



Bettering Canadian Lives: Harnessing the Canadian Gas Energy Opportunity

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Executive summary

Energy is a fundamental Canadian advantage. We hold and have developed vast energy resources affordably and reliably. The list includes crude oil, uranium, water, coal, wood, critical minerals, and — of increasing importance — natural gas. We have turned those resources into exceptional energy services — delivered by road, rail, ships, wires and pipelines — again, affordably and reliably — to meet the needs of Canadians and Canadian industry, commerce, agriculture, heating, cooling, cooking and more. Despite our vast and challenging terrain and relatively small population, Canada has leveraged its energy resources and realized their potential to build a robust economy and an extraordinary quality of life.

Canada's natural gas energy infrastructure system spans 600,000 km and serves nearly two-thirds of Canadians across eight provinces and one territory. This system enables the transportation of gas energy, which includes natural gas, hydrogen, and renewable natural gas, directly into homes and businesses for various end-uses from space and water heating to industrial heat and feedstock applications. The infrastructure also possesses several characteristics to ensure that energy remains reliable and affordable for all Canadians.

Natural gas is the fastest-growing energy choice amongst Canadians, a choice backed up by a robust production, transportation, and delivery industry. The natural gas industry is constantly improving its performance, investing in innovation (like carbon capture, gas heat pumps and renewable gases), and continuously improving efficiency in the delivery and use of the product. All of this helps keep natural gas affordable, reliable, and acceptable to Canadians. However, fragmented public policy and calls for banning natural gas use stand to hinder our Canadian advantage. To date, such efforts have served to increase costs through burdensome regulatory processes and new taxes, a situation further compounded by declining Canadian productivity. We can and should do more to solve these issues.

The public sentiment on gas energy remains positive. Recent public opinion research¹ shows that 68% of Canadians believe natural gas is important to the country's energy security, with 61% trusting natural gas to be reliant and reliable, no matter the weather conditions. Energy choice is a firmly rooted value that Canadians hold, with 84% believing it is their right to choose the energy source they use at home.

The combination of favourable market conditions, the value proposition of gas energy and infrastructure, and positive public sentiment provide an opportunity for the Government of Canada to set the tone and message on gas energy and to define a vision and message for the future. To date, the federal public policy message on gas energy has remained largely undefined. A strong federal signal will serve to improve the investment conditions in Canada, benefit our economy, provide us energy security and continued energy choice.

There is a pressing need for Canadian federal leadership in articulating a new and innovative vision for Canadian gas energy and its infrastructure. This document is intended to serve as a resource and guide for governments and parliamentarians, both as an ongoing resource document and as a tool to inform policy positions ahead of the next federal election. In it, we highlight the necessary conditions to leverage the role of gas energy and its infrastructure in delivering Canadians the energy they need and want. We outline recommendations on how the federal government can foster a set of policies to ensure the gas energy infrastructure system remains a robust tool that can support continued Canadian productivity and prosperity, and give consumers expanded access to energy choices that are affordable, reliable, and acceptable for bettering their lives. The image below presents a summary of our vision, goal, recommendations and guidance principles as an industry.

¹ Leger public opinion polling – Spring 2022, 2023, Fall 2023

Canadian Gas Energy **Bettering Canadian Lives**



Vision

Canadian energy policy supports improved energy security and the lives of Canadians.

Goal

To bring forward a federal policy package that will leverage the gas energy system for generations to come.



01

The energy trilemma

Balance affordability, reliability, and acceptability to ensure energy security.

Recommendations:

- Make addressing the energy security trilemma a mandate letter priority for key departments.
- Create an energy security parliamentary caucus by defining gas energy infrastructure as a vital national asset.
- Require energy and environmental legislation/regulation to pass an energy security trilemma screen and improve energy modelling to consider all trilemma priorities.

02

Clean technology and emissions reductions

Reduce emissions by leveraging existing infrastructure to deliver new gas energy.

Recommendations:

- Introduce a new Canadian Centre of Energy Excellence for joint research in energy innovation.
- Promote investment in energy technology by extending investment tax credits (ITC) for innovations that enhance affordability, reliability, and acceptability.
- Prioritize funding for codes and standards for gas energy including those for hydrogen.

03

Consumer affordability and resilient infrastructure

Extend resilient gas infrastructure to remote and Indigenous communities to provide affordable energy choice.

Recommendations:

- Introduce a federal program to extend gas infrastructure to rural and Indigenous communities.
- Ensure federal building policies and programs preserve energy choice and remain fuel/technology neutral.
- Develop a Canadian Cyber Security Ecosystem Strategy to improve information sharing.

Guiding Principles: Our Commitment to Canadians



Our infrastructure delivers reliable energy to Canadians year-round.



Our infrastructure enables unmatched resiliency and affordability.



We ensure safety and infrastructure integrity to workers and the public.



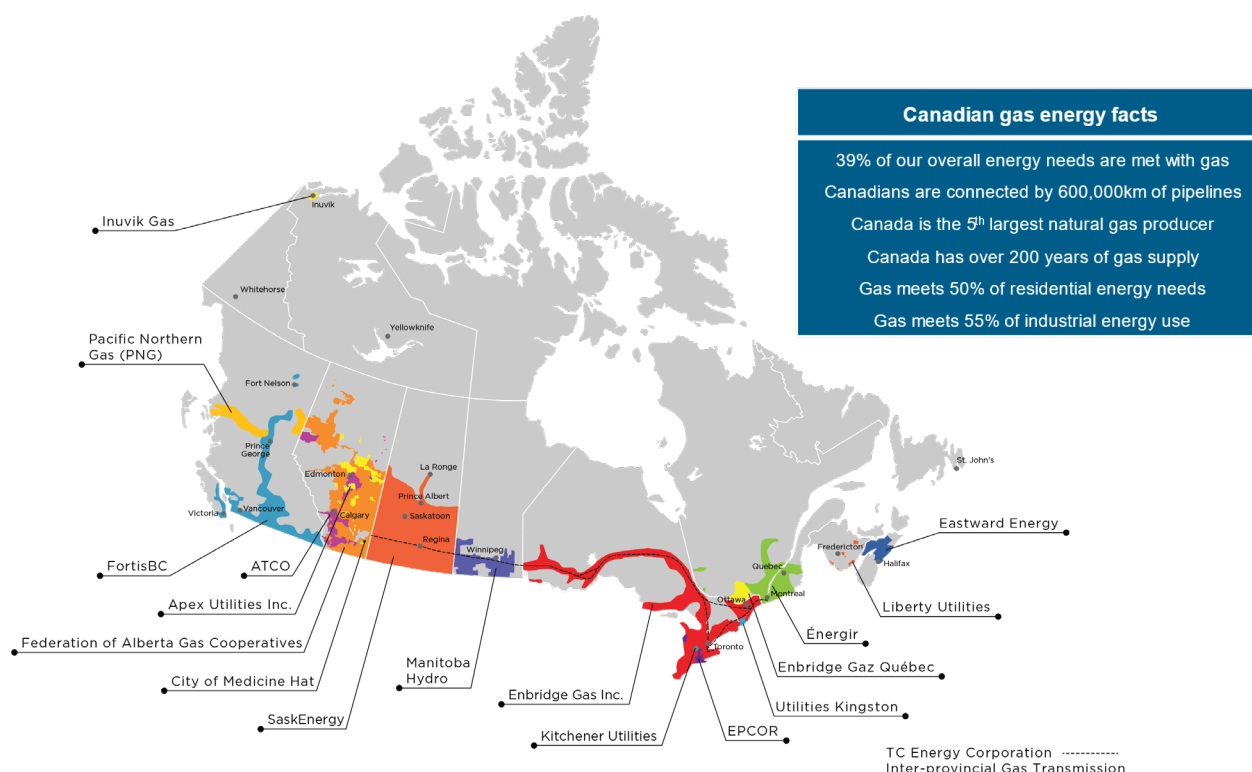
We provide customers with energy efficiency and emission reduction solutions.



We partner with Indigenous people and all communities we serve.

Canadian gas energy at a glance

Canadian gas energy delivery system



Natural gas delivery industry

We provide customer safety and deliver affordable energy

The natural gas distribution industry delivers safe, secure, resilient, and environmentally responsible energy to its customers. Our systems are designed, built and operated to meet or exceed the highest codes and standards. Households that use natural gas save up to \$2,000 annually compared to alternative options. Reduction in energy costs is more money for families and businesses.

We deliver year-round energy to Canadians through a reliable and resilient infrastructure

Approximately 600,000 kilometers of transmission and distribution lines and natural gas storage facilities ensure the delivery of reliable natural gas to over two-thirds of Canadians, meeting nearly 40% of Canada's energy needs. Natural gas's underground infrastructure delivers and stores energy even during severe weather conditions and peak demands.

