

Responses to *Régie de l'énergie's* Interrogatories

R-3552-2004 – March 9, 2005

1. Références : (i) Pièce HQD-1, document 1, pages 35 et 36 (ii) Rapport des experts communs de FCEI/AIPVFQ, ROEE, RNCREQ, UC et UMQ (version corrigée), pages 50 et 51

Préambule :

Dans le cadre du programme *Inspection énergétique Énergide de l'AEÉ*, le propriétaire d'une habitation doit déboursier les montants suivants pour l'inspection énergétique de type A :

- > 150 \$ pour un bâtiment unifamilial;
- > 300 \$ pour un duplex ;
- > 450 \$ pour un triplex.

Dans leur rapport, les experts Dunsky, Belliveau et Plunkett mentionnent que :
« *Hydro-Québec has proposed to maintain upfront 'A' evaluation audit cost at their current level of \$ 150 par audit. [...] we recommend that Hydro-Québec and the AEÉ launch a limited pilot project in which audits are provided at a reduced \$ 50 rate.* »

Le rapport des experts ne semble pas aborder le cas des duplex et des triplex.

Demande :

1.1 Veuillez indiquer si les coûts de l'inspection de type A doivent être maintenus à 300 \$ pour un duplex et à 450 \$ pour un triplex. Si oui, veuillez expliquer pourquoi. Si non, veuillez présenter et justifier votre proposition.

Answer :

Indeed, we neglected to specify the 'plex' market. In fact, the same logic applies to duplexes and triplexes, and we suggest they be included in the pilot project. The pilot should evaluate a similar 'A' audit cost option, i.e. \$50 per unit instead of \$150/unit. For duplexes and triplexes, this comes to \$100 and \$150 respectively.

2. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROÉÉ, RNCREQ, UC et UMQ (version corrigée), pages 36 et 37

Préambule :

« However, best practice suggests that incentives can be used more effectively when aimed primarily at the builder community, and when supplemented by the full suite of strategies required to address the other barriers and players (see below).

[...]

Recommendation : Shift a share of the proposed customer incentive upstream to builders, subject to adoption of the full suite of complementary strategies discussed below. »

Demandes :

2.1 Veuillez indiquer le nombre d'entrepreneurs (constructeurs) actuellement accrédités pour la construction de maisons *Novoclimat* au Québec.

Answer :

As of mid-January, there were approximately 175 accredited entrepreneurs. This number is expected to increase substantially (to 275 or more) within the coming month following a recent direct mailing by the *Agence de l'efficacité énergétique*.

2.2 Veuillez expliquer concrètement comment le transfert d'une partie de l'aide financière aux entrepreneurs permettrait d'abaisser les barrières économiques à l'achat et ainsi d'assurer une meilleure participation au programme. Veuillez notamment indiquer si ce transfert doit avoir un effet sur le nombre d'accréditations *Novoclimat* et, si oui, dans quelle proportion.

Answer :

The market for new homes is supply-driven: builders develop projects and market them aggressively. This sales effort strongly influences buyer decisions, more so than in many other markets (this is because of the central role intangibles – location, design, etc. – play in new home purchasing).

Supply-push strategies have been proven to succeed in the new homes market precisely because of the central role marketing plays in buyer decisions. **The builder is always better placed than the utility to influence home buyers' decisions.** Builders have the advertising channels, the flexibility and the know-how to reach customers directly. While utilities can *aid* builders in developing promotional materials and in understanding efficiency performance, builders are best suited to make the sale. As long as *Novoclimat* homes do not provide considerable direct benefits to builders, they are unlikely to invest their full efforts into selling the product.

Best practice experience strongly upholds this program theory. While demand-side incentives may be used for more customer-driven measures like choices of appliances, lighting, etc., *all* of the best practices we're aware of focus new home construction incentives on the supply side.

