

**Gaz Métro – Application regarding the generic matter bearing
on the allocation of costs and rate structure of Gaz Métro – R-
3867-2013 – phase 3B
Methodology for assessing the profitability of system extension
projects**

Analysis Report

by

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for the

**Regroupement des organismes environnementaux en
énergie (ROEE)**

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PRESENTATION OF THE ROÉÉ

The ROÉÉ was founded in 1997. It represents the interests of seven not-for-profit environmental groups, in particular with the Régie de l'énergie. They include:

- *Nature Québec*, a province-wide organization comprised of more than 5,000 members and supporters and 130 affiliated bodies involved in the conservation of nature, the preservation of life-sustaining ecosystems and the sustainable use of resources;
- *Fondation Rivières*, an organization involved in the preservation, restoration and development of the natural character of rivers, as well as water quality;
- the *Fédération québécoise du canot et du kayak* whose mission is to facilitate canoeing and kayaking activities, make rivers and other water bodies accessible to all paddlers and help preserve lakes and rivers in their natural state;
- *Eco home*, which facilitates the development of healthier energy- and resource-efficient homes that are affordable, accessible to all and characterized by their sustainability. It carries out its mission through advocacy, awareness-raising, training and support activities with the general public, housing industry stakeholders and political decision-makers;
- the *Canadian Coalition for Nuclear Responsibility*, a not-for-profit organization that is dedicated to education and research on all issues related to nuclear energy;
- the *Association madelinienne pour la sécurité énergétique et environnementale*, which promotes environmental and energy security in the Îles de la Madeleine; and
- the *Regroupement vigilance hydrocarbures Québec (RVHQ)*, which comprises citizen committees in Québec, helping them monitor hydrocarbon-related projects and raise public awareness about the need to turn to green energies and change our behaviours to protect water, air and the earth.

The ROÉÉ promotes sustainable energy development through integrated resource planning (IRP). In the context of limited resources and imperative threats to the global balance posed by the over-exploitation of the resources at our disposal, the ROÉÉ believes that environmental issues must be at the heart

of our decisions concerning the satisfaction of Québec's energy needs and cannot be relegated to secondary concerns. In this regard, it prioritizes energy consumption reduction, energy efficiency and demand management pertaining to all energy production, even from renewable sources.

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Need to find the right cost in the methodology calculating the profitability of system extensions

As part of the study of the application regarding the generic matter bearing on the allocation of costs and rate structure of Gaz Métro (R-3867-2013), the distributor presents in phase 3B part of its method for determining marginal costs to calculate the profitability of Gaz Métro system extensions.

In the methodology presented for phase 3B (B-0220, B-0277, B-0278), Gaz Métro bases itself on the Black & Veatch (B&V) report. This report presents changes in how to calculate the profitability of system extension projects. Gaz Métro adopts the recommendations of B&V's item B-0277. The following table outlines the key points of these recommendations under the "New Method" column.

Table 1: Inputs used by profitability assessment methods

Inputs	Current method	MAT method	New method
Valuation period	40 years		
Revenue	Revenue from customers ready to sign a contract and potential customers are considered for the profitability calculation.	Only contractually incurred revenues are considered for the profitability calculation.	
Costs of pipes, connections and meters	The direct costs of the pipe, connection and meter are included and amortized according to the appropriate depreciation. The financial return on the unamortized balance of the assets as well as the tax are also considered.		

Inputs	Current method	MAT method	New method
Financial assistance	CRP and CASEP financial assistance is included in the profitability analysis.		
UMQ fees	Two percent of the direct costs of the pipeline and connection is included in the profitability calculation.		
Marginal costs of long-term service delivery	These operating costs are considered on a project-by-project basis when assessing profitability. The marginal costs of long-term service delivery applied to the profitability analysis were addressed in phase 3-A of this file.		
Provincial tax on public services	These costs are considered on a project-by-project basis when assessing profitability.		
Annual duties payable to the Régie	These costs are considered on a project-by-project basis when assessing profitability.		
Annual duties payable to the Régie du bâtiment	These costs are considered on a project-by-project basis when assessing profitability.		
Corporate overheads	These costs are considered on a project-by-project basis when assessing profitability.		These costs are considered in the overall profitability of the development plan.
Contractor overheads	These costs are considered on a project-by-project basis when assessing profitability.		These costs are considered in the overall profitability of the development plan.
Contribution	A contribution may be requested if $IRR < PCC$.	For projects with no expectation of future profitability, a contribution may be requested if $IRR < PCC$. For projects with expectation of future profitability, a contribution can be requested if $IRR < MAT$.	For projects without expectation of future profitability, a contribution may be requested if the $PI < 1$. For projects with expectation of future profitability, a contribution may be requested if $PI < 0.08$.
Reinforcement of distribution network	These costs are considered in the overall profitability of the development plan.		

