PROVINCE OF QUÉBEC

BEFORE THE RÉGIE DE L'ÉNERGIE

Gaz Métro Cost Allocation and Rate Structure: Methodology for the Evaluation of Line Extension Profitability	))))	**R-3867-2013 ph 3B**

DIRECT TESTIMONY OF

PAUL CHERNICK

ON BEHALF OF

REGROUPEMENT DES ORGANISMES ENVIRONNEMENTAUX EN ÉNERGIE

(ROEÉ)

Resource Insight, Inc.

SEPTEMBER 26, 2017

TABLE OF CONTENTS

I. Identification

Q: Mr. Chernick, please state your name, occupation, and business address.

A: I am Paul L. Chernick. I am the president of Resource Insight, Inc., 5 Water St, Arlington, Massachusetts.

Q: Summarize your professional education and experience.

A: I received an SB degree from the Massachusetts Institute of Technology in June 1974 from the Civil Engineering Department, and an SM degree from the Massachusetts Institute of Technology in February 1978 in technology and policy.

For more than 37 years, I have been engaged in the analysis of energy-utility planning and ratemaking. I was a utility analyst for the Massachusetts Attorney General for more than three years, and was involved in numerous aspects of utility rate design, costing, load forecasting, and the evaluation of power supply options. Since 1981, I have been a consultant in gas- and electric-utility regulation and planning, first as a research associate at Analysis and Inference, and after 1986 in my current position at Resource Insight (which was known as PLC, Inc., until 1990). In these capacities, I have advised a variety of clients on utility matters, including government-sponsored and non-profit consumer advocates, regulatory agencies, environmental organizations, energy-efficiency advocates, power-plant developers, large energy consumers, and utilities.

My work has considered a wide range of topics in the planning and regulation of electric and gas utilities, including load forecasting, system planning, embedded and marginal costs, the profitability of utility investments to support new loads, allocation of costs of service between rate

classes and jurisdictions, and design of retail and wholesale rates, among other topics. My professional qualifications are further detailed in my resume, already filed as Document C-ROEÉ-0067.

Q: Have you testified previously in utility proceedings?

A: Yes. I have testified as an expert witness more than 300 times on utility issues before various regulatory, legislative, and judicial bodies, including utility regulators in six Canadian provinces (Québec, Nova Scotia, Ontario, Manitoba, British Columbia, and Alberta), thirty-six states, and two U.S. Federal agencies.

Q: Have you previously testified as an expert witness before the Régie?

A: Yes. I testified as an expert witness in phase 1 and in phase 3A of the present matter at the Régie de l'énergie, R-3867-2013.

Q: Have you testified previously regarding marginal utility costs?

A: Yes. I have provided expert testimony on marginal costs and cost causation in numerous proceedings, as listed in my resume.

II. Introduction and Summary

Q: On whose behalf are you testifying?

A: I have been engaged by the Regroupement des organismes environnement-aux en énergie (ROEÉ), to provide my independent expert testimony and opinion. I understand that my expert evidence will also be referred to by Union des consommateurs (UC) for the purposes of the preparation of its intervention evidence.

Q: What is the purpose of your testimony?

A: The purpose of this testimony is to assist the Régie de l'énergie in determining what it should require of Gaz Métro with respect to assessing the profitability of line extensions and determining whether additional contributions in aid of construction are required to protect existing customers from subsidizing new customers. Specifically, I deal with the following matters:

- Gaz Métro should extend lines to new customers only where the revenues from those new customers will cover the costs they impose.
- All identifiable incremental costs should be included in the project profitability analyses.
- Revenue projections for the project profitability analyses should be realistic.
- Gaz Métro should present detailed retrospective so that the Régie can regularly review the profitability targets.

Q: Have you authored any other documents in phase 3B of this proceeding?

A: I contributed to the experts' joint report, summarizing the areas of agreement and disagreement among the three experts: Gaz Métro's expert witness Russ Feingold from Black and Veatch (B&V), William B. Marcus on behalf of the Option Consommateurs (OC), and me (C-OC-0047).

Q: Why should the Régie be concerned with the methodology of the profitability analysis for line extensions?

