliserait l'effet des variations de ces taux tout en intégrant les coûts de retraite dans l'enveloppe de la formule d'indexation. Elle recommande de mettre en place une telle exclusion. »

⁹ Ibid., p. 6.26.

¹⁰ Please also note that in his Alberta testimony Dr. Lowry has provided PMF results for rapid-growth and western utilities that differ from national results due, for example, to greater opportunities to realize scale economies.

¹¹ PEG also tailors its productivity research to local business conditions where warranted.

(ii) Dans sa preuve, OC indique que :

« Si la Régie décidait d'inclure à l'intérieur de la formule d'indexation le coût de retraite, une possibilité pourrait être de permettre au Distributeur de demander la création d'un compte comptabilisant les variations du coût de retraite advenant un changement important au niveau des marchés financiers et selon un seuil de matérialité suffisant. OC entend questionner davantage PEG au sujet du coût de retraite et formulera sa recommandation finale lors de l'audience. »

(iii) Dans sa preuve, l'UMQ indique que :

« L'UMQ tient toutefois à préserver la capacité du Distributeur à remplir ses diverses fonctions sans mettre en danger la continuité des opérations ni la qualité du service. Aussi, de façon à introduire une certaine responsabilisation tout en évitant des chocs de court terme trop importants, l'UMQ propose un mécanisme hybride qui ferait assumer une première part de l'écart au Distributeur et une seconde part à la clientèle. Après avoir considéré différentes variations basées sur un mécanisme de moyenne mobile pour lisser les écarts, l'UMQ n'a pas jugé satisfaisants les résultats obtenus, car une telle approche maintient pour le Distributeur l'inconvénient d'une charge imprévisible et incontrôlable.

En conséquence, il semble à l'UMQ plus porteur et prévisible de faire porter à la responsabilité du Distributeur une portion fixe d'écarts, ce qui lui apparaît plus facile à gérer pour ce dernier, et à la clientèle la portion variable. Par hypothèse, l'UMQ suggère de ne retenir pour la durée d'application du premier MRI que les premiers 15 millions de charge relative aux coûts de retraite, ce qui se situe à la fois au seuil de matérialité évoqué par la Régie et très près du plus petit résultat obtenu sur la période analysée (18,4 M\$ en 2010).

L'UMQ recommande à la Régie de l'énergie de considérer uniquement comme faisant partie du facteur Y la partie des écarts annuels supérieurs au premier palier, établi à 15 M\$ pour la durée du premier MRI. »

[nous soulignons]

Demande :

La question suivante s'adresse au témoin expert de l'AQCIE-CIFQ, PEG :

3.1 Veuillez commenter la position de chacun des intervenants, présentée aux références (i) à (iii).

Réponse de AQCIE-CIFQ / PEG :

3.1 PEG shares the interest of all of these intervenors in incentivizing retirement cost containment if retirement costs are Y factored. The approach set forth by UMQ is similar to the approach PEG has proposed for most Y factored costs. Prudently incurred variances exceeding \$15 million (as escalated by the revenue cap index) should be eligible for recovery. The alternative

approaches proposed by intervenors also merit consideration but may not have been set forth in sufficient detail to be approved in this proceeding.

Comptes d'écarts et de reports (CER) afférents aux exclusions et exogènes

- 4. Références :**
- (i) Pièce [B-0175](#), p. 12;
 - (ii) Pièce [B-0013](#), p. 25 et 26;
 - (iii) Pièce [C-AQCIE-CIFQ-0032](#), p. 59, tableau 8.

Préambule :

- (i) Dans la pièce révisée du 5 janvier 2018, le Distributeur soumet que :

« En ce qui concerne les CER se rapportant à des exclusions, il ne s'agit pas de « créer » un nouvel élément à traiter en Facteur Y, mais plutôt de faire en sorte que l'exclusion à laquelle est associé le CER en question, intégrée aux revenus requis, soit traitée en pur « pass-through » (ou « flow-through»). D'une part, l'élément de coût auquel se rapporte un CER a déjà subi le test de qualification au traitement en Facteur Y. D'autre part, la décision de créer un CER s'est appuyée sur la détermination du bien-fondé, par la Régie, de garder indemnes, tant le Distributeur que ses clients, des écarts entre les coûts prévus et les coûts réels, notamment pour des éléments estimés hors du contrôle du Distributeur, imprévisibles, volatiles ou importants, puisque les exclusions peuvent varier tant à la hausse qu'à la baisse par rapport aux prévisions. En conséquence, le Distributeur soutient qu'il est nécessaire d'adjoindre un CER à chacun des éléments de coûts traités en exclusion.

« Pour ce qui est des CER associés à des exogènes, il s'agit de mettre en place un mécanisme de récupération des coûts éligibles à un tel traitement, sur la base des coûts prévus ou réels, selon le cas. Dans ce cas également, c'est l'événement à l'origine d'un possible déclenchement d'un Facteur Z, et non pas le CER, qui fera l'objet de l'examen de la Régie, à la lumière des critères dont elle se sera dotée.

En conséquence, le Distributeur soutient qu'en ce qui a trait aux CER associés à des exclusions et dans le cas où des exogènes nécessitent la création de CER, la notion de cohérence doit se substituer aux critères de détermination des éléments à traiter en Facteur Y ou Z. Le critère du seuil de matérialité ne s'applique donc pas aux CER. » [nous soulignons]

- (ii) Dans la pièce initiale déposée le 31 juillet 2017, le Distributeur soumet que :

« En ce qui a trait aux CER existants en lien avec des coûts récurrents de distribution et de service à la clientèle, le Distributeur propose le retrait des CER suivants : [...]

