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A LEADERSHIP BLUEPRINT FOR CANADA'S HIGH-ESG GAS

SERVING THE PUBLIC AND GLOBAL GOOD



ABOUT PPF

The Public Policy Forum builds bridges among diverse participants in the policy-making process and gives them a platform to examine issues, offer new perspectives and feed fresh ideas into policy discussions. We believe good policy makes a better Canada.

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FOREWORD

Climate actions, despite their obvious importance, aren't as easily done, as said. That should be clear enough in looking at the stresses Europe, despite its best intentions, began experiencing even before the invasion of Ukraine. Like many others, Europe, in its quest to be a leader in emissions reductions, failed to pay adequate attention to security and affordability issues. Now, the trade-offs have become impossible to ignore. Europe is scrambling to rectify its inattention to energy transition complexity through a two-track strategy: an attempt to further accelerate the growth of renewables, while urgently scouring the earth for new sources of gas, restoring gas exploration in the North Sea, breaking ground on new LNG import facilities, recommissioning closed coal plants and perhaps nuclear facilities, and planning for the very real possibility of energy rationing.

Among other things, the winter of 2022 will be remembered for stacking an energy crisis onto the climate crisis. The message to all is that energy transitions are messy affairs and that policymakers can never afford to lose sight of the broad menu of risks to citizens and consumers forced to live in the here and now.

For Canada, it is often said that being both a supplier and consumer of fossil fuels – and one with highly differentiated regional economies – makes the pursuit of sound climate and energy policies all the more complex. To achieve our domestic objectives of meeting or exceeding our 2030 Paris targets and reaching net-zero emissions by 2050, our choices must be environmentally,

economically and politically sustainable over decades, not just years. Canadians are, by their nature, internationalists. They also abhor disorder. As such, they expect to contribute to global climate solutions, so long as they aren't subjected to European-style disruptions.

For too long, Canada's unusual energy circumstances have been viewed as a negative. In fact, our blend of resource wealth, technological prowess and good global citizenship provide a unique opportunity for Canada to help other nations with their energy transitions while serving our national interests. As a high-ESG (Environmental, Social and Governance) energy exporter, there is no pre-ordained contradiction between Canada's national public good and the global good. Achieving both simply takes some policy imagination – and not a massive amount.

Natural gas provides a case in point. Canadians might be surprised to learn that our natural gas is among the cleanest in the world in terms of carbon content. As will be demonstrated in this paper, this juxtaposition of abundant and lower-carbon natural gas provides an opening to thrive at home and to matter abroad.

The word 'ambition' is often – and appropriately – attached to ever-more, far-reaching climate actions. Ambition also must be applied to the ability to execute on national and global objectives, which, in a democracy, also means the ability to carry the public without undue division. When confronted with what is considered a “wicked problem,” policymakers often remind themselves that “the perfect cannot be the enemy of the good.” This is very much true for the future of Canada's natural gas. Canada's ability to play an outsized role depends on possessing and communicating clear goals and implementing them pragmatically.

In March 2022, the Public Policy Forum hosted a “High-Level Gas Summit” to explore the opportunities and obstacles presented by Canada's natural gas gifts, and weigh whether and how to further develop a resource that remains in high demand at home and abroad. The Gas Summit served as one of several key inputs into this paper, which builds on the intellectual foundations laid out in PPF's February 2022 Leadership Blueprint on



Canada's Net-Zero Energy Transition. The Public Policy Forum operates under a principle we call Inclusion to Conclusion. It means making sure a range of interests and perspectives (thinkers, doers and deciders) with mutual interests confront the trade-offs inherent in any policy decision (Inclusion) before settling on the options with the most promise of making for a better future (Conclusion).

In the case of the Gas Summit, viewpoints were offered by government officials, environmentalists, investors, geopolitical strategists, public opinion professionals, Indigenous leaders, natural gas distributors, industrial users, proponents of liquefied natural gas (LNG) and of hydrogen, importers of Canadian energy and others. Many of the participants have been involved in PPF's wider Energy Future Forum. It has heard from representatives based in Europe, Asia, the United States and Canada and has debated and come to conclusions on such matters as carbon capture and removal, nature-based solutions, the decarbonization of fossil fuels, electrification, Indigenous ownership, sustainable finance and low-carbon exports.

We are grateful to everyone for their spirited contribution to the Gas Summit and other Energy Future Forum activities. We trust they will see the discussions in which they've been involved reflected in the thinking behind this paper. I am particularly grateful to our partners at McCarthy Tétrault, Wayne Wouters and Dave Nikolejsin, for their co-leadership in this process, Kim Henderson for chairing our gas working group and co-authoring this paper, Steve Carr, Janet Annesley and Dale Eisler for their contributions to the drafts, and to a large number of my colleagues at the Public Policy Forum, including Darren Touch, David Campbell, Nina Newman, Masha Kennedy, Brian Bohunicky and Hannah Yakobi.

There is no room to compromise on the scourge of climate change. Yet, there are better and worse and safer and riskier routes to our collective future. Identifying these is the point of PPF's Energy Blueprint series.



Edward Greenspon
President & CEO
Public Policy Forum

GUIDING PRINCIPLES



Develop a clear picture of the leadership role Canada's high-ESG (Environmental, Social and Governance) gas can play in ensuring reliable, affordable and low-carbon energy at home and contributing to energy security and decarbonization abroad.