A: Appropriate computation of line-extension profitability is essential for rational choices determining when gas utilities should expand their systems, and who should pay for that expansion. Line extensions can be very expensive. An extension project that does not produce enough revenue to cover its costs (plus the other costs of serving additional customers and

additional load) will burden existing ratepayers with excessive costs. On the other hand, if Gaz Métro fails to extend the system and pick up load that would more than pay for the incremental costs, existing customers (and the potential customers who are not served) will miss an opportunity to reduce their bills. Reasonable inputs and methodologies will reduce the probability of both types of errors and benefit Gaz Métro customers and the Québec economy.

In addition to the economic and consumer implications of improperly analysing the costs of line extensions, there are other public interest, environmental and sustainability implications. Inadequate analysis of line extensions may distort the investment decisions of the utility and customers.

Failing to invest in cost-effective line extensions may leave some end users dependent on oil, which is generally more polluting than natural gas, and discourage investment in efficient combined heat and power. On the other hand, excessive extension of the system would result in large sunk costs for Gaz Métro, making an eventual transition from fossil fuels (and their associated greenhouse gas emission) to renewable energy (from biomass, solar thermal, or through electricity from hydro, wind, and other renewables) more financially painful and potentially slowing that process. My understanding is that ROEÉ's interest in line extensions stems from its support for regulatory policy that fully accounts for public-interest, sustainability and environmental considerations, on an equal footing with economic issues. In this proceeding, those considerations include targeting natural-gas consumption to essential uses, reducing greenhouse gas emissions, facilitating transition to a sustainable economy, encouraging compact urban development and avoiding the subsidization of unnecessary urban sprawl.

Q: Please summarize your concerns about Gaz Métro's proposals in this subject 3B sub-phase of the proceeding.

A: My concerns relate primarily to the following issues:

- Ensuring that all reasonably foreseeable costs are included in the profitability analyses.
- Including only a reasonable expectation of revenues in the profitability analyses.

In addition, I have some brief comments regarding the retrospective analysis of profitability.

Q: On which documents have you relied in developing this evidence?

A: Having participated in all phases of R-3867-2013, I have good overall familiarity with this proceeding. With specific regard to subject 3B and the preparation of my expert evidence, my primary sources were translations of the following Gaz Métro filings in this proceeding:

- B-0178, Gaz Métro-7, Document 1, translated in C-FCEI-0084;
- B-0225, Gaz Métro-8, Document 7, responses to my initial questions in Phase 3A, translated in C-FCEI-0081;
- B-0257, Gaz Métro-9, Document 3;
- B-0258, Gaz Métro-9, Document 4, the responses to the OC's questions, translated as C-FCEI-167
- B-0260, Gaz Métro-4, Document 4, Attachment Q-7.1;
- B-0264, Gaz Métro-9, Document 6, responses to my second set of questions, translated in C-FCEI-0151;
- B-0265, Gaz Métro-9, Document 6, Attachment Q-1.7;
- B-0266, Gaz Métro-9, Document 6, Attachment Q-4.2;

- B-0267, Gaz Métro-9, Document 6, Attachment Q-12.1, translated as C-FCEI-0144;
- B-0268, Gaz Métro-9, Document 6, Attachment Q-12.2;
- B-0269, Gaz Métro-9, Document 6, Attachment Q-12.9;
- B-0270, Gaz Métro-9, Document 6, Attachment Q-8.1;
- B-0273, Gaz Métro-7, Document 2, Gaz Métro's filing in this phase, translated in C-FCEI-0134;
- B-0278, Gaz Métro-7, Document 5, Review of Methodologies for Evaluating the Profitability of System Extension Projects – Black and Veatch evidence;
- B-0295, Gaz Métro-9, Document 14, responses to my third set of questions, translated in C-FCEI-0182;
- B-0308, Gaz Métro-9, Document 6, revised responses to my second set of questions; and
- B-0319, Gaz Métro-9, Document 14 revised.

III. The Purpose of the Profitability Analyses

Q: Why do local distribution companies perform profitability analyses for line extensions?

A: It is my understanding that the purpose of those analyses is to avoid situations in which the utility commits to spending more on acquiring new customer load—including the costs of building the line extension, service lines, and meters; servicing the new customers; and accommodating the incremental load of the new customers—than the new customers will pay in revenues. When those situations occur, the existing customers wind up paying the revenue shortfall and subsidizing the new customers.