Sources: B-2077, pp. 5 and 6

From the outset, some of the proposals, like those proposed by the distributor in the previous phases of the file, seem to favour the largest consumers (Sales Major Industries), which are generally more mobile compared to residential and small businesses customers. Since, similar to the Régie, the ROÉÉ would like, during an eventual phase 4 of this file, for there be an informed debate on the issues specific to the establishment of the rate structure and schedule, it seems reasonable to verify the B&V methodology.

However, not having the necessary expertise for such a verification, the ROÉÉ mandated Paul L. Chernick, an expert well known for his work in many North

American jurisdictions,¹ to help it fully understand all the issues presented by Gaz Métro and make recommendations to the Régie.

More specifically, the ROÉÉ asked the expert, Mr. Chernick, to check and propose alternatives, if any, on the following topics:

- In terms of profitability, what are the conditions to promote a system extension;
- What are the expected incremental costs that should be included in the project profitability analyses;
- Verify whether Gaz Métro's revenue projections for the project's profitability analyses are realistic;
- How Gaz Métro can present a detailed retrospective so that the Régie can regularly review the profitability objectives.

Mr. Chernick's mandate is to assist the Régie and the ROÉÉ in developing a solid methodology for assessing the profitability of Gaz Métro's system extension.

The interest of Mr. Chernick's ROÉÉ mandate stems from the Regroupement's significant concerns regarding the use of hydrocarbons (especially since we can assume the strong presence of shale gas, the production of which is associated with significant GHG emissions in natural gas used in Québec), and even more so in the case of natural gas system extensions.

From an environmental point of view, the ROÉÉ wants to ensure that the methodology used to calculate the profitability of a natural gas system extension is fair and that it reflects the effects of costs based on users.

An overly large system expansion based on inaccurate information could contribute to urban sprawl and hinder an energy transition based on renewable energy. Similarly, if inaccurate information led to a system extension that was too expensive, it would make it difficult to eliminate fuel oil in certain activity sectors.

However, although the interest of the ROÉÉ is related to the issues of energy transition toward the reduction of energy consumption, a significant improvement in energy efficiency and the elimination of fossil fuels in Québec, the Regroupement considers that the main goal of Mr. Chernick's mandate is to assist in the development of a rigorous and adequate cost allocation methodology so that all stakeholders can have a debate on solid foundations during phase 4 of this file.

¹ You can find all of Mr. Chernick's qualifications at C-ROÉÉ-0067.

In this regard, the ROÉÉ welcomes the Régie's decision to mandate the concerted work of experts as well as the work of expert William Marcus (OC) in item OC-0047, which puts into perspective the different positions of Mr. Chernick (ROÉÉ), Mr. Marcus (OC) and Russell Feingold (Black & Veatch, GM).

The ROÉÉ is announcing that it supports the proposals on which there is consensus among the three experts. When the different experts do not agree, the ROÉÉ supports and endorses the recommendations and proposals of Mr. Chernick. That is why the ROÉÉ adopts the recommendations of Mr. Chernick's report.²

In addition to this position, the ROÉÉ wants to provide further evidence in support of Mr. Chernick's recommendation to use a 25-year valuation period, rather than a 40-year period, in the method for evaluating the profitability of system extension.

To support this position, the ROÉÉ questions the validity of the period used by Gaz Métro and will present its arguments in favour of reducing the 25-year valuation period.

[Is a 40-year period still valid?](#)

When questioned about the reasons for determining a 40-year period as a valuation period, the B&V expert responded that:

“Black & Veatch understands that the Régie renewed the use of a 40-year valuation period by Gaz Métro in R-3173-89-E (Decision D-90-60.). In addition, during the course of its project with Gaz Métro, Black & Veatch was made aware of the average service lives of the facilities placed into service in conjunction with Gaz Métro's system extension projects, and the lives were within a reasonable range of the 40-year valuation period”³

Gaz Métro echoes B&V's response to CFIB's question 13.1 (Gaz Métro-9, Document 9 (B-0281)) in which the distributor explains that:

“Gaz Métro points out that the method for calculating the revenue required to analyze the profitability of a project was presented in file R-3173-89 and approved by the Régie du gaz naturel [sic] in its decision D-90-60. The analysis method described in the file, which includes the use of a 40-year period, is still used by Gaz Métro. This period should represent the average useful life

² R-3867-2013 ph 3B, Testimony of Paul Chernick for the ROÉÉ, Ressources Insight inc., September 26, 2017, 22 p.