Ensure the full participation of Canada's Indigenous Peoples in the energy transition through access to competitive capital, loan guarantees and other financial vehicles, and by tapping into traditional knowledge of environmental stewardship.



Clearly communicate Canada's clean gas advantage with pride not ambivalence, including the strong linkage between our national interests and the global good.



Act expeditiously in moving from the consultative phase to concrete actions to build out the decarbonized gas system of tomorrow using renewable and low-carbon hydrogen and renewable natural gas. Early-mover advantage matters. Get out ahead of competitors.



Recognize the importance of the electricity and gas systems supporting one another in enabling a resilient and reliable low-carbon energy system to carry us through the transition.



Align orders of governments to create seamless processes of regulation and permitting in support of speedy decarbonization and the continuation of reliable and affordable energy supplies.



Continue to press for implementation of multilateral enablers of low-carbon energy trade, such as Article 6 of the Paris Agreement, while aggressively pursuing bilateral arrangements that ease the movement of Canadian gas to help other nations with their energy transitions.



SECTION 1: CANADA'S UNSUNG GAS STORY

In an age of worsening impacts from climate change, Canada's natural gas has an important story to tell. And Canadians have important decisions to make. Do we develop our gas and make it available to our world partners, aiding not just the cause of international security but also – perhaps counter-intuitively – contribute to global emissions reduction? Or does Canada, the world's fifth-largest producer and sixth-largest exporter of natural gas, leave our stores of energy in the ground despite their reliability and affordability at home and with a queue of partners reaching out for us to help facilitate their own energy transitions?

At the heart of the matter lies a surprising paradox: while developing Canadian gas would put upward pressure on our own national climate targets, it could also contribute to lowering *global* emissions. It comes down to what is essentially a moral choice about being a good neighbour to our friends abroad while protecting our energy independence at home. Do Canadians vacate the field for the sake of their own internal scorecard, even if it means leaving the market to low-ESG performing competitors and condemning the world to even higher emissions?

Most global energy scenarios forecast a significant reduction in fossil fuel use by 2050. The exception is natural gas, where demand is expected to increase until about 2040 before it begins a gradual decline. While some worry that the expansion of gas could result in stranded assets, the International Energy Agency forecast in its 2021 World Energy Outlook that global gas demand in 2050 will be approximately 30 per cent higher than it was in 2020¹. The U.S. Energy Information Administration also forecasts global gas output will grow by around 30 per cent from 2020 to 2050.

If demand for gas is to persist to 2050 and beyond, the question becomes who is best positioned to supply it? Canada is blessed with carbon advantages and has designed policies, such as carbon pricing, tax credits and public investment funds, to further decarbonize. In a 2020 study, verified by a third-party accounting firm, the British Columbia Business Council found that B.C.'s natural resource exports would possess half the greenhouse gas (GHG) content of competitors and that the liquified natural gas (LNG) exports on British Columbia's planning boards would spare the world up to 9.9 million tonnes annually of GHG emissions.² Given the strong regulatory and tax framework in Canada and the net-zero commitments of Canadian-based firms, this advantage should continue to grow.

Unquestionably, gas is a fossil fuel – and as such produces GHG emissions. There is much work ahead to reduce these effects. We also need to decide exactly how it should fit into government emissions cap plans for oil and gas or, indeed, whether oil and gas should continue to be counted together. What we can say with certainty today is that Canada's gas and LNG will produce significantly fewer emissions than that of the Big Three suppliers – Russia, Qatar and the United States. Moreover, this gas versus gas gap widens even more when our gas resource displaces coal, which, incredibly, is back on the upswing in large parts of the world.

The gas story might have a different telling if renewable energy sources could reasonably be counted on to reach sufficient scale

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and reliability to displace fossil fuels in the near term. But that is unlikely, a risk Europe ignored to its detriment. Intermittency remains a problem, access to critical minerals is only beginning to gather attention, energy storage is making strides but remains far from a breakthrough, and for some high-temperature industrial applications it is simply not technically feasible to replace gas with electricity.

Gas, which can be quickly turned up and down, is in fact complementary to renewables in that it furnishes steady supplies for high-demand periods, such as during a cold snap. The federal government's net-zero electricity grid plan for 2035 recognizes that in certain circumstances gas generation will be required well into the future, "such as for emergency events, back-up power to complement variable renewables, and potentially supplying power during seasonal peaks of demand."³

A prudent approach to the environment and to the economy would travel down two lanes simultaneously: picking up the pace on energy efficiencies, renewables and hydrogen development, on one side; while on the other, also investing heavily in the decarbonization of proven fuels, like gas. This, essentially, is the new European approach, and needs to be the approach of energy transition realists everywhere. Picking a lane is, in this case, a mistake. The planet is in a race with worsening climate harms and humankind cannot prosper without reliable and affordable sources of energy. We must walk and chew gum at the same time – and that gum will have to contain ever lower carbon.