Q: How are those analyses performed?

A: Typically, the local distribution company (LDC) would compute the present value of the expected capital and operating costs, and of the expected revenues. The expected revenues would include any line-extension fees or contributions in aid of construction charged directly to the new customers or their representatives (e.g., the developer of a residential subdivision or an office park).

In general, if the project is expected to produce revenues higher than the total cost—for the line extension, servicing the customers and accommodating their loads—the project is profitable for existing customers. That condition is met if the present value of expected revenues is greater than the present value of expected costs, or equivalently, if the ratio of revenues to costs (in present-value terms) exceeds 1.0.[1]

For example, if a line extension costs $1 million, and each year generates $80,000 in revenues and $10,000 in costs (for $70,000 in net revenue), the present value of the net revenue (at Gaz Métro's 5.42% discount rate) would be $1.14 million over 40 years, and the project would be profitable. If the annual revenues were $65,000, or the annual costs were $25,000 (either of which would reduce the annual net revenue to $55,000), the present value of the net revenues would be $0.9 million, and the project would be unprofitable. The same would be true if the $70,000 of net revenue lasted 25 years, rather than 40 years.

---

[1] If profitability is to be expressed as a ratio, the present value of continuing costs, such as metering, billing, and maintenance, can be (1) added to the original investment or (2) subtracted from the revenue. Option 1 results in a ratio closer to 1.0 than does Option 2; the results of Option 1 look better than those of Option 2 for unprofitable projects with ratios below 1.0, but not as good as Option 2 for profitable projects.

IV. The Costs of Line Extensions

Q: What costs should be included in the profitability analyses of line extension projects?

A: The costs in the profitability analyses should include all the costs that result from extending service to the new customers. In most cases, the largest such cost would be the immediate capital investments required to connect the new customers (e.g., the line-extension mains, service lines, and meters), along with some administrative costs of initiating service to the customers (such as creating a customer file). In addition, having added the new equipment, Gaz Métro will incur the initial and continuing operating and maintenance (O&M) for those investments. Having added the customers, Gaz Métro will incur the O&M associated with servicing the customers (e.g., metering, billing, customer service, collections); most of those costs are required to actually collect revenue from the new customers. Finally, Gaz Métro will incur the incremental costs associated with increasing its ability to serve its design-day loads, which will be increased by addition of the new customers.

All these costs—initial investment, maintenance, customer service, and capacity—should be considered in the analysis of each project.

Q: Does Gaz Métro's approach include all these costs?

A: No. Gaz Métro's approach to the profitability analyses would omit or understate the following costs associated with the line extensions:

1. Working capital on O&M for the line extension, customer-service costs, and upstream costs.
2. The Human Resources Department overhead costs allocated to construction projects.
3. Contractor capital overheads.

4. Incremental upstream capacity-related investments.

5. O&M costs of new incremental capacity-related investment.

6. The cost of replacing the original meters after 20 years.

It is my understanding the Mr. Marcus, on behalf of the OC, will explain in detail the propriety of including items 1, 2, 5 and 6, as well as providing estimates of the values, where possible. I will not discuss these items in great detail.

Suffice it to say that working capital is a real cost of the increased O&M expenses, since more O&M results in Gaz Métro needing more working capital to cover expenses until customers are billed and pay those bills; human-resources expenses are real costs of having the additional staff necessary to run the construction program; installing additional mains requires periodic monitoring and remediation; and Gaz Métro indicates that its meters last an average of 20 years, so a new customer will require a replacement meter in the analysis period. All of these are real costs that should be included in the profitability analysis. Based on our discussions in preparing the expert report, I believe that Mr. Marcus's approach to estimating these components is reasonable.

Q: Why should contractor capital overheads (your third category of costs) be included in the profitability analysis of individual line-extension projects?

A: The number of contractors and the amount of fixed costs that they must dedicate to Gaz Métro projects must both depend on the number and scale of the projects that Gaz Métro plans for the upcoming contract period. Ignoring the effect of the projects on this cost component could result in the existing

customers paying for costs required by new customers served by the lines extensions.[2]

Q: What is Gaz Métro's estimate of the contractor capital overheads?