³ B-0295, GM 9- doc 14, question 10.1

of the building connections and mains, which represent the major investments of projects.”⁴

Therefore, there are two main reasons for recommending the use of a 40-year period as an input in the calculation of profitability, namely: the decision of the Régie de l'énergie D-90-60 in file R-3173-89-E, and the use of a sample of distributors using a valuation period close to 40 years.

The ROEE considers that it is necessary to question the validity of these two justifications on the basis of the transformation of knowledge of the energy and environmental situation in 1990, when decision D-90-60 was made. That situation was extremely different from the present situation. In addition, the challenges of reducing greenhouse gas (GHG) emissions for the planet were virtually unimaginable in 1990. In this sense, even just the new knowledge of the effects of hydrocarbons on global warming should have an influence on Gaz Métro's activities and thus make the long-term profitability of the system extensions more risky.

In addition, the expected economic growth in the next 50 years is significantly lower than that seen in the 1990s. This will have an impact on the activities of Gaz Métro's large-volume customers, which could have a lower economic life expectancy than expected when extending the gas system in order to serve them.

Lastly, as will be presented below, the ROEE considers that the sampling conducted by B&V presents the possibility of establishing a valuation period of less than 40 years during a system extension cost analysis.

[Better understanding of the effects of GHG emissions from natural gas in the environment](#)

Since 1990, tremendous progress has been made in this area in terms of understanding the effects of GHGs on global warming. Bear in mind that since decision D-90-60, the Intergovernmental Panel on Climate Change (IPCC) was created and has submitted numerous reports demonstrating the effect of human activity on global warming. These reports first led

The Kyoto Accord and now the Paris Agreement, where the majority of states have agreed to try to limit global warming to below 2 degrees Celsius.

⁴ B-0257, GM 9 doc 3 question 7.1

The evolution of the situation since 1990, unthinkable 20 years ago, is illustrated by the finding of the International Energy Agency (IEA) that 90% of new sources on the planet come from renewable energy.⁵ Thus, although integrating solar and wind into important industrial sectors is still complex, the growth of renewable energy and drop in prices for these energy sources will be extremely competitive in 20 to 30 years, which will have an effect on the competitive situation of natural gas. This will impact the number of high-consumption customers on a system extension. Environmental considerations will also affect the image of companies with high GHG emissions. In the long term, corporate practices and the natural gas consumption of various companies in Québec could transform their practices in order to reduce or eliminate their natural gas consumption over 40 years.

On a more local level, these changes have led Québec to aim to “reduce GHG emissions by 80% to 95% below the 1990 level”⁶ by 2050. This means that over a period of 33 years, all industrial practices will have to undergo some important changes in one way or another. Sales Major Industries customers, who are the main reason for Gaz Métro’s system extensions,⁷ will not escape this reality.

In addition, given that Gaz Métro’s direct competitor is Hydro-Québec, which produces primarily renewable energy, it will be difficult for Gaz Métro to maintain a long-term competitive position. An increase in the price of gas would have a major effect on Gaz Métro, which should compete with a Crown corporation with a better environmental reputation and competitive prices. In the opinion of the ROÉÉ, in 25 years Gaz Métro’s competitive position with respect to Hydro-Québec will be very different from today’s.⁸

According to the ROÉÉ, it is important that when considering the long-term supply of hydrocarbon energy, the Régie must take into account a major transformation of the energy supply related to GHG emissions. A decrease in the valuation period during the profitability analysis of a system extension helps to respond to this challenge.