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In early 2022, the Public Policy Forum published **A Leadership Blueprint for Canada's Net Zero Energy Transition**. It pointed to two competing visions of a net-zero future that struggle for primacy in Canada's public dialogue.⁴

The first is an Accelerated Phaseout vision. It lines up with the now discredited European course of focusing on the quickest possible reduction in fossil fuel production, even if that means energy supply is brought down more quickly than demand and price volatility. An Accelerated Phaseout approach risks policy incoherence. For example, mismatches between supply and demand could result in the fleet of electric vehicles mandated by government lacking adequate electricity to power them. Similarly, the premature shut down of natural gas home heating systems could frustrate electric vehicle (EV) policy by diverting limited electricity away from transportation. In the European case, it has meant the questionable ethical choice of building up a favourable domestic emissions record by leaning heavily for gas on Russia, one of the world's lowest ESG producers.

The Energy Blueprint endorsed an alternative second vision, what it called an Aggressive Decarbonization approach. This approach focuses more directly on emissions levels rather than on fossil fuel production per se as public enemy number one, reasoning that achieving net zero would render the difference largely moot and that decarbonization of existing energy sources will make for a less costly, more orderly and, therefore, more politically sustainable transition. The Aggressive Decarbonization vision underlines the federal government's new carbon capture tax credit and should logically embrace the development of Canada's natural gas, which already occupies a position of advantage.

The Energy Blueprint was distinctive for the emphasis it places on reliability, affordability and security, in other words the confidence that consumers and nations can feel knowing energy will be at their disposal without interruption through the transition. "Europe, particularly Germany, provides a cautionary tale of what happens if existing energy systems are phased down before new ones are firmly established," the Energy Blueprint observed. "Prices have spiked, and supplies rendered insecure. Europe has been left more vulnerable to geo-economic gamesmanship by Russia."

On February 2, 2022, 22 days before the invasion of Ukraine, the European Commission began to reverse course on its energy policy approach by re-classifying both natural gas and nuclear power as transitional fuels that would qualify for green financing.⁵ This dramatic move came after a winter of discontent across much of the continent and the United Kingdom as shortages of gas combined with low winds led to energy prices more than doubling.⁶ The self-inflicted damage was the product of the risk European leaders took because of their enthusiasm to lead into swapping out proven systems before renewables had worked through their reliability issues, and to willfully ignore Russian geo-political intents. In so

doing, they unnecessarily tested the goodwill of European energy consumers and voters for the overall climate project. Sustainability is an economic and political proposition, too.

Less than three weeks later, Russia invaded Ukraine, sowing modern killing fields in Europe and moving energy security alongside reliability and affordability onto the front burners of European energy policy. This led Germany and the European Commission to scramble to effect further revisions to their energy policies, which included previously unthinkable plans to build LNG import facilities and restart gas exploration in the North Sea.

Energy security has too often been taken for granted in energy transition planning. A failure by signatories of the Paris Agreement to address all risks equally and concurrently has resulted in such setbacks as an 18 per cent surge for coal-fired electricity in 2021. Until the invasion of Ukraine, the International Energy Association appeared content that its net-zero plan of action would have increased the dependence of the liberal democracies on OPEC, which it projected going from 37 per cent of market share today to more than 50 per cent by 2050. Obviously, this is no longer acceptable.

Make no mistake, the policy and investment decisions to reach Canada's net-zero future must be built on a coherent policy foundation with four cornerstones – climate, economy, Indigenous reconciliation, and energy security, reliability and affordability. Each is indispensable to success, and all must be mutually supportive of each other and the common goals that reflect Canada's national interest and the global good. The seriousness of the climate crisis deserves no less.

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CANADA AS A PREFERRED GAS SUPPLIER

The most compelling aspect of the gas story is how Canada's national interests and the greater global good are so closely aligned when it comes to environmental and economic considerations. The key question is not whether gas is good or bad. Rather, if it is to be consumed for at least several decades more, the question is how do we transition the gas system towards our net-zero goals and, in the interim, use it to get Canada and the world on an ever-steepening downward emissions trajectory? We must look at gas within the context of whether it provides a quicker, more affordable and more resilient pathway towards deep decarbonization. And we need to re-imagine a system that delivers new forms of energy such as hydrogen, considered by many as the holy grail of the energy transition – a point to which this paper will return.

In January 2022, the International Energy Agency released its in-depth review on Canada's specific energy equation. It argued that Canada's strong ESG (environmental, social and governance) record renders us a preferred supplier of oil and gas for as long as demand exists⁷. "We will still need oil and gas for years to come," IEA Executive Director Fatih Birol said in releasing the Canada report. "I prefer that oil is produced by countries ... like Canada, who want to reduce the emissions of oil and gas."⁸

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Geology has blessed Canada with some of the world's lowest-carbon natural gas coming out of the ground. Innovation and good governance add to that advantage. Our regulation of methane leaks and venting are among the strictest in the world; our abundance of clean hydro-electricity allows for cleaner production processes; our colder temperatures aid the liquefaction process; the contours of the earth situate us fewer shipping days to markets, reducing the carbon footprint of transporting product. The bottom line: for every cubic foot of Canadian gas that displaces a cubic foot from

elsewhere – or, even better, replaces coal, while renewables continue to mature – the planet is better off. The government has sought to place the onus on Canadian exporters to prove that this displacement actually occurs in individual instances, but ultimately it is the aggregate effect that packs the real punch.