To this effect, we take this opportunity to correct an error in our initial report, as follows:

Some efficiency programs focus almost entirely on the incentive strategy. For example, the New Jersey Energy Star for Homes program provides incentives covering 100% of incremental construction costs.²⁴ Combined with measures aimed at other barriers, the New Jersey incentive approach has been very successful, moving the State from a 4% market share to a 35% market share in only three years. Vermont and Texas have achieved similar penetration rates (roughly 50% market share in Texas), though with a broader suite of measures. In all cases, incentives are targeted primarily at builders, whose enthusiastic participation leads to high sales. ~~Most other successful programs, however, have placed far greater emphasis on the supply side (builders), offering higher incentives and adopting a broader suite of measures to address other barriers. For example, in Texas and Vermont, incentives are focused almost exclusively at builders, with tremendous results (nearly 50% market share in Texas in 2004).~~

Indeed, while the initial text seemed to suggest that New Jersey's incentives may be directed at buyers, quite the contrary is true: incentives are directed at builders, as is the case with Vermont, Texas and others.

Finally, as for the effect this would have on the number of accreditations, it would be logical that greater success would also lead to more accreditations. However, the primary change we seek to bring is not so much in the number of accreditations per se, but in the number of Novoclimat homes the accredited builders actually develop.

3. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROÉÉ, RNCREQ, UC et UMQ (version corrigée), page 41

Préambule :

« Hydro-Québec has proposed to cover 75% of the incremental costs of Novoclimat efficiency standards for social housing units. (...) In terms of barriers, first -cost and capital access barriers play a much greater role. (...) we fail to understand why Hydro-Québec has chosen not to cover the totality of incremental costs. »

Demande :

3.1 Veuillez spécifier à quel type de propriétaire cette mesure s'applique et motiver la proposition à l'effet que le Distributeur défraie 100 % des coûts incrémentaux de Novoclimat.

Answer :

The measure as we understand it applies to housing projects financed in part by the SHQ's *AccèsLogis* or *Logement abordable Québec* programs.

The reason we propose that Hydro-Québec cover the full incremental cost is threefold:

- > First, since participation in SHQ programs is based on a "needs test" (i.e. is reserved for those with limited incomes), the first cost and capital access barriers are particularly acute. Since the SHQ *AccèsLogis* contribution is presumably already calibrated to provide the minimum required to make participation accessible for this population segment, they are unlikely to have additional access to capital or borrowing ability. If this is the case, then covering the additional 25% of incremental cost is necessary.
- > Second, while the SHQ could theoretically increase its contribution to total costs (given the resulting reductions in *Supplément au loyer* payments), it seems unwilling to do so in a context of limited capital and considerable construction expectations.
- > Third, doing so remains cost-effective for Hydro-Québec. As indicated on page 41 of our report, we estimate the incremental Novoclimat cost for social housing units at approx. 4.1¢/kWh (compared to ~3¢ that Hydro-Québec is proposing to cover). While this is slightly above the overall PGEÉ average, it also avoids higher costs than the PGEÉ average (approx. 10¢ avoided costs) and, as such, offers a very respectable 2.5:1 benefit/cost ratio. Note that this 2.5:1 B/C ratio includes only Hydro-Québec's direct avoided costs; including non-energy benefits would suggest substantially higher net benefit.

That being said, we recently learned that the City of Montréal currently offers an additional incentive of its own, valued at between \$100 and \$500 depending on the program component. This additional incentive may reduce or eliminate the need for Hydro-Québec to increase its incentive in order to cover 100% of incremental costs.

4. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROÉE, RNCREQ, UC et UMQ (version corrigée), page 53

Préambule :

Le tableau 8 fait état des taux de participation observés pour six programmes de rénovation nord américains. Dans ce tableau, les experts communs présentent les « *Vermont Gas Systems high-use weatherization program* » et « *NSTAR Residential High-Use Program* ».