⁵ IEA, Decoupling of global emissions and economic growth confirmed, March 16, 2016, online, <https://www.iea.org/newsroom/news/2016/march/decoupling-of-global-emissions-and-economic-growth-confirmed.html>

⁶ Québec, CIBLE DE RÉDUCTION D’ÉMISSIONS DE GAZ À EFFET DE SERRE DU QUÉBEC POUR 2030 Consultation document, 2015, p. 1

⁷ R-3867-2013, phase 1, ROÉÉ-0050, p. 11

⁸ B-0257, GM 9 doc 3 question 7.2

Natural gas as transitional energy:

One of the arguments that Gaz Métro frequently presents to support its development is that natural gas is a transitional energy. Because natural gas is less polluting than fuel oil, it would reduce GHGs by about 32%.⁹ It is for this reason that in Québec's 2030 energy policy, the Québec government intends to continue extending the gas system and favouring liquefied natural gas (LNG).¹⁰

In reality, if natural gas can be a short-term transition energy, it's probably not a wise choice in the long term. As stated by Dr. Normand Mousseau, former co-chair of the Commission on Energy Issues in Québec and academic director of the Institut de l'énergie Trottier, in his book *Gagner la guerre du climat : douze mythes à déboulonner* [Winning the Climate War: Twelve Myths to be Debunked], when speaking of natural gas as transitional energy:

“If it is possible to make some progress with natural gas, we will have to quickly tackle the reduction of the use of this fossil hydrocarbon, which is not clean, in a context of global warming, despite what we believe all too often.”¹¹

For Mousseau, all the progress and energy needed to establish a gas system to replace the use of oil and coal with natural gas will have to be replaced relatively soon after by energies that are cleaner than natural gas. This view is shared by Damon Matthews, a professor at Concordia University and a scientist who helped draft two IPCC reports. He explains that:

“We can debate the fact that natural gas is a little better than other fuels. But the fact is that it is a fossil energy source. And when we build a new infrastructure to use it, it will have a lifespan of at least 30 or 40 years. So we are investing in an energy source that will emit CO₂ and other greenhouse gases for at least 30 or 40 years [...] The idea that we can build new infrastructure for slightly less polluting fossil fuels is not in keeping with the goal

⁹ Gaz Métro, response to the leaflet on hydrocarbons, document submitted by Gaz Métro: document submitted in the consultation for a Québec energy policy, July 2015, p.11

¹⁰ B-0264, GM-9 doc-6, question 7.10

¹¹ Mousseau, Normand, *Gagner la guerre du climat : douze mythes à déboulonner*, Boréal, p.134

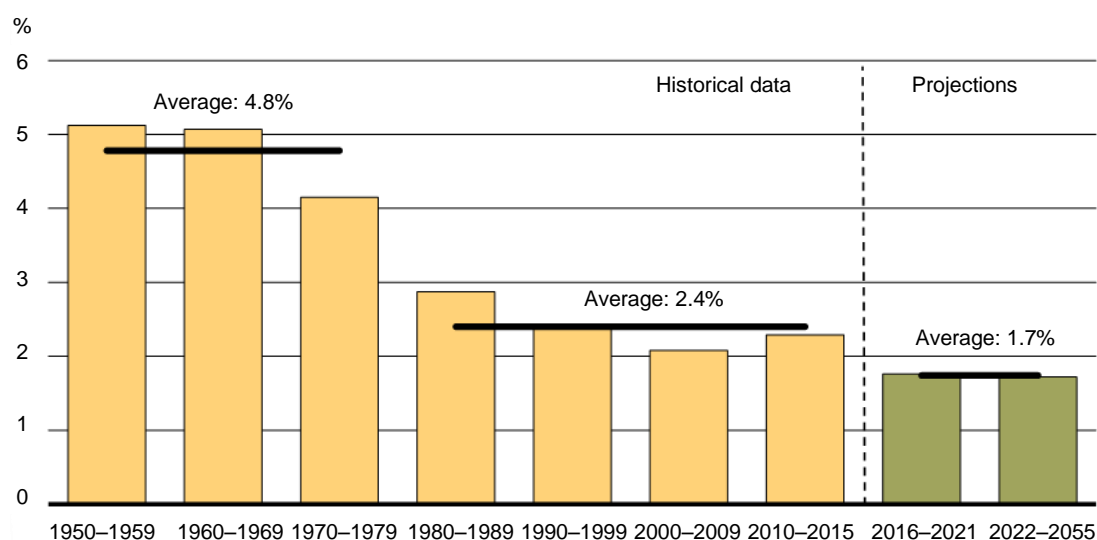
of rapidly and significantly reducing greenhouse gas emissions.”¹²

In short, a sound public management policy requires Québec society to revise its time horizon on the use of natural gas as a transition tool. According to the ROÉÉ, this involves decreasing the valuation period in the calculation of a natural gas system extension.