A: Gaz Métro estimates that these costs amount to a 27.1% adder on top of the projected cost of the projects, so for every $100,000 of contractor direct costs that Gaz Métro plans for the development year, Gaz Métro obligates itself to pay the contractor an average of $27,100 in fixed overhead fees (B-0278, p. 26; B-0293, response to question 8.1).

Q: Why should incremental upstream capacity-related investments (your fourth cost category) be included in the profitability analysis of individual line-extension projects?

A: Each line-extension project adds customers (whose costs were dealt with in Phase 3A) and also adds design-day load that must be delivered from a pipeline and carried by one or more supply mains and distribution mains from that pipeline to the extended line. Gaz Métro undertakes many investments every year to expand capacity on various pieces of equipment. Some line-extension projects will add enough load to require one or more capacity expansions as the customers served by the line extension are connected, while other projects in other locations will accelerate the date at which future capacity expansions will be needed and some projects will require both prompt and subsequent expansions.

---

[22] Some of the corporate overheads may also vary with the number of line extensions that Gaz Métro plans for any given year. For example, Gaz Métro indicates that these costs include warehouse and delivery costs, fleet services and fuel, and construction labour loaders (B-0278, p. 27), all costs that I would expect to be driven by the number and scale of capital projects, including line extensions. Excluding these costs from the project profitability evaluation may overstate the profitability of some projects.

Q: How should the cost of incremental upstream capacity-related investments be estimated for the profitability analyses?

A: It is probably impractical to identify the exact upstream investments that will be added or accelerated due to each individual line extension, especially considered the uncertainty of future growth patterns. But the challenges of identifying the exact cost that will be incurred for any particular load addition does not justify ignoring those real costs in evaluating project profitability.

Rather, the normal approach for estimating incremental costs due to load growth is to estimate the amount of load-related investment over a representative recent or forecast period, along with design-day load growth that drives that investment. The ratio of these two values represents the load-related investment per m^3 of design-day load growth. The load-related cost of a line extension would then be the product of the investment per m^3 of design-day load and the m^3 of design-day load for the customers on the line extension. This computational approach is widely used for estimating marginal costs for rate design and avoided costs for energy-efficiency programs. Several of the utilities summarized in B-0278, Appendix A, use versions of this approach.

Q: How should Gaz Métro estimate the design-day load of the new customers?

A: Unless Gaz Métro has more specific information for a particular line extension, it should estimate the design-day load from the sales used in projecting project revenue by class or other grouping and the load factor for that grouping.

Q: Have you estimated the incremental load-related cost per m^3 of design-day load?

A: Yes. In response to my discovery question 1.6 (B-264, Gaz Métro-9, Document 6), Gaz Métro provided a list of "reinforcement projects" from 2004 through 2017, along with the cost of each project. Unfortunately, Gaz Métro did not provide several important pieces of information:

- whether these were the total costs of the projects completed since 2004 or the expenditures since 2004,
- the costs of the individual projects (requested in my questions 1.4 and 1.6),
- the in-service dates of the individual projects,
- the annual expenditures.

In any case, the costs totaled $129.8 million, plus about $7.3 million to complete a couple of compressor station projects. The $129.8 million is in mixed current dollars, from 2004 (or perhaps earlier for some projects) to 2017; in 2017 dollars, the cost would be higher.

In response to discovery (B-225, Gaz Métro-8, Document 7, #4.5), Gaz Métro provided its design peak load for 1999 through 2016. Unfortunately, I do not have a ready source for Gaz Métro's 2017 design peak, so the load data and cost data do not exactly match. Gaz Métro's estimate of its design peak load grew 6,174,000 m^3, from 28,309,000 m^3 in 2004 to 34,263,000 m^3 2016. But as of 2004, the highest historical peak had been the 29,118,000 m^3 in 2001, so the system was probably already designed to meet that load.[3] Hence, the investments from 2004 to 2016 would have been designed to accommodate about 5,145,000 m^3 of growth.

[3] The 2001 design-peak load was exceeded in 2005–2008. Load fell after 2008, again passing the 2001 peak only in 2014, following a change in Gaz Métro's methodology for forecasting design peak.

Roughly speaking, the investments were $129.8 million ÷ 5.145 million m^3, or about $25.2/$m^3$ of load growth. Gaz Métro should add this value to the capital costs of line extensions, until such time as it can develop a better estimate.