We are innovative and efficient solution providers to big challenges

Natural gas is an efficient and cleaner energy choice with fewer emissions than many other fuels. Hydrogen and renewable natural gas energy will further reduce the emissions profile of natural gas. Natural gas is also a partner for intermittent electric renewables (like wind and solar), filling the gap when the electric system needs reliable backup.

01

The energy trilemma

Balance affordability, reliability, and acceptability to ensure energy security.



Canadians need energy policy that reflects their values and responds to their changing daily needs. Whether that need is access to affordable energy to heat their home or run their business, reliable energy to attract new industrial investment, or acceptable energy that meets concerns about emissions. Meeting all three needs — affordable, reliable and acceptable energy — is addressing the energy security trilemma.

Looking deeper into the elements of the trilemma, affordability is front and centre for Canadians. Energy represents a significant portion of our overall spending, whether this is gasoline for the car, propane for the barbecue, or the home natural gas or electric utility bill. The price of energy has immediate and real implications for consumers and the Canadian economy. Higher prices affect all Canadians but those of lower income face the most pressing challenge. Energy poverty is a very real issue in Canada. A February 2024 paper released by researchers from McGill University points to as many as one in five Canadian households facing energy poverty², with numbers as high as 40% in some communities. This must change and must be a priority for future policies and programs.

The second element of the trilemma is reliability. Canada's enviable position as a large producer, transmitter, and distributor of multiple forms of energy means we are largely insulated against energy reliability issues many other nations face. For example, Japan, with a population of 125 million, imports 95% of its energy³. Despite Canada's position, energy reliability cannot be taken for granted. Calls to “electrify everything” presents the prospect of eliminating a core strength — multiple pathways to meet our energy needs. Several have commented on the impracticality of such an approach, not to mention the enormous cost it would represent—especially considering that liquid and gas energy currently meet four times the end-use needs of electricity for Canadians and, during the winter, many, many times more. Canada should pursue an “all of the above” strategy, not one that seeks to eliminate any one technology or fuel. Natural gas and its infrastructure are an essential source of energy to balance this energy trilemma due to key attributes:

Energy delivery capacity

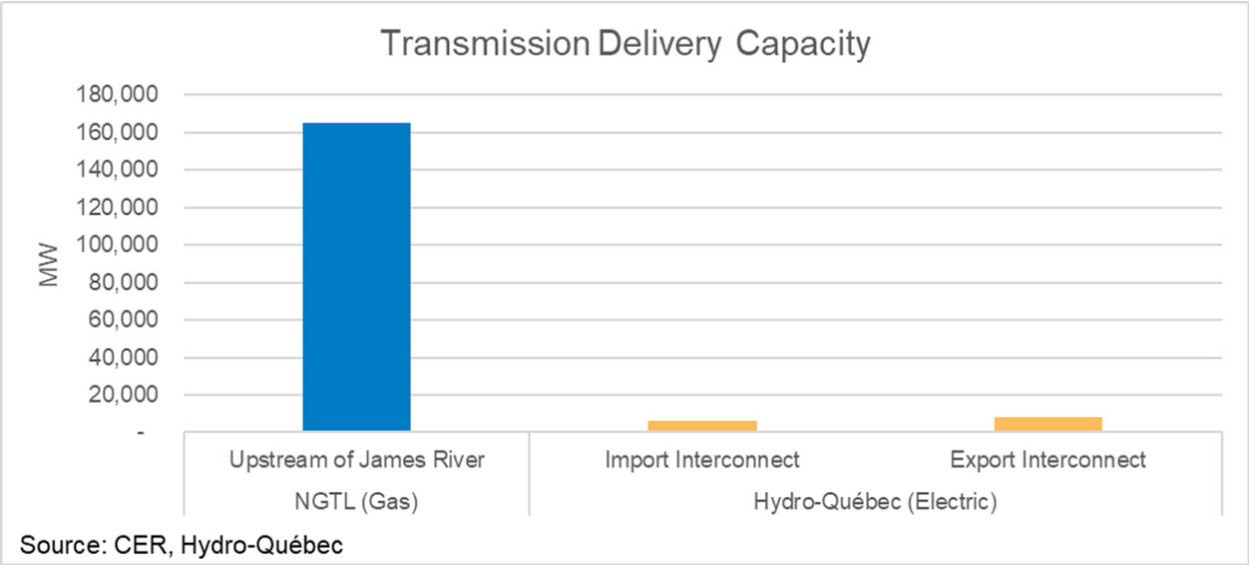
In 2022, Canadians used nearly 4,500 petajoules (PJ) of natural gas making it the most used form of energy in the country. In contrast, Canadians used about 2,100 PJ of electricity, less than half the amount of natural gas. Delivering large volumes of energy requires infrastructure, which acts as the backbone of our energy systems, connecting production to demand. Two common methods of moving large volumes of energy are via pipelines and electrical wires.

Pipelines have tremendous delivery capacity, being capable of moving large quantities of gas energy with speed and efficiency. For example, TC Energy's Nova Gas Transmission line (NGTL) system is both a gathering and transmission system that transports natural gas from the Western Canada Sedimentary Basin (WCSB) to markets in both eastern and western Canada. At its peak, parts of the system can move gas energy at a rate of 13.1 billion cubic feet of natural gas per day — equivalent to 165,000 MW. To put this into perspective, this is more than the total electricity generation capacity in all of Canada at 150,400 MW⁴.

² <https://link.springer.com/article/10.17269/s41997-023-00741-0>

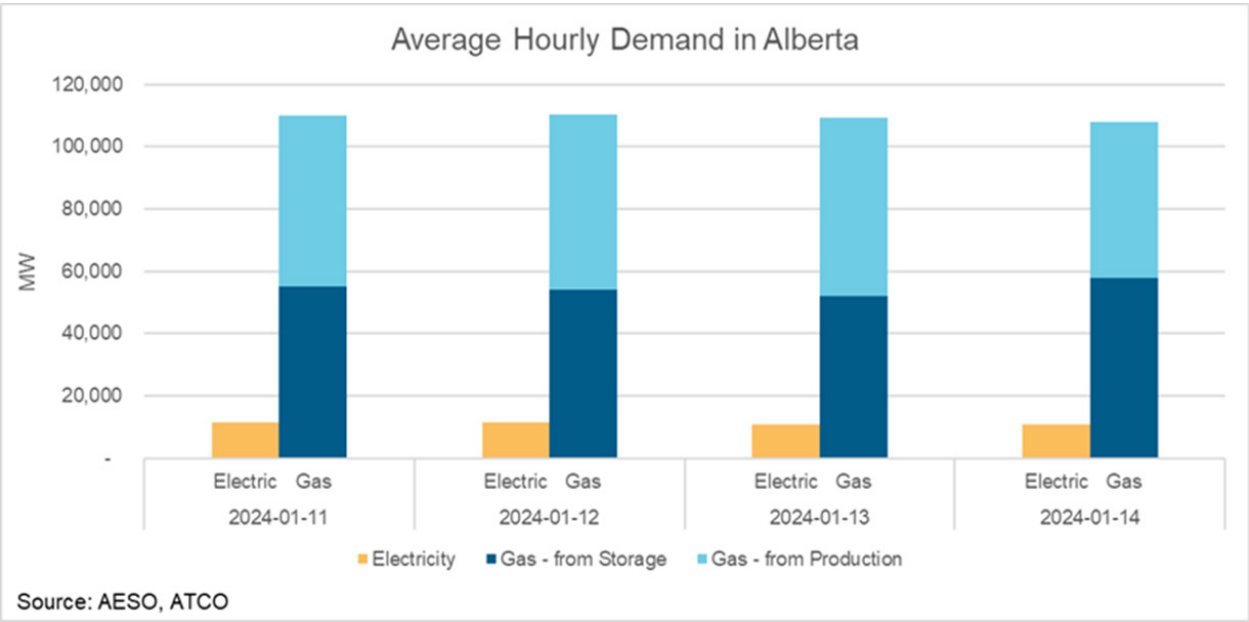
³ <https://www.eia.gov/international/analysis/country/JPN>

⁴ Canada Energy Regulator. Canada's Energy Future Data Appendices. DOI: <https://doi.org/10.35002/zjr8-8x75>



We can contrast this to the capability of a large-scale transmission system. Hydro-Quebec’s transmission system, which is considered one of the most extensive systems in North America, has an interconnection capacity of 6,015 MW of imports and 8,190 MW of exports⁵. The NGTL system alone has 20 times more capacity.

The high capacity of the gas system positions it well to respond quickly to peak demand periods or emergency situations. To illustrate this, we can look toward the polar vortex event in Western Canada in January 2024. As temperatures plummeted below -45°C, energy usage of all forms spiked. The Alberta Electric System Operator (AESO) indicated the province set a new all-time peak record of 12,384 MW and called on load shedding measures. At the same time, the natural gas system was delivering up to 110,340 MW, nearly 10 times more energy than that record electric peak.