Projection of economic growth

Another aspect that decision D-90-60 could not take into account in 1990 is the decline in economic development projections between 1990 and 2055. Today, after the 2011 crisis, the Department of Finance Canada’s economic projections tend to show that growth will be about 1.2 percentage points lower than the historical growth between 1980 and 1989 and 2.4 points lower than the growth between 1970 and 1979, as shown in Graph 1.

Graph 1: Growth and projection of GDP in Canada from 1950 to 2055.



¹² Shields, Alexandre Le gaz naturel ne serait pas une énergie de transition viable, Le Devoir, September 6, 2017, online, <http://www.ledevoir.com/environnement/actualites-sur-l-environnement/507324/le-recours-accru-au-gaz-naturel-nuit-a-la-lutte-contre-les-changements-climatiques-affirme-un-expert-du-giec>

Sources: Department of Finance Canada, Statistics Canada

Obviously, a lower growth rate means fewer business opportunities as well as greater difficulty in densifying the system quickly. In addition, it may mean the decline in life expectancy of companies using natural gas. This increases the risks for stable customers who support the risk of system extension projects.

According to the ROÉÉ, while the calculation of the GDP growth is taken into account in the methodology for the system extension profitability analysis a priori and a posteriori,¹³ since the economic situation is less positive than in the 1990s, the risks of developing a gas system that is not profitable in the long term to the detriment of more stable customers should be minimized.

In short, the choice of the 40-year period adopted in decision D-90-60 was based on a completely different environmental and economic situation than today and should be reviewed.

The case of the Soleil Side as an example of the consequence of a withdrawal of large customers:

One of the concerns of the ROÉÉ is that for environmental and economic reasons, some system extension projects that seem profitable in year 1 are no longer profitable thereafter due to the withdrawal of large customers or an inability to densify the network in the long term. This was referring to a rate increase among stable customers.

A smaller scale example of this type of problem would be that of the Soleil Side project extension on Mont-Tremblant where, despite a projected internal rate of return of 13.79%, a 40-year rate decrease of \$868,417,¹⁴ and the connection of 35 buildings generating 1,443,103 m³ at maturity,¹⁵ in the end the project had a rate of return of 1.13% while creating a rate increase estimated at \$124,225.¹⁶

This is because of the 35 buildings that were to be connected, only 3 were actually connected, which led to a net loss.

¹³ 13 B-0264, GM-9 doc-6, question 12.7

¹⁴ R-3642-2007, Gaz Métro-1, Document 1, p. 13, lines 1 to 9

¹⁵ R-3642-2007, Gaz Métro-1, Document 1, p. 7, lines 1 to 7

¹⁶ R-3831-2012, Gaz Métro-17, Document 1, pp. 2 and 3.

This is despite the fact that the Régie specifically indicated that the project entailed risks to profitability.¹⁷ Ultimately, it is a customer's change of project choice that changed the overall profitability of the project.

According to the ROEE, this type of situation could be repeated in Québec in more generalized ways since the climate threat has a real impact on the future of natural gas use. Furthermore, note that the methodology of the profitability calculation as proposed would have a similar effect today since it essentially remains the same.¹⁸ It seems logical to want to ensure that customers who will have to be connected can quickly make the system extensions profitable.

B&V samples

In Table 3 included in the B&V document B-0278¹⁹ presented below, we note that only 4 of the 9 jurisdictions presented used a 40-year valuation period.

Table 1: Valuation periods for the analyses of system extension profitability by jurisdiction (reproduction of Table 3 of B-0278)