Q: How could Gaz Métro improve on your estimate?

A: Gaz Métro could better match the time frames for the load growth and investments, and compute inflation of the capital expenditures. Gaz Métro could also determine whether the cost of meeting increasing peak loads varies across the service territory. For example, the load-related cost of adding load may be low in Montréal, but much higher in outlying areas

Q: What additional cost items should be included in the evaluation of the annual portfolio of line extensions?

A: That evaluation should include the cost of administering line extension program and marketing line extensions to new customers, as well as the corporate capital overhead charges, which Gaz Métro estimates as 14.53% of the direct costs (B-0278, p. 25). Some of those costs probably vary with the number and cost of the line extensions, but many (such as executive salaries) probably do not.

V. Revenue Projections

Q: What topics do you discuss in this section?

A: I discuss the general relationship between revenue growth on line extensions (densification) and the minimum acceptable benefit-cost ratios by project, the treatment of some special situations, and the number of years that a project should be assumed to produce revenue.

A. Densification Expectations and Acceptance Thresholds

Q: How does Gaz Métro reflect its projected revenue from the new customers on a line extension?

A: As I understand it, the projection has two parts. First, Gaz Métro estimates the gas consumption and hence the revenue of the potential customers who have committed to connecting to the line extension. I have not reviewed these projections. Gaz Métro computes the profitability of the project using this estimate of the first-year revenue, extended over forty years.

Second, Gaz Métro implicitly incorporates potential future growth in sales along the line extension (or densification), not by increasing the revenue over time but by accepting a lower value for the profitability threshold. Gaz Métro has proposed to use a 0.8 acceptance threshold.[4] (B-0278, p. 4) Gaz Métro believes that the 0.8 acceptance threshold is reasonable, given its retrospective (*a posteriori*) analysis of the profitability of selected projects, using data for the first five years of operation of projects from the 2009 through 2011 plans. (C-FCEI-0084) The sample consisted of projects costing more than $1.5 million and requiring a customer contribution, which I understand to mean that the profitability ratio was less than 0.8 in the *a priori* analysis. (C-FCEI-0084, page 5)

Q: Do you consider Gaz Métro's analysis of the acceptance threshold to be adequate?

A: Not entirely, for several reasons. First, the criteria for distinguishing projects that require a 1.0 ratio from those that require only a 0.8 ratio are not clear.

[4] Based on the discussions with Mr. Feingold, I understand that Gaz Métro only intends to apply the 0.8 threshold if the project has potential for densification; otherwise, Gaz Métro would require a 1.0 ratio.

Second, Gaz Métro reports *a posteriori* results as a percentage increase in internal rate of return, or IRR, from the *a priori* to the *a posteriori* analyses; it is not clear how a change in IRR changes the profitability ratio. Third, it is not clear whether its sample of projects is entirely representative of the projects that passed the 0.8 profitability ratio test, but may have experienced limited densification. Fourth, while Gaz Métro asserts that the average project in its retrospective profitability analysis did considerably better than expected, Gaz Métro does not appear to have considered whether those results are applicable to a wide range of projects, including differing numbers and mixes of potential customers along the line extension.

Gaz Métro's review of the profitability threshold also assumes that the revenue levels of the first few years of the line extension will continue through the expected physical life of the main, ignoring customer attrition and the likelihood of future initiatives to reduce greenhouse-gas emissions from the consumption of natural gas, through increased efficiency and switching loads to renewable-powered electricity.

Q: What do you recommend with respect to recognizing densification potential in the acceptance ratio?

A: I recommend that Gaz Métro apply the following acceptance ratios to future projects, based on experience with similar projects:

- An acceptance ratio of 1.0 for projects with limited densification potential, which will need to be cost-effective with only the identified load and without load growth.
- An acceptance ratio of 0.8 for projects similar to past projects that have experienced 50% or greater densification.

- An acceptance ratio of 0.6 for projects similar to past projects that have experienced over 100% densification.

I selected the 0.8 and 0.6 ratios so that the expected (but not assured) eventual revenues would result in a profitability ratio of 1.2, leaving a margin of safety to protect the existing ratepayers from excessive costs.