Demande :

4.1 Veuillez spécifier la définition de « *high use* » dans ces deux cas.

Answer :

Vermont Gas Systems: In theory, Vermont Gas uses a threshold of 1400 CCF to determine “high use”. In practice, they assess whether a home seems to present high consumption levels through a short phone conversation with the occupant. The conversation aims to assess general home characteristics (size, age) against which the reasonableness of metered consumption can be measured.

NStar (Massachusetts): NStar Electric used to use a threshold of 12,000 kWh/year, but has since reduced that to 8000 kWh/year load to determine high-use customers. As with Vermont Gas, however, the threshold is only used to identify *potentially* eligible customers; a questionnaire-based assessment determines actual eligibility.

5. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROÉÉ, RNCREQ, UC et UMQ (version corrigée), pages 68, 84 et 85

Préambule :

À la page 68, les experts communs exposent qu’un certain nombre d’arguments raisonnables soutiennent l’intégration, dans le programme *Mieux consommer – Energy Star*, de différents types de mesures, bien que ces dernières soient différentes.

Les experts communs s’opposent cependant à l’intégration des pompes géothermiques à ce programme, sur la base des éléments suivants :

« Geothermal pumps are part of an entirely different market – the market for primary home heating systems. Their sale and installation involve a completely different set of market actors – ranging from home builders to contractors to financial institutions – and, as such, their promotion requires working through entirely different channels. From a barriers perspective, they more closely resemble those that apply to the new homes construction market. Finally, their capital cost and long lifetimes put them in a completely different category from a consumer perspective.

For these reasons, we urge that geothermal heat pumps be considered on their own merits, in the context of a distinct program. »

Par ailleurs, aux pages 84 et 85, les experts communs se disent surpris de constater que le Distributeur n'ait pas inclus les fenêtres efficaces à son programme *Mieux consommer – Energy Star* « *Efficient Energy Star windows offer a considerable energy savings opportunity for Québec. [...] With Québec's cold climate and high electric space heat saturation, efficient windows should play a major role in Hydro-Québec's MC/ES program.* » Les experts recommandent de développer immédiatement « *an efficient windows initiative as part of the MC/ES programme. This initiative should focus simultaneously on upstream collaboration with – and incentives to – the windows manufacturing industry, and sales-end promotions at the retail level.* »

Demande :

5.1 Veuillez concilier la position des experts en ce qui a trait à l'exclusion des pompes géothermiques et à l'inclusion des fenêtres efficaces du programme *Mieux consommer – Energy Star*.

Answer :

The primary reason for including windows within the MC/ES program is that the program we propose is aimed at *natural replacement*, not early retrofit. As such, the program strategies will closely resemble those of appliances – point of purchase marketing and rebates. The point is to convince buyers to choose the Energy Star or *Mieux consommer* model when shopping for similar models, despite a slightly higher cost.

Geothermal systems on the other hand represent a radically different option for the consumer, with considerably different implications in terms of cost, performance and hassle factor. Purchase channels are also different, as are the extent of incremental capital costs.

In other words, while a windows retrofit program may have fallen outside the natural purview of the MC/ES program, the windows *replacement* program we propose falls more squarely within it.

6. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROÉÉ, RNCREQ, UC et UMQ (version corrigée), pages 85, 86 et 88

Préambule :

« *These power supplies will save on average more than 80 kWh/year per desktop and 300 kWh/year per server. Given extremely fast computer rollover, transformation on the supply side can lead to 100% market penetration within four years. (...). The “80+” program is aimed at transforming the power supply market for desktop and stand-alone servers*

from current standards to 80 %-or-higher efficient power supplies. These power supplies will save on average more than 80 kWh/year per desktop and 300 kWh/year per server. (...). Incentives are set at \$ 5 for efficient desktop power supplies and \$10 for efficient stand-alone servers; (...). A number of utilities, including all four California utilities, Efficiency Vermont, National Grid, Nstar and others, have committed to providing incentives to 80+ sales. Recently discussions have begun with several large corporations toward including 80+ in their computer procurement specs, while the U.S. government's Federal Energy Management Program has advised all government agencies to do the same. Significantly, positive discussions now appear to be underway with a leading computer manufacturer. (...) The 80+ program is a unique opportunity for Hydro-Québec to join with leading North American utilities in transforming the market for energy efficient power supplies. (...) Hydro-Québec should immediately commit to it. »

Demandes :

6.1 Veuillez fournir les hypothèses et les sources d'information permettant d'établir le potentiel d'économie d'énergie lié à cette mesure.

