BEFORE THE

RÉGIE DE L'ÉNERGIE

IN THE MATTER OF:

HYDRO QUÉBEC DISTRIBUTION

Demande relative à la détermination du coût du service du Distributeur
et à la modification des tarifs d'électricité

DOSSIER R-3492-2002

Phase 2

Interrogatory Responses of:

Industrial Economics, Incorporated
2067 Massachusetts Avenue
Cambridge, Massachusetts

On Behalf of:

l'Association québécoise des consommateurs industriels d'électricité (AQCIE)

Conseil de l'industrie forestière du Québec (CIFQ)

10 November 2003
Revised 24 November 2003

Interrogatories from the Régie

1. Référence: AQCIE/CIFQ 1, page 6:

> *"This approach is not consistent with normal regulatory practice, in IEc's experience. The normal practice is for the utility to specify a test year to which the entire rate increase applies. The regulator then determines what the appropriate revenue requirement for the utility will be for that test year, and the new utility rates are set such that they recover that revenue requirement over the whole year."*

Question 1.1

A l'appui de l'affirmation citée en préambule, pouvez-vous fournir des références et un exemple chiffré de l'approche que vous recommandez.

Response:

Regarding the request for references, IEc has not prepared a study of each base rates proceeding in which it has been involved. However, Mr. Knecht cannot recall any base rates proceeding in which rates, on an annualized basis, were specifically designed to produce revenues well in excess of the revenue requirement. In general, rates are established that will produce the utility's revenue requirement for the test year under the assumption that those rates are in place for the full year. If, in actuality, rates go into effect after the beginning of the test year they are not adjusted in any way to account for possible cost variances between the test year used for regulatory purposes and the first year of the new rates.

For example, in IEc's most recent base rates case involving National Fuel Gas Distribution in its Pennsylvania service territory (before the Pennsylvania Public Utility Commission, Docket R-00038168), the utility's test year *ended* 30 September 2003. However, rates set based on that test year will not go into effect until early 2004, more than 15 months after the beginning of the future test year.

Thus, there is no *a priori* reason why the test year need exactly match the rate year. By way of a numerical answer, IEc refers the questioner to the first paragraph on page 7 of IEc's report, showing how a 5.1 percent increase effective 1 April 2004 would be consistent with its test year revenue requirement.

Please see also response to questions 2.1 through 2.3 below.

2. Référence: AQCIE/CIFQ 1, page 6:

"HQD's proposal, however, involves a mid-year rate increase. In effect, the proposal contains a mismatch between revenue requirement and proposed rates. By so doing, HQD's rate increase is more than that necessary to recover test year costs on an annualized basis. By setting new rates at the higher level, HQD will be over-recovering its approved revenue requirement effective 1 April 2004."

Questions

2.1 Veuillez indiquer si la pratique réglementaire requiert de la part du distributeur un mécanisme d'ajustement permettant de prendre en compte le décalage entre l'année tarifaire et l'année témoin au niveau des revenus.

2.2 Le cas échéant, veuillez définir et expliquer le ou les mécanismes prévus à cet effet et des cas concrets de juridictions ayant pratiquée ce ou ces mécanismes d'ajustement.

2.3 Veuillez indiquer les conditions requises pour qu'un mécanisme d'ajustement puisse s'appliquer.

Response:

2.1 For the reasons detailed in the response to question 1.1 above, IEc does not believe that an adjustment mechanism is necessarily required. Moreover, if the Régie were to approve slower progress toward full recovery of the revenue requirement than HQD's "sudden leap" strategy, the need for an adjustment mechanism is essentially moot.

2.2 As noted, IEc does not believe it is necessary to implement an adjustment mechanism, particularly since there is only a three-month difference between the test year and the rate year. However, IEc offers two approaches that are superior to HQD's approach below. Note, however, that these mechanisms are based on the assumption that HQD is granted its full revenue requirement in one sudden leap, an assumption with which IEc does not agree.

First, the Régie could consider a "CPI - X" adjustment, similar in concept to "performance-based rates" but applied only for a very short period. Under this approach, the Régie would determine the *distribution* revenue requirement for the calendar test year, and adjust it upward by a factor equal to some measure of general inflation (e.g., consumer price index (CPI) or GDP deflator), reduced by some reasonable measure of productivity improvement by the utility. Thus, for example, if inflation is 2.0 percent and the productivity improvement factor is 1.2 percent per year, the adjustment factor for three months would be 0.2 percent, calculated as [(1+.02-.012)^(1/4)-1=.00199]. This 0.2 percent increase would be applied to the distribution revenue requirement only, unless evidence is presented that production and transmission costs would also be subject to inflationary forces. (Please note that the inflation and productivity improvement factors are illustrative examples, not IEc recommendations.)

A second alternative would be to ignore the test year/rate year difference in this, the first year under this regulatory regime, and then adopt HQD's approach for the future. To show a numerical example of how this would work, consider HQD's proposed revenue requirement for test year 2004, which has a shortfall of $409 million. (In light of the policy issues discussed in IEc's report, and based on the evidence filed by other experts in this proceeding, this example must be considered to be illustrative only.) Under this approach, rates would be set to go into effect on 1 April 2004 which increase revenues by $409 million on an annualized basis, or an approximate average increase in total rates of 5.1 percent. In the next proceeding, HQD would develop its revenue requirement for test year 2005. To the extent that the rates developed in this proceeding are not sufficient to meet the 2005 revenue requirement, a rate increase would be set to recover test year revenue requirement inclusive of the first quarter shortfall.

This second approach has the same methodological disadvantage as the HQD approach, namely that annualized rates set in 2005 would exceed costs for 2005 because they would also be recovering a shortfall from the first quarter. However, the magnitude of the impact will likely be much smaller, since it is assumed that HQD will not be proposing a 28 percent increase in distribution cost revenues in 2005.