⁵ <https://www.hydroquebec.com/transenergie/en/>

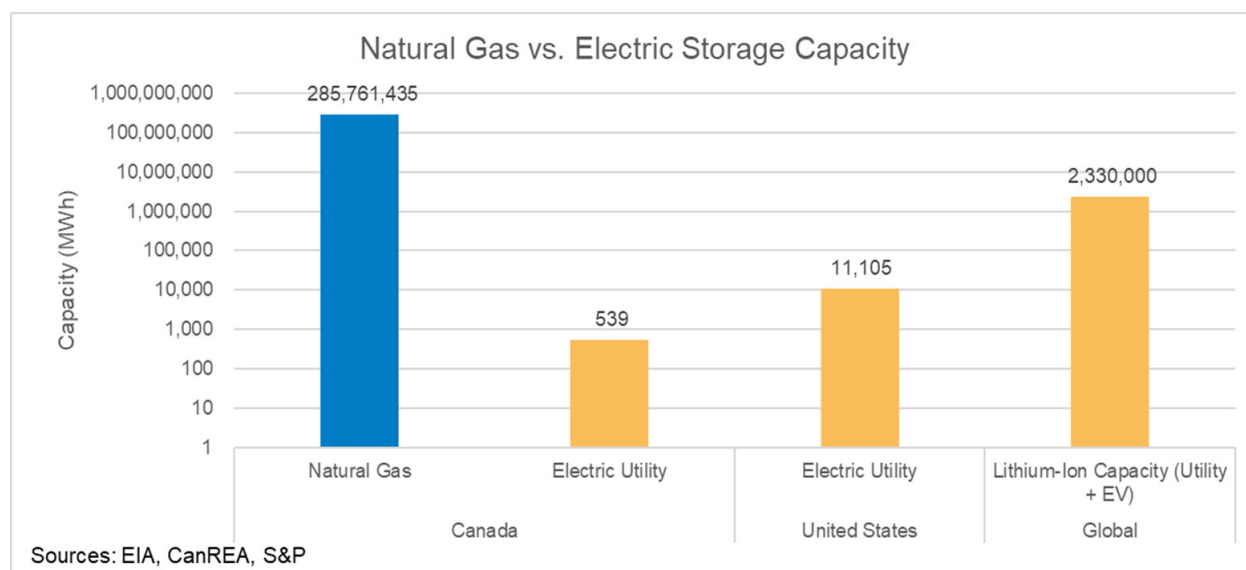
Storage infrastructure

One of the most advantageous characteristics of Canada's natural gas infrastructure, in addition to its delivery capacity, is its energy storage capacity. Energy storage is incredibly important for ensuring energy systems are resilient and reliable.

Today, natural gas storage plays a vital role by providing reliable supply, buffering against seasonal variations, providing market stability and flexibility, and responding to emergencies. Looking back to the polar vortex event in January 2024, nearly 50% of the gas delivered in Alberta during the four-day event was supplied from withdrawals out of gas storage.

Altogether, Canada has 948 billion cubic feet of underground natural gas storage capacity. This is enough to heat 11.5 million residential customers for one year or provide more than 50 days of supply during a typical Canadian winter when demand is at its highest. Expressed in electrical terms, this volume is equivalent to 285,750,000 MWh of energy storage or 21.2 billion Tesla Powerwall home electricity storage systems.

To showcase the contrast in the storage capacity of energy sources, see the graph below. Notice the logarithmic scale here — the energy storage capacity of Canada's natural gas system alone is 500,000 times greater than all of Canada's electric storage capacity, 25,000 times greater than all the United States' electric storage capacity, and still more than 100 times greater than all the world's lithium-ion battery storage capacity.



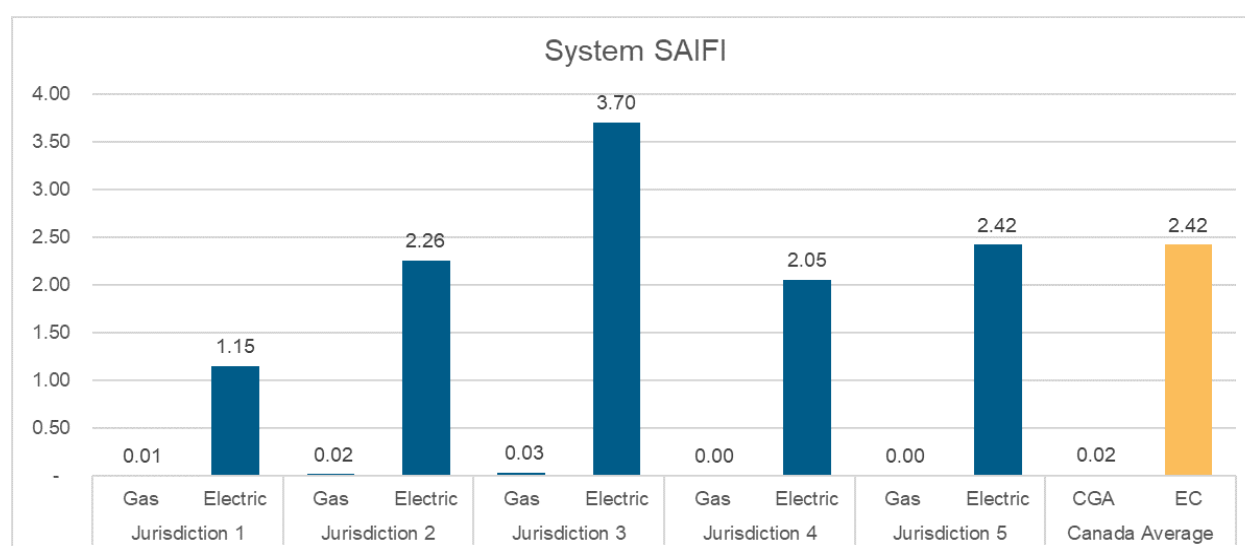
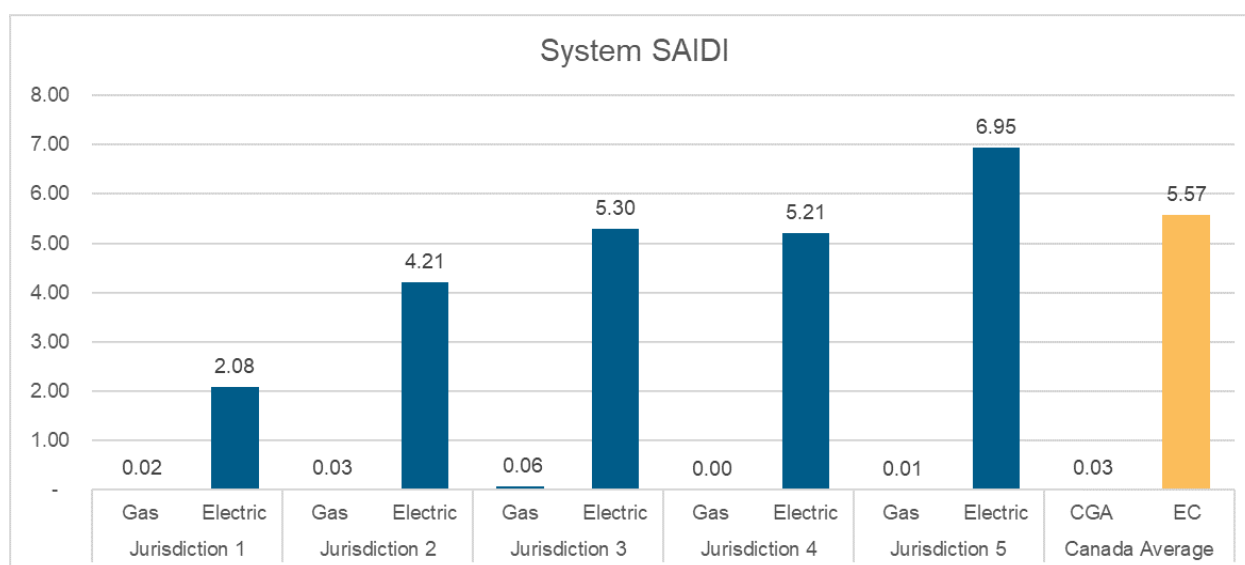
This is a reminder that energy storage comes in many forms. While much of the focus today is often on battery technology and its future development, natural gas storage is already available today at a significantly larger scale.