Before the invasion of Ukraine, Canada stood alone among gas-producing nations in displaying ambivalence about developing its resource for export. At the PPF Gas Summit, we heard the same message from a broad grouping coalition of domestic gas producers and exporters, electricity utilities and distributors, industrial end users and importers that they depend on Canadian gas as a key component in their own transition plans. They are far from ready to make a go of it without gas. Furthermore, they are looking for Canadian producers to turn their attention over time to developing blue hydrogen from gas, which they see happening sooner than hydrogen from electrolysis, at a lower cost and with greater energy density for high-temperature uses.

Canada's natural gas endowment is also very much a domestic story. It accounts for 36 per cent of energy consumption in Canada, about double that of electricity. According to StatsCan, almost half (47 per cent) of Canadian households – largely in the Western provinces, Ontario and parts of Quebec – rely on natural gas as their main heating source. FortisBC's gas assets in British Columbia's Lower Mainland and on Vancouver Island are valued at \$6 billion, while Enbridge's system in Ontario is valued at \$16.7 billion. That is a lot of infrastructure to have to replace if, instead, gas can be decarbonized. With electricity supply needing to roughly double across Canada, other uses, such as for electric vehicles, would likely be further up the electrification line.

Canadian consumers like the reliability and affordability of their gas connections, and with good reason – they have learned they can count on them. The ferocious public reaction to the Rogers wireless blackout in July 2022 served as a timely reminder of the great stock consumers put in reliability of what they consider essential services, whether continuous access to the internet or

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worry-free warm homes. Affordability was also becoming a growing issue among Canadians even before the post-pandemic run-up in inflation. We need to be careful not to stifle production before reliable replacements are proven. Whenever consumer prices go up too much, too fast – whether for natural gas or gasoline – it places pressure on governments to pay increased attention to affordability at the expense of the price on carbon pollution.

On December 27, 2021, the coldest temperatures ever recorded in British Columbia's Lower Mainland caused a steep spike in home heating demand. It is reasonable to wonder if this extreme weather situation, like the record hot summer that preceded it, is a manifestation of climate change. Either way, the short-term demand was for heat and the natural gas system is well suited to meet the challenge as extreme cold weather. If there was no gas system and heat was fully electrified with conventional heaters, the demands on the provincial grid would have required approximately three times the entire installed generating capacity in the province. Even if high-efficiency electric heat pumps were to replace today's home furnaces, the combined load from heating homes on such a frigid day, along with additional loads required to reduce GHG emissions such as from vehicle charging, would require the additional generating capacity with storage equivalent to six Site C-size hydroelectric projects. This clearly poses a significant challenge, since a single Site C dam has proven contentious and expensive enough to frighten political leaders.

The gas system possesses a key attribute missing from electricity, at least so far. Gas can be stored, including within the multi-billion-dollar transmission systems that carry it to homes and factories, and gas can be ratcheted up when demand surges. Essentially, gas serves as a battery for the energy system. In contrast, electricity still lacks the requisite low-cost storage capacity and therefore it must be purposely over-built to meet the peak demand of the coldest days – at huge cost to either taxpayers or ratepayers.

Even hydro-rich Quebec relies on the gas system to shoulder heavy loads during the cold. In its energy transition planning, the Quebec government is proposing dual electricity-gas home heating units to deal with weather-induced surges. A Montreal Economic Institute report on natural gas in electrification concluded that gas will continue to play an important role in heating Quebec homes.⁹ Moreover, the report says that the usage of natural gas in place of electricity for heating would free up an extensive amount of hydropower to electrify other sectors of the economy, making them more competitive in a carbon-constrained world. This message was echoed at the PPF Gas Summit by both producers and end users, all of whom emphasized the need for Canada to be prudent, pragmatic and practical in resisting any temptation to move prematurely away from natural gas for residential and industrial usage. British Columbians were fortunate that gas remained an integral component of their energy system – reliably and affordably flowing into homes when demand surged on December 27, 2021.

This proven and trusted system needs to be modernized to fit the climate imperative of the current era by pushing forward on carbon capture and low carbon and renewable gases. Change

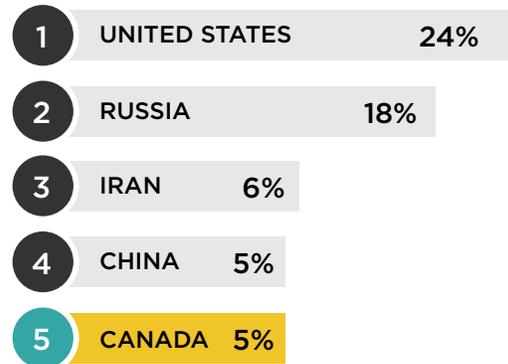
is in the cards, but at the lowest possible abatement costs and while maintaining the system's great attributes.