2.3 Please see the response to items 2.1 and 2.2 above.

3. Référence: AQCIE/CIFQ 1, page 9

Préambule: Le tableau IEc-3 del page 9 réfère au tableau 8 des pièces HQD-8, documents 2, 3 and 4

Question 3.1

Pouvez-vous concilier les données en GWh contenues dans le tableau IEc-3 avec celles auxquelles il réfère.

Response:

The GWh annual sales data in Table IEc-3 include relatively small load in the autonomous networks. The table incorrectly referenced Tableau 8 from HQD's cost of service study; it should have referenced Tableau 11. IEc regrets any inconvenience caused by this error.

4. Référence: AQCIE/CIFQ 1, page 21

"To avoid unnecessary loss of load and to avoid creating unreasonable uncertainty in the investment climate in the province, IEc recommends that the Régie select a target period of at least five years for the phase-in to full revenue requirement recovery. With such a period, and with the expectation of continued modest load growth, IEc believes that this target can be achieved with annual distribution rate increases that are less than 1.0 percent of total electricity costs per year, and less than 5.0 percent of distribution costs. For this specific proceeding, IEc recommends that the Régie approve an overall increase of 1.0 percent, effective 1 April 2004. On an annualized basis, that increase will produce an increase in revenues of approximately $80 million, or 4.6 percent of distribution costs. It will reduce HQD's revenue deficiency from the 0.48 cents per kWh in 2002 to 0.23 cents per kWh in 2004."

4.1 Veuillez préciser si la réduction du manque à gagner sur plus d'un an pour une entreprise publique d'électricité a déjà été pratiquée par des organismes

4.2 Le cas échánt, veuillez citer des exemples de juridictions ayant adopté cette mesure et la durée concernée par cette mesure.

Response:

4.1 IEc is not familiar with any government-owned utilities in similar circumstances to Hydro Québec, in which the generation business unit is allowed an 18 percent return on investment from domestic customer rates (see Table 2 on page 28 of the "Merrill-Lynch Report"), while the distribution business under-recovers its revenue requirement at a lower regulated rate of return. Moreover, an analysis of the complex interwoven pattern of subsidies and rates that affect the revenue requirements of government-owned utilities such as the Tennessee Valley Authority and the Bonneville Power Authority requires a detailed study unto themselves (see, for example, http://www.eia.doe.gov/oiaf/servicerpt/subsidy1/index.html). Generally, it is IEc's view that the determination of the proper revenue requirement for government-owned utilities like Hydro Québec, TVA, BPA or even the Philadelphia Gas Works is much more affected by efforts to achieve public policy aims than it is for investor-owned utilities. Some government-owned utilities may receive subsidies from the government, in order for the utility to supply its services at a lower cost, thereby encouraging economic development and employment. (See EIA report cited above.) Other government-owned utilities may set rates in excess of the costs that an investor-owned utility would face, in order to offset tax requirements or provide special benefits to customers (for example, Philadelphia Gas Works, and recent Enmax filing in Alberta). In IEc's view, whether and how subsidies or "inverse subsidies" are reflected in a government-owned utility is specific to the utility in question.

In developing its recommendation, IEc recognizes that the revenue requirement for all of Hydro Québec is, to a significant extent, a matter of public policy, and that those policies must be specific to Québec. IEc's recommendation in this matter, which calls for a phased transition to full distribution cost recovery, comes not from the practices of other government-owned utilities, but from the previous statements of Hydro Québec. The recommendation is based on the public policy and economic development advantages of (a) the government-owned utility keeping its promises, and (b) the benefits of stability in public policy for attracting investment in the province.

4.2 N/A

Interrogatories from Hydro Québec Distribution

1. Références : Preuve de AQCIE/CIFQ 1 , page 5, paragraphe 2

> *"However, it is necessary to recognize that the large industrial customers are much more exposed to production and transmission cost increases than residential and small commercial customers. If, for example, production cost increases (associated with exhaustion of the heritage pool) require a production rate increase of 5 percent, small commercial customers would see an increase in current overall electricity rates of about 1.8 percent, but large industrial customers would face an increase of 3.2 percent.*[5]
>
> [5] *These increases could potentially be greater, if the Regie rigidly maintains constant revenue-cost ratios to implement the cross-subsidization mandate in the Act. That is, any increase in allocated production or transmission costs could potentially get a cross-subsidy "adder" effect associated with an effort to retain historical revenue-cost ratios. This potential adder effect increases the exposure of all non residential rate classes to increases in production and transmission costs."*

Question 1.1 :

Veuillez fournir et démontrer quels seraient les taux d'augmentation des tarifs si, selon votre note 5, la Régie maintenait les indices d'interfinancement au niveau de l'an 2002.

Response:

To respond to this request, IEc prepared Exhibit IEc-HQD-1.1 in the IEc IR Responses Revised.xls workbook attached. These exhibits are provided in live electronic format, allowing the parties to this proceeding to review the formulae used in the calculations. Note that this spreadsheet contains a number of computations that are resolved through an iterative solution; therefore, before using this workbook, the calculation mode must be set to "iteration" with a sufficiently small "maximum change" level (IEc recommends .0001).

Exhibit IEc-HQD-1.1 contains three sets of calculations for 2004. The first is the base case for this exhibit, based on HQD's filing for 2004, using revenues before any proposed increase.

The second section assumes that production costs for each class increase by 5 percent, and that current rates are increased by the exact amount of the production cost increase. This is defined as a pass-through of costs. In effect, this scenario simply implies that each class pays for its share of the increase in production costs, no more and no less. As shown in the second section, this pass-through of costs leaves the dollar-value of the cross-subsidy virtually unchanged (there are small changes, due to the scaling necessary in the HQD index, but they are relatively minor). However, this second scenario shows the HQD index rising for the residential class and falling for the non-residential classes.

