REPONSES DE AQCIE-CIFQ/PEG À DEMANDE DE RENSEIGNEMENTS N^{O} 1 D'OPTION CONSOMMATEURS (OC)
À PACIFIC ECONOMICS GROUP RESEARCH (PEG)

DEMANDE DU TRANSPORTEUR DE MODIFICATION DES TARIFS ET CONDITIONS DES SERVICES DE TRANSPORT POUR L'ANNÉE 2019

R-4058-2018

PARAMETRIC FORMULA FOR CAPITAL COST

1. Reference : **i) Pièce C-AQCIE-CIFQ-0018, p. 38.**
ii) Pièce C-AQCIE-CIFQ-0018, p. 40.

Preamble :

i) *"Transmission operating scale is multidimensional, so HQT's use of a single scale metric may be one reason that its formule paramétrique doesn't fit its cost data better."*

ii) *"The formula should use the elasticity-weighted scale index that results from our econometric cost research, or at least incorporate transmission line miles with a substantial weight."*

Requests :

1.1 Aside from using an elasticity-weighted scale index, are there other changes to HQT's proposed formula that could be made so that the results "fit its cost data better"?

1.2 Please provide more details on how the *elasticity-weighted scale index* could be used in HQT's proposed formula. Please provide a numerical example.

Responses :

1.1 PEG believes that the gross domestic product implicit price index for final domestic demand would be preferable to the Company's proposed inflation measure.

1.2 PEG proposes to replace HQT's proposed growth term in the *formule paramétrique* with one calculated using the elasticity-weighted scale index. Using PEG's econometric research detailed in Table 3 of its testimony, the weights on the elasticity-weighted scale index would be 0.415 for ratcheted peak demand, 0.339 for transmission line km, 0.148 for the number of retail customers, and 0.099 for generation capacity. The growth rate in the scale index would then be measured as growth Scale = 0.415 x growth ratcheted demand + 0.148 x growth retail customers + 0.099 x growth generation capacity + 0.339

x growth Line Km. A 1% increase in ratcheted peak demand would be presumed to lead to a 0.414% increase in capital expenditures.

PERFORMANCE INDICATORS AND THE ESM

2. Reference : i) Pièce C-AQCIE-CIFQ-0018, p. 47.

Preamble :

i) *"We recommend the following revisions to HQT's proposed service quality mechanism.*

- *The weight on the safety metrics and the customer satisfaction surveys should each be reduced to 15%. A reliability and availability category should be established that has a 70% weight. Metrics in this category would have equal weights.*
- *Consideration should be paid to using T-SAIFI and T-SAIDI as reliability metrics."*

Requests :

2.1 Please provide justifications for reducing the weight of the customer satisfaction surveys. In general, please explain why reliability metrics in an incentive mechanism should be given more weight than other areas of performance.

2.2 Please discuss the link between T-SAIFI, T-SAIDI and the two reliability indicators proposed by HQT.

2.3 Please provide a table with all of the indicators proposed by PEG with their corresponding weight.

Responses :

2.1 The weights on the various metrics in the IMQ should reflect the relative impacts on customer welfare of reductions in the dimensions of quality which they represent. PEG believes that customers care much more about reliability than they do about the other performance dimensions in the IMQ. If the weight on reliability is to be increased, weights on other performance dimensions must be reduced.

2.2 HQT proposed two reliability metrics for inclusion in the IMQ: *IC-Opérationel* and the number of outages leading to customer service interruptions. T-SAIDI is similar to *IC-Opérationel*, as both measure outage duration performance. T-SAIFI is similar to the number of outages leading to customer service interruptions, as both metrics measure outage frequency performance.