Fewer outages and better reliability

The gas energy system delivers exceptional reliability and resiliency which stems from the industry practice of locating our infrastructure underground – in contrast with electricity infrastructure which is above ground as transmission towers and overhead wires. Aboveground infrastructure is much more susceptible to external factors

like inclement weather, natural disasters, wildlife and vegetation. According to the Ontario Energy Board (OEB), tree contact was responsible for 43% of all outage hours experienced by electric utility customers in Ontario in 2021⁶.

Two common metrics that are used to measure reliability in the electricity sector are the System Average Interruption Frequency Index (SAIFI) and the System Average Interruption Duration Index (SAIDI). SAIFI refers to the average number of interruptions a customer would expect. SAIDI refers to the average outage duration a customer would expect, often measured in hours. Below are the comparable 2023 statistics for different gas and electric utilities across the country.



It is seen across the board; gas utilities experience far fewer interruptions when compared to their electric counterparts. Of the five gas utilities that have provided data, the SAIFI reveals that a gas outage is 150 times less likely to occur than an electric one. The SAIDI also reveals a gas outage would be 200 times shorter in duration than

⁶ <https://www.oeb.ca/ontarios-energy-sector/performance-assessment/natural-gas-and-electricity-utility-yearbooks>

an electric one. Expressed in another way, while the average electric customer would expect 2.5 outages per year, the average gas customer would expect to experience one gas outage every 68 years.

Simply put, outages in the gas system are incredibly rare. In the natural gas delivery system, Canadians can expect an affordable, reliable, and consistent source of energy that meets their demands. A diversified approach will help strengthen the overall reliability of our energy systems. It is important to be cautious of policies that limit and eliminate this diversity, especially if the system that we fall back on is one with tremendously inferior reliability.

The final element of the trilemma is acceptability. In policy discussions today, this is usually entirely focused on the environment, and more particularly, emissions reductions. Canada has long been a champion of environmental stewardship regarding emissions reductions. This should and must continue. But it must do so in a manner that balances acceptability with our energy affordability and reliability needs. Much of the developed world, Canada included, has been concentrated on reducing greenhouse gas emissions at the expense of energy reliability and affordability. Bringing our goals around emissions reductions in line with other major public policy issues is of central importance. This is not to suggest we lose sight of the importance of emissions reductions. Far from it. What it means is we develop our environmental policy and regulations with a global mindset and ensure we are leveraging our natural advantages — including gas energy.

Policy must aim to keep the elements of the trilemma in balance, recognizing that unforeseen events will temporarily raise the importance of one area over the others. This is to be expected. However, Canadians expect to bring the trilemma back into balance. A prolonged overemphasis on one aspect leads to unintended consequences.

Recommendations



Include the energy security trilemma as a mandate letter priority for Ministers of Global Affairs, NRCan, ECCC, and ISED.



Create an energy security parliamentary caucus.



Require energy and environmental legislation/regulation to pass an energy security trilemma screen and improve energy modeling to consider all trilemma priorities.

02

Clean technology and emissions reductions

Reduce emissions by supporting innovations that leverage existing infrastructure to deliver new gas energy.



Global cleantech activity continues to grow and is projected to exceed US\$2.5 trillion by 2022, or about 2.5% of the anticipated global gross domestic product (GDP). In Canada, environmental and cleantech products (ECT) have contributed 3% to our GDP since 2012, with the cleantech portion contributing about 1.5% of the total GDP from 2012 to 2020. Canada's ECT share of the global market is estimated at around 2% of the total with cleantech specifically accounting for 1%⁷. In 2023, over a billion dollars in seed through growth-stage funding has gone to Canadian startups in sustainability-focused industries. However, the industry recognizes the significant gap in the availability of commercial-ready technologies required to meet forward looking goals around environmental performance. A large body of work must be completed now to identify the cost-effective technologies that will lead to significant GHG emissions reductions.

NGIF Accelerator (NGIF)

To address these challenges, the NGIF Accelerator (NGIF) was formed. NGIF is a national not-for-profit industry-led grant funding organization that operates technology and innovation programs for cleantech startups. It currently operates two programs – Industry Grants (IG) and the Emissions Testing Center (ETC). These programs are designed to de-risk and commercialize cleantech solutions through pilot projects, field trials, and industry validation to deploy them into the gas market faster. NGIF's work helps reduce GHG emissions from the gas energy sector.

The Industry Grants program's mandate is to help pre-commercial cleantech startups – whose technology is of interest to the gas industry – accelerate their development through field trials and pilots. The program's priorities include CCUS, methane management, hydrogen, RNG, and energy efficiency. Industry Grants has 15 companies from the energy industry contributing support. The program offers a non-dilutive grant that a startup can use to fund a project that has a scope of de-risking technologies at Technology Readiness Levels 4–7. The Industry Grants program allocation to date is \$26MM, which has funded 97 projects led by 86 startups. The program's funding into active projects has supported the creation of over 230 cleantech jobs and has a total environmental benefits opportunity of 8.7MT CO₂e reductions by 2030.

The Emissions Testing Centre (ETC), a program launched in 2021, is a collaborative industry, government, and academia initiative. It provides startups with a dedicated space to develop, test, and field-validate technologies to measure, monitor, and reduce methane emissions. The program is unique by providing technology innovators with a Technology Readiness Level range of 1-7 free-to-test access to support a rapid scale-up of technologies from concept to commercial-ready deployment. The program has received funding support from government agencies including Natural Resources Canada, Prairies Canada, and Alberta Innovates. The program has also received funding support from the University of Calgary, which offers its laboratories to test and de-risk technologies in a controlled environment, and from Tourmaline Oil and Perpetual Energy who offer sites for field trials (the two companies jointly own the West Wolf Lake Gas Plant and offer that site, and Tourmaline offers other sites). The program allocation to date is \$34MM with 37 projects led by 21 startups supported to date.

Utility Acts

A barrier facing technology innovation is the often restrictive language of the Utility Acts – the legislation governing the operation of utilities. These acts were

⁷ Economic Development Canada (EDC), "Exploring Canada's Cleantech Sector", (October 2022)

written and brought into law decades ago, long before the current policy focus on technology innovation. The acts specify what a company can invest in, and how it can receive cost recovery from its consumers. At present, utility acts generally prohibit companies from making investments into pre-commercial technologies and emissions reductions solutions like hydrogen, RNG, and CCUS. Two provinces have started to systematically review their Utility Acts - British Columbia and Quebec. These two are, not surprisingly, home to most of Canada's RNG, hydrogen, and natural gas vehicle deployment projects. Other jurisdictions have been slower to make progress and the process remains fragmented. At the federal level, leveraging the precedent of the Government of Canada work on a model building code with a "model utility act" could serve to benefit in providing a reference case and presenting the opportunity of bringing provinces together to discuss this issue and to come to a common understanding of the opportunities that are presented by modernizing such legislation in Canada.

Canadian Methane Management Coalition (CMMC)

Canada is home to some of the world's cleanest gas energy molecules. The Canadian natural gas industry has taken significant strides in managing methane emissions in response to internal corporate goals, safety measures (safe digging initiatives) and regulations. Downstream natural gas infrastructure operators have reduced their methane emissions by 30% over the last decade⁸.

The gas energy industry continually invests in new technologies and practices to reduce methane emissions from its infrastructure systems, such as optical gas imaging cameras and continuous monitoring systems, which have greatly improved leak detection speed and accuracy and building more infrastructure. Canada stands apart from the United States in that it no longer has any cast iron gas energy distribution system assets.

The full value chain of the gas energy industry has recently come together and launched the Canadian Methane Management Coalition (CMMC). This initiative unifies the Canadian natural gas industry's efforts to tackle methane emissions from extraction to end-use. Established by the CGA, the Canadian Energy Partnership for Environmental Innovation (CEPEI), Enbridge Gas Inc., and Tourmaline Oil, the coalition works with many other stakeholders to drive innovation and methane emissions reductions across the sector.

The Coalition's formation responds to the need for a coordinated approach to methane management, capitalizing on the significant progress both upstream and downstream companies have achieved in emissions reductions. The CMMC enhances these sector-specific gains by sharing innovations and best practices while also providing a platform for discussing regulatory development and policy matters with an aim to bolster Canada's standing in natural gas methane emissions management.

Tax credits to support clean energy investments

One of the many advantages of the Canadian gas system is its versatility. It is capable of safely and affordably delivering molecules other than natural gas to its millions of customers. RNG and hydrogen are both being blended into the natural gas system in different areas across Canada. Both are clean energy sources reducing the emission profile of natural gas. The following is an overview of hydrogen and RNG as a source of energy.

⁸ CEPEI, 2022 inventory data

Hydrogen: A clean and versatile energy carrier

Hydrogen is the simplest and most abundant element in the universe. It is colourless, odourless, and nontoxic. When combusted, hydrogen does not produce any carbon emissions. Many countries including Canada, are looking to build out hydrogen economies to reduce worldwide emissions.

