The Economic Role for Gaz Métro in Promoting *2030 Energy in Québec*

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Introduction

Québec has usefully recognized in *2030 Energy in Québec* that an active energy policy is in the public interest of the citizens of the province. Québec wants to become a leader in the provision of renewable energy, the promotion of energy efficiency, and the development of innovative energy sources. As with any major region in a democracy, such as Canada's, Québec's current energy supply picture reflects its natural resource endowments as well as its political, industrial, and institutional history—shaped before climate change and a green and low-carbon energy supply became a key focus of policy. Québec's energy supply in the twenty first century, thus, is a result of a complicated function of the region's natural resources, energy market development, energy production technology, legislative action, regulatory custom, and public opinion regarding a low-carbon economy. In a word, in respect of its potential to move successfully to a lower-carbon and more efficient energy economy, Québec has its own particularities.

An important part of Québec's uniqueness is the ownership diversity of its major energy suppliers. The generally unregulated private sector provides petroleum products and motor fuels. A publicly-owned company—Hydro Québec—produces, transmits, and distributes almost all of the electricity. A regulated, investor-owned company—Gaz Métro—secures Québec's access to North America's competitive gas markets and distributes the fuel as one of two local public utilites serving the province. In this respect, Québec has various options in promoting low-carbon and more efficient energy use—through legislative action for the private sector, through

the ownership and management of its publicly-owned electricity industry, and through regulatory policy, by which it incentivizes the private actions of its regulated gas supply.

In any jurisdiction, the local gas distribution company has a particular role as a regulated, investor-owned enterprise with a low cost of capital because of its status as a local public utility. Gas distributors, reflective of their historical position as competitors in providing local services, are traditionally active in pursuing efficient and competitive energy supply for their service area. Reflecting that competitive history, Gaz Métro works successfully with other Eastern Canadian gas distributors to promote competitive access to North America's low-cost gas supplies. It also operates effectively within the regulatory framework created by the Régie to chart and achieve energy efficiency incentive targets. The company's access to low-cost capital exists because of the capital market's longstanding and special consideration for the creditworthiness of well-regulated utility enterprises.

Perceiving a public utility, like Gaz Métro, as an instrument of wider public policy for Québec may seem out of character—where its core business is acquiring and distributing gas. For the purpose of pursuing the goals like those stated in *2030 Energy in Québec*, thinking about gas distribution companies only through the lens of their core business is simply too narrow. Unlike other types of utilities (electricity, water, old-style telephone service), local gas utilities in Canada and the United States have long been instruments to pursue the public interest in areas outside of their local utility function. As in all major cities in North America, local gas service long pre-dates electric service—starting in 1837 in Montréal. Switching to natural gas involved the gas companies exiting from the manufacturing business, in Québec, as elsewhere in North America. It was a great change, reflecting new high-pressure, long-distance natural gas transportation. The switch greatly benefitted consumers but not necessarily the gas companies—who had to retire capital facilities. Working with other gas companies to resist rising gas prices and to promote competitive access (via TransCanada and other competitive upstream pipelines) to shift gas supplies highlighted the wider public interest aspect of local gas utilities, like Gaz Métro. As I said in my book, *The Political Economy of Pipelines*:

> Any economic history of [the gas market in North America] would be incomplete without recognizing the sustained collective action on the part of gas distributors

> and their state and municipal allies who acted in the interest of the constituencies of many millions of local gas consumers. … They pushed for decades to erase the sources of market power or the barriers to energy that would keep delivered gas prices up and transport options restricted.[1]

Of course, not all distributors acted or were regulated in the same way, and US gas distributors had different "upstream" forces to deal with than those in Canada. But while the trends for distributor public interest activism came a little later in Canada, reflecting different upstream supply and competitive issues, the developments are similar. Specifically, the three major gas distributors in Eastern Canada, representing service areas covering of half the country's population, have worked for continued access to the most low-cost and competitive sources of energy for the region.

Consistent with such public interest activism, Gaz Métro proposes to widen its participation in promoting *2030 Energy in Québec* in more ways than simply the distribution of natural gas. Gaz Métro has the ability to expand renewable energy sources by facilitating the private, rather than strictly public, financing of the associated costs. Gaz Métro's service network and access to low-cost capital allow it to offer the types of energy services that can help to increase the share of renewable energy sources in Québec. The company should be able to work within the current regulatory framework to promote and bring other types of energy services to the wider energy market in Québec. Rather than viewing the current regulatory framework in the context of the past, the regulator should be able to interpret it in the context of the future evolution of clean energy technology. In this new context, Gaz Métro is primed to play[2] a leading role. By using Gaz Métro, the province will be able to move toward the vision in the *2030 Energy in Québec* in a more efficient and cost-effective manner.

Investor Ownership in Energy Utilities in North America

[1] Makholm, J.D., *The Political Economy of Pipelines*, University of Chicago Press, Chicago and London (2012), p. 150.

[2] MERN - Avis sur les mesures suceptibles d'améliorer les pratiques tarifaires dans le domaine de l'électricité et du gaz naturel, mémoire de Gaz Métro, R-3972-2016, Gaz Métro 1, document 1.

The importance of investor capital in the provision of utility service in North America has a long history. But in charting the source of the regulatory institutions that can help to promote *2030 Energy in Québec*, it is useful to recognize the depth of support for investor-ownership in utilities. To be sure, major hydroelectric operations in North America require a commitment of land and capital that often-enough requires government sponsorship and ownership, as in the case of Hydro Québec.[3] And most people in North America get their water services from publicly-owned enterprises.[4] But outside of these hydroelectric and water service examples, investor-owned companies dominate the provision of utility services.