PEG believes that there are several differences between T-SAIDI and T-SAIFI and the

Company's proposed metrics. Some of these differences are likely immaterial. The key difference between T-SAIDI and *IC-Opérationel* is the scope of outages covered, as T-SAIDI includes a wide range of unplanned outages and excludes planned outages while *IC-Opérationel* limits the types of outages included in the metric to those from current network operations (e.g., equipment failures, planned outages, and operating incidents). A key difference between the number of outages leading to customer service interruptions and T-SAIFI is that T-SAIFI reports the number of interruptions per delivery point, while the number of outages leading to customer service interruptions is not adjusted for scale.

PEG's understanding is that T-SAIDI and T-SAIFI are more commonly reported metrics amongst North American transmitters and have been used to benchmark reliability performance. For example, HQT presented reliability benchmarking evidence from a CEA peer group featuring T-SAIDI and T-SAIFI on pages 19-21 of HQT-3, Document 3 of this proceeding.

2.3 The attached table provides the recommended indicators and weights.

INDICATEURS	PONDÉRATIONS		CIBLES	
	HQD	PEG	HQD	PEG
SATISFACTION DE LA CLIENTÈLE	**25%**	**15%**		
Satisfaction du client Hydro-Québec Distribution	12.5%	7.50%	7.9	
Satifaction des clients point à point	12.5%	7.50%	8.9	
FIABILITÉ ET DISPONIBILITÉ DU RÉSEAU	**50%**	**70%**		
Indisponibilité forcée	25%	23.3%	6867	
Indice de continuité opérationel	12.5%	23.3%	0.23	
Nombre de pannes et interruptions planifiées	12.5%	23.3%	919	
SÉCURITÉ	**25%**	**15%**		
Taux de fréquence des accidents	25%	15%	2.45	
Total	**100%**	**100%**		

3. Reference : i) Pièce C-AQCIE-CIFQ-0018, p. 48.

Preamble :

i) *"There is a way to avoid a deadband in the penalization for declining quality. HQT can be subject to a revenue penalty only at the end of the plan if there is an average decline in IMQ scores on balance over the four years of the MRI term. Improvements in quality in some areas would be allowed to offset quality declines in other areas. However,*

HQT would receive no reward for a rise in the IMQ.

The Régie should reconsider its decision to penalize HQT for poor quality only when the Company has surplus earnings. In principle, it can approve a supplemental revenue adjustment that doesn't conflict with its decision to link the MTÉR to service quality. Here is an example.

- *Declining service quality will reduce allowed revenue formulaically. To guard against excessive penalties, it is reasonable to place a cap (e.g. 3% of allowed revenue) on these penalties.*
- *If the indicated revenue reduction for declining quality is less than HQT's share of surplus earnings under the existing MTÉR formula, the Company's share will be reduced by this amount.*
- *If the indicated revenue reduction for declining quality exceeds the Company's share of surplus earnings, it will retain no surplus earnings and allowed revenue will be further reduced by the amount necessary to achieve the indicated revenue reduction"*

Requests :

3.1 OC understands that PEG is proposing a one-time application, at the end of the MRI's term, of HQT's IQM proposal instead of annual applications. Please confirm and add comments.

3.2 Please explain how "average decline in IQM scores" would be tied to overearnings and the ESM. Please provide a numerical example.

Response :

3.1 PEG confirms that revenue would be adjusted for poor quality only at the end of the MRI term. The size of the adjustment would depend on how much the IMQ declined on average during the four years of the plan.

The chief advantage of the proposed treatment is to avoid a situation where revenue is decoupled from quality. The Company can potentially experience lower revenue due to any average decline in quality. The Transmitter would be able to keep track of its service quality performance with annual IMQ scores and strategically adjust as needed throughout the MRI to increase the chances that it retains its full share of surplus earnings by the end of the plan.

The Company could be subject to a sizable quality penalty at the end of four years. However, the mechanism need not be construed as keeping HQT in doubt as to the size of its retained surplus earnings. The Company could, in effect, keep its share of surplus earnings as provided for in the current MTÉR and remit them to its owner. At the end of four years, however, the Company might be compelled to pay a penalty if its service quality declined on average during the MRI term. This is analogous to a contract that an

unregulated firm might have with a customer which contained a provision for a rebate after four years if quality was substandard.