A world grappling with the extraordinary challenges of the energy transition is increasingly turning to gas as a key solution. Production and exports are in full growth mode. New export and import liquefied natural gas (LNG) facilities are being built around the globe. The United States has moved from a standing start in 2016 to become the world's top exporter in 2022, with the majority of its sales going to Europe and the United Kingdom, some of it enabled by Canadian gas trapped by our own policy choices in North America. By virtue of being part of an integrated North American gas system, Canada is receiving more money for its gas, with annualized export revenues of \$21.8 billions through to April 2022. Natural gas contributed a \$10.4 billion surplus (exports minus imports) to Canada's trade balance in 2021, less than oil and more than electricity.¹⁰

THE WORLD'S TOP GAS PRODUCERS AND EXPORTERS

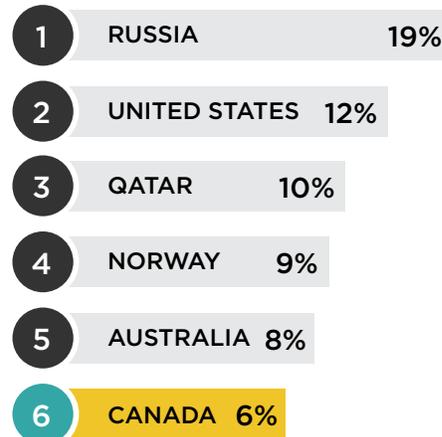
INTERNATIONAL CONTEXT WORLD PRODUCTION

388 BCF/D (11 BCM/D) (2020, PRELIMINARY)



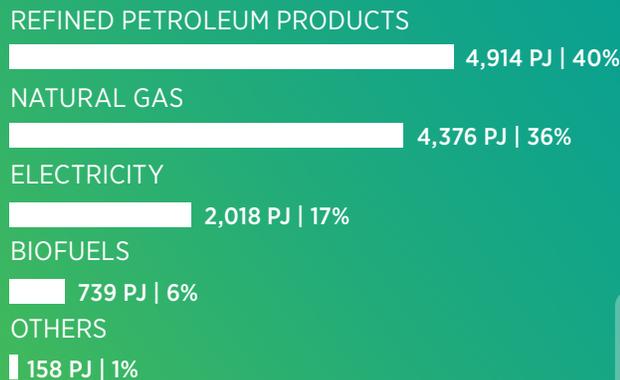
WORLD EXPORTS

120 BCF/D(3.4 BCM/D) (2020, PRELIMINARY)



Source: Energy Factbook 2021 – 2022, Natural Resources Canada

END USE DEMAND BY FUEL IN CANADA, 2019



Source: Canada Energy Regulator (CER) Provincial and Territorial Energy Profiles





COAL-TO-GAS SWITCHING

The case for gas is made even stronger in relation to what's happening with coal, the most carbon-polluting of the fossil fuels. Demand for coal is staging a stunning comeback in many parts of the world. After peaking in 2013-14, the International Energy Agency reports that the bounce in coal usage from Indiana to India was responsible for more than 40 per cent of the overall growth in global CO₂ emissions in 2021 – the single largest reason for the increase in global emissions. Price has also added impetus to this coal revival. When gas development is discouraged or obstructed, coal costs became more attractive relative to gas – the opposite effect to the expansion of shale gas knocking king coal off its throne. In 2020-21, the IEA reported gas-to-coal switching pushed up global CO₂ emissions from electricity generation by well over 100 million tonnes, notably in the United States and Europe where competition between gas and coal power plants is tightest.

In its attempt to wean itself off Russian fuels in the wake of the Ukraine invasion, even climate-conscious Europe has fired up previously decommissioned coal power plants. Germany is allowing coal plants to continue operating past their planned closure dates and even to temporarily burn high-polluting brown lignite coal. “As the regional energy crisis shows, coal remains a critical component of the power mix, especially when the reliability of other sources of energy is called into question, and that is unlikely to change in the immediate future,” said Carlos Torres Diaz, head of gas and power markets research at Rystad Energy.¹¹

Canada serves as a global role model in switching electricity production from coal to gas and other cleaner energy sources – the opposite of what occurred in much of the world last year. According to the IEA Canada 2022 report, coal's share in Canada's energy mix has significantly decreased since the dawn of the 21st century. Coal shifted from accounting for 12 per cent of total energy supply in 2000 to 3.4 per cent in 2020 and from 19 per cent to 4.8 per cent of electricity generation over the same period.¹² In 2016, the federal government announced plans to accelerate the phase out of coal power generation by 2030, with Saskatchewan, New Brunswick and Nova Scotia working to catch up with the early movers of Ontario and Alberta. At least two of those provinces, Saskatchewan and New Brunswick, are investigating small modular nuclear reactors,¹³ but they would still need gas to bridge them to their eventual destination.

