C A N A D A

PROVINCE DE QUÉBEC
DISTRICT DE MONTRÉAL

DOSSIER R-4167-2021

RÉGIE DE L'ÉNERGIE

CAUSES TARIFAIRES 2021 ET 2022
D'HYDRO-QUÉBEC TRANSÉNERGIE (HQT)

HYDRO-QUÉBEC
En sa qualité de Transporteur, TransÉnergie

Demanderesse

-et-

REGROUPEMENT POUR LA TRANSITION, L'INNOVATION ET L'EFFICACITÉ ÉNERGÉTIQUES (RTIEÉ),
un Regroupement comprenant les organismes suivants : l'*Association québécoise de lutte contre la pollution atmosphérique (AQLPA)*, *Stratégies Énergétiques (S.É.),* le *Groupe d'Initiatives et de Recherches Appliquées au Milieu (GIRAM)* et *Énergie solaire Québec (ÉSQ)*

Intervenant

EXCERPTS FROM THE PROOF REGARDING THE DETERMINATION OF THE X AND S FACTORS OF THE INCENTIVE MECHANISM

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Regroupement pour la transition, l'innovation et l'efficacité énergétiques (RTIEÉ)

Le 13 décembre 2021

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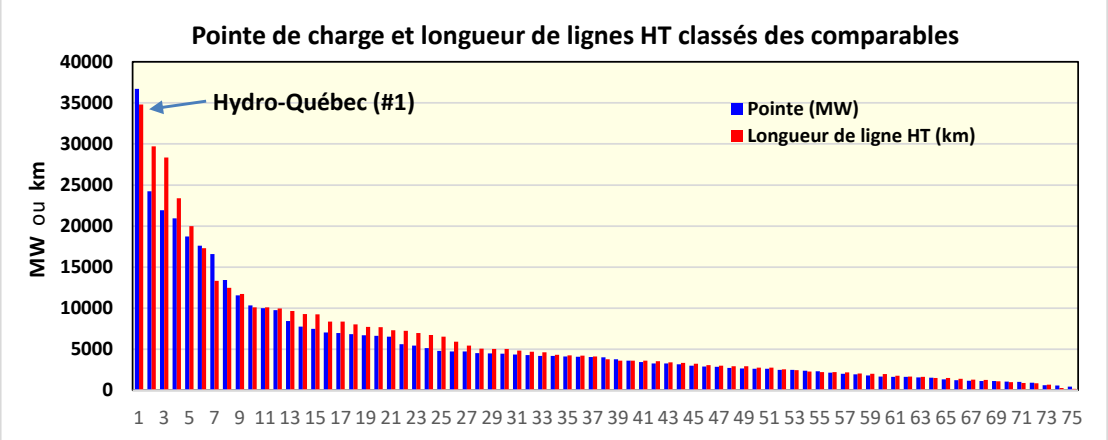
We have reconstituted the following graph abd table from Brattle's proof and more specifically from its answer to RTIEE (B-0061, HQT-10, Doc. 6.1, page 11 :

Brattle's sample
Blue = System Peak (MW)
Red = High tension length of lines (km)



Company number in Brattle's sample (classified by us)

Excerpts from Brattle's sample:

Company Name	System Peak (MW)	Total Energy (MWh)	Load Factor (from the two preceding columns – Should normally be between 40% and 75%)	Note
Central Maine Power Company	1 616	232 245	1,64%	Seems Implausible Load Factor
Cleveland Electric Illuminating Company	4 188	2 236 070	6,10%	Seems Implausible Load Factor
Dayton Power and Light Company	3 246	4 996 704	17,57%	Seems Implausible Load Factor
West Penn Power Company	4 012	7 563 429	21,52%	Seems Abnormally low Load Factor
Niagara Mohawk Power Corporation	6 518	14 584 609	25,54%	Seems Abnormally low Load Factor
Public Service Electric and Gas Company	9 753	22 667 677	26,53%	Seems Abnormally low Load Factor
Potomac Edison Company	3 609	8 662 701	27,40%	Seems Abnormally low Load Factor
Central Hudson Gas & Electric Corporation	1 109	2 732 139	28,12%	Seems Abnormally low Load Factor
Black Hills Power, Inc.	420	2 970 013	80,72%	Seems Abnormally high Load Factor
Southwestern Public Service Company	4 261	30 385 349	81,40%	Seems Abnormally high Load Factor
Entergy Arkansas, LLC	4 513	32 438 515	82,05%	Seems Abnormally high Load Factor
Avista Corporation	1 656	12 497 786	86,15%	Seems Abnormally high Load Factor
Monongahela Power Company	2 121	17 649 894	94,99%	Seems Abnormally high Load Factor
Green Mountain Power Corporation	612	5 437 646	101,43%	Seems Impossible Load Factor
ALLETE (Minnesota Power)	1 573	14 058 786	102,03%	Seems Impossible Load Factor
Ohio Valley Electric Corporation	1 021	11 366 445	127,09%	Seems Impossible Load Factor

We add this excerpt from Pacific Gas and Electric Company (PG&E)'s website (https://www.pge.com/en_US/about-pge/company-information/profile/profile.page) in December 2021 :

> *Fast Facts*
> *Service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east.*
> *106,681 circuit miles of electric distribution lines* ***and 18,466 circuit miles of interconnected transmission lines****.*

Excerpts from Brattle's answer to RTIEE (B-0061, HQT-10, Doc. 6.1, page 11

> *Pacific Gas and Electric Company*
> *2019 Length of Transmission Lines (Miles) :* ***36 659****.*

The totality of the following excerpts were all already included in our questions to PEG and in pages 6 to 9 of PEG's answer C-AQCIE-CIFQ-0058 (and the full text of Joskow and Giannakis's articles had already also been filed by RTIEE as Exhibits C-RTIEE-0015 and C-RTIEE-0016) :

ii) **HYDRO-QUÉBEC TRANSÉNERGIE (HQT)**, Dossier R-4167-2021, Pièce B-0012, HQT-5 Document 2, Brattle Report :

> *Page Adobe 31, note 47 :« it seems that **a key assumption** of the cost benchmarking and comparison approach is the belief that the statistical model predicts the production possibility frontier, so that a top performer is on the frontier and thus it could make no further improvements. The production possibility frontier refers to all the combinations of output that a firm can produce if it uses all its resources and inputs efficiently. ». Page Adobe 32, note 49 : « **There are many intangible factors** that can explain why one firm performs differently from another, such as the quality of workers and management, the quality and strength of the procurement process—i.e., negotiation and bargaining with suppliers—and the amount of X-inefficiency in the company. **To the extent that data limitations preclude such relevant factors from being included in an econometric cost model, departures from "average" efficiency may well represent the effect of these other factors, rather than failure to minimize cost.** ».*

iii) **HYDRO-QUÉBEC TRANSÉNERGIE (HQT)**, Dossier R-4167-2021, Pièce B-0061, HQT-10 Document 6.1, Brattle's answers to RTIEÉ :

> ***BRATTLE'S ANSWER 1.1.5 TO RTIEE:***
> *We believe it is a strong assumption in that it is unlikely that a statistical model will be able to capture and control for all observable and unobservable factors and predict accurately the production possibility frontier of each firm's position within the frontier.*

BRATTLE'S ANSWER 1.1.6 TO RTIEE *:*
For purposes of our analysis, intangible factors are those factors that likely have an impact on a transmission company's costs but that are unobservable.

There are two possibilities for why they are unobservable. The first is that they are inherently unobservable—i.e., the X-inefficiencies that are discussed in the economics literature and that we cite in note 48. The second is that, even though the factors in theory may be measurable, resource constraints—e.g., time, data, costs—make them unobservable to the researcher.