Such investor participation in utility services has a comparatively unique history in North America. In the early twentieth century, the role of private ownership of regulated businesses was confirmed by a newsworthy task force that sought to determine, with intensive study of US and UK utilities, the wisdom of continuing the use of private capital for the building and operation of regulated utilities.[5] The findings confirmed the continuing role of private capital in regulated utility enterprises. After the study, the United States—and to a large extent Canada—continued down the path of private utilities.[6] Public utilities in the UK and almost every other country were built and operated largely with public funds—if not from the start of the 20th century than from its middle (e.g., Clement Atlee nationalized the gas industry in the UK in the early 1950s). Only later in the twentieth century would a worldwide trend develop to shift many

[3] The US examples are the Bonneville Power Authority in Washington State, the Tennessee Valley authority and the Salt River Project in Arizona.

[4] United States Environmental Protection Agency, "2006 Community Water System Survey," Volume I: Overview https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1009JJI.txt.

[5] *Municipal and Private Operation of Public Utilities* (three volumes), National Civic Federation, New York (1907). Major players in the development of North American regulation were part of the study, including the economist John R. Commons, utility holding company pioneer Samuel Insull and future US Supreme Court Justice Louis Brandeis.

[6] Canada and the United States share common utility regulatory roots. See: Grieve, Willie, "One Hundred Years of Public Utility Regulation in Alberta," *Energy Regulation Quarterly* - See more at: http://www.energyregulationquarterly.ca/articles/one-hundred-years-of-public-utility-regulation-in-alberta#sthash.fFzFDwMa.dpuf.

of the world's publicly-owned utilities into private hands, driven by a consensus view that the participation of investor-owned utilities increases economic efficiency and productivity.[7]

Québec has a similar history of private enterprise as the United States and the rest of Canada. Apart from its continued ownership of Hydro Québec, the provincial government has fostered investor-ownership. Gaz Métro was founded as Québec Natural Gas Corporation in 1955 and took control of the government-owned Hydro Québec system in 1957, completing the privatization of Québec's gas distribution network.[8]

Private Utilities Work in the Public Interest

A good example of investor-owned distribution companies working in the public interest is their pursuit of the switch from manufactured gas to natural gas in the middle of the twentieth century—swapping upstream contracts and gas supplies for gas manufacturing rate base. The role of the local gas utility is to ensure the secure, stable and low-cost supply of gas for its customers. As the technology to obtain natural gas improved, starting in the 1920s and continuing into the 1930s, its price dropped compared to the manufactured gas that was the primary supply for most utilities since the nineteenth century. This decrease in price led to a rush to supply natural gas more broadly across the continent. For example, underwritten by Commission approval of upstream contracts, interstate pipelines extended into the New England area in the early 1950s (and Gaz Métro territory in 1958).[9] The new supply facilitated the rapid switch from manufactured to natural gas as illustrated in Table 1. This speedy and efficient switch, trading upstream contracts for gas manufacturing rate base, illustrates the history that utilities have in serving the public interest, despite being investor-owned companies.

[7] Nobel Laureate, Economist Gary S. Becker notes that "[t]he privatization revolution sweeping the world surely ranks among the remarkable economic developments of the past few decades." Gary S. Becker, "Surprises in a World According to Adam Smith," *Business Week,* August 17, 1992, p. 16.

[8] Gaz Métro, "Who We Are," https://www.gazmetro.com/en/about/the-company/who-we-are/history/.

[9] Gaz Métro, "About Us: History," https://www.gazmetro.com/en/about/the-company/who-we-are/history/.

Table 1

Gas Sales of Utilities in New England, 1945-1959 (millions of therms)

Year	Natural Gas	Manufactured Gas
1945	0	321
1947	0	364
1949	0	375
1951	15	414
1953	214	220
1955	441	17
1957	625	16
1959	894	16

Source: Christopher James Castaneda, "Regulated Enterprise: Natural Gas Pipelines and Northeastern Markets, 1938-1954," Ohio State University Press, Columbus, OH, 1993, Chapter 7, p. 144-166.

Québec's natural gas regulatory framework has facilitated achievements on other public interest matters. The Régie approved a performance incentive mechanism for Gaz Métro in 2000, which included the Global Energy Efficiency Plan (GEEP) to help Gaz Métro increase efficiency and maximize social benefits. Gaz Métro identified energy efficiency incentive programs—setting objectives and estimating the costs and social benefits for each. The GEEP included an Energy Efficiency Plan Performance Incentive (EEPPI) to neutralize the costs and revenues of any project. Gaz Métro was rewarded a sliding scale percentage of the program's social benefits (estimated as the program's costs) when it attained various percentages of the projects' objectives. The performance incentive mechanism also includes a program (the Assistance Account for the Substitution of Pollutant Energy Sources, known as CASEP) to assist Gaz Métro in replacing more carbon-intensive forms of energy, like petroleum products and coal, with natural gas.[10]

The GEEP now includes some programs from the Energy Efficiency Fund (EEF). The EEF was created at the same time as GEEP to manage complementary energy efficiency programs until 2012. Under EFF, priority was given to projects that are innovative, assist low-

[10] Gaz Métro PBR Settlement, August 21, 2000, R-3425-99.

income residential customers, social and community projects, and those that partner with other energy firms. Gaz Métro continues to make an effort to displace more carbon-intensive energies with natural gas.[11]

Gaz Métro has had great success at increasing the energy efficiency of their residential and business customers under the GEEP and energy displacement program. Since the implementation of GEEP in 2001, Gaz Métro has helped with over 115,000 of their customer's energy efficiency projects, saving 460 million cubic meters of natural gas. In 2015 alone, Gaz Métro helped with over 4,100 projects and saved 42 million cubic meters of natural gas, which could generate savings of over $160 million for consumers, depending on the price of gas, over the lifespan of the energy efficiency measures applied.[12]

Based on this record of incentive-based success, Québec can allow Gaz Métro to perform the energy services embedded in *2030 Energy in Québec*. The GEEP and similar programs are simply a regulatory framework; a set of rules and incentives that reinforce Gaz Métro's behavior. This regulatory framework should accommodate Gaz Métro's emergence as an energy services provider outside the realm of natural gas in the same way it accommodates energy efficiency programs. By employing Gaz Métro to perform these services, Québec is simply extending the reach and flexibility of its regulatory framework to further seek the public interest in pursuit of Québec's targets, as stated in *2030 Energy in Québec*.