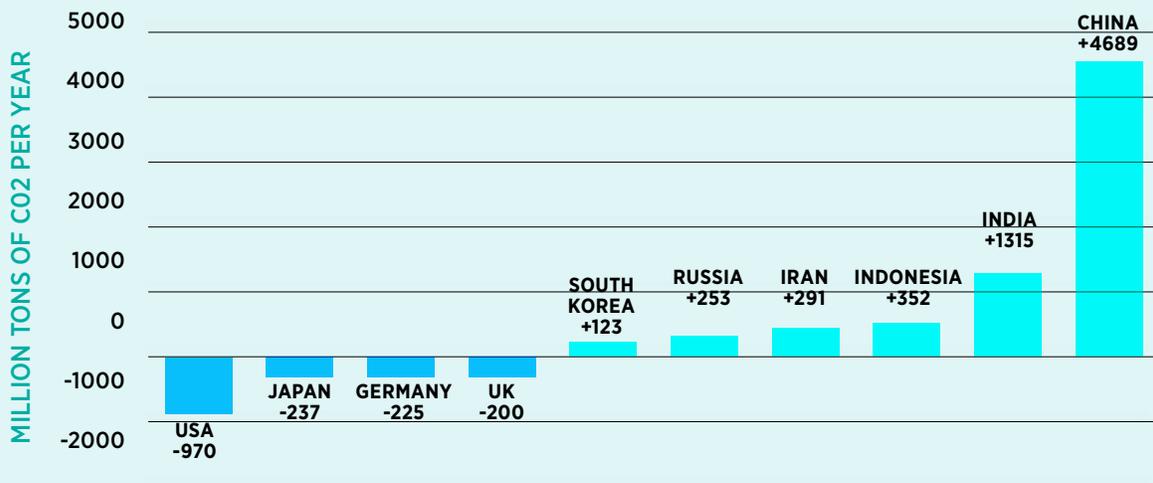
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Between 2003 and 2014, Ontario led the way with an aggressive program to eliminate coal generation. Over that timeframe, it removed 34 million tonnes, or 17 per cent of annual GHG emissions. Alberta has followed suit. Its private electricity operations are years ahead of their 2030 deadline and are expected to be off coal by the end of 2023. In the process, they have spared the provinces, country and world of approximately 25 million tonnes of emissions annually from that single policy. In Alberta's case, this is equivalent to shutting down a third of the oil sands or switching every car and truck in British Columbia, Alberta and Saskatchewan to electric power. That means Alberta's coal policies have already had the same or more effect as the 2035 electric vehicle mandate will have in Canada's three westernmost provinces.¹⁴

A similar coal-to-gas trendline has been apparent for more than a decade in the United States. It was driven in large part by the advent of shale gas in the 2000s, resulting in low-cost gas becoming more attractive to U.S. electricity generators, even in the absence of a carbon tax or other policy inducements. The net effect has been the removal of 525 million tonnes of GHGs annually between 2005 and 2019, more than half of overall U.S. emissions reductions of 970 million tonnes.¹⁵

2005 TO 2020 CHANGE IN CO2 EMISSIONS

ANNUAL MILLION METRIC TONS OF CO2 DIFFERENCE



Source: Our World in Data¹⁶

That means that since 2005, all U.S. emissions reduction efforts *combined* had less impact than coal-to-gas switching alone. As with Canada, these emissions reductions from coal-to-gas switching between 2005 and 2019 represent the equivalent of electrifying approximately 190 million cars, or roughly 70 per cent of the total number of cars in the United States.¹⁷ What the world expects to achieve in the electric vehicle market in 10 years would equate to just 15 per cent¹ of what coal-to-gas switching has already achieved in the United States alone over the last 15 years.¹⁸

The facts on the ground are clear. Replacing coal generation is among the lowest hanging fruit for policymakers globally, so long as they can substitute cleaner, viable energy sources for electricity generation. Gas is the most available option, and Canada sits on the best gas. It is important to note that this coal-to-gas switching has not come at the cost of renewable energy development. Both wind and solar expanded rapidly in this period, proving the point you can get to a better place more quickly and reliably via a two-lane approach, rather than placing an undue burden on intermittent renewables to carry too much of the load.

If we are to bend the emissions curve downward and make absolute global reductions in GHG emissions, the success in the United States and other regions must be replicated by China and India, which are the world's most important GHG emitting countries still reliant on coal. Canada should explicitly make the enablement of coal-to-gas switching part of our international climate offering by exporting a modus operandi that has served us well domestically.

Canadian gas may prove in time to serve only as a transitional slayer of Asian coal. Or, given our start down the path of decarbonization and the excitement in the world around hydrogen as a

long-term energy source, Canadian gas can become a sustainable product in a portfolio of green energy solutions. Unlike many other gas exporters, Canada is fully committed to net-zero Scope 1 and Scope 2 emissions by 2050. Canada also is increasingly prepared, even legally obligated, to develop these resources in partnership with Indigenous Peoples. This presents a leadership moment in which Canadian policymakers not only possess a highly defensible rationale for supporting gas but can provide a true ESG gas template for the world, and a refashioning of Canada's energy brand.

Other factors must be put in alignment, such as the pursuit of net-zero initiatives and the carbon and cost competitiveness of Canadian gas. The IEA Canada 2022 report pointed out that the LNG Canada plant nearing completion in Kitimat, British Columbia, "is designed to be one of the lowest CO2 intensity LNG facilities currently operating in the world, with a 60 per cent lower emissions rate than the global average."¹⁹ Future Canadian LNG projects, such as Woodfibre, Cedar, FortisBC's Tilbury expansion and a second phase of LNG Canada, the report says, would feature emissions profiles closer to 90 per cent lower than global competitors. Yet, the case for Canada's natural gas goes well beyond its critical low-carbon advantages to encompass broad social and economic benefits in the national interest, such as:

- providing affordable, reliable and secure supplies of energy for consumers and industry at home and trading partners (all fellow Paris Agreement signatories) abroad;
- advancing Indigenous economic reconciliation as First Nations from British Columbia to Newfoundland and Labrador look to gas deposits as a means to truly execute on the concept of sovereignty;
- enhancing the export strength that will allow Canadians to prosper and enable our current account to cover the costs of importing the wind turbines, solar panels and smart grids critical to a successful green energy transition, yet generally not manufactured in Canada;

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- promoting jobs and investment in rural communities that often feel left behind, addressing political polarization between urban and rural communities;
- creating and contributing the surest pathway to a hydrogen-powered future (see Section 2);
- using real-world deeds in supporting Canadian allies and partners subject to geo-political pressures by autocratic and aggressive regimes, such as Russia.