Q: Those ratios are for individual projects. What acceptance threshold do you propose for the portfolio?

A: I would accept Gaz Métro's proposed 1.1 ratio, provided that the Régie requires Gaz Métro to set the evaluation period at 25 years (see Section V.C). If the evaluation period remains at the 40 years that Gaz Métro proposes, I believe the acceptance ratio should be increased to 1.3, reflecting the risk of falling revenues over time.

B. Special Situations

Q: What special types of line extensions has Gaz Métro identified for special treatment?

A: Gaz Métro has identified new industrial parks and street repaving as warranting special treatment. Gaz Métro proposes to subsidize these programs by using an imaginary fund (initially $1.5 million annually, although Gaz Métro proposes to change it over time) to artificially bring each of these projects up to a 0.8 benefit-cost ratio.

Q: What is Gaz Métro's rationale for manipulating the cost-benefit analysis?

A: I understand that Gaz Métro's view is that, to the extent that the portfolio exceeds the minimum benefit-cost ratio, it creates a pot of free cash that Gaz Métro can redirect to funding unprofitable projects. I am not familiar with

any other utility that redirects ratepayer savings from profitable projects to subsidize unprofitable projects.

Q: Is that view correct?

A: No. As I explain in Section III, Gaz Métro's approach would harm existing customers, raising their rates compared to the minimum cost of providing adequate, safe and reliable service. Gaz Métro would take funds from existing customers to subsidize uneconomic line extensions. In addition, Gaz Métro may be subsidizing decisions to use natural gas instead of high-efficiency electric applications (such as ground-source heat pumps) that would impose much smaller environmental costs over their lifetimes. In some situations, the natural gas end uses may be retrofit to use efficient electric equipment or direct renewable energy; in others, the design of the facility may make that retrofit much more expensive, committing the customer to using natural gas and emitting greenhouse gases for decades to come.

Q: How should Gaz Métro deal with the new industrial parks?

A: A new industrial park, perhaps with just a single initial tenant, presents Gaz Métro with multiple options, including the following:

1. Extend service to the industrial park, including distribution throughout the park, before the roads and other amenities are in place. This may be the lowest-cost option of serving the entire park, if it is fully occupied in the future.
2. Extend service to the industrial park, but only to the committed tenant(s). Defer the remainder of the distribution system in the park until addition customers are committed.
3. Do not connect the park until additional load materializes.

Gaz Métro should answer two questions before extending service to a new, largely vacant, industrial park. The first is whether past experience provides a reliable indication that densification at similar parks has been sufficient to cover the costs of extending service, and that the pattern is likely to repeat for a new park. If not, Gaz Métro should not use any accounting legerdemain to justify the expenditure.

If the project passes that test, the next question is whether the cost of an immediate build-out (option 1 above) is less expensive than a phased build-out (option 2), which may have higher costs incurred later (and hence with a lower present value).

Q: How should Gaz Métro deal with a potential line extension when the street under which it would run is scheduled for repaving?

A: These situations may be more varied than those resulting from new industrial parks, but the reasoning is similar. First, Gaz Métro must develop a rationale for extending a line that does not meet the general benefit-cost threshold, perhaps based on some limited commitments and data on the densification history of similar speculative line extensions. Assuming that there is a case that the line extension could pay for itself, Gaz Métro would need to also compare the net present value benefit of extending system now, compared to waiting until end of the pavement-cutting moratorium imposed after the repaving.

C. Revenue Longevity

Q: How long a period of revenues and expenses does Gaz Métro use in its profitability analyses?

A: Gaz Métro assumes a project life of 40 years.

Q: Is this assumption reasonable?

A: I think not, for three reasons.

First, the large anchor customers that provide most of the justification for many line extensions may not operate indefinitely. International industrial markets shift, local resources (timber or minerals) are depleted, and/or technology changes and a once-bustling paper mill, ore-processing facility, or factory is abandoned. Gaz Métro reports that about 1.5% of industrial customers and 1.8% of commercial customers left the system each year 2014 to 2016 (B-0308, response 11.6). The rate of failure for these customers is likely to be higher during economic downturns. Even at the 1.5% to 1.8% attrition rates, a customer would have only a 70% to 74% chance of staying in operation for 20 years, and just a 45% to 52% chance of staying in operation for 40 years.