New Services within the Regulatory Framework

The recent emphasis on energy efficiency around the world has led distributors (in both electricity and gas) and regulators to rethink and reimagine the role of the investor-owned utility in the current regulatory environment. In both the United States and Canada, investor-owned utilities are beginning to be an active participant in customer services and other areas that would have previously been considered outside their duties as strictly gas or electricity distributors. Perhaps the best example of this is New York's "Reforming the Energy Vision" initiative. This

[11] Gaz Métro PBR Settlement, November 5, 2003, R-3494-2002.

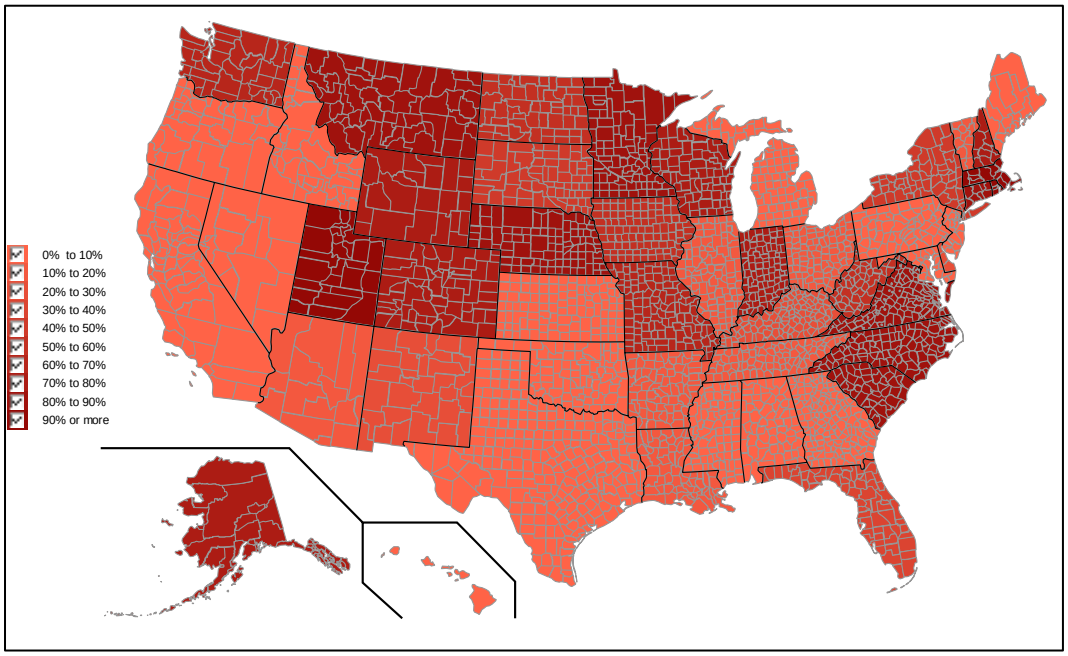
[12] Gaz Métro, "Energy Efficiency," https://www.gazmetro.com/en/about/sustainable-development/report/topics/energy-efficiency-and-internal-energy-consumption/energy-efficiency/.

effort, launched in April 2014, gives electricity distributors new tools to promote energy efficiency goals and distributed energy. It calls on utilities to become "distributed system platform (DSP) providers." Rather than simply providing electricity, distributors in New York will now develop markets for distributed energy resources (DER), such as solar and combined heat and power, among many others.[13] The REV initiative encapsulates the multiple roles that energy distributors can play beyond simply providing gas or electricity.

Another example of innovation by energy distributors is the recent emergence of advanced metering infrastructure (AMI). One type of AMI, advanced meter reading (AMR) allows the direct transmission of a customer's energy usage to the energy company. A more advanced version of AMR, smart meters, also allows customers to monitor their usage in real-time. The market-wide implementation of these resources allows customers to better monitor and control their consumption and allows distributors to better match prices to actual energy usage. Both of these outcomes increase the efficiency of energy consumption. The implementation of smart infrastructure by distributors is under development around the world. Figure 1 shows the availability of AMR in the US and Figure 2 shows the penetration of smart meters.