Note that this second section shows the 1.8 percent increase for the small commercial class and the 3.2 percent increase for the large industrial class from the cited portion of the IEc report.

The third section of the exhibit displays the impact suggested in the cited footnote from IEc's report. A rigid interpretation of holding the HQD index constant, pursuant to one aspect of the

Régie's decision in Phase 1, would preclude this type of shifting of the indexes between classes, despite the obvious equity of having each class pay its share of the cost increase. Thus, the third section shows the impact of holding HQD indexes constant between the base case 2004 and the revised case with higher production costs. It is also based only on increasing production costs by 5 percent. However, as stated in IEc's report, it is algebraically impossible to hold HQD indexes constant and still meet the new revenue requirement. Therefore, this section applies an adjustment factor to each HQD index value to reconcile the "constant" HQD index concept with the necessity of meeting the revenue requirement. (It is this adjustment factor that is derived in the iterative process.)

As shown, this third section shows that the production costs for the residential class increase by $89.3 million, but the residential class revenues increase only by $69.8 million, with the addition in the cross-subsidy absorbed by the non-residential classes. If this production cost increase is assigned in this manner, the Rate L class faces an increase of 3.4 percent, compared to 2.0 percent for the small commercial class. In addition, the residential class, despite having rates that already substantially under-recover costs, would be assessed the lowest average rate increase of any class. Further, as shown in the final column of the exhibit, the residential class essentially receives a distribution rate decrease of over 4 percent.

In sum, this example shows one example of the distortions caused by a too-rigid adherence to a fixed HQD cross-subsidy index in developing class-specific revenue requirements.

Exhibit IEc-HQD-1.1 Revised
Impact of Production and Transmission Rate Increase
($ millions, except as noted)

2004 Present Rates and Costs	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*	*Scaled Revenues*	*HQD R-C Index*	*Cross-Subsidy*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,426.0	3,599.0	80.7%	862.3
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,085.0	1,139.8	121.8%	(203.8)
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,574.0	1,653.5	130.6%	(387.4)
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,881.0	1,976.0	115.9%	(271.1)
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***7,966.0***	***8,368.3***	***100.0%***	-

2004 with 5% Production Cost Increase						*Cost Pass-Through Revenues*				*Total Percent Increase*
Domestique	55,884	1,875.4	1,167.8	1,507.4	4,550.6	3,515.3	3,688.4	81.1%	862.2	2.6%
Petite Puissance	13,916	419.9	218.0	318.1	956.0	1,105.0	1,159.4	121.3%	(203.4)	1.8%
Moyenne Puissance	25,952	731.6	327.0	242.3	1,300.9	1,508.8	1,688.1	129.8%	(387.1)	2.2%
Grande Puissance	48,467	1,262.1	431.2	71.7	1,765.0	1,941.1	2,036.7	115.4%	(271.7)	3.2%
Tarifs reguliers	***144,219***	***4,289.0***	***2,144.0***	***2,139.5***	***8,572.5***	***8,170.2***	***8,572.5***	***100.0%***	-	***2.6%***

2004 with 5% Production Cost Increase						*Constant R C Revenues*		*Constant R/C Ratio Approach*		*Total Percent Increase*
Domestique	55,884	1,875.4	1,167.8	1,507.4	4,550.6	3,495.8	3,667.9	80.6%	882.7	1.9%
Petite Puissance	13,916	419.9	218.0	318.1	956.0	1,108.6	1,163.2	121.7%	(207.2)	2.0%
Moyenne Puissance	25,952	731.6	327.0	242.3	1,300.9	1,617.9	1,697.5	130.5%	(396.6)	2.7%
Grande Puissance	48,467	1,262.1	431.2	71.7	1,765.0	1,948.0	2,043.9	115.8%	(278.9)	3.4%
Tarifs reguliers	***144,219***	***4,289.0***	***2,144.0***	***2,139.5***	***8,572.5***	***8,170.2***	***8,572.5***	***100.0%***	***(0.0)***	***0.0%***

Sources:
1) Load: HQD-8, Document 4, page 17
2) Production/Transmission Costs/Distribution: HQD-8, Document 4, page 13
3) Current Revenues: HQD-9, Document 1, page 13, Tableau 4

Adjustment Factor	0.99915
Iterator	0.99915

2. Références : Preuve de AQCIE/CIFQ 1 , page 6, paragraphe 4

Préambule :

"However, had the full increase applied for the whole year, IEc estimates that the revenue increase would be $490 million, some $75 million greater than the revenue requirement. Thus, had HQD developed a test year that is consistent with the timing of the rate increase, namely one beginning at 1 April 2004, its proposed rate increase would likely over-recover the revenue requirement by at least $75 million."

Question 2.1:

Comment concilier vous l'hypothèse de "over-recover" de 75 M$ avec la décision D-2003-93 de la Régie à l'effet que l'année témoin projetée (test year) couvre la période du 1er janvier au 31 décembre.

Response:

In the cited paragraph, IEc is not recommending that the test year begin 1 April 2004. IEc recommends that, whenever the rate increase is applied, that on an annualized basis that rate increase produce the revenues necessary to meet the deemed revenue requirement for the test year. Thus, if HQD needs $415 million to meet the revenue requirement that the Régie deems appropriate (after considering both revenue requirement and public policy issues raised in this proceeding), the rate increase should be designed to produce an additional $415 million over a full year. Rates that are set to recover a full-year's deficiency in less than a full year are, almost by definition, in excess of allowed costs.

Please see also responses to Régie-AQCIE/CIFQ-1 and Régie-AQCIE/CIFQ-2.

3. Références : Preuve de AQCIE/CIFQ 1, page 16, paragraphe 1

Préambule :

"This example uses "conservative" estimates of price elasticities, meaning values at the relatively low end of the range for price elasticities. In this table, the immediate price impact on demand is assumed to be zero; for the longer term, the price elasticities are estimated at -0.75 for residential and small commercial, -1.0 for medium commercial and -1.25 for large industrial."