Answer :

The reported savings are 80 kWh/year for desktops and 300 kWh/year for servers. These are based on the following assumptions. Note that contrary to other analyses, we did not include cross effects here, partly from lack of cross effect information for the commercial sector.

For desktops:

- > Market share: 75% residential, 25% commercial/institutional
- > Savings (residential)
 - o baseline consumption of 318 kWh/year
 - o 80% efficient power supplies consumption of 243 kWh/year
- > Savings (comm/inst.):
 - o baseline consumption of 362 kWh/year
 - o 80% efficient supplies consumption of 274 kWh/year
- > Average desktop savings: $(318-243)*75%+(362-274)*25%=$ **79 kWh/year savings**

For servers:

- > Baseline consumption of 1263 kWh/year
- > 80+ efficient supplies cons. of 962 kWh/year
- > Thus $1263-962 =$ **301 kWh/year savings**

Finally, please note that consumption for both baseline and 80+ units is based on the following hourly operating distribution:

	StandBy	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Totals
Residential Operating Hours												
Proportion of Year:	60%	10%	20%	6%	2%	1%	1%					100%
Operating Time (hr/yr)	5260	877	1753	526	175	88	88	-	-	-	-	8766
Commercial Operating Hours												
Proportion of Year	37%	40%	15%	6%	1%	1%						100%
Operating Time (hr/yr)	3243	3506	1315	526	88	88	-	-	-	-	-	8766

The data originate from work done for the Lawrence Berkeley National Laboratory and are used by the 80+ program and accepted by participating utilities throughout North America.

6.2 Veuillez indiquer le coût moyen d'un bloc d'alimentation d'ordinateur efficace.

Answer :

The incremental cost of the high-efficiency transformer is estimated at \$5 USD (this is actually the incentive offered). This cost is borne by independent transformer manufacturers who sell to large computer makers (e.g. Dell, HP, Apple) and value-added resellers (VARs).

6.3 Veuillez indiquer la période de retour sur l'investissement du client, sans subvention du Distributeur.

Answer :

First, it is important to understand that this is primarily a turnkey, upstream market transformation program. As such, it would involve payments to a third party contractor, not subsidies to clients.

Nonetheless, we calculated the payback period. Assuming average cross effects of 41% in the residential sector and 20% in the commercial sector (including servers), the *measure* itself presents a payback period of 2.3 years for residential desktops, 1.5 years for C&I desktops and 0.9 years for servers.

Again, we stress that this is not a retail-based program, and that clients (with the exception of large-volume institutional purchasers) in no way have the opportunity to "choose" the higher-efficiency models. The payback period is thus theoretical only.

6.4 Veuillez indiquer les avantages et les inconvénients du lancement d'un tel programme par le Distributeur comparativement à la transformation du marché en travaillant directement avec les manufacturiers d'ordinateurs.

Answer :

Our apologies if the text of our report was unclear. In fact, this is precisely the upstream market transformation approach the question above seems to imply could be useful, except that it is being run on a continental – as opposed to provincial or State-wide – level.

For background, computer transformers are made by independent manufacturers, largely located in Asia. They are sold to large computer makers and, to a lesser extent, to value-added resalers (VARs) who assemble computers locally. Hydro-Québec alone cannot influence the manufacturers; only a concerted, continent-wide approach has the ability and market volume to affect the manufacturing practice of manufacturers operating in a globalized market.