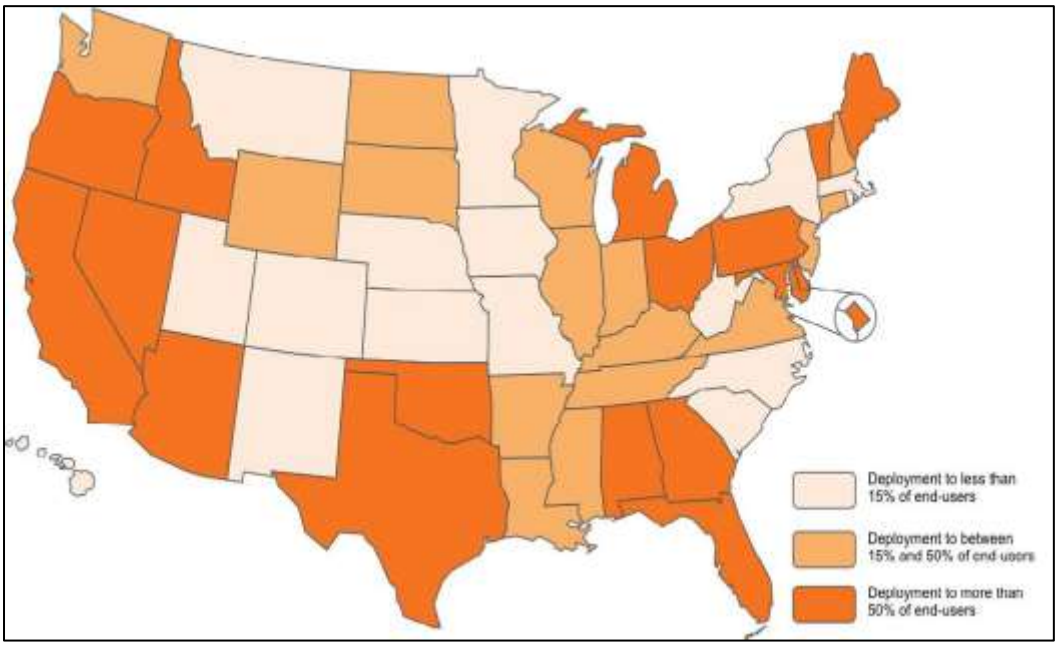
[13] Enerknol Research, "New York Adopts New Revenue Model For Electric Utilities Under REV," Breaking Energy, June 6, 2016, http://breakingenergy.com/2016/06/06/new-york-adopts-new-revenue-model-for-electric-utilities-under-rev/.

Figure 1: Percent of Customers using AMR by State, July 2016



Source: Created by NERA using Energy Information Administration (EIA) data.

Figure 2: United States Smart Meter Penetration in 2014



Source: Jeff St. John, "50 Million US Smart Meters and Counting," Greentech Media, September 16, 2014, https://www.greentechmedia.com/articles/read/50-million-u.s.-smart-meters-and-counting.

In addition to these broader aims at becoming distributed system platforms providers, investor-owned utilities have begun to provide more specific services targeted at promoting renewable energies. For example, Green Mountain Power is embracing solar and energy efficiency.[14] Also, the California Public Utilities Commission (CPUC) recently approved pilot

[14] Transcript from *Charlie Rose* at 7:32 to 7:43, Peter Corsell: "Green Mountain Power in Vermont is…doing the best job of any in really pushing the envelope…They are embracing solar, they're embracing energy efficiency…" June 9, 2016, https://charlierose.com/videos/28221. See also Green Mountain Power, "Products and Services," http://products.greenmountainpower.com/ and Rosalind Jackson, "Meet Our 2014 Utility Solar Champion: Vermont's Green Mountain Power," Vote Solar, March 25, 2014, https://votesolar.org/usa/other-states/updates/solar-green-mountain-power/.

programs to allow distributors to use ratepayer money to fund the construction of electric vehicle (EV) charging infrastructure. Prior to this, California had relied on third-parties providers for this service. But, these third-party providers could not implement the infrastructure on the scale necessary to achieve significant market penetration. Thus, the CPUC has asked the investor-owned utilities to submit plans to construct EV infrastructure. Other states, such as Oregon, Washington, Illinois, Kansas and Kentucky are also exploring how electricity distributors can assist with EV charging.[15] The use of utilities in providing EV charging infrastructure illustrates the unique role that distributors have, which makes them better situated to provide some energy services that third-party providers cannot adequately provide.

New York's REV initiative, the promotion of AMR and smart meters and electric vehicle charging are products of the new paradigm that regulators and distributors face. Regulators want to promote energy conservation and renewable energy within market structures. Distributors are uniquely situated to provide these services, given economics of scale and scope with the regulated services they already provide. Those distributors are effectively becoming regulated promoters of distributed energy and energy efficiency to accomplish a broader, activist energy policy. These examples are only a small sample of the many ways that distributors can expand their offerings to better match their service to the stated goals of the regulator and the best interests of the consumer in the new environment that stresses both efficient and low-carbon energy consumption.

New Energy Services for Québec

In *2030 Energy in Québec*, the government outlines the significant alterations it plans to make to Québec's energy profile in order to move to a more energy efficient and low-carbon economy. Most importantly, *2030 Energy in Québec* sets out to achieve a 13.3 percent increase in renewable energy production by 2030.[16] This goal will be accomplished through an increase in

[15] Center for Strategic & International Studies, "Utility Involvement in Electric Vehicle Charging Infrastructure: California at the Vanguard," April 6, 2016, https://www.csis.org/analysis/utility-involvement-electric-vehicle-charging-infrastructure-california-vanguard.

[16] *The 2030 Energy Policy, Energy in Québec* states that Québec's goal is to achieve an increase from 47.6% of renewable energy to 60.9% of renewable energy in the energy mix.

the use electricity, biomass, and decentralized energies (such as geothermal and solar energy) for energy needs. Further, the government envisions a complete displacement of coal and a sizeable reduction in oil-based motor fuel. Québec proposes to achieve these gains in renewable energy and efficiency by making more than $4 billion available to households, businesses, and public establishments over the fifteen year period. This money will fund energy efficiency and energy substitution measures by consumers.[17]

Gaz Métro believes[18] that it is uniquely situated to provide access to a number of diverse energy services outside the realm of strictly natural gas that will accomplish these goals. While some technologies might not need Gaz Métro's expertise in order to effectively enter the market, others will. The company's utility status makes it the natural entrant to bring various energy services to market on the scale necessary to achieve the ambitious targets. Which services could benefit from the company's intervention is an important question, but one on which both the company and the Régie can act usefully as a necessary part of an active energy policy that looks to the inherent advantage of one of its local public service providers to foster efficiency.