What is hydrogen

Hydrogen gas is often called an “energy carrier” because it is produced from other energy sources, such as hydroelectricity and natural gas. Once produced, hydrogen can be delivered to end-users using the natural gas pipeline infrastructure. It can also be stored and utilized during peak demands to avoid energy disruptions, making hydrogen a reliable and no-emission gas energy.



Hydrogen production

Canada has many sources of energy that can be used to produce hydrogen, but perhaps the most promising in terms of abundance and affordability is natural gas. There are several different processes that can be used to produce hydrogen. Each process has unique considerations including cost, technology readiness and emissions profile.

Hydrogen's potential

Hydrogen has diverse applications. It can be combusted directly, just like natural gas in space and industrial heating applications, or used in a fuel cell, for electricity generation or transportation applications. Hydrogen can also be blended with natural gas and delivered through its existing infrastructure for end-use appliances such as stoves, water heaters etc. It can also be a remarkable “battery” for intermittent renewables like wind and solar, in a process known as Power to Gas using surplus grid electricity to produce hydrogen which can then be stored in the existing natural gas infrastructure.



The natural gas delivery industry and hydrogen

Canada's natural gas delivery industry is front and centre in efforts to assess the viability of greater hydrogen use. Gas utilities – already experienced in the safe and affordable transportation and delivery of gaseous fuels – are exploring different blending rates and approaches for managing storage and delivery of hydrogen, helping address Canada's growing energy needs.



The renewable natural gas opportunity

Renewable natural gas

Produced from organic waste from farms, forests, landfills, and water treatment plants. The gas is captured, cleaned, and injected into pipelines to be used in the same way as conventional natural gas.



RNG production

By the end of 2023, RNG producers and Canada's gas utilities have brought 27 RNG projects online – and the number is constantly growing. These projects alone produce enough renewable fuel to meet the energy needs of more than 98,000 homes.

RNG's potential

By 2026, the number of RNG production facilities is expected to more than double with production capacity expanding to more than 30 PJ per year – enough energy to heat more than 318,000 homes per year.



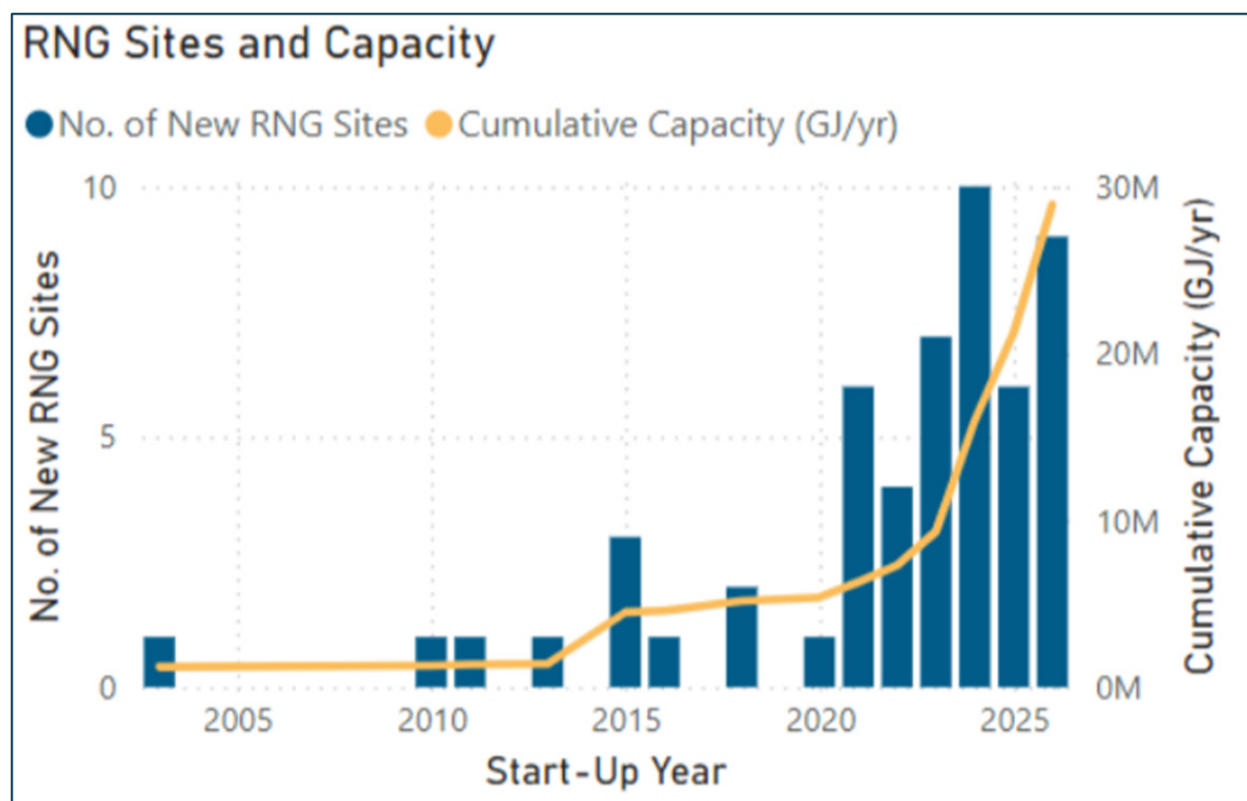
The future of RNG

Canada's natural gas utilities have set an aspirational target of 10% RNG blended into natural gas streams by 2030. Nationally, the increased RNG content would result in 26 MT of GHG emission reductions per year by 2030, equivalent to removing 5.6 million passenger cars from the road.



There is steady growth in the number of production projects being commissioned for both RNG and hydrogen. This is also leading to higher volumes of low-carbon gases being distributed to Canadians using the existing natural gas infrastructure. This makes new gases one of the most cost-effective means to lower emissions as they do not require a new distribution system and current end-use appliances can use the energy directly.

There are currently 27 operational RNG facilities in Canada injecting RNG into our gas systems and the number of facilities is expected to more than double by 2026 and produce over 30PJ's of RNG.



CGA member Enbridge Gas was the first natural gas distributor in North America to begin blending hydrogen into a natural gas network. In 2018, Enbridge and project partner Cummins began the initial phases of this first of kind pilot project in Markham, Ontario. In January 2022, Enbridge began to deliver blended natural gas with 2% hydrogen to 3600 residential and commercial customers. ATCO Gas began delivering a blend of natural gas containing 5% hydrogen by volume into a subsection of the Fort Saskatchewan natural gas distribution system in October 2022. About 2,100 customers became the first in the province to use hydrogen-blended natural gas to fuel their homes and businesses safely and reliably. ATCO is looking to go further and become the first natural gas utility in North America to build and operate a 100% hydrogen network – to be located in Strathcona County, Alberta. With funding from Alberta Innovates, ATCO is studying the logistics, technology requirements and other considerations involved in safely and affordably developing 100% pure hydrogen communities.

The US is supporting the production of renewable gases with the IRA which includes investment and production tax credits⁹. Canada risks losing domestic production of

⁹ Canadian Gas Association 2024 Pre-Budget Submission accessible at <https://www.cga.ca/wp-content/uploads/2024/02/Canadian-Gas-Association-PreBudget-RNG-ITC.pdf>

such gases to the US unless we establish long term and predictable investment tax credit (ITC) frameworks.

Canada remains behind the European Union in developing and modernizing its codes and standards for hydrogen blending and end-use. The federal government needs to give a clear signal to the standards development organizations in Canada that standards development must keep pace with industry innovation or hydrogen blending cannot advance. The natural gas industry and its stakeholders have been delayed in blending hydrogen into our infrastructure due to the lack of the necessary standards. Funding should be made available for their timely development and updating.

Canadian LNG opportunity for reducing global emissions

Canadian liquefied natural gas (LNG) provides a significant opportunity for emissions reductions. At the domestic level, LNG currently serves trucks, peak winter energy demands, marine vessels and remote industries and communities. Canada can and should do more to leverage the domestic LNG opportunity by establishing trade corridors and supply hubs that would allow multiple end-users to access LNG. Domestic LNG hubs would naturally be situated where existing LNG production exists, including Ontario, Quebec, Alberta, Northwest Territories (under development), and British Columbia.

The export of LNG deserves attention as the world continues to rely heavily on coal-fired electricity generation. While Canada has made tremendous progress in phasing out coal, the same cannot be said for the rest of the world. In 2022, coal was still the largest source of electricity generation in the world, accounting for 35% of globally generated power. As nations worldwide look to reduce emissions, coal-to-gas conversions have emerged as the most economical and timely option. The potential emission reductions available for coal-to-gas conversions are enticing; it is estimated that switching just 20% of Asia's coal generation to gas can reduce global emissions by 680 million tonnes¹⁰.