This program is one of upstream market transformation. It focuses on a combination of market pull and market push strategies. The market pull strategy is rooted in the collaboration of North America's leading utilities, coming together to offer incentives directly to manufacturers for sales of 80+ units. This is what we are proposing that Hydro-Québec join. Simultaneously, it includes a market push strategy rooted in two dynamics: first, technical assistance in developing, testing and approving 80+ units, and second, efforts to have the U.S. DOE's Energy Star program revise its own computer specifications up to the 80+ standard. The latter element has recently evolved significantly, and a final decision on Energy Star specs will be taken within one year from now. Note that roughly 90% of computers are currently deemed *Energy Star* compliant (under the old specs).

At this point, and given recent developments, we believe Hydro-Québec's joining the 80+ program will send a valuable signal to manufacturers *and* Department of Energy staff regarding interest in moving to an 80+ standard. We now believe this is by far the likeliest of the three scenarios we laid out in our report, i.e. scenario 3 on page 88. Given this likelihood and the regulatory timeframe that has been announced, we can only emphasize again the value of Hydro-Québec joining this program without further delay. We also remind the Régie that should scenario 3 occur, the cost to Hydro-Québec will, for all intents and purposes, be next to nil.

7. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROEE, RNCREQ, UC et UMQ (version corrigée), page 111

Préambule :

En ce qui a trait au programme d'*Initiatives énergétiques bâtiments CI*, les experts communs recommandent de rejeter la structure de support financier proposé par le Distributeur et d'adopter plutôt « *a replacement structure based directly on*

incremental costs, and modulate the incentive levels to encourage comprehensive projects and to account for differences between lost opportunity and retrofit needs. »

Demande :

7.1 Veuillez proposer une structure de remplacement et veuillez quantifier l'impact financier d'une telle modification.

Answer :

Our recommendation

We recommend that Hydro-Québec adopt an incentive structure that rewards comprehensiveness. The tenet of such a structure is an incentive that pushes customers to look for additional savings; to become more comprehensive in their approach to energy savings projects.

Our specific proposal is as follows:

Proposed Revised CI Initiatives Incentive		
Type of project:	Existing (Early Retrofit)	New Construction / Replacement
Incentive base:	Percent of installed cost	Percent of incremental cost
Savings Threshold		
0-5%		
5-10%		75%
10-15%		
15-20%		
20-25%		85%
25-30%	60%	
30-35%		
35-40%		90%
Over 40%	70%	

As an option, in addition to the percent of incremental cost approach, Hydro-Québec could institute a payback floor to its structure. Should Hydro-Québec go this route, we would recommend that they limit new construction project incentives to a two-year payback floor and existing projects to an 18 month floor. Hydro-Québec should continue with its proposed \$500,000 project cap.

Finally, as noted in our report, projects would of course be automatically subject to a cost-effectiveness screen.

Cost impact

While it is beyond the scope of our mandate to analyze the financial impact of a change in incentive structure, there are a few items to consider:

- > Our change is primarily a structural, not incentive level, change. Overall, we believe its impact will be to reduce the relative cost (¢/kWh) paid by Hydro-Québec and increase participation and thereby energy and economic savings.
- > Hydro-Québec's proposal, while *theoretically aimed at* covering 50-75% of incremental costs, is far more likely *in practice* to end up covering a much higher share of incremental costs. This is because in practice its incentives – as a function of incremental cost – will vary tremendously (as noted in our report, they would cover anywhere between 16% to 115% of incremental costs of the CMNEB+25% target measure, depending on the customer type). As such, participation will tend to be far more weighted toward those who receive the high % of incremental cost incentives, while those being offered low incentives are less likely to participate. While difficult to quantify, **we believe Hydro-Québec's proposal *in practice* is likely to cover at least 75-100% of incremental costs on average.**
- > Our proposal for new construction / replacement would provide incentives covering between 75%-90% of incremental costs. This is comparable to (though lower than) the likely range for Hydro-Québec's proposal. As such, we don't believe this proposal will materially affect the per-project cost.
- > We also note that our proposal for new construction / replacement is similar to the program approach used in Massachusetts (75%-90% of incremental cost). From experience, we know that total incentives paid in that State average approximately $\$0.20\text{USD/ann.kWh}$. When compared with Hydro-Québec's total (not marginal) incentive ($\$0.10\text{-}0.37\text{CAD/ann.kWh}$ for 1%-40% savings), we see that our proposal falls squarely in the middle of the range. Again, this suggests no material per-project cost difference between our proposal and Hydro-Québec's.
- > Our proposal for existing (early retrofit) projects would provide typical incentives of between 40%-60% (slightly more in exceptional cases) of *total cost*. While this represents a larger per-project amount, each early retrofit will also generate considerably greater savings. Contrary to the comparison with new construction / replacement, it is difficult to compare this component with Hydro-Québec's likely average incremental cost coverage. However, we note that CI programs in Massachusetts, which offer to cover 50% of installed costs for retrofit projects (thus are similar to our proposal), end up spending roughly $\$0.15\text{USD/ann.kWh}$ for these programs. We can then compare this to Hydro-Québec's proposal, which would offer total (not marginal) incentives to the existing retrofit market of $\$0.10\text{-}\0.51CAD/ann.kWh (for 1%-40% savings). As we see, real-world

experience from Massachusetts suggests that our incentive would tend to be on the low end of Hydro-Québec's proposal range.

- > Total incentive spending depends on how many customers of each type avail themselves of the program. In Hydro-Québec's *CI Initiatives* program, they cannot control the number of customers saving 10%, 20% or 50% applying for program incentives. The cents per kWh spent are a direct result of the depth of savings attained, and budgets presented are merely forecasts. The same is true with our proposal, although we believe that it will generate greater participation and thus greater benefits than Hydro-Québec's.

In sum, we believe our proposed changes will result in similar or lower incentives provided to energy efficient projects, all things being equal. We do believe, however, that the program will be more successful and therefore receive a greater number of projects.

8. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROÉÉ, RNCREQ, UC et UMQ (version corrigée), page 131

Préambule :

En ce qui a trait au programme Mieux consommer – Power Smart, clientèle d'affaire, les experts communs exposent qu'ils sont « *concerned the incentive amounts may be insufficient. While Hydro-Québec has indicated that it has not yet determined the precise incentives for specific measures, it has provided overall incentive targets that seem low compared with other utilities.* »

Demande :

8.1 Veuillez indiquer si des prêts sont appropriés, au lieu des subventions prévues dans le cadre de ce programme.

Answer :

No, experience suggests that financing is not the prime barrier when it comes to prescriptive measures. Rather, customers are swayed when incremental costs are reduced or annulled.

9. Référence : Rapport des experts communs de FCEI/AIPVFQ, ROÉÉ, RNCREQ, UC et UMQ (version corrigée), pages 24, 42, 45, 60, 65, 72 et 84.

Préambule :

« *If results of the ongoing evaluation of the Negawatts pilot project are positive, consider supplementing the current automated diagnostic approach with targeted*

on-site home visits. Specifically, consider using the on-site visits to target communities with aboveaverage residential consumption.

(...)

On an interim basis, increase the proposed incentive to the social housing segment in order to cover the full incremental costs.

(...)

Reject Hydro-Québec's target market penetration and adopt a target market share of 25% on average during the period 2005-2010.

(...)

Adopt an annual revision of the fee schedule paid to delivery agencies and index them to inflation for budgetary purposes.

(...)

Consider integrating an appliance replacement component where economics warrant.

(...)

Ensure comprehensive and integrated renovation designs that account for the interactive effects of measures, including on HVAC capacity sizing.

(...)

Offer a standard, year-round rebate of roughly \$3 per CFL (starting higher, declining with time) in addition to temporary joint promotions with large retail outlets.

(...)