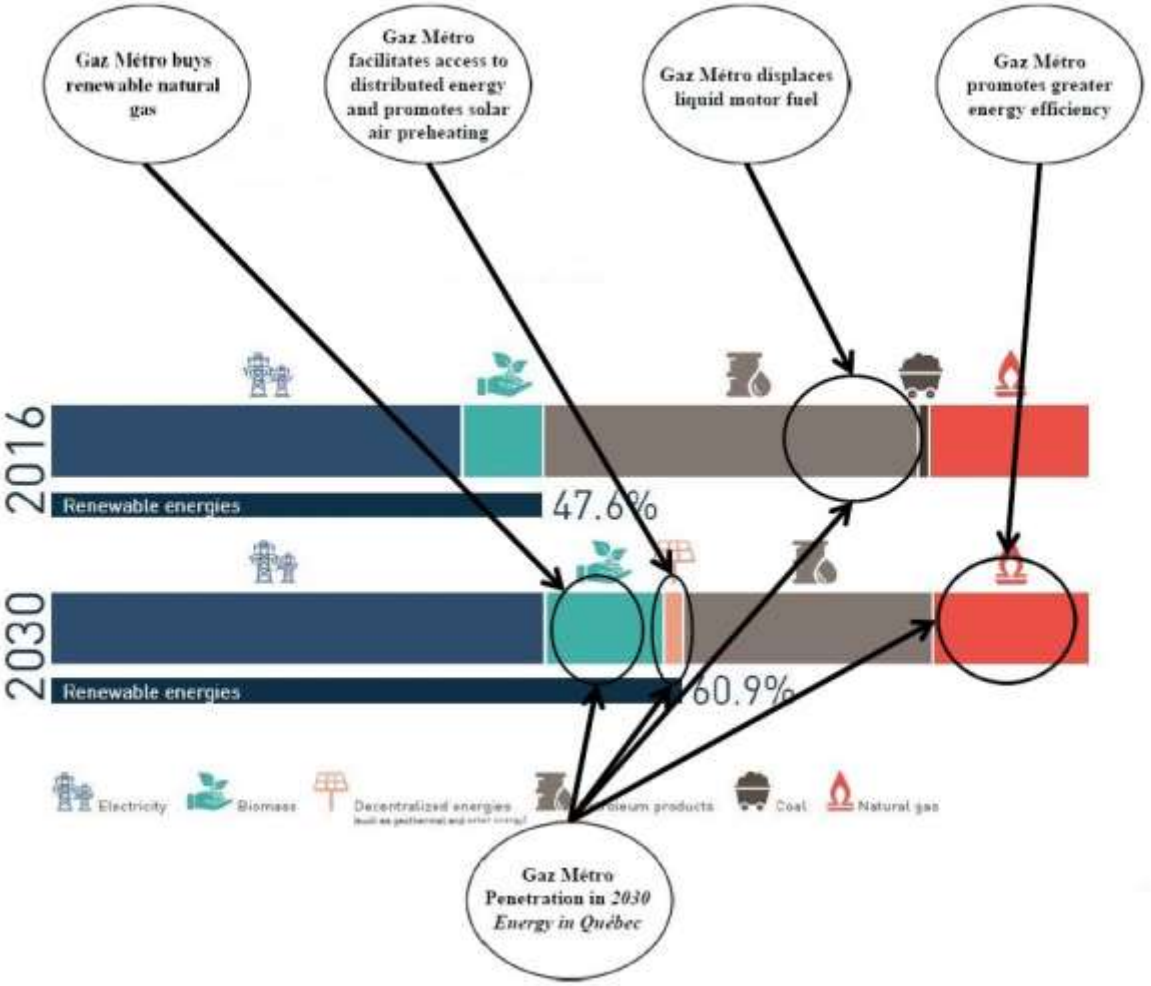
Gaz Métro's entrance into these markets does not kill competition for the provision of such services but simply uses its current public service role to the advantage of an active energy policy in Québec. This public service role allows Gaz Métro access to the necessary customer base. Its low cost of capital, existing relations with over 200,000 customers and economies of scale allow for the efficient and timely construction of infrastructure on the scale required to achieve the government's goals. These characteristics mean that energy services which have high set up costs and barriers to entry would greatly benefit from intervention by a public utility like Gaz Métro. These services would be costly and inefficient for private companies, who do not have the same access to low cost capital and economies of scale that Gaz Métro can provide. Thus, by letting Gaz Métro enter as a prime buyer of such services in the market, *2030 Energy in Québec* is aiming to provide expanded energy services in the best interests of both consumers

[17] *The 2030 Energy Policy, Energy in Québec.*

[18] MERN - Avis sur les mesures suceptibles d'améliorer les pratiques tarifaires dans le domaine de l'électricité et du gaz naturel, mémoire de Gaz Métro, R-3972-2016, Gaz Métro 1, document 1.

and an active energy policy. Figure 3 illustrates the areas where Gaz Métro can actively participate in the *2030 Energy in Québec* framework.

Figure 3: Gaz Métro Penetration in *2030 Energy in Québec*
Source: Image is originally from *The 2030 Energy Policy, Energy in Québec*, edited by NERA.



Gaz Métro can also assist in the direct costs of *2030 Energy in Québec* by promoting an economically efficient funding element of the expenditures, in addition to the province's commitment of $4 billion in customer incentives. That is, Gaz Métro can finance, through the rates its customers pay over time, the necessary charges. By funding the construction of infrastructure and services in this way, Gaz Métro can effectively shield the full taxpayer base in Québec from the burden of paying. Instead, only those who are using and benefitting from the

energy services will pay for them, through the rates they pay to Gaz Métro. This matches the costs of the policy to those who benefit in a way that only a local distributor, like Gaz Métro, can do in this situation. Thus, the large scale incorporation of diversified energy services into Gaz Métro's portfolio will meet Québec's energy targets in a more efficient way than simple government funding.