Cette proposition a pour but de limiter le nombre d'éléments à suivre à l'extérieur de la formule d'indexation, comme le souhaite la Régie, et ainsi, favoriser l'allégement réglementaire en vertu de l'article 48.1. En outre, le Distributeur souligne que le MTÉR permet le traitement d'écarts découlant d'éventuelles variations de coûts autorisés/réels pour les exclusions auxquelles ces comptes d'écarts auraient pu être associés. De fait, le MTÉR permet de traiter les écarts de

prévision de toutes les dépenses associées aux coûts de distribution et de services à la clientèle. À cet égard, le Distributeur rappelle que, comme il est d'ailleurs prévu dans le cadre de la phase 3 du MRI, les dispositions de ce mécanisme seront revues afin de tenir compte de l'ensemble du nouveau régime réglementaire établi. » [nous soulignons]

(iii) Dans sa preuve, le témoin expert de l'AQCIE-CIFQ, PEG, présente les résultats de l'étude de balisage sur le traitement des facteurs Y par les autres organismes de réglementation canadiens et/ou américains.

Demandes :

Les questions suivantes s'adressent au témoin expert de l'AQCIE-CIFQ, PEG :

- 4.1 Veuillez fournir les avantages et les désavantages d'associer un CER à toutes les exclusions et à tous les exogènes. Veuillez fournir également les avantages et les désavantages d'introduire un seuil de matérialité de 5M\$ ou 15 M\$ applicable aux CER. Veuillez présenter les recommandations de PEG.
- 4.2 Veuillez compléter l'étude de balisage présentée à la référence (iii) sur l'association d'un CER à des exclusions et à des exogènes, auprès des autres organismes de réglementation canadiens et/ou américains.

Réponse de AQCIE-CIFQ / PEG :

- 4.1 CERs broadly defined are a sensible means to effect Y and Z factor revenue adjustments in MRIs. For the utility, they have the appeal of ensuring that approved adjustments are eventually fully effected. Adjustments need only be made for costs (and cost variances) that are deemed prudent and exceed materiality thresholds. Multiyear deferrals can smooth the impact on rates of unusually large cost surges.

In the absence of tracker incentivization and prudence vigilance, CER treatment reduces the incentive to contain Y factored costs. Regulatory cost can be trimmed and performance incentives enhanced by using materiality thresholds and deadzones to determine sums eligible for CER treatment. Review of the prudence of these costs is a valuable supplemental tool.

In its January 2018 report, PEG provided an outline for the ratemaking treatment of Y factors. PEG would like to clarify this outline. The materiality threshold and related deadzones should be applicable only to Y factors that do not result from pass through costs paid to 3rd parties. This exception would allow all charges paid to HQP and HQT to be recovered in full. All costs incurred for conservation and demand management programs should be recovered in full. All other Y factors would be subject to the \$15 million materiality threshold. The first \$15 million of costs (or, as applicable, cost variances) would not be recoverable from customers. The \$15 million threshold would be escalated annually by the revenue cap index.

Precedents for Y and Z factor materiality thresholds in other jurisdictions can be found in Table 9 of PEG's January 5 report as amended. In Ontario, Z factors for most power distributors are triggered when the costs of eligible events exceed 0.05% of their revenue requirement. A dollar threshold similar to this Ontario materiality threshold using HQD's proposed 2018 revenue requirement for *distributeur* services is approximately \$15 million.

Further support for a \$15 million threshold for Y and Z factors can be found in the Régie's previous approval of two *comptes d'écarts* with materiality thresholds of approximately \$15 million. HQD's current *compte d'écarts* for *pannes majeures* requires O&M expenses to exceed \$16 million for costs to be deferrable. The Régie also authorized a *compte d'écarts* to address costs related to unforeseeable events in order to cover risks associated with the use of fuels in the autonomous networks, including their spill during shipment and handling. This *compte d'écarts* records costs of these events for future disposition in rates that exceed the minimum of \$15 million per event.

CER treatment with interest is reasonable for eligible costs. However, multiyear deferrals should be reserved for unusually large cost surges like those resulting from major storms.

- 4.2 Expanding Table 9 of PEG's January 5 report, as corrected, was not feasible in the time allotted for two reasons. First, PEG has never undertaken a review of the use of CERs to effect Y and Z Factor adjustments. Second, ratemaking treatment of Y factors varies greatly. Table 8 shows that North American regulators have approved a wide variety of Y factors and it would be quite time consuming to review and report on all of the ratemaking treatments relied upon to address each Y factor.

However, based on the broad definition of CERs that appears to be used by the Régie, PEG believes that most, if not all, of the plans listed in Table 8 there are CERs for many Y and Z factors. Multiyear recovery of eligible deferrals is more the exception than the rule.

PEG has reviewed the use of deadzones below the materiality threshold for Y and Z factors in other jurisdictions and found several pertinent examples of these. The Régie has a deadzone for costs of *pannes majeurs*. Some examples of deadzones for power costs were presented in AQCIE's response to question 10.1 of the Régie's first round of interrogatories in dossier R-3897-2014. Eversource Energy's MRI includes a storm fund which does not allow the company to recover costs below a \$1.2 million materiality threshold. Union Gas has a symmetric deadband of \$5 million in its current MRI before rates are allowed to change due to unaccounted for gas volume variances. The incremental capital modules used in many Ontario MRIs do not provide for recovery of capex costs until they exceed a formulaic budget by 10%. Green Mountain Power has deadzones for some types of power cost variances and Z factors.