Recommendations



Introduce a new Canadian Centre of Energy Excellence (C2E2), a joint industry platform for innovative research aimed at making energy more affordable, reliable, and acceptable.



Promote investment in energy technology by extending investment tax credits (ITC) for innovations that enhance affordability, reliability, and acceptability, including the existing hydrogen ITC and introducing a new renewable natural gas ITC.



Prioritize funding for codes and standards for gas energy, including those for hydrogen blending in natural gas distribution networks and end-use equipment.

¹⁰ <https://www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook-2023.html>

03

Consumer affordability and resilient infrastructure

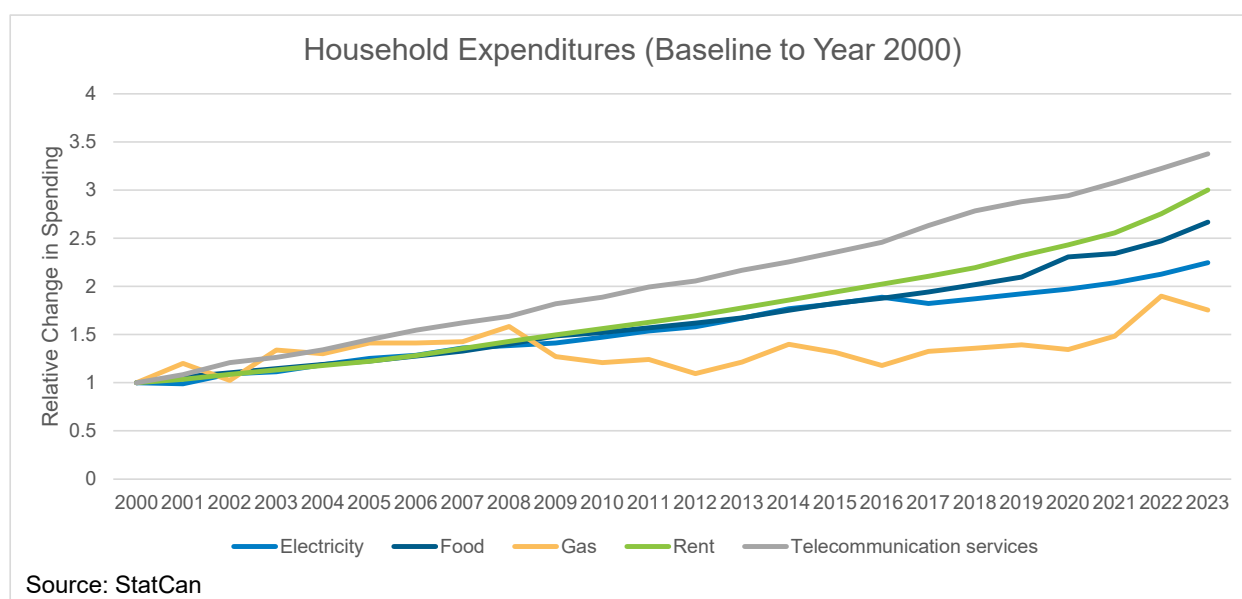
Extend the resilient gas infrastructure to remote and Indigenous communities to provide affordable energy choice.



Consumer affordability

Natural gas' affordability underscores its value proposition to Canadians. Households using natural gas can save significantly on their energy bills in the range of \$500 to \$2,500/year.

The chart below shows the relative change in household expenditures in Canada since 2000. Compared to other expenses like electricity, rent, and food, the relative increase in natural gas prices has been the lowest over the last twenty years, further emphasizing the clear advantage for Canadians.



However, millions of Canadians lack access to affordable gas energy, particularly in rural and remote areas of Canada where heating and cooking options are limited and often more expensive and higher emitting. Federal leadership by partnering with energy utilities to finance and connect underserved Canadians is a “ready now” solution to support emissions reductions and support economic development.

Canada's gas energy utilities are regulated monopolies. Before building new infrastructure in a community or region, they must first secure approval from their provincial economic regulator. Regulators use a payback methodology, or profitability index, whereby a new community expansion project must, over a pre-determined number of years (e.g., 30 or 40) generate enough revenue to pay back the associated cost of building the new infrastructure. This ensures that existing ratepayers do not subsidize new projects. For most parts of Canada, this economic test works effectively. However, regions that do not currently have natural gas, which are often long distances from the existing infrastructure, have higher associated costs to bring natural gas to these communities. These economic challenges are also seen in renewable natural gas (RNG) projects, where pipeline costs to connect RNG production sites to existing gas infrastructure can represent up to 60% of total project costs, making proximity to existing pipelines a critical factor. This significantly adds to the overall cost of community expansion projects and with smaller populations this test does not pass, and Canadians are left without gas energy access. For these communities, a partnership between private industry and the public sector would be beneficial. Historically, the Government

of Canada has had support programs in place to facilitate connections to gas energy.

Evidence from existing initiatives points to the success of such collaborative approaches. For instance, the estimated benefits from extending natural gas services include not just customer savings but also broader economic benefits like job creation and attracting new businesses to these regions. RNG projects can also provide similar benefits by diversifying energy sources and generating economic growth. These projects can also contribute additional government revenues, illustrating the multiplier effect of strategic infrastructure investment. With strategic federal support, both natural gas and RNG expansion projects can boost local economies while improving access to affordable energy.

Learning from Ontario's Natural Gas Expansion Program

Ontario's Natural Gas Expansion Program serves as a model for a potential federal program. Through phases 1 and 2, more than 17,000 families and businesses in 59 communities have gained access to natural gas. The first phase connected 9,000 customers across 16 communities, providing substantial savings and improved energy access. Households are seeing up to 55% in annual energy savings, while businesses have reduced costs by as much as 30% per year, enhancing local competitiveness and investment. The second phase, covering 28 projects in 43 communities, is even more ambitious. Moving from propane or heating oil to natural gas has also helped reduce emissions, with phase 2 expansions projected to cut 1,146 tonnes of CO₂e annually within ten years.

As noted, at the federal level there have been programs to support the expansion of gas energy infrastructure. For instance, in the late 1990s the Canada-Manitoba Economic Development Partnership agreement funded natural gas expansion from the TransCanada Pipeline to the rural municipalities of Hanover and La Broquerie. This project included the installation of 600 km of new infrastructure¹¹. Below is a table summarizing past federal programs.

Program Name	Department	Timeframe	Funding	Project
Distribution System Expansion Program (DSEP)	EMR	1980-1984	\$100 MM	Grant provided to utility companies for natural gas network expansion in Ontario.
Canada Oil Substitution Program	EMR	1980-1985	\$715 MM	Grants for homeowners for converting heating systems from oil to natural gas.
Market Development Incentive Payments	NRCan	1981-2016	\$191.3 MM	MDIP-funded organizations (gas utilities, research, trade associations). Programs funded were DSEP, Industrial Conversion, Compressed Natural Gas Fueling Station, and Vehicle Conversion.
Vancouver Island and Sunshine Coast network expansion	EMR	1983	\$100 MM and \$50 MM interest free loan	Brought gas to over 20 communities to serve roughly 100,000 people.
Natural Gas Laterals Program	EMR	1984	\$225 MM	333 km pipeline between Grand-Mere and La Baie to Saguenay.
Canada-Manitoba Infrastructure Program	NRCan	1994-1997	\$5.7 MM	Brought natural gas service to 6 towns south of Brandon, Manitoba.

¹¹ Manitoba Government Announces... (November 6, 1998). Manitoba Government News Release. Retrieved from <https://news.gov.mb.ca/news/index.html?item=23688&posted=1998-11-06>

Canada Agriculture Infrastructure Program	NRCan	2000	\$2.35 MM	Connected Interlake Region north of Winnipeg to natural gas system.
Parry Sound network expansion	NRCan	2000	\$3 MM	Connected pipeline network to rural Ontario.
Vallée-Jonction to Thetford Mines QC Pipeline	NRCan	2012	\$18 MM	Funding to extend Gaz Métro natural gas pipelines 80 km.
Red Lake ON Pipeline	NRCan	2012	\$2.7 MM	Expansion of Union Gas natural gas pipeline to Red Lake.
Bellechasse, QC	QC Economic Development Fund	2017	\$17 MM	Expansion of Énergir system to Bellechasse.