The proposed 13.3 percent increase in renewable energy resources includes two broad policy areas where Gaz Métro can help to make Québec's energy profile more efficient and sustainable. First, the government wants to facilitate large scale consumer switches from more emissives energies to renewable energies, in order to reduce the use of more carbon intensive resources and increase the use of renewable resources. One way in which Gaz Métro can facilitate this switch is through the continued adaptation and expansion of district heating. District heating networks use one or more central boilers to create and distribute heat to homes within a local network. They allow for the incorporation of the waste heat from electricity production, the incorporation of more renewable sources that waste a lot of energy (such as solar), and are beneficial to consumers by making the energy profile cleaner.

District heating networks are already being used around the world to conserve resources and switch to renewables. One of the most prominent examples of district heating currently in use in Québec is the CCUM Montreal Network, which provides thermal services to over one third of Montreal's downtown core. This project is the second largest district heating network in Canada. The scale of this project shows the success that district heating networks can have in the province.

Gaz Métro can help achieve a further decarbonisation of the heating industry by targeting decentralized energy technologies that reduce load. One example of this is heat pumps, also called geothermal heating and cooling, which use the heat from the ground to heat homes. However, while district heating requires infrastructure at a decentralized location, installing heat pumps requires a substantial amount of infrastructure at individual homes. Despite this difference, Gaz Métro is still uniquely situated to install this service because of its proximity to its customers. In various parts of Canada, most notably British Columbia, local utilities currently

provide a number of rebates and incentives for customers to install heat pumps—for those who opt to take advantage of them.[19] By allowing Gaz Métro to facilitate the access to this type of technology, Québec can achieve the scale necessary to lower costs and make a more substantial impact on it's energy profile. The incorporation of heat pumps allows for network optimization by making heating more efficient, saving energy, and better matching the supply of heat with demand. These benefits flow to consumers in the form of lower prices and more efficient heat consumption.

Further, Gaz Métro can help facilitate the use of decentralized energies to reduce natural gas consumption. A key element in the search for lower-carbon energy supply involves solar photo-voltaic (PV) installations—from utility-scale installations to "rooftop solar" and small-scale geothermal. Distributed PV generation, for example, is a highly attractive concept because it involves small-scale installations making use of the cleanest energy source.

More specifically, Gaz Métro can use its unique position to increase the use of solar air preheating to replace natural gas. This technology preheats the air before it enters a ventilation system, decreasing the need for natural gas to warm air straight from outside.[20] Québec in particular can benefit from solar air preheating because of its long but sunny winters.[21] Gaz Métro already offers a grant to businesses installing a solar air preheating system, which offers $2 per cubic meter of natural gas displaced.[22] In addition, while Gaz Métro does not currently have a grant program for solar water heating, one could be incorporated in a similar way.

Gaz Métro can also be used to remedy some of the ailments of the solar PV market. Despite recent technological advances in bringing down the cost of solar panels (by over a factor of two since 2008), there remains tension between stated installation goals and supply in distributed PV generation. Adding a new distributed PV program to the existing industry, its

[19] Natural Resources Canada, "Rebates and incentives," http://www.nrcan.gc.ca/energy/products/energystar/why-buy/14136.

[20] U.S. Department of Energy Federal Energy Management Program (FEMP), "Solar Ventilation Air Preheating," https://www.wbdg.org/resources/svap.php.

[21] Mario Pagliaro, "Solar power in Québec: a unique potential soon to be fulfilled," Energy Science & Engineering 2014; 2(2): 86-93, February 28, 2014.

[22] Gaz Métro, "Solar air preheating system," https://www.gazmetro.com/en/business/grants/energy-efficiency-programs/solar-preheating/.

practices, and its regulation is more difficult than it might first appear. Splicing distributed PV programs onto the grids that modern electricity consumers have inherited face various problems, including the fact that consumers may not be well informed about the long-term payoff of small scale PV installations.

The current market structure uses separate rooftop solar providers, rather than utilities, to install solar panels. There have been many cases where consumers have signed contracts for the long-term repayment of rooftop solar installations.[23] Members of the US Congress have written to the Federal Trade Commission and Consumer Financial Protection Bureau about sales and marketing practices of rooftop solar providers—comparing the problem to the subprime loan marketing problems.[24] Indeed, some residential consumers who agree to long-term rooftop solar obligations may not fully understand their contracts with these providers or the elements that determine whether their installations are worthwhile.

The regulation of the private energy delivery systems has developed over more than a century in North America to balance the goal of facilitating the commitment of investor capital in reliable and economical services while ensuring that consumers pay reasonable tariffs for those services without undue discrimination. Those regulatory methods changed in the late 20th century to be highly effective in promoting competitive power generation and low power costs (and even more so in encouraging competitive gas supply) while limiting regulatory control to those parts of the power delivery system for which competition was not practical or possible. But that regulatory system is not well designed to encourage the economical provision of small-scale renewable power at the consumer end of the system that active energy policies like *2030 Energy in Québec* describe. It is reasonable to consider that an incentivized Gaz Métro can help to pursue such an active, low-carbon energy policy.

[23] Tori Richards, "Surprised solar customers find themselves with liens," April 15, 2015, http://watchdog.org/212170/surprise-solar-liens.

[24] Tori Richards, "Congressional leaders charge 'potentially deceptive sales tactics' by SolarCity, others," January 8, 2015, http://watchdog.org/191409/congress-probes-solarcity/.