Question 3.1:

Veuillez expliquer ce que vous entendez par «conservative estimates»

Question 3.2:

Veuillez produire les références à la base des élasticités prix de long terme mentionnées en préambule.

Response:

3.1 In this context, as stated in the report, "conservative" means relatively low (in absolute value).

3.2 The basis for these estimates is Mr. Knecht's experience with energy and utility industry analyses for some twenty years, and on his observed behavior of utilities in rate proceedings for nearly 15 years. Price elasticity of demand estimates vary hugely from study to study, particularly the longer term price effects which are difficult to estimate statistically. Moreover, most detailed studies of price elasticity impacts are based on nation- or world-wide changes in prices. These studies therefore miss the substitution effects that are associated with price increases in a specific geographic area. Therefore, these studies also understate the elasticity of demand that HQD can expect associated with its price increase, particularly for large industrial customers. The following is a list of publicly available materials that Mr. Knecht consulted in preparing his report, but it is only a small fraction of the literature and experience upon which IEc's report is based:

1. "Demand Responsiveness in Electricity Markets," Lafferty, Hunger, Ballard, Mahrenholz, Mead, Bandar; FERC Office of Markets, Tariffs and Rates, 15 January 2001

2. "Price Responsiveness in the NEMS Buildings Sector Model," Wade, EIA/DOE.

3. "Price Elasticity of Demand for Electricity," Bonneville Power, CR-WA-004A.

4. "Predicting California Demand Response," King, Chatterjee; Public Utilities Fortnightly, 1 July 2003.

5. Energy, The Next Twenty Years, Resources for the Future, Landsberg, 1979.

6. "Testimony on the Effect of Restructuring on Price Elasticity of Demand and Supply," Stevens, Lerner; 14 August 1996.

7. "Industrial Energy Demand and the Effect of Taxes, Agreements, and Subsidies," and "Industrial Companies' Demand for Electricity: Evidence from a Micropanel," Bjorner, Jensen, Institute of Local Government Studies, October 2000 and 2001.

4. Références : Preuve de AQCIE/CIFQ 1 , page 18, paragraphe 4

Préambule :

"Specifically, to maintain the dollar values in cross-subsidy from 2002 to 2004, the average annualized rate increases at the full 2004 revenue requirement (excluding the Rate BT deficiency) are shown below. The resulting revenue cost ratios are shown in parentheses.

- *Residential:* *4.9% (80%)*
- *Small Commercial:* *6.7% (123%)*
- *Medium Commercial:* *4.5% (130%)*
- *Large Industrial:* *5.3% (116%)*
- *Total:* *5.1% (100%)"*

Question 4.1:

Veuillez fournir le calcul détaillé du taux de croissance moyen annualisé des tarifs ainsi que des ratios d'interfinancement.

Response:

The workpapers used to develop these figures are shown in the attached Exhibit IEc-HQD-4.1 in the IEc IR Responses Revised.xls workbook. These exhibits are provided in live electronic format, allowing the parties to this proceeding to review the formulae used in the calculations.

Exhibit IEc-HQD-4.1 Revised
Full 2004 Revenue Requirement Scenario: 2002 to 2004
($ millions, except as noted)

2002 Actual	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*	*Scaled Revenues*	*HQD R-C Index*	*Cross-Subsidy*
Domestique	52,969	1,691.9	1,148.8	1,536.4	4,377.1	3,231.0	3,509.8	80.2%	867.2
Petite Puissance	13,859	398.3	222.1	331.8	952.2	1,079.0	1,172.1	123.1%	(219.9)
Moyenne Puissance	24,361	654.3	332.0	237.2	1,223.5	1,471.0	1,597.9	130.6%	(374.5)
Grande Puissance	45,171	1,120.2	433.5	70.1	1,623.8	1,746.0	1,896.7	116.8%	(272.9)
Tarifs reguliers	***136,360***	***3,864.7***	***2,136.4***	***2,175.5***	***8,176.6***	***7,527.0***	***8,176.6***	***100.0%***	-

2004 Present Rates	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*	*Scaled Revenues*	*HQD R-C Index*	*Cross-Subsidy*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,426.0	3,599.0	80.7%	862.3
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,085.0	1,139.8	121.8%	(203.8)
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,574.0	1,653.5	130.6%	(387.4)
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,881.0	1,976.0	115.9%	(271.1)
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***7,966.0***	***8,368.3***	***100.0%***	-

2004 with Constant Dollar Cross-Subsidy						*Future Revenues Const. $*				*Total Percent Increase*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,594.1	3,594.1	80.6%	867.2	4.9%
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,155.9	1,155.9	123.5%	(219.9)	6.5%
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,640.6	1,640.6	129.6%	(374.5)	4.2%
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,977.8	1,977.8	116.0%	(272.9)	5.1%
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***8,368.3***	***8,368.3***	***100.0%***	-	***5.1%***

Sources:

1) Load: HQD-8, Documents 2,4, page 17
2) Production/Transmission Costs/Distribution: HQD-8, Documents 2,4, page 13
3) Current Revenues: HQD-9, Document 1, pages 10 and 13

5. Références : Preuve de AQCIE/CIFQ 1, page 21 paragraphe 5; page 22 , paragraphe 1 et 2 et table IEc-6 (IEc Proposed Rate Increases: Calendar Year 2004 Basis, $millions)

Préambule :

"On a per-class basis, to retain the cross-subsidization dollar values from 2002 into 2004 (for the reasons discussed in Section 4.1 above), the following allocation of the rate increase would be necessary (with normalized revenue-cost ratios in parentheses):

- *Residential: 0.8% (80%)*
- *Small Commercial: 2.5% (123%)*
- *Medium Commercial: 0.4% (130%)*
- *Large Industrial: 1.1% (116%)*
- *Total: 1.0% (100%) "*

Question 5.1:

Veuillez fournir le calcul détaillé du taux de croissance moyen annualisé des tarifs ainsi que des ratios d'interfinancement.