Indigenous communities and natural gas

Natural gas is crucial for Indigenous communities providing not only affordable, reliable, and clean energy but also significant economic opportunities that promote self-sufficiency and sustainability. There are several notable examples:

- The Memorandum of Understanding (MOU) between the First Nations Power Authority (FNPA) and SaskEnergy, signed in April 2024, aims to enhance energy security for First Nations communities currently relying on diesel and boost Indigenous economic participation. By extending gas service to more First Nations and conducting community energy audits, this collaboration helps identify optimal clean energy paths ensuring these communities can access reliable energy sources.
- Six Nations Natural Gas in Ontario, serving over 2,500 community members and businesses, highlights the economic advantages of Indigenous ownership. The enterprise ensures reliable service and encourages local economic development. Additionally, equity ownership in the pipeline assets transferred from Enbridge Gas to Six Nations has ensured long-term revenue streams that promote local economic development, empowering communities to reinvest in social programs, education, and infrastructure.
- The Cascade Power Project, involving six First Nations communities — Alexis Nakota Sioux Nation, Enoch Cree Nation, Kehewin Cree Nation, O'Chiese First Nation, Paul First Nation, and Whitefish Lake First Nation — represents a \$93 million investment backed by the Alberta Indigenous Opportunities Corporation (AIOC). This \$1.5 billion natural gas-fired power plant will supply 8% of Alberta's electricity needs and generate hundreds of millions of dollars in revenue over its 30-year life.

The substantial revenues from these initiatives enable Indigenous groups to fund critical social programs and infrastructure transforming communities for the better.

The newly introduced Federal Indigenous Loan Guarantee Program, which provides up to \$5 billion in loan guarantees, could help do more.

Reducing diesel reliance in the north

Inuvik, a town with a population of around 3,137 in the Northwest Territories, is a success story that highlights the environmental and economic benefits of natural gas. Located 200 km north of the Arctic Circle, the Inuvik LNG power generation plant which began operations in 2013, has significantly reduced the community's reliance on diesel. The environmental impact has been profound with lower greenhouse gas emissions leading to improved air

quality. Economically, the project has stabilized energy costs demonstrating that LNG can offer a cleaner and more reliable energy source for remote northern communities. This model can be replicated across other northern regions enabling broader economic development and supporting Canada's overall emissions reductions targets.

The Indigenous Off-Diesel Initiative (IODI) further exemplifies efforts to lessen the dependency on diesel fuel in remote communities. The program, emphasizing Indigenous-led solutions, offers a structured path from training to project implementation enabling communities to align their energy projects with their specific needs and priorities. For instance, the Energy Champions within the IODI receive funding to encourage community engagement and develop comprehensive Community Energy Plans. These plans lay the groundwork for transitioning to lower emission energy sources. Expanding the IODI to include natural gas — whether by pipeline, LNG, or compressed natural gas (CNG) — presents a new solution to bring cleaner energy to communities in place of diesel. To date, the program has excluded gas energy solutions.

Investments in natural gas infrastructure and partnerships with Indigenous communities not only support economic growth and environmental sustainability but also promote self-sufficiency and resilience. By expanding access to clean energy and encouraging Indigenous business participation, Canada can build a resilient and inclusive energy future that benefits all communities. The success of projects like the Inuvik LNG facility illustrates the potential for natural gas to be a cornerstone of energy solutions in the North, reducing diesel dependence and contributing to national climate goals.

Leveraging regional economic development funds

Canada has in place several regional economic development funds, including ACOA, CanNor, PrairiesCan and others. These funding bodies have, in some cases, supported the connection of new towns and communities to natural gas. For example, the Quebec regional economic development agency supported the extension of the gas pipeline system to Thetford Mines. More recently, in 2017, the gas system in Quebec was expanded to the Bellechasse region. The 72 km project was made possible by \$17.5 million from Canada Economic Development for Quebec Regions (CED).

Transitioning to natural gas, businesses in Bellechasse were projected to save \$2.5 million on energy annually and reduce GHG emissions by 8,600 tonnes. This change is equivalent to taking 2,050 cars off the road each year, demonstrating substantial environmental benefits alongside economic savings.

Economic value and affordability of the infrastructure

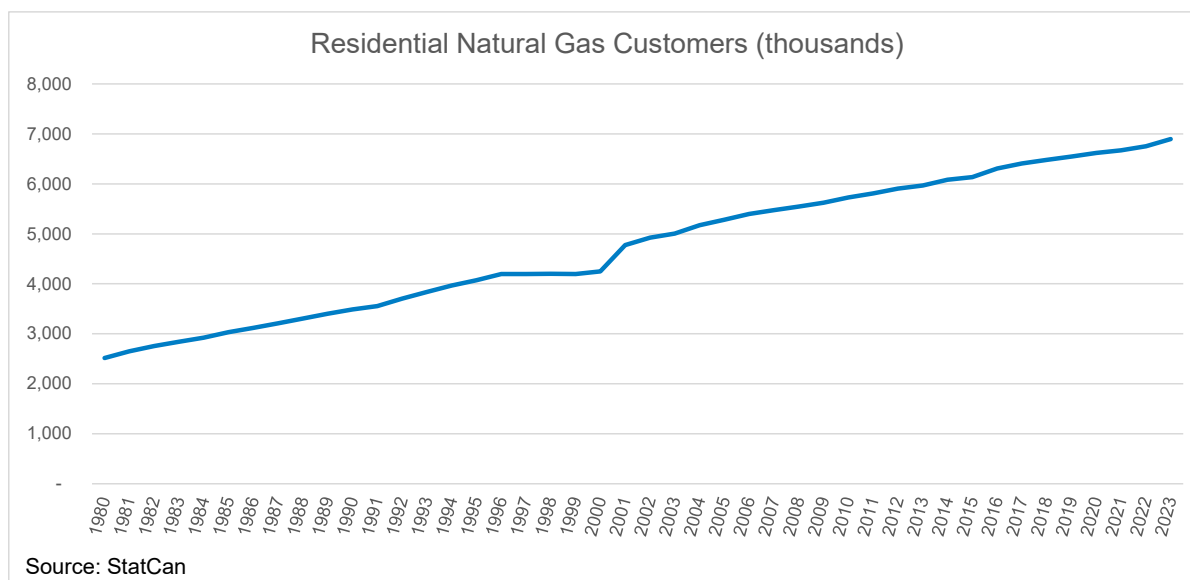
Another advantage of gas infrastructure is its relative cost compared to that of the electricity sector. The build-out of new energy infrastructure is highly capital-intensive and serves as one of the most significant barriers to growth in the energy sector. The existing gas system is a solution to help minimize future investment costs. According to Statistics Canada, the book value of natural gas infrastructure assets is valued at \$86.6 billion dollars¹². In contrast, the estimated cost of electricity infrastructure assets is almost four times as expensive at \$327.7 billion¹³. Knowing the type and amount of end-use energy can help normalize the cost of infrastructure relative to the amount of energy used. By doing so, the average cost of natural gas infrastructure is \$67.86 per MWh, while the average cost of electricity infrastructure is \$567.31 per MWh.

In short, a dollar spent on gas infrastructure has been eight times more cost effective at

¹² <https://www150.statcan.gc.ca/n1/daily-quotidien/230310/dq230310e-eng.htm>

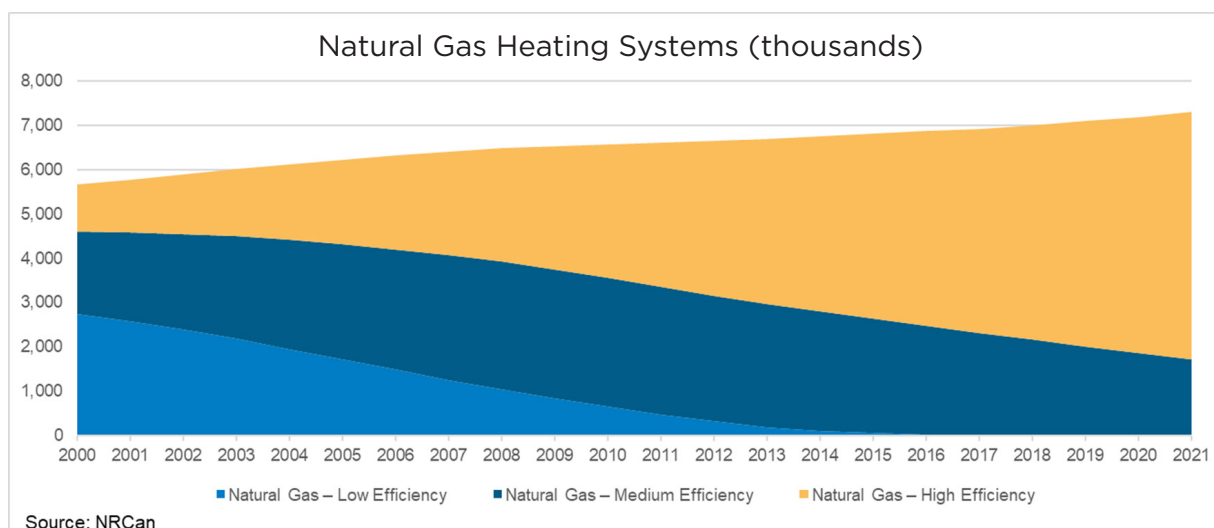
¹³ <https://www150.statcan.gc.ca/n1/daily-quotidien/230526/dq230526g-eng.htm>

delivering a unit of energy than if it were spent on electric infrastructure. Given this, there is a need to caution against policy driven electrification of our energy system in Canada. The Conference Board of Canada has estimated that over \$1.7 trillion dollars of investment would be needed in the electricity sector to meet our climate objectives¹⁴. Ultimately, these costs will be passed back to consumers making energy costs unimaginably unaffordable. A diversified approach to energy sources by continuing to utilize and expand the vast natural gas infrastructure to keep energy costs affordable for all Canadians needs to be established.