A continued role for gas will also be influenced by the optimal sequencing of the energy transition. For instance, if we add 'X' more units of electricity, to what uses should they go first: electrical vehicles, industrial production, home heating or other uses? And to what extent should the market influence this allocation? And to what extent should politicians and regulators choose the particulars of the energy transition?



Either way, any serious and sustainable climate strategy must consider the undeniable case – even the moral case – for applying Canadian gas resources to alleviate the menace climate change poses while advancing toward net zero. With its natural environmental, social and governance performance (ESG) advantage in the global marketplace, Canada's gas simply should be the world's gas. On 'Environmental,' it is materially less carbon intensive and can be made even more so; on 'Social,' it is produced in a diverse country dedicated to gender and other forms of equality and is increasingly attentive to the correcting the historical wrongs perpetrated on Indigenous Peoples; on 'Governance' Canada is a major supporter of the Paris Agreement, is a leader on addressing methane leaks and other environmental risks, is a reliable trader that does not hold other nations hostage to its geopolitical machinations, is home to regulated financiers and corporations that are committed to a net-zero future, abides by the rule of law enforced by an independent judiciary and respects human rights conventions.

With its natural environmental, social and governance performance (ESG) advantage in the global marketplace, Canada's gas simply should be the world's gas.

These are important attributes in a world in which energy development must be free of environmental degradation and human exploitation and in which nations can trust their energy suppliers to treat them as partners, not pawns.

Opponents to gas development employ many of the same arguments they mounted against development a decade ago – essentially that gas is a fossil fuel and the world should be getting out of fossil fuels. The case then, like the case now, sidesteps that the world is queuing up for more liquified natural gas, and that net zero, if seriously pursued, draws a critical distinction between emissions and fossil fuels as the bullseye target for climate action. The challenge for gas producers today is to make a credible net-zero case. The problem for gas restrictors is that lower ESG suppliers, like Russia, will fill demand.

While Canada, with its many advantages, dithered and demurred on liquified natural gas development in the 2010s, the United States began exporting from its first LNG facility in 2016 and has tripled exports in the past several years. In 2022, it became the world's largest LNG exporter. The United States has given itself the capacity to make a difference in today's difficult geo-political circumstances. It can help its allies and, in so doing, strengthen both global security and its domestic economy at the same time. Canada, in contrast, sits with a single gas export market, the United States. To the extent we rely on it as a conduit to markets beyond North America, we do so at a price of higher global emissions than if we did it ourselves and putting the lion's share of the benefits into U.S. not Canadian hands.

We were both at a standing start in the mid-2010s. Today, Canada is still awaiting completion around mid-decade of our first liquified natural gas plant in Kitimat, a \$40 billion joint venture of Shell, Malaysia's PETRONAS, Japan's Mitsubishi, China's PetroChina and Korea's KOGAS. The Kitimat LNG plant represents the largest private sector investment in Canadian history. The small Haisla-owned Cedar project nearby is still in feasibility studies and the Woodfibre project in Squamish has made a positive final investment decision, but has not broken ground. Meanwhile, the United States has eight LNG export terminals in operation with another three under construction. Australia went from having no LNG industry to being the world's largest exporter. Russia developed its gas resources and then put them to use in a tight market to weaken its neighbours. Projects in Africa and the Middle East have also taken root.

Canada's gas story is worth hearing and deliberating upon as Canadians come to terms with how we carry out the energy transition at home and help others, especially those still burning coal, do so abroad. The remainder of this report builds on the vision for Canadian gas from four perspectives: the environmental story, the economic story, the Indigenous story and the hydrogen story. Global security and the responsibility of allies to one another also stand out as key factors, as does the reliability and affordability for energy consumers here at home.



SECTION 2: HOW GAS FITS INTO CANADA'S ENERGY TRANSITION AMBITION

A: THE ENVIRONMENTAL STORY

As highlighted in PPF's Net-Zero Energy Blueprint, the energy transition is a dial not a switch. It will play out over decades and depend in good measure on breakthrough technologies not yet available. The prevalent argument of the times is not yay or nay to fossil fuels, but nay to GHG emissions in the most straightforward manner possible.

In the past year, large Canadian investment pools steeped in ESG principles, such as the Canada Pension Plan and Quebec-based Caisse de dépôt, have concluded that instead of divesting from energy companies, they will support those they believe are serious about decarbonizing their operations. Gas development, hydrogen, carbon capture and more is on the list of sectors from which they expect real action. "We will not pursue a path to blanket divestment. We will continue to invest in energy, oil and gas and hard to abate sectors with a view of being an engaged active investor," says CPP CEO John Graham.²⁰ Graham has argued that divestment does nothing

to actually remove carbon from the economy, but rather just shifts the responsibility to new shareholders who may not adhere to the same decarbonization values or objectives.

As the following pages show, there are increasing examples of how natural gas, including the development of LNG, is consistent with the full range of Canada's ESG priorities. A few examples:

- ARC Resources, a natural gas producer operating in northeastern British Columbia and northern Alberta, has reduced its absolute GHG emissions by 37 per cent between 2016 and 2020 despite growing production by 36 per cent. It did so largely through electrification. Today, four of its six major facilities in northeast British Columbia power their operations with hydroelectricity, with the other two poised to move ahead. With the market clamoring for low-emissions natural gas, the company views its electrification investments as a long-term environmental and strategic advantage. This makes its gas – Canadian gas – more attractive in the marketplace.