Question 5.2:

Veuillez fournir le calcul détaillé des colonnes Percent of Total Revenues, Prop. HQD Index, et Cross Subsidy du tableau IEc-6.

Response:

5.1 The workpapers used to develop these figures are shown in the attached Exhibit IEc-HQD-5.1 in the IEc IR Responses Revised.xls workbook.

5.2 The "Percent of Total Revenues" column in Table IEc-6 represents the average percentage rate increase recommended by IEc in this proceeding, as a percentage of total current revenues (in contrast to distribution revenues). Thus, for example, the average percentage rate increase for the residential class is $3,435/$3,404 - 1 = 0.9%. IEc regrets the misleading column title.

The supporting calculations for the HQD index are shown in the attached Exhibit IEc-HQD-5.2.

Exhibit IEc-HQD-5.1 Revised
2004 Revenue Requirement at 1.0 Percent Increase Scenario: 2002 to 2004
($ millions, except as noted)

2002 Actual	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*	*Scaled Revenues*	*HQD R-C Index*	*Cross-Subsidy*
Domestique	52,969	1,691.9	1,148.8	1,536.4	4,377.1	3,231.0	3,509.8	80.2%	867.2
Petite Puissance	13,859	398.3	222.1	331.8	952.2	1,079.0	1,172.1	123.1%	(219.9)
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Grande Puissance	45,171	1,120.2	433.5	70.1	1,623.8	1,746.0	1,896.7	116.8%	(272.9)
Tarifs reguliers	***136,360***	***3,864.7***	***2,136.4***	***2,175.5***	***8,176.6***	***7,527.0***	***8,176.6***	***100.0%***	-

2004 Present Rates	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*	*Scaled Revenues*	*HQD R-C Index*	*Cross-Subsidy*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,426.0	3,599.0	80.7%	862.3
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,085.0	1,139.8	121.8%	(203.8)
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,574.0	1,653.5	130.6%	(387.4)
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,881.0	1,976.0	115.9%	(271.1)
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***7,966.0***	***8,368.3***	***100.0%***	-

2004 with Constant Dollar Cross-Subsidy						*Future Revenues Const. $*				*Total Percent Increase*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,455.5	3,594.1	80.6%	867.2	0.9%
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,111.3	1,155.9	123.5%	(219.9)	2.4%
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,577.3	1,640.6	129.6%	(374.5)	0.2%
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,901.5	1,977.8	116.0%	(272.9)	1.1%
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***8,045.7***	***8,368.3***	***100.0%***	-	***1.0%***

Sources:

1) Load: HQD-8, Documents 2,4, page 17
2) Production/Transmission Costs/Distribution: HQD-8, Documents 2,4, page 13
3) Current Revenues: HQD-9, Document 1, pages 10 and 13

Exhibit IEc-HQD-5.2 Revised
2004 Revenue Requirement at 1.0 Percent Increase Scenario: 2002 to 2004
($ millions, except as noted)

2002 Actual	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*	*Scaled Revenues*	*HQD R-C Index*	*Cross-Subsidy*
Domestique	52,969	1,691.9	1,148.8	1,536.4	4,377.1	3,231.0	3,509.8	80.2%	867.2
Petite Puissance	13,859	398.3	222.1	331.8	952.2	1,079.0	1,172.1	123.1%	(219.9)
Moyenne Puissance	24,361	654.3	332.0	237.2	1,223.5	1,471.0	1,597.9	130.6%	(374.5)
Grande Puissance	45,171	1,120.2	433.5	70.1	1,623.8	1,746.0	1,896.7	116.8%	(272.9)
Tarifs reguliers	***136,360***	***3,864.7***	***2,136.4***	***2,175.5***	***8,176.6***	***7,527.0***	***8,176.6***	***100.0%***	-

2004 Present Rates	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*	*Scaled Revenues*	*HQD R-C Index*	*Cross-Subsidy*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,426.0	3,599.0	80.7%	862.3
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,085.0	1,139.8	121.8%	(203.8)
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,574.0	1,653.5	130.6%	(387.4)
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,881.0	1,976.0	115.9%	(271.1)
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***7,966.0***	***8,368.3***	***100.0%***	-

2004 with Constant Dollar Cross-Subsidy						*IEc Recommendation*				*Total Percent Increase*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,456.8	3,595.8	80.6%	865.5	0.9%
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,106.7	1,151.2	123.0%	(215.2)	2.0%
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,583.4	1,647.1	130.1%	(381.0)	0.6%
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,897.9	1,974.2	115.8%	(269.3)	0.9%
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***8,044.9***	***8,368.3***	***100.0%***	-	***1.0%***

Sources:

1) Load: HQD-8, Documents 2,4, page 17
2) Production/Transmission Costs/Distribution: HQD-8, Documents 2,4, page 13
3) Current Revenues: HQD-9, Document 1, pages 10 and 13

Interrogatories from FCEI

Request 1 Reference: Evidence of Robert D. Knecht, p. 5

Preamble:

If, for example, production cost increases (associated with the exhaustion of the heritage pool) require a production rate increase of 5 percent, small commercial customers would see an increase in current overall electricity rates of about 1.8 percent, but large industrial customers would face an increase of 3.2 percent.

Question:

Please provide all the assumptions and calculations, for each rate classes, that lead to the conclusion stated above.

Response:

Please see Exhibit IEc-HQD-1.1 and the response to HQD-AQCIE/CIFQ-1.

Request 2

Reference: Evidence of Robert D. Knecht, p. 13

Preamble:

While it is difficult for an outside consultant to say that a price increase will result in any near term plant closures or significant reductions in load in the near term without intimate knowledge of the economics of a specific plant, a wide variety of economic and econometric analyses confirm that load reductions will take place.