While there is judgement involved, some on the list in the question seem to fall into the first category while others fall into the second category. For example, "scope of the obligation to serve", "accommodations and adaptations to concerns of social acceptability", "accommodations and adaptations to local purchasing concerns," seem to be very difficult to measure in an objective and robust manner, even if resources were not constrained. The others seem to fall more into the second category.

In addition to these, in note 49 we included: "quality and strength of the procurement process—i.e., negotiation and bargaining with suppliers."

iv) **HYDRO-QUÉBEC TRANSÉNERGIE (HQT)**, Dossier R-4167-2021, Pièce B-0061, HQT-10 Document 6.1, Brattle's answers to RTIEÉ :

BRATTLE'S ANSWER 1.1.8 TO RTIEE (EXCERPT) *:*
Firms that compete in a market are different in many ways—reflecting differences in both tangible and intangible factors. Firms may have different wage contracts, procurement practices, cost of capital, strategic initiatives, managerial quality and brand value. These differences determine a company's overall strength and weakness in competing—with all firms being good at some things and not as good at others. There is no requirement, however, that firms be identical in every way for competitive markets to function

v) **REGROUPEMENT POUR LA TRANSITION, L'INNOVATION ET L'EFFICACITÉ ÉNERGÉTIQUES (RTIEÉ)**, Dossier R-4167-2021, Pièce **C-RTIEÉ-0016, RTIEÉ-1, Doc. 3 :**

Dimitrios GIANNAKIS, Tooraj JAMASB, Michael POLLITT*, Benchmarking and incentive regulation of quality of service : An application to the UK electricity distribution networks, In: (2005) vol 33 no. 17 Energy Policy, pp. 2256-2271, https://nyuscholars.nyu.edu/en/publications/benchmarking-and-incentive-regulation-of-quality-of-service-an-ap:*

> *p. 33: We also found that* ***some firms that performed well in the cost-only models did not score high in our quality-only model and the correlation coefficients between the cost-only and quality-only***

> ***scores were somewhat low****. This indicates a* ***possible trade-off or differing competencies between costs and quality of service****. These findings show that, at least conceptually,* ***it is plausible and desirable to integrate quality of service and capital expenditure in benchmarking and incentive regulation of electricity networks****.*
>
> *p. 33: Regulatory benchmarking schemes involving capital expenditures and quality of service still need to address concerns about* ***long-term impacts of leaving investments and quality to benchmarking models instead of approval of investment plans and standards of performance for quality****.*
>
> *[Souligné en caractère gras par nous]*

vi) **REGROUPEMENT POUR LA TRANSITION, L'INNOVATION ET L'EFFICACITÉ ÉNERGÉTIQUES (RTIEÉ)**, Dossier R-4167-2021, Pièce C-RTIEÉ-0015, RTIEÉ-1, Doc. 2 :

> ***Paul L. JOSKOW, MIT****, Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks, Harvard, January 21, 2006, https://hepg.hks.harvard.edu/files/hepg/files/joskow_incentive_2006.pdf*
>
> > *p.51 :* ***Incentive regulation in practice is considerably more complicated than incentive regulation in theory****.*
> >
> > *p. 51: Incentive regulation has been promoted as a straightforward and superior alternative to traditional cost of service or rate of return regulation.* ***In practice, incentive regulation is more a complement to than a substitute for traditional approaches to regulating legal monopolies****.*
> >
> > *pp. 51-52:* ***Performance benchmarks must be defined and the power of the relevant incentive mechanisms determined****. The information burden to implement incentive regulation mechanisms well is similar to that for traditional cost of service regulation.*
> >
> > *p. 52:* ***There is a lot of loose and misleading talk about the application of price caps in practice****. From a theoretical perspective the infatuation with price caps as incentive devices is surprising since* ***price caps are almost never the optimal solution to the tradeoff between efficiency and rent extraction*** *when the regulator must respect the regulated firm's budget-balance constraint (Schmalensee 1989)* ***and raise service quality issues****. However, price caps in practice are not like "forever" price caps in theory.*