Build the efficient appliances effort around a combination of standard rebates, joint promotions and salesperson incentives. »

Demande :

9.1 Veuillez évaluer les impacts budgétaires et les objectifs en termes d'économie d'énergie pour chacune de ces recommandations. Veuillez indiquer, pour chaque recommandation, s'il y a lieu de contribuer par voie de subvention ou en facilitant le financement.

Answer :

Regarding budgetary impacts

It is obviously impossible for us, in the span of a few days, to perform the analysis requested by the Régie. Nonetheless, for a proposal-by-proposal review of cost-effectiveness issues, please see our response to Hydro-Québec's Question 1, reproduced below.

Reproduction of Our Response to Hydro-Québec's Question 1:

“Answer:

As indicated in our report, our recommendations are strictly limited to cost-effective changes that are aimed at maximizing the PGEÉ's

net benefits. We adopted different approaches to ensuring that recommended changes are cost-effective:

Firstly, of the 74 recommendations, the vast majority involve no-cost/low-cost strategy improvements. In these cases, costs are either *negligible* (e.g. relocate the audit link to a more prominent place on Hydro-Québec's web page), *nil* (e.g. transfer a greater share of the proposed incentives from buyers to builders) or *negative* (e.g. replace geothermal incentives with a less expensive leasing strategy). For these measures, we did not provide an economic analysis of the proposals because they should not materially affect current cost-effectiveness.

Secondly, in cases where our recommendations involve higher incentives, we *did* assess measure costs and benefits in order to ensure cost-effectiveness. Specifically:

- > *Novoclimat social housing segment*: We proposed that Hydro-Québec increase its incentive to social housing new construction from 75% to 100% of incremental costs. We estimated the incremental cost at 1¢/kWh and the total cost at 4.1¢/kWh (for that segment of the program only), generating a total social housing segment benefit/cost ratio of 2.5:1 (see pp. 41-42).
- > *EnerGuide for Houses pilot project*: We proposed a limited-scale pilot project to assess the merits of covering a part of the initial audit cost for 'A' level inspections. We estimated the incremental cost at 0.5¢/kWh (see pp. 50-51). This does not materially affect the program's overall cost-effectiveness.
- > *Low-Income Direct Install*: We proposed a structural change to the way in which Hydro-Québec pays its delivery agents, in order to allow it to install more cost-effective measures. We estimated the lighting measure – the most likely to receive greater treatment – at 2¢/kWh, or a 4:1 benefit/cost ratio (see p. 59).
- > *MC/ES Efficient Products – lighting*: We proposed that Hydro-Québec offer a permanent compact fluorescent lightbulb incentive of \$3 on average to complement its (assumed) temporary joint promotions strategy. We estimated this will cost Hydro-Québec 1.5¢/kWh, as compared with avoided costs of 8¢, thus generating a >5:1 benefit/cost ratio (see pp. 71-72).
- > *MC/ES Efficient Products – windows*: We proposed the addition of an efficient windows incentive aimed at natural replacement

and new construction markets. We recalled that if done correctly, the program should be able to achieve costs on the order of 1¢/kWh, for a ~10:1 benefit/cost ratio (see p. 85).

- > *MC/ES Efficient Products – computer transformers:* We proposed that Hydro-Québec join the North American effort at transforming the market for efficient computer transformers. Given current uncertainty, we presented three possible outcome scenarios: 0¢/kWh (program fails), 3¢/kWh (marginal success) and ~0.00005¢/kWh (market transformation) (see pp. 87-88). While we did not indicate it specifically, this would result in a benefit/cost ratio of between 2.6:1 and 1548:1.
- > *MC/ES for Business:* We proposed that Hydro-Québec increase its incentive level so that it covers three quarters of incremental costs. We assessed the direct cost of this incentive at 2¢/kWh, as compared with avoided costs ranging from 7.3 to 8.8 ¢/kWh (see p. 132). Thus, while not specified as such, this would result in a benefit/cost ratio on the order of 4:1.

It is important to note that real TRC-level benefit/cost ratios are higher, in some cases substantially, than what we report above, since we have not included non-energy benefits into our equations.