Second, tightening limits on carbon emissions will eventually lead to conversion of most gas-consuming end uses to renewable-powered electricity. In the short term, extending natural-gas service to customers who are burning oil produces environmental benefits. Over time, this situation is likely to change, as pressure grows for deep reductions in carbon emissions and more efficient electric technologies are developed. The transition to a low carbon economy is likely to include switching fossil-fuel uses to electricity and substantial improvements in the efficiency of remaining fossil consumption, leading to long-term reductions in overall energy use and particularly fossil-fuel consumption. The 2024 gas consumption of customers along a line extended in 2018 may generate revenues that would pay for the line extension, but those sales and revenues may be much lower by 2030, 2040 or out a full 40 years to 2058.

The governments of Canada and Québec have international commitments and energy policies that would require transition to a low-carbon economy and reduced usage of fossil fuels.[5] It would be imprudent for Gaz Métro or the Régie to ignore those policies and simply assume that expansion of the gas delivery system can be realistically evaluated on the basis of an unchanged role for gas over 40 years.

Q: In light of these two considerations, what analysis period do you propose?

A: I would limit the analysis period to about 25 years. For the projects implemented in 2018, that analysis period would extend to the mid-2040s, by which time large reductions in fossil-fuel use would be required to meet climate goals. Based on the experience that Gaz Métro reports for the last three years, 30% to 35% of large customers would have left the system by then; if there are financial crises or economic downturns in the next 25 years, the business failure rate may be higher. Combining the customer attrition rate with the pressure to reduce carbon emissions, assuming that the near-term

[5] That this issue should be considered is confirmed by easily accessible sources. The Paris Agreement of 2015 has been signed and ratified by Canada (http://unfccc.int/paris_agreement/items/9444.php). Québec has committed to the Agreement and to leadership in achieving its greenhouse gas goals (http://www.international.gouv.qc.ca/en/accueil/actualites/17219). Québec's reduction target is to bring emissions to 37.5 % below 1990 levels by 2030 and at the time horizon that Gaz Métro would use, Québec is actively committed to a regional objective of bringing greenhouses gas emissions to 80% to 95% below 1990 levels by 2050, which would require substantial reduction in stationary energy emissions, even if all current oil uses were converted to natural gas. Québec's 2030 Energy Policy (http://politiqueenergetique.gouv.qc.ca/wp-content/uploads/Energy-Policy-2030.pdf) calls for transition to a low carbon economy and envisages a transitional role for natural gas, particularly replacing oil in transportation and in the North, but also calls for increased energy efficiency (which will tend to reduce gas use per customer) and does not consider policies after 2030.

revenues persist for more than an average of 25 years would be speculative.[6] For the Régie to include such speculative benefits of system expansion would be poor regulatory practice, inconsistent with the public interest, inequitable to existing customers, and inconsistent with long-term sustainability in meeting energy needs. Charging existing customers for lines that will increase short-term sales but never pay for themselves would result in rates that are neither just nor reasonable.

Q: Are you suggesting that natural gas consumption in Québec will be zero by the mid-2040s?

A: No. Some line extension projects may experience large decreases in sales and revenues in the 2020s and 2030s, and others may continue to generate substantial cash flow through the useful life of the mains.

VI. Retrospective Analysis

Q: What comments do you have on Gaz Métro's retrospective analyses?

A: Gaz Métro presents data on retrospective analyses of past line-extension projects in C-FCEI-0084. This analysis is useful in guiding the setting of profitability thresholds and should be repeated on a regular basis so that the Régie can regularly review those thresholds.

While Gaz Métro reports its retrospective results only for selected projects and at the portfolio level, the results should also be reported for each project. Those more granular results may assist Gaz Métro and the Régie in identifying improvements in forecasting future densification and revenue.

[6] As a corollary, if the capital costs of the line extension are annualized as part of the analysis, the depreciation rate for mains should be increased to reflect a shorter average life, such as 30 years.

The retrospective results should not be used to second-guess good-faith decisions previously made, but only to improve the selection process for future projects.

Retrospective review of the costs and benefits of investment programs, in enough detail to guide improved decision-making, represents best practice in the management and regulation of utilities.

Q: Does this conclude your evidence on this matter?

A: Yes.