Question:

i. Please file all the relevant studies and analyses supporting the assertions made above;

ii. Please explain how the effect of electricity price increases for industrial users is different than for large commercial users and file any relevant studies or analyses;

iii. Please explain how the effect of electricity price increases for industrial users is different than that for small commercial users and file any relevant studies or analyses;

iv. Please explain how the effect of electricity price increases for industrial users is different than that for small residential users and file any relevant studies or analyses;

Response:

i. The cited assertion indicates that the demand for a product goes down as prices increase; i.e., that the product exhibits a downward sloping market demand curve. This relationship is generally attributed to Alfred Marshall in his Principles of Economics published in 1890. It is a fundamental precept of economics theory, found in every basic microeconomics textbook. These materials are a matter of public record.

ii. Please see the response to HQD-AQCIE/CIFQ-3.2, FCEI-AQCIE/CIFQ-3, FCEI-AQCIE/CIFQ-4.

iii. Please see the response to item ii above.

iv. The long-run price elasticity of electric power demand by large industrial customers associated with a provincial rate increase is likely to be higher than that for residential customers for reasons that are similar to those identified below relating to commercial customers. First, electricity costs generally constitute a higher percentage of total costs for large industrial customers than for residential customers, making it a more important decision-making criterion. Second, industrial customers have greater flexibility in moving their demand to locations with lower electricity rates; it is unlikely that tens of thousands of residents will relocate to avoid an electricity price increase.

While it is IEc's opinion that the demand for electric power is somewhat more elastic in the industrial sector than other sectors, it is important to recognize that an important thrust of IEc's report is that the long-run price elasticities of demand for electric power associated with local price increases in *all* sectors are high, and that the Régie should consider that elasticity in evaluating the magnitude of HQD's proposed new "sudden leap" policy in the context of a government-owned utility.

Request 3 Reference: Evidence of Robert D. Knecht, p. 14

Preamble:

Figure IEc-1 presents a comparison of the prices for various key commodities produced by HQD's industrial customers with heretofore-flat electricity prices.

Question:

i. Please provide a table and graph showing the average output per kWh consumed for each of the products presented in figure IEc-1 from 1998 to 2004;

ii. As productivity and efficiency improvements are requested of the Distributor, would it be normal to assume that industrial users have and will be improving their output per kWh consumed? In the affirmative or the negative, please explain;

iii. Please explain how the price constraints faced by large industrial users are different from those of manufacturers that are part of the small and large commercial users that operate in equally competitive markets.

iv. Please explain how the price constraints faced by large industrial users are different from those of municipalities, hospitals and school boards, institutions that are all part of small and large commercial users.

v. Whether there are differences or not, please explain, in each of the cases presented in ii, iii, and iv, how small and large commercial users can afford a larger electricity price increase than that of industrial users.

Response:

i. IEc has not compiled the requested information, nor did IEc rely on such analysis in preparing its report.

ii. IEc is unsure what the "productivity and efficiency improvements . . . requested of the Distributor" refer to in IEc's report. However, in an effort to be responsive, it is IEc's understanding that the interrogatory is attempting to make a parallel between rate reductions requested of HQD for providing its services with energy efficiency improvements made by large industrial customers. However, this comparison represents an "apples and oranges" combination. Product prices can be reduced in many ways, and not simply by improvements in only one aspect of overall productivity.

Both HQD and large industrial firms can lower their rates in three different ways. One way would be to simply pay a lower price for the factor inputs needed to supply distribution services, such as labor (lower salaries/wages), energy (lower purchased power costs), capital (better financing rates). To the extent factor input prices are set in competitive markets or by legislative fiat, it may be difficult to reduce rates in that manner.

The second way would be to reduce the amount of factor inputs needed to provide the service, such as reducing labor, energy, materials or capital stock needed per unit of service. Reductions in any of these factor inputs per unit of output represent a *productivity* improvement. However, because there are substitution effects between factor inputs (e.g., capital can be substituted for labor or energy), economists tend to think of productivity of all factors, a concept called total factor productivity. Simply looking at the energy use per unit of output is an incomplete picture of productivity effects.

The third way would be to reduce the return to shareholders.

The fact that product prices earned by Québec large industrial customers have declined relative to prices in general, as shown in Figure IEc-1, implies that these companies have been able to, or have had to, reduce prices through one of these means. How each company has effected these price reductions is not known to IEc, but is surely specific to the company.

iii. It is not possible to respond to this request in a way that is applicable to every circumstance. Each large industrial customer, each small commercial customer and each medium commercial customer face very different markets for their own products, cost structures, and competitive conditions, all of which impact their demand for electric power. However, the long-term demand responses of all business customers in very competitive markets are related to their ability to pass on price increases to their own customers. Many small and at least some mid-size businesses compete primarily with other firms who take service from HQD. If all the competitors in a particular industry face the same price increase, customers have little ability to switch suppliers to avoid the price increase. For large industrial customers, however, with prices set in world markets, the HQD rate increase has little to no impact on world prices for those products. They therefore have less opportunity to pass on those rate increases, and are more likely to either disinvest in existing facilities, transfer manufacturing activity to other locations, lose market share or close.

Consider one component of both small and medium sized businesses, namely retail stores. The retail business is quite competitive, and therefore may meet the assumption in the interrogatory of businesses that are "equally competitive" with those in the large industrial rate classes. Moreover, a price increase for electric power will obviously not help the competitive position of these businesses. However, much of the competition in the retail sector comes from other HQD customers in the retail sector. If all competitors in a particular market all face the same electricity rate increases, they all are better able to pass those increases on to their customers than those customers who compete with firms in other jurisdictions.