¹⁷ R-3642-2007, D-2007-98, pp. 7 and 8

¹⁸ B-0263, Gm-9 doc 5, question 2.3

¹⁹ B-0278, pp. 18 and 19

Utility Name	Analysis Method	Valuation Period (years)
<u>Canadian Utilities</u>		
ATCO Gas	If the extension is greater than 50 meters, customer must pay ATCO the difference between the cost of construction and the estimated revenue to be generated by the customer in the first 3 years of service (i.e., the contribution is set to recover any shortfall from the equation : (capital cost) - (revenue *3).	N.A.
Enbridge Gas Distribution and Union Gas Limited	The Ontario Energy Board's 188 Decision requires standardized discounted cash flow (DCF) analysis to be performed using the prospective average cost of capital. The OEB set the minimum threshold for the Rolling Project Portfolio at 1.0 P.I. and the minimum for an individual project to 0.8. The GEE also set the minimum threshold for the Investment Portfolio to 1.1 which included all distribution business projects necessary to attach customers of all rate classes in a given test year. Enbridge and Union utilize a DCF model using their prospective average cost of capital.	40 ^(a)
Enbridge Gas New Brunswick	In order for the utility's capital expenditures to be considered prudent, the System Expansion Portfolio test requires that revenues exceed incremental costs by at least 4% (using a revenue-to-cost ratio as the measure).	N.A.
FortisBC	All applications to extend the distribution system to new customers are subject to an economic test. Test is a DCF analysis of projected revenue and costs associated with the extension. If economic test results in P.I. < 0.8, customer can make up the shortfall with CIAC. FortisBC may finance CIAC amounts, and also waive amounts less than \$100. There is a P.I. target of 0.8 for individual projects and a P.I. target of 1.1 for the portfolio of projects.	40

Utility Name	Analysis Method	Valuation Period (years)
U.S. Utilities		
Cascade Natural Gas	Cascade offers a generous allowance based on the Perpetual Net Present Value (PNPV) of adding the customer, which is the customer's expected annual net revenue divided by its WACC. Customer pays for construction costs above the allowance.	N.A.
Chesapeake Utilities	Tor residential, an Internal Rate of Return (IRR) Model is used; for commercial & industrial, a 6 times net revenue test is used. If the IRR of the revenue test is less than the WACC then they require a contribution from the customer.	40
Columbia Gas (NiSource)	Residential: Customer entitled to a set footage allowance for main and or service line extensions. For projects larger than the allowance, customer must pay a contribution equal to the difference between the amount of capital that can be justified on a project (measured by expected revenues) and the minimum capital investment required to serve the customer. Commercial & Industrial: Same as residential but usually with no footage allowance (depending on the state).	40
Interstate Power & Light	If the first 3 years of revenues is greater than or equal to the capital investment than no CIAC is needed. They can extend the 3 years to 5 in certain circumstances. The gas utilities in Iowa are currently in a rulemaking process whereby they are proposing an economic test with 20 years of forecasted revenue in rural areas.	N.A.
Unitil Corporation	In cases where the proposed project does not meet the criteria for a standard allowance, a DCF analysis is run using the WACC, requiring Unitil to show the project can recover its costs or require a customer to make up the shortfall with a CIAC.	200 ^(b)
^(a) 20 years for large volume customers		
^(b) 10 years for residential and commercial customers		

Source: Black & Veatch, B-0278

Some distributors like Enbridge use a 20-year period for large-volume customers,²⁰ others like Unitil have an average valuation period of 20 years as well as a specific period of 10 years for a smaller volume extension.²¹ Unfortunately, at the time, B&V did not have the information that justified these decisions.²² The ROEÉ understands that for B&V experts, it is an industry standard that Gaz Métro should replicate. The ROEÉ submits that the sample presented shows that there are other possible models and invites the Régie to take note of them.

²⁰ idem

²¹ Idem

²² B-0294, Gm 9 doc 13, question 2.2,2.3,2.4,

What should the valuation period for calculating the profitability of a system extension be?

The ROÉÉ asks the Régie to acknowledge that it will be one of the first to make a decision on this issue since the majority of industrialized countries have ratified the Paris Agreement and that it is now aware that by 2050, the GHG reductions in Québec will have to be very significant. In addition, the conditions for economic growth are likely to be less than in past decades, in which case the ROÉÉ adopts the recommendation of the expert, Mr. Chernick, proposing the use of a 25-year valuation period.

As Mr. Chernick explains:

“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 revenues persist for more than an average of 25 years would be speculative.”²³

In the opinion of the ROÉÉ, this recommendation takes into account all environmental and economic inputs in establishing a valuation period pertaining to the profitability of a system extension while reducing the risks for all customers.

²³ R-3867-2013 ph 3B, Testimony of Paul Chernick for the ROÉÉ, Ressources Insight inc., September 26, 2017, p. 20

Summary of recommendations:

- **The ROEÉ supports all of the recommendations that are unanimous in the joint expert report in this case (C-OC-0047).**
- **Where there is no unanimity, the ROEÉ recommends to the Régie the recommendation of the expert, Mr. Chernick.**
- **More specifically on the question of the valuation period pertaining to the profitability of the system extension, the ROEÉ recommends that the Régie select a period of 25 years.**