*p. 53: **The evaluations of the performance of price cap regulation should therefore be evaluated from the perspective of the effects on performance incentives not on its effects on price structures** since these are typically not chosen voluntarily by the regulated firm but are subject to independent regulatory determinations.*

*p. 53: **Collection of data on all relevant and significant measures of firm performance and the use of these data for benchmarking purposes and for developing performance targets is an important component of good incentive regulation in practice**. **Regulators need the authority to require firms to collect performance data, to audit performance data and to analyze these data. Absent these authorities and resources incentive regulation mechanisms will not achieve their promise in practice**.*

*p. 53: **Quality of service schemes appear to have been bolted on to schemes designed to provide incentives for cost reduction and do not effectively incorporate information on consumer valuations of quality and the costs of varying quality in different dimensions**.*

*p. 54: **it is better to use an imperfect estimate of the right number than a highly accurate estimate of the wrong number***

*p. 55: Incentive regulation mechanisms often have "deadbands," caps, and floors **that place limits on the performance realizations for which the regulated firm is at risk**.*

[Souligné en caractères gras par nous]

vii) **R. Anthony INMAN**, Page Internet de présentation, http://www.business.latech.edu/inman/ : Le professeur R. Anthony Inman de la Louisiana Tech University souligne la difficulté mais néanmoins la nécessité, dans les études de productivité, de trouver un moyen de **mesurer non seulement les extrants quantitatifs mais aussi les extrants qualitatifs** :

*The ways in which input and output are measured can provide different productivity measures. Disadvantages of productivity measures have been the distortion of the measure by fixed expenses and also **the inability of productivity measures to consider quality changes** (e.g., output per hour might increase, but it may cause the defect rate to skyrocket). **It is easier to conceive of outputs as tangible units such as number of items produced, but other factors such as quality should be considered**.*

viii) **Anthony INMAN**, *Productivity concepts and measures*, http://www.referenceforbusiness.com/management/Pr-Sa/Productivity-Concepts-and-Measures.html , Souligné en caractère gras par nous :

> ***Experts have cited a need for a measurement program that gives an equal weight to quality as well as productivity.***

ix) **Erwin DIEWERT**, *Le défi de la mesure de la productivité totale des facteurs*, http://www.csls.ca/ipm/1/diewert-un-fr.pdf : Dans le même sens, le Professeur Erwin Diewert du département d'économie de l'Université de la Colombie-Britannique, dans *« Le défi de la mesure de la productivité totale des facteurs »*, souligne que *« **de nombreux extrants du secteur des services sont difficiles à mesurer conceptuellement** : il suffit de songer à la prolifération des forfaits de services téléphoniques et aux difficultés que pose la mesure de l'assurance, du jeu, des affaires bancaires et des opérations sur options. »*. (page 3). Il se demande en outre : *« **Comment pouvons-nous mesurer le capital-savoir ?** Compte tenu de la façon dont nous avons défini le savoir (comme ensembles de possibilités de production propres à l'entreprise et qui sont fonction du temps), **il est extrêmement difficile de mesurer le savoir et les variations du savoir (l'innovation)**. » (page 10).*

x) **John O'GRADY (Prism Economics and Analysis), Prof. Brenda MCCABE (Dept. of Civil Engineering, University of Toronto)**, *Productivity in the Construction Industry: Concepts, Trends, and Measurement Issues*, http://www.ogrady.on.ca/Downloads/Papers/Productivity%20in%20the%20Construction%20Industry.pdf , page 6. Souligné en caractère gras par nous. Selon cette référence, s'il y a variation des extrants du point de vue qualitatif, John O'Grady (de Prism Economics and Analysis) et le Professeur Brenda McCabe (du Département du génie civil de l'Université de Toronto) recommandent un ajustement qualitatif pour refléter cette variation qualitative :

> ***If the quality of the output changes over time, an allowance must be made for the improvement or reduction in quality.***