In Québec, there is a relatively high demand for solar PV technology that is not currently being met by the supply in the market. In 2010, 67 percent of Canadians over the age of twenty-five, who owned a home, wanted to install a solar plant.[25] The regulatory regime in Québec has attempted to incentivize the development of PV, with the same limited success seen around the world. The province has, for years, offered public subsidies for solar investment and recently implemented the EcoPerformance program, which provides financial help for consumers who install technologies that reduce their greenhouse gas emissions. Hydro Québec has implemented a Net Metering scheme for customers that install PV.[26] Despite the high demand and current regulatory incentives, only 86 PV systems have been interconnected with utilities as of 2015. These systems have an installed capacity of 0.679 MW, compared to an installed capacity of 9.161 MW in Alberta, 3.238 MW in British Columbia, and 2.499 MW in Ontario. The relatively low level of PV installations in Québec illustrates the disconnect between the supply and demand in the province.[27]

The absence of substantial market penetration for PV installations provides an opportunity for Gaz Métro to make use of its network and low cost of capital for the benefit of the whole province. Instead of relying on uncoordinated private demand to bring PV to market in Québec, Gaz Métro can implement PV on a scale large enough to actually make a difference in the makeup of Québec's energy supply. The company will be able to communicate effectively the long-term benefits and payoff for the installations, oversee the provision of PV technology and maintain the facilities. Gaz Métro can act as a regulated third party PV provider to bring solar power to Québec on a scale that Québec has not yet achieved.

Gaz Métro also provides renewable natural gas alternatives to fossil fuels. Renewable natural gas is produced from organic materials like manure and household waste, which can be processed and used as a renewable energy source with fewer greenhouse gas emissions than

[25] Pagliaro, "Solar Power in Québec: A unique potential soon to be fulfilled."

[26] Ibid.

[27] Yves Poissant and Lisa Disnard-Bailey, CanmetENERGY, Natural Resources Canada, Patrick Bateman, Canadian Solar Industries Association (CanSIA), "Photovoltaic Technology Status and Prospects Canadian Annual Report 2015."

traditional fossil fuels. In all of Canada, renewable natural gas resources have the potential to save 37.5 million tons of carbon dioxide emissions a year, which is the equivalent of removing 7.5 million cars from the road.[28] Gaz Métro currently has approval from the Régie to buy about 12 Mm^3 of renewable natural gas from the city of Saint-Hyacinthe each year. It can accommodate this renewable gas in its distribution network and potentially more through further capital improvements to its system.[29] Gaz Métro is uniquely situated to increase the market penetration of this renewable resource with its large distribution network that can purchase and use the gas at the minimum efficient scale. The Gouvernement has indicated its intention to have a minimum amount of renewable natural gas in the distribution network.[30]

One more service Gaz Métro can provide, to encourage a switch away from high-carbon emissions, is the incorporation of expanded liquefied natural gas (LNG) and compressed natural gas (CNG) in the transportation sector as an alternative to diesel and other motor fuels. In 2013, the transport sector (road, air, maritime, rail etc.) accounted for 43.0 percent of greenhouse gas (GHG) emissions in Québec. Road transport alone accounted for 78.2 percent of the transportation sector's emissions, which equalled 33.6 percent of total GHG emissions.[31] There are efficiency gains to be had by replacing diesel fuel with natural gas, which releases 28 percent less carbon dioxide per unit of heat than diesel fuel.[32]

Gaz Métro, through its unregulated subsidiary, Gaz Métro Transport Solutions, has begun to market natural gas as an alternative to diesel fuel. This company played a large role in creating "The Blue Road," which is one of the first natural gas-fuelled freight transportation corridors. It runs along the 20/401 highway between Québec City and the Greater Toronto area, where heavy

[28] Biogas Association, "Canadian Biogas Study: Benefits to the Economy, Environment and Energy," Summary Document, November 2013, page 3, http://biogasassociation.ca/images/uploads/documents/2014/biogas_study/Canadian_Biogas_Study_Summary.pdf.

[29] Gaz Métro, "In Saint-Hyacinthe, nothing is lost-everything is transformed," March 6, 2015, https://www.gazmetro.com/blogue/en/energy/saint-hyacinthe-nothing-lost-everything-transformed/.

[30] Assemblée nationale, Projet de loi 106, Loi concernant la mise en œuvre de la Politique énergétique 2030 et modifiant diverses dispositions législatives, 2016.

[31] Inventaire Québécois des émissions de gaz à effet de serre en 2011 et leur évolutions depuis 1990, p.8.

[32] Oscar Delgado and Rachel Muncrief, "Assessment of Heavy-Duty Natural Gas Vehicle Emissions: Implications and Policy Recommendations," The International Council on Clean Transportation, July 2015.

duty trucks make 48,000 trips every week.[33] In April of this year, Gaz Métro Transport Solutions partnered with SÉMER to install the eighth LNG refuelling station on the "Blue Road."[34]

The success and continued expansion of the "Blue Road" project represents the feasibility of LNG and CNG as a cleaner transportation fuel. Given this success, Québec can use Gaz Métro, as a regulated investor-owned utility, to promote natural gas for transport on a larger scale, in the same way that California has started to use its utilities for the construction of EV charging infrastructure. Gaz Métro has valuable experience in the industry and can finance, with customer backing, the construction of natural gas refuelling stations across Québec. While Gaz Métro Transport Solutions has experienced success as an unregulated provider of refuelling stations, natural gas will not reach the market penetration necessary to significantly displace motor fuel, without the involvement of Gaz Métro, the regulated entity, and its economies of scale and low cost capital.

Besides an increase in renewable energies, Québec also wants to reduce the use of more carbon intensive resources in individual homes. While the switch to more renewable resources outlined above will achieve a portion of this goal, Gaz Métro can also substantially affect the way its customers behave through demand side management (DSM) and energy optimization programs. DSM programs reduce the consumption of natural gas by improving the energy efficiency of buildings, space heating systems, water heating systems, and other gas appliances. These programs can fall into a number of categories including weatherization, retrofitting equipment, and educating customers on ways they can reduce their individual natural gas consumption.