3.2 Our proposed service quality incentive mechanism would take the following form.

Total Service Quality Penalty[1]

$= max\ (\alpha * IMQ, 0)$

= Surplus^{HQT} Adjustment + Supplemental Quality Penalty

= min ($\sum_t$ *Surplus$^{HQT}{}_t$, Total Service Quality Penalty*)

+ Supplemental Quality Penalty.

Here

α is the Service Quality Penalty Rate;

IMQ is the average of annual IMQ scores during the MRI;

Surplus$^{HQT}{}_t$ is the Transmitter's share of surplus earnings in each MRI year *t*; and

Supplemental Quality Penalty = max (*Service Quality Penalty -* $\sum_t$ *Surplus$^{HQT}{}_t$, 0*).

It can be seen that if the average of IMQ scores at the end of the plan is at or above 0, the Company would keep its full share of any surplus earnings. If the IMQ is below 0, the Company would effectively return some or all of its share of surplus earnings and may also pay a Supplemental Quality Penalty.

The reasonableness of this approach hinges on the value of α. The calibration of α is based on returning all of the Company's share of surplus earnings when the IMQ = -2. This is consistent with HQT's proposal under the same circumstances. This calibration exercise is illustrated in Table 1 using data for the year 2017. The value of α applicable over the four-year MRI term if the 2017 calibration is used is

-13,765 x 4 or -55,061 ($000).

[1] The maximum and minimum functions that follow ensure that there is no penalty when the IMQ is positive or zero.

Table 1

Calibration of the Service Quality Penalty Rate α using 2017 ROE ($000)

Rate of Return on Equity		
Actual	9.143%	
Allowed	8.200%	
Rate of Return Gap		
Share 50/50 because < 100 basis points	0.943%	A
Actual Rate Base	19,463,115	
* Capital Portion of the Capital Structure	30%	
Assumed Equity for Regulated Activities	**5,838,935**	B
Surplus Earnings (A X B)	**55,061**	C
Customer Portion		
(C X 50%)	27,531	
Carrier Portion Before Possible Service Quality Penalty		
(C X 50%)	27,531	D
Alpha		
Set (**α** X IMQ) = D when IMQ = -2		
=> (**α** X -2) = D		
=> **α** = (D/(-2))	**-13,765**	E
Alpha Applied at End of MRI		
E X 4 Years	**-55,061**	F

In each year of the MRI, the Company retains its portion of surplus earnings until the end of the plan when the service quality penalty could be applied in the event of an average decline in service quality performance.

Table 2 presents an application of the mechanism at the commencement of an MRI using example numbers. It can be seen from an average IMQ score of -0.25 in the 'Exit MRI' column that there was a modest deterioration in average service quality. The Company must therefore refund a portion of its surplus earnings back to the consumers.

Table 2

Numerical Example ($000) of Service Quality Penalty at Commencement of MRI

	Year 1	Year 2	Year 3	Year 4			Exit MRI	
Rate of Return								
Actual	11.07%	8.50%	7.32%	9.17%				
Authorized	8.20%	8.20%	8.20%	8.20%				
Gap	2.87%	0.30%	-0.88%	0.97%				
Rate Base	19,463,115	19,463,115	19,463,115	19,463,115				
Capital Structure	30%	30%	30%	30%				
Assumed Equity	5,838,935	5,838,935	5,838,935	5,838,935				
Surplus Earnings	167,294.2	17,582.3	(51,488.5)	56,645.6				
Customer Portion								
	110,873.3	8,791.1	-	28,322.8				
Transmitter Portion								
Retained in Full During MRI	56,420.9	8,791.1	-	28,322.8	Sum	=	93,534.8	**A**
Service Quality Penalty (α = -55061 from Table 1)								
IMQ	0.20	-0.40	-1.10	0.30	Average	=	-0.25	**B**
Penalty	NA	NA	NA	NA	max(**α** x **B**, 0)	=	**13,765**	**C**
Transmitter Portion of Surplus Earnings at Commencement of MRI					**A** - **C**	=	79,769.5	

The Supplemental Quality Penalty represents the additional amount beyond the Company's share of surplus earnings. In this example, there was no Supplemental Quality Penalty since the nominal amount of the penalty was less than the amount of the Company's Surplus Earnings.