A second important generic difference between large industrial and small/medium commercial customers is the percentage of operating costs that are related to electric power. Because Québec is and has been a relatively low-cost jurisdiction for electric power, it has attracted industries that are very electric-intense. Electric costs therefore can comprise a very high share of the operating costs of the business. The higher the

share of costs represented by electricity, the greater will be the impact of an electric price rise. Again, while each business has its own cost structure, it is IEc's experience that the type of large industrial customers served by HQD (forest products, aluminum, electric-furnace steelmaking, etc.) have a relatively high share of costs associated with electric power compared to typical small and medium commercial businesses.

As a very simple example, IEc is a commercial electric customer, occupying about 24,000 square feet of office space in an all-electric building in Cambridge, Massachusetts (not, unfortunately, a low-cost electric jurisdiction). For our business, IEc's electric costs (including all electric cost borne by the landlord) comprise some 0.5 percent of operating costs. By way of contrast, the electric costs for some of HQD's large industrial customers represent up to 65 percent of operating costs. Thus, a significant increase in electric costs will have a greater impact on management decision-making at a large industrial customer than for IEc.

iv. IEc believes that the factors described in the response to part iii above apply also to public institutions, in that they are better able to pass on increases (in some cases, by redirecting government funding or by growth in tax revenues) and that electricity is, in general, a smaller share of the operating costs of these customers, relative to large industrial customers.

v. Please see the responses to items ii, iii and iv above.

Request 4 Reference: Evidence of Robert D. Knecht, p. 15

Preamble:

The recent weakness in the US dollar, particularly vis-à-vis the Canadian dollar, decreases the international competitiveness of Canadian producers.

Questions:

i. Please explain how the appreciation of the Canadian dollar vis-à-vis the US dollar affects differently Canadian producers that are part of the small commercial, large commercial and industrial users.

ii. If there are no differences, please explain how small and large commercial users can afford a larger electricity price increase than that of industrial users.

iii. If there are differences, please state their nature and how they support a larger electricity price increase for small and large commercial users relative to industrial users.

Response:

i. As was the case in the response to FCEI-AQCIE/CIFQ-3, it is impossible to make a general rule for every small, medium and large business served by HQD, in respect of the impact of the appreciation of the Canadian dollar vis-a-vis the US dollar. However, as detailed in that response and in the IEc report, the prices for the products of large industrial customers tend to be set in international markets and are often US dollar-based. An appreciation of the Canadian dollar reduces the competitiveness of firms whose costs are denominated in Canadian dollars (e.g., labor and electricity). While some small and medium businesses compete with businesses in other countries, a larger percentage of these firms compete with other Québec or Canadian competitors. As such, the appreciation of the Canadian dollar has a relatively smaller competitive impact on these sectors than on those that compete extensively with foreign firms.

ii. N/A

iii. As detailed on pages 14-15 of the IEc report, IEc's primary observation was that the timing of the "sudden leap" policy direction was inopportune for reasons of the international competitiveness of its business customers. Pursuant to the logic in part i of this response, the timing of the "sudden leap" strategy is inopportune for both industrial and commercial customers who compete in international markets. However, as stated in part i of this response, the impact of the appreciation of the dollar on competitiveness is likely to be greater for large industrial customers than that for commercial customers.

Request 5 Reference: Evidence of Robert D. Knecht, p. 18

Preamble:

In its phase 1 decision in these proceedings, the Régie accepted the use of the HQD index as the appropriate measure of cross-subsidization.

Question:

i. Please explain how the use of the dollar values of the cross-subsidies are consistent with the decision D-2003-93 about cross-subsidies;

ii. Have any revision to decision D-2003-93 about cross-subsidies been published by the Régie;

iii. Please explain why the Régie should consider the dollar values of the cross subsidies when deciding about the relative tariff increases of each rate class in the framework of phase 2;

Response:

i. As stated in the IEc report, and as detailed in IEc's report in Phase 1 of these proceedings, it is algebraically impossible to hold cross-subsidies constant using the HQD index measure. Moreover, it is IEc's understanding of the Régie's Phase 1 decision that it would consider other factors in developing the proposed revenue requirement. IEc observes that the cross-subsidy issues in Phase 1 of these proceedings were essentially theoretical, in that no specific rate increase was proposed. When faced with real numbers, a regulatory authority may depart from the purely theoretical. Moreover, Phase 1 was conducted under a stated policy of Hydro Québec that the transition to full recovery of the revenue requirement would take place through rate increases on the order of price inflation. In the current context, with a request from the distributor for a "sudden leap" in rates and with specific dollar figures on the record, IEc recommends that the Régie also consider the dollar value impact on the massive cross-subsidies provided from all the business classes to the residential class, and the related effects on economic development. Finally, IEc observes that a slavish arithmetic adherence to the HQD index would imply a larger rate increase for commercial customers than a constant dollar approach, particularly for medium commercial customers.

ii. While IEc is unaware of any changes published by the Régie, HQD has proposed a very significant change in the policy environment from the one in which the Phase 1 decision was made.

iii. Please see the response to part i and part ii.

Request 6 Reference: Evidence of Robert D. Knecht, pp. 18-19

Preamble:

For example, the more price elastic demand of industrial customers and their greater exposure to future production and transmission cost increases suggest mitigating the rate increase for that class.

Question:

i. Please provide all the assumptions and all the calculations supporting the position stated above;

ii. Please explain how the exposure to production and transmission cost increases vary between domestic, small commercial, large commercial and industrial users;

iii. Please explain how this recommendation can be defended in the context of the decision by the Régie stating that the HQD index is the appropriate measure of cross-subsidies.