Affordable homes and buildings

Canada is facing a housing shortage and a housing affordability crisis. Ensuring we get affordable homes built, both to purchase and operate, is critical for the growing population. Energy costs form a large component of a household's operating costs, both the purchase, installation and payment of utility bills. Canadians need and deserve energy choices. A 2022 Leger research project showed that 84% of Canadians want to choose how they heat their home. Preserving choice and affordability in the energy we use in our homes should be a goal of government. In 2023, the residential sector consumed 1300 PJ of energy, representing 15% of total demand in Canada. Natural gas is the most relied upon energy source in the residential market at 47%.



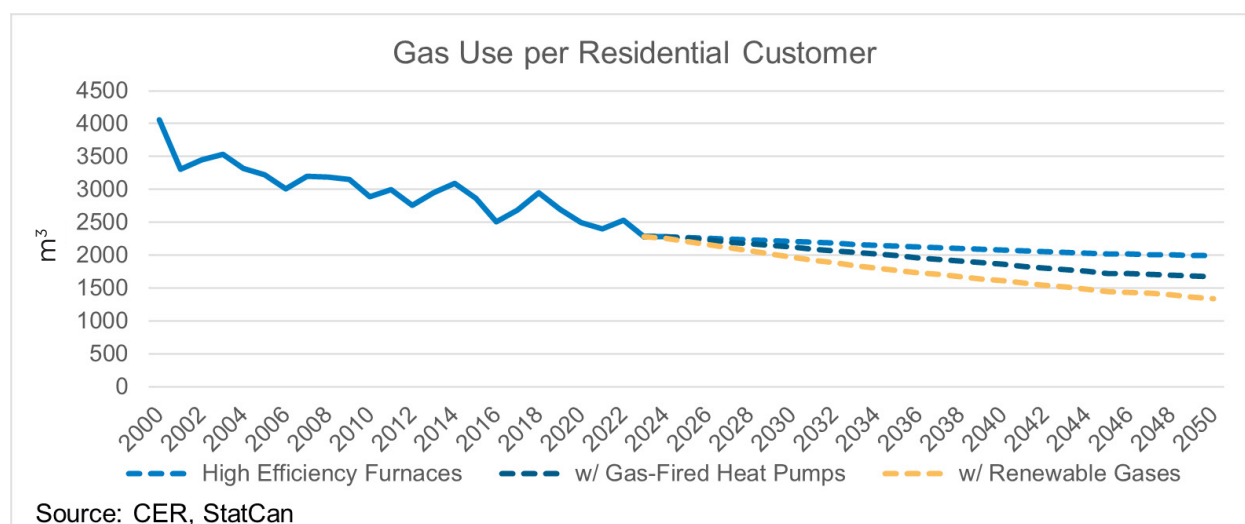
¹⁴ <https://www.electricity.ca/knowledge-centre/the-grid/regulatory/barriers-to-building-infrastructure/>

The number of residential natural gas customers has been steadily increasing over the last two decades. By the end of 2023, there were nearly seven million residential natural gas customers in Canada, representing a 62% increase since 2000, or about an average increase of 2.5% per year.

In terms of the type of heating system installed, natural gas furnaces are the most common heating system in the country. If we break down the furnace systems by type, high efficiency gas furnaces have seen the most significant increase of 4.5 million heating systems since 2000. Despite making up only 19% of all gas furnaces in 2000, high efficiency furnaces make up 77% of all gas furnaces in 2021. By 2013, all low efficiency furnaces have been replaced.

The switch over to high efficiency furnaces over the years has paid dividends in terms of energy savings for residential natural gas customers. The graph above shows the trend of average gas consumption per household as well as a few projected scenarios. While the average gas customer had used more than 4,000 m³ of natural gas in the year 2000, the average household consumption had nearly halved by 2022, equivalent to a decrease of 2,300 m³ per household by 2022.

As we look to the next 5 years, industry is currently deploying and testing gas-fired heat pumps. Much like electrically driven heat pumps, gas-fired heat pumps absorb and transfer heat from the ambient outside air allowing them to run at efficiencies beyond 100%. While high efficiency furnaces are 98% efficient, a gas-fired heat pump can reach an average efficiency of 150%. The three dotted lines in the graph below indicate the potential energy savings that can still be realized with residential gas customers. The dotted light blue line indicates a pathway where the rest of the current heating stock gets replaced by high efficiency furnaces, resulting in a 15% reduction in energy use. The dark blue line assumes a steady adoption of gas-fired heat pumps, reaching 30% by 2050, resulting in a 27% reduction in energy use. The yellow dotted line provides another potential pathway where up to 20% renewable blends like hydrogen and RNG are included in the gas system which could reduce average household gas use by up to 41%.



Recently, natural gas heating equipment has been excluded from federal programs, such as the Greener Homes Grant. We believe this is a missed opportunity and that such equipment should be a part of such programs going forward.

Aligning building codes with Canadian affordability

Natural gas plays an outsized role in home heating across Canada as it is the most affordable and reliable way to heat our homes. Over the past decade, we have seen a shift in the National Building Code process to, in effect, limit or ban its use. For the 2025 National Building Code cycle, building codes have started to focus on the energy being supplied to homes and buildings with an aim to limit the emission of greenhouse gases in the operation of the building. This is a deviation from the historical role building codes have played in focusing on the envelopes of buildings and their safety and efficiency.

Numerous regulations and legislations are in place at the federal and provincial levels to address emissions. Building codes, particularly in a time of a housing and affordability crisis, should get back to basics — building safe, efficient, and affordable homes that Canadians want without adding costly barriers to the process. Building codes that add to the cost of building homes, codes that limit choices in energy used in homes, will only lead to higher building costs, higher monthly costs for homeowners, and further exacerbation to the affordability of housing as builders adjust to new code requirements. Canadians should retain their energy choice, including gas energy and other fuels, to meet their housing energy needs.

Protecting our energy supply and systems

With the onset of cyber security legislation in Canada and increasing threats facing the North American way of life, along with the heightened global threat environment, cyber security is a more and more important area of focus across all critical infrastructure (CI) sectors and especially within the energy sector. Our adversaries have established footholds inside CI sector systems. New revolutionary technologies such as AI and quantum computing are either upon us or quickly approaching, putting Canadian CI systems at great risk. This translates into an urgency for the public and private sectors to have better cyber security and a more sophisticated plan for the future.

Currently, two key Canadian national strategies — the National Strategy for Critical Infrastructure and the National cyber security strategy — are being reviewed. The gas industry also calls for the renewal of the CSIS Act, which was last updated prior to the birth of the Internet. Amid these renewals and changes, there is a pivotal opportunity to establish a renewed vision for cyber security in Canada across all critical infrastructure.

During an October 2023 joint event with the heads of the Five Eyes security agencies, the importance of collaboration was front and centre. All Five Eyes countries have ramped up their engagement activities with “nontraditional partners” (e.g., academia and private industry) and recognize the value of building partnerships with the private sector. This type of partnership can effect positive change “at scale”.

There is an increasing awareness of the critical importance of industry-government collaboration. Therefore, new legislative and national strategic structures are needed to enable decisive and effective collaboration between government, industry, academia, and key defense stakeholders. Most critical infrastructure is owned and

operated by private industry, whereas governments own critical intelligence and advanced capabilities. Working together in a cohesive fashion will empower all areas of the Canadian economy.

Canada needs to further its Cyber Security Ecosystem, akin to what exists in allied countries like Israel, where there is close collaboration across government, academia, private CI, military, and other key defense stakeholders. We need a coordinated set of national strategies across critical infrastructure, national security, and cyber security. Only a fully integrated approach towards cyber security, involving all relevant stakeholders, will bring our country to where it needs to be in cyber security.

Recommendations



Introduce a federal program to extend gas infrastructure to rural and Indigenous communities, which includes recapitalizing the NRCan off-diesel funding program to cover natural gas and other gas energy for remote areas.



Ensure federal building policies and programs preserve energy choice and remain fuel/technology neutral.



Improve information sharing between industry and government via a Canadian Cyber Security Ecosystem strategy.

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