Table 3 decomposes the Service Quality Penalty into its Company Surplus Earnings Adjustment and Supplemental Quality Penalty components and shows penalties for varying average IMQ scores.

Table 3
Decomposition of Service Quality Penalty

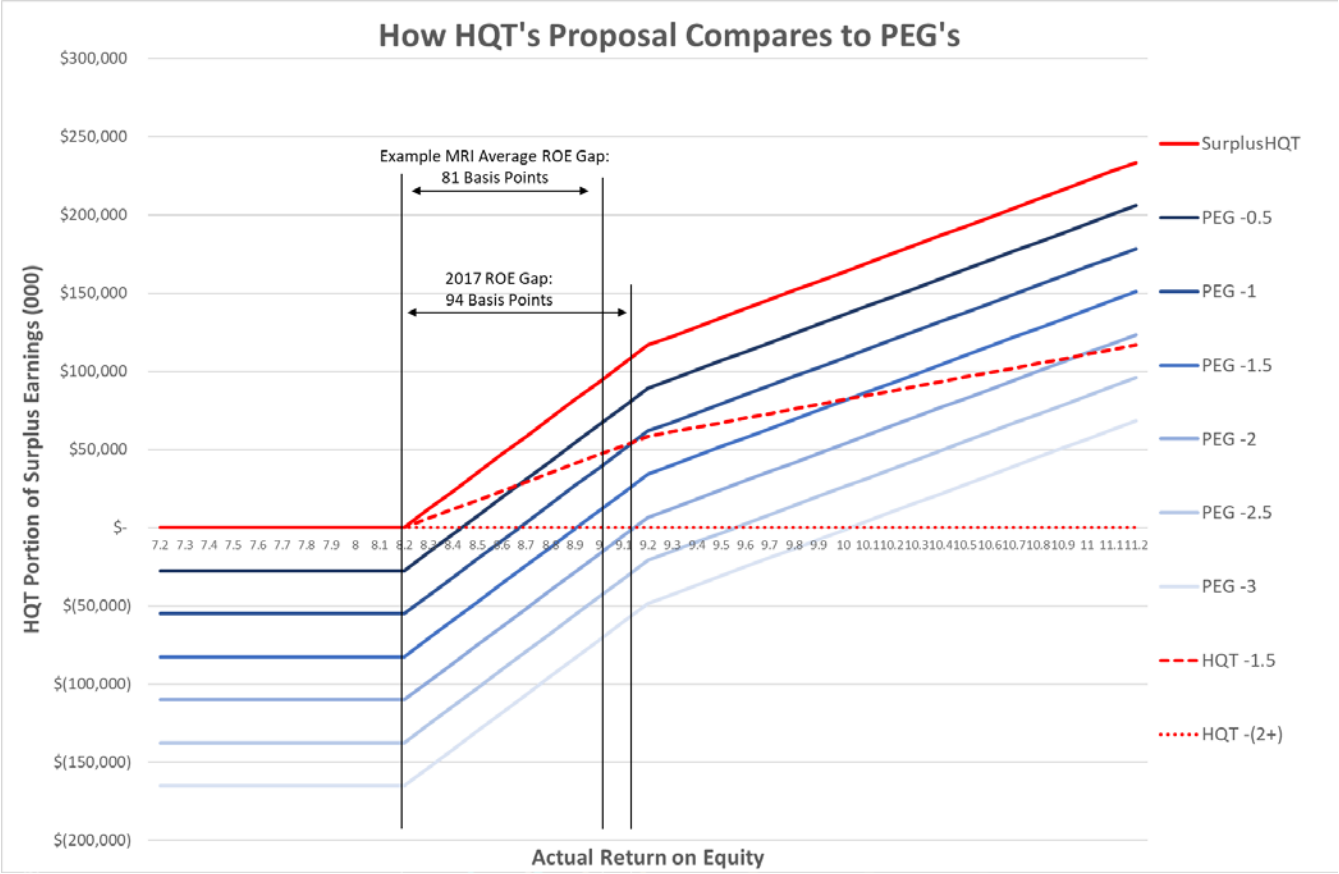
	α	**Average IMQ**	**Surplus^{HQT}**	**Service Quality Penalty**	**=**	**Surplus^{HQT} Adjustment**	**+**	**Supplemental Penalty**
Reference	A	B	C	D				
Definition	Service Quality Penalty Rate	Measure of Global Service Quality	HQT Share of Surplus Earnings	Nominal Amount HQT Forfeits		Amount by which to Reduce Surplus^{HQT}		Penalty Amount Surplus^{HQT} Does Not Cover
Formula	Table 1	HQD Proposal	Table 2	A X B		min (C, D)		max (D - C, 0)
	-55,061.15	-3	93,534.81	165,183.46		93,534.81		71,648.64
	-55,061.15	-2.5	93,534.81	137,652.88		93,534.81		44,118.07
	-55,061.15	-2	93,534.81	110,122.30		93,534.81		16,587.49
	-55,061.15	-1.5	93,534.81	82,591.73		82,591.73		0.00
	-55,061.15	-1	93,534.81	55,061.15		55,061.15		0.00
	-55,061.15	-0.5	93,534.81	27,530.58		27,530.58		0.00
	-55,061.15	0	93,534.81	0.00		0.00		0.00