Response:

i. The relative exposure of a rate class to production or transmission cost increases is a function of the percentage of current revenues generated by that class that are related to production and transmission costs. Because large industrial customers are assigned only minimal distribution costs, production and transmission costs represent a significant share of current revenues. See Exhibit IEc-FCEI-6i for a summary of share of rates represented by production and transmission costs. Please see also responses to HQD-AQCIE/CIFQ-1.1 and Exhibit IEc-HQD-1.1.

ii. Please see response to FCEI-6(i).

iii. It is not IEc's understanding of the Régie's decision in Phase 1 of these proceedings that it will consider *only* the HQD index in developing class revenue requirements. For example:

> *"Alternatively, it is also necessary to avoid the adoption of [cross-subsidy] guidelines that are so rigid that they would render the other legal provisions useless and prevent the Régie from exercising its judgment in the process of establishing just and reasonable tariffs."* (D2003-93, page 182)

IEc recommends that the Régie consider many factors in subjectively evaluating the relative revenue requirements for the various rate classes, one of which is relative exposure to future production and transmission cost increases.

Exhibit IEc-FCEI-6i Revised
2004 Cost Shares by Function
($ millions, except as noted)

2004 Present Rates	*Load (GWh)*	*Production Cost*	*Transmission Cost*	*Distribution Cost*	*Revenue Reqm't*	*Current Revenues*
Domestique	55,884	1,786.1	1,167.8	1,507.4	4,461.3	3,426.0
Petite Puissance	13,916	399.9	218.0	318.1	936.0	1,085.0
Moyenne Puissance	25,952	696.8	327.0	242.3	1,266.1	1,574.0
Grande Puissance	48,467	1,202.0	431.2	71.7	1,704.9	1,881.0
Tarifs reguliers	***144,219***	***4,084.8***	***2,144.0***	***2,139.5***	***8,368.3***	***7,966.0***
2004 Percent of Current Rates						
Domestique		52%	34%	44%	130%	100%
Petite Puissance		37%	20%	29%	86%	100%
Moyenne Puissance		44%	21%	15%	80%	100%
Grande Puissance		64%	23%	4%	91%	100%
Tarifs reguliers		***51%***	***27%***	***27%***	***105%***	***100%***

Sources:

1) Load: HQD-8, Documents 2,4, page 17
2) Production/Transmission Costs/Distribution: HQD-8, Documents 2,4, page 13
3) Current Revenues: HQD-9, Document 1, pages 10 and 13

Interrogatories from UC

Question 1: Référence: AQCIE/CIFQ : Preuve d'expert de M. Robert D. Knecht, page 2

> *« In sum, IEc concludes that HQD's new strategy of moving to full revenue requirement recovery within the next six months through a large distribution rate increase is inconsistent with stable public policy and regulatory economics principles.»*

1.1 Veuillez fournir des exemples de politiques publiques et de principes de réglementation économique qui ont permis de ralentir le rythme de récupération des revenus requis d'un service public (électricité, gaz, etc.).

Response:

1.1 As a matter of clarification, IEc is not proposing a slowdown in the recovery of the revenue requirement. IEc's proposal is reasonably consistent with previously announced policies of Hydro Québec, and recognizing the changes in HQD's cost structure. Thus, rather than promoting a "slowdown," IEc is opposing a "speedup."

A stable public policy is one in which the announced intentions of the government are consistently implemented, and are not subject to sudden changes. A stable public policy is advantageous for attracting investment and retaining existing businesses in a particular jurisdiction, for the reasons stated in the IEc report. In the case of electricity intensive industries, consistently following the stated intentions of the government makes Québec a more attractive place for investment or re-investment than a policy which is subject to sudden change.

In respect of regulatory economics principles, the principle of "avoidance of rate shock" or "gradualism" supports the gradual implementation of achieving the full distribution revenue requirement.

Question 2: Référence: AQCIE/CIFQ : Preuve d'expert de M. Robert D. Knecht, page 21

> *« By proposing that this deficiency be deferred for future recovery from other classes of ratepayers, HQD's proposal transforms a "subsidy" from the shareholders into a "cross-subsidy" from other ratepayers. The Rate BT deficiency is not related to any costs caused by the other rate classes, and therefore cannot be allocated as a cost to the other rate classes under cost causation principles. It is therefore not properly a component of the revenue requirement for regular rate customers.»*

2.1 Veuillez préciser si vous connaissez un organisme de réglementation qui a déjà autorisé le transfert aux consommateurs de coûts qui n'ont pas de lien de causalité avec leur consommation dans une situation comparable à la demande d'HQ pour la couverture du déficit du tarif BT.

2.2 Dans l'affirmative, veuillez décrire le contexte et rapporter les décisions de l'organisme de réglementation en question.

Response:

2.1 In responding to this interrogatory, two separate concepts must be delineated. The first is how the costs of providing service to Rate BT should be allocated in the cost of service study. The second is what rates should be charged to Rate BT, and whether it is necessary for those rates to recover the fully allocated costs. All regulatory commissions require some customer classes to pay for costs that are not caused by their demands on the system. If customer classes were all required to pay only for the costs caused by them, all customer classes in every rate proceeding would exhibit revenue-cost ratios of unity. In the other jurisdictions, requiring other customer classes to pay for the Rate BT shortfall would not *theoretically* be different than requiring other HQD customer classes to pay for the residential shortfall.

However, in the context of the Act in Québec, Rate BT is not automatically entitled to the cross-subsidy protections for the residential class embedded in the Act, and HQD is proposing to begin offering a massive cross-subsidy to that class. Moreover, it is IEc's view that the circumstances surrounding the development of the new BT shortfall are not sufficient to begin providing an additional cross-subsidy entitlement to a new class of customers. It is IEc's understanding that HQD attempts to get around this legal problem by arguing that the costs of providing the service to Rate BT should be allocated to other rate classes, thereby avoiding the cross-subsidy problem. However, it is IEc's view that HQD can only do so by re-assigning costs related to Rate BT to the other rate classes in contravention of the principle of cost causation.

In response to the interrogatory, IEc is not aware of any regulatory authority that specifically decided not to allocate costs on what it considered to be a cost causation basis. However, it should be noted that IEc does not always agree with regulatory authorities' interpretation of cost causation.

2.2 N/A