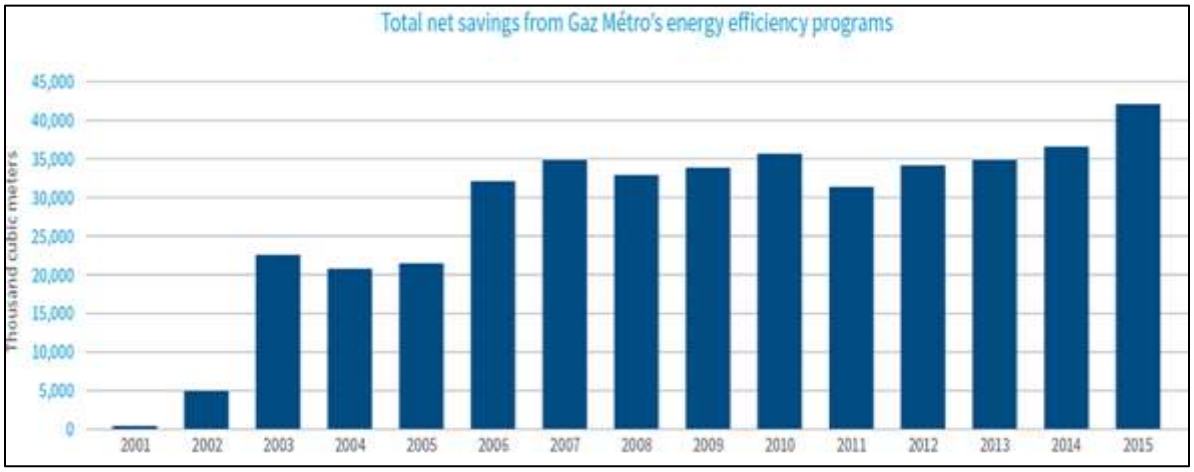
Currently, Gaz Métro offers more than twenty programs and incentives to its customers to encourage energy efficiency. These programs have been tailored to different customer needs and include grants for high efficiency appliances to residential, commercial and industrial

[33] Gaz Métro, Press Release, "The "Blue Road" project- A Canadian first in the freight transportation industry," October 17, 2011, https://www.gazmetro.com/en/about/media/news/the-blue-road-project-a-canadian-first-in-the-freight-transportation-industry/.

[34] Gaz Métro, Press Release, "Rivière-du-Loup joins the Blue Road, a natural gas network for heavy-transport vehicles," April 28, 2016, https://www.gazmetro.com/en/about/media/news/20160428/.

customers, grants to buy programmable electronic thermostats (which save 7 to 10 percent in energy), and external consultants who work with customers to reduce their consumption costs and optimize their equipment's performances.[35] The grants offered also include up to $0.25 per cubic meter of natural gas saved following the implementation of an energy efficiency measure, and 50 percent of the cost of the work for any renovation of a building supplied with natural gas, depending on the energy savings generated.[36] Figure 4 shows the yearly net natural gas savings from Gaz Métro's energy efficiency programs. In order to achieve the goals of *2030 Energy in Québec*, namely the decrease in natural gas consumption outlined, Gaz Métro can well build upon and expand these DSM programs.

Figure 4



Source: Gaz Métro, "Energy Efficiency," https://www.gazmetro.com/en/about/sustainable-development/report/topics/energy-efficiency-and-internal-energy-consumption/energy-efficiency/.

Besides these existing technologies, new renewable and efficient energy technologies will emerge in the coming years. Gaz Métro can similarly play a role in facilitating customer access to these new energy technologies and services, and better fulfil the vision in *2030 Energy in Québec* than if customers implemented these new services on an individual basis. Gaz Métro

[35] Gaz Métro, "Customer Support," https://www.gazmetro.com/en/about/our-energies/energy-efficiency/customer-support/.

[36] Gaz Métro, "Energy Efficiency Grants," https://www.gazmetro.com/en/business/grants/energy-efficiency-programs/.

has the infrastructure and knowledge to distribute, not just the services mentioned here, but also new technologies in the most cost-efficient and effective manner.

Conclusion

A number of elements come together to promote an active regulatory policy for low-carbon energy efficiency in Québec. A key element is a re-examination of traditional tolling practices so that consumers better perceive the incremental economic costs of their decision to consume—when they consume. But other elements go beyond regulated tolling, and these are important in an active energy policy like *2030 Energy in Québec*, which recognizes the wider interest in promoting a low-carbon economy. One of these interests involves the specific promotion of gas for motor transport. Another involves the expansion of load-levelling and low-carbon energy services on a large scale—serving to minimize the cost to consumers of doing so. A local distributor, like Gaz Métro, with its service network and access to low-cost investor capital, can participate in both areas. Increasing the ability to provide expanded low-carbon energy services is in the public's best interest. Investor-owned companies like Gaz Métro have been the vehicles for promoting the public's interest in diverse and low-cost energy sources for decades, and it is in the interest of such companies to promote both programs to pursue energy efficiency (as Québec has seen for its gas distributors) and as a key entrant in the business of providing expanded energy.

The goal of industry regulation, in Québec and generally, is to try to foster competitive-like outcomes in markets where competition does not do well if left on its own (e.g., natural monopolies like local energy distribution). In this way, regulation tries to promote competitive-like efficiencies and outcomes in non-competitive markets. Regulation generally does not desire to expand its boundaries beyond what is needed to deal with related industries. Indeed, competitive gas markets in North America reflect the successful move of regulators, both in Canada and the United States, to permit gas to be competitively bought and sold while retaining regulation in pipelines and distribution companies like Gaz Métro. A more progressive view of where regulation can advance the public interest is justified, however, in the pursuit of more renewable and efficient energy services. The participation of regulated operations can speed the

implementation of related industries and operations that can help to promote the transition to the vision in *2030 Energy in Québec*. Some of the markets for different types of energy services, outlined in this paper, lend themselves to regulated company participation because of existing regulatory infrastructure, connections to consumers, the ability to access low-cost capital, and regulatory oversight of information and the quality of services.