Figure 1 illustrates how the incentive properties of PEG's Service Quality Penalty Proposal are robust to all earning outcomes. On the y-axis is Surplus^{HQT} and on the x-axis is the actual rate of return. The graph corresponds to an alpha and service quality penalty generated by Tables 1 and 2. The curves for PEG IMQ = 0 and HQT IMQ = -1 are omitted since they both equal Surplus^{HQT}. Negative surplus earning amounts are interpreted as the supplemental quality penalty. Flattening slopes of the lines after 100 basis points of over-earning reflect the formulaic change in sharing of surplus earnings between customers and the Transmitter.

Inspection of Figure 1 reveals the following:

- PEG's proposed IMQ is calibrated so that it produces the same result as Hydro Quebec's IMQ under the assumed circumstances for 2017 and an IMQ of negative 2.
- Penalties can occur even if the Company's ROE is negative.
- Penalties can occur even if the IMQ has a value less than or equal to -1.

Figure 1



An IMQ value less than -5 represents global service quality deterioration more than 5 standard deviations below average historic performance. Such a severe drop in service quality performance is likely indicative of a larger problem not within the purview of what a service quality performance incentive mechanism is meant to address. For these reasons, we recommend the penalty be capped at the penalty associated with an average IMQ value of -5.

OFF-RAMP

4. Reference : i) Pièce B-0013, p. 25-27.

Preamble :

In its report, CEA discusses HQT's ROE and equity ratio, as compared to other electric and gas distributors. CEA states that "*This supports a lower threshold than might otherwise be appropriate to achieve a comparable percentage of earnings at risk"*.

Request :

4.1 Does PEG agree with CEA's statement? Please discuss.

Response :

4.1 Table 10 on p. 26 of Concentric's July report suggests that the authorized ROE of HQT is only 4% below the norm for a group of Canadian transmission utilities. HQT's numbers reflect in part the lower risk of operating a system that is principally engaged in the transport of low-cost hydroelectric power and owned by the government of Québec. HQT's equity ratio is a more material 17% below the norm. On balance, these considerations suggest a modest increase in the variance of earnings outcomes produced by a given *clause de sortie.*