Thirdly, in the case of changes suggested to the CI (and SMI) Initiatives programs, recall that the change is aimed primarily at the incentive structure, not level. Nonetheless, we note that the move to an incremental cost-based incentive must be accompanied by cost-effectiveness screening, as is practiced elsewhere (see pp. 108-109). We also note that this change, as with some others, should result in *less* wasted resources and *cheaper* net ¢/kWh savings for Hydro-Québec. See our response to Régie question 7.1 for more information.

Finally, in a few cases, we are not certain whether changes will be cost-effective, and in those cases, we limit our recommendations to *examining* the pertinence of a given measure. For example, we suggest *considering* use of the community-based home visits approach to target high-use customers *if* the results of the ongoing pilot evaluation are positive (see p. 24). Similarly, we recommend *considering* – i.e. assessing the relative economic merits of – integrating bulk efficient appliance purchasing into the Novoclimat program's social housing component (p. 42), and an appliance replacement component into the SHQ Affordable Housing program (pp. 64-65). We also encourage Hydro-Québec to *investigate* opportunities for adding incentives based on new SEHA Tier-2

appliance ratings (p. 82). Finally, we make our benchmarking recommendation conditional on results from the ongoing cost-effective potential review working group (p. 146).

In all cases, our recommendations are carefully crafted to ensure cost-effectiveness. Most importantly, they propose strategies aimed at addressing market barriers head-on, and are designed to minimize cream skimming, lost opportunities and free riders. In so doing, these recommendations are aimed at *reducing waste* and *increasing net benefits* by getting “more bang for the buck” from Hydro-Québec’s proposed PGEÉ investments.”

As a complement to that response, we believe it is important to distinguish between *costs* and *budgets*. When Hydro-Québec forecasts a budget of \$107m, it is only that, a forecast. In practice, if participation rates are higher than expected, or if *Initiatives* projects are deeper than expected, actual costs will be considerably higher (or, inversely, lower). In other words, if real-world costs exceed budgets, it will only be because the plan was more successful than expected (and economic savings will be commensurately higher as well).

Our proposals are aimed squarely at improving program performance. Such improvements will lead to changes in **total cost**, **average cost** and **net benefit**.

Performance improvements will tend to *increase overall costs* as more customers participate in and benefit from the PGEÉ programs. This will increase the incentives Hydro-Québec will pay to consumers (and lower the fees Hydro-Québec will pay to power producers for energy purchases).

Conversely, improved program performance will tend to result in *lower average costs* (¢/kWh saved), for two reasons: First, because improved program design reduces free ridership rates, thus “eliminating waste” (notably wasted incentives) relative to poorer program design. And second, because higher participation means maximizing savings from similar “fixed” costs.

Finally, improved program performance from our recommendations will result in *higher net benefit* to Hydro-Québec and its ratepayers. This is true only to the extent that proposed changes are cost-effective. However, as noted in our response to Hydro-Québec’s Question 1 (reproduced above), *every* recommended incentive change is cost effective, with benefit/cost ratios ranging from a low of 2.5:1 to a high of 10:1 (notwithstanding the computer transformer initiative, whose total B/C ratio could exceed 1500:1). In fact, a cursory look at the list of recommendations and their cost-effectiveness strongly suggests that they will both *increase the PGEÉ’s total B/C ratio* and, assuming stronger performance, *increase considerably its net economic benefit*.

Thus, our recommendations can be expected to improve the PGEÉ's performance and, as a result, produce higher total costs, lower average costs and higher net benefits, both in relative and absolute terms.

Regarding financing in lieu of grants

For the most part, we do not believe loans or other financing schemes will achieve desired results. The exceptions, as noted in the report, are geothermal systems, at least at the outset, and municipal financing. Financing can also be used in the *Initiatives* program as *one of a set of options* from which participants can choose according to their own needs, as outlined in our report. Otherwise, financing will not suffice to overcome real-world market barriers and ensure successful program implementation.