- ARC has also accepted gender and other social criteria, along with emissions targets, in gas supply agreements with Quebec and others, considering these a competitive advantage in the marketplace. Approximately 95 per cent of its production has received certification under Equitable Origin's EO100™ Standard for Responsible Development. Equitable Origin is a non-profit organization that measures a company's performance based on a comprehensive set of standards that include Indigenous engagement, air, water and land stewardship. Certification under this global standard brings an independent validation of ARC's ESG performance.

- Cedar LNG is an \$2.4-billion export facility owned by the Haisla Nation in partnership with Pembina Pipelines. The project is in late feasibility studies to construct and operate a floating liquefied natural gas (LNG) processing facility and marine export terminal near Kitimat, British Columbia. Thanks to electrification, the project would have an emissions intensity of 0.08 per cent metric tonnes of carbon dioxide equivalent per metric tonne of LNG produced (twice as much as required by British Columbia), compared to the global LNG average of 0.35 per cent.²¹ A final investment decision is expected in 2023. If the project goes ahead, it will create 500 jobs during construction and 100 permanent positions on Haisla traditional territory.

- Woodfibre LNG has received environmental approvals – including one from the Squamish First Nation – for a small LNG facility on the site of a long-shuttered pulp and

paper plant in Squamish. The plant will be powered entirely by renewable electricity and have a world-leading emissions intensity of 0.03 per cent.

- Proponents in Newfoundland and Labrador have also proposed an LNG plant in partnership with the Miawpukek First Nation, which would utilize gas from existing offshore oilfields and enjoy greater proximity than U.S. providers to European markets. The facility at Placentia Bay would also be powered by clean electricity.

Low-carbon or renewable gas can also be used to relieve pressure on electricity system being called upon for massive expansion in an extraordinarily tight time period. Fraser Valley Biogas, which has been in production since 2011, makes renewable energy from organic matter such as food and cow manure that produce naturally occurring methane. That methane is captured and purified to make renewable natural gas or RNG. The RNG mixes seamlessly with conventional natural gas in existing gas lines and is contracted to FortisBC, the first utility in North America with a renewable natural gas program. FortisBC has set a target that 15 per cent of its total gas supply will come from renewables gas by 2030 and has submitted a regulatory proposal that would see 100 per cent renewable gas delivered to all new residential connections. A recent study by industry and the B.C. government estimates that there is enough potential supply of renewable and low-carbon gas in the province to more than double current consumption of natural gas by end users.²² Depending on its scalability, this could provide a complementary path to eliminate emissions without having to put the entire burden on electricity.

Increasingly, gas is making the case for inclusion in the future energy mix by electrifying production; sharply reducing methane emissions; and removing carbon from the equation via nature-based solutions and various technological means of carbon capture and removal.

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ELECTRIFICATION

The IEA Net Zero by 2050 scenario report released in the spring of 2021 places electricity at the core of the energy system by 2035. When it comes to gas, we are seeing encouraging decarbonization activity by producers leveraging Canada's clean electricity grid up and down their production value chain.

However, even with the addition of BC Hydro's Site C hydroelectric dam project, the B.C. grid simply doesn't have enough supply for additional gas liquefaction, or, for that matter, for such other uses of electrification as home heating. The First Nations Climate Initiative has been urging the federal and provincial governments to get behind grid expansion in northwest British Columbia. "We need renewable energy to reinforce net-zero ambitions in many sectors including current and future LNG, hydrogen, methanol and NGL exports," the group says. "The revenues generated from expediting low carbon energy exports including LNG, NGL's, methanol and hydrogen will pay for the public investment in transmission infrastructure."

Key climate deadlines are staring us in the face, but the necessary policy coordination to deliver is not in place. We are stimulating demand for electricity to replace fossil fuels, but the indicators point to inadequate progress on efficiencies, as well as the need for additional new generating capacity and distribution capabilities. In the meantime, we are failing to exploit low-carbon export opportunities that can help pay for the electrification we require one way or another.

This situation is made that more complex because of the nature of electricity, which, unlike gas, still lacks seasonal storage capacity. Germany is attempting to fill its gas storage terminals before winter sets in. Until the long-standing storage problem is overcome, an electricity system operating without the support of gas must be purposely over-built at enormous cost to taxpayers and/or ratepayers. Otherwise, it will fail to satisfy peak demand on the coldest days. Moreover, the enormous cost of expanding the electricity system must be factored into the sequencing of electrification priorities. Would one start by developing incremental electricity generation and distribution to home heating, for example, entailing huge costs to replace existing infrastructure without commensurate economic benefits? There is also the tricky question of who would pay – the fiscally strapped taxpayer or the price sensitive ratepayer?

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Then there's the question of Indigenous participation. The 2021 Blueberry River First Nation decision established a new requirement that the cumulative effects of hundreds or thousands of individual resource projects must be taken into consideration in the context of any new project. When it comes to electrification or gas expansion, or mining, forestry or anything else, governments and corporations are on even greater notice that development cannot occur indiscriminately over the objections of First Nations. Although, the Blueberry River First Nation and B.C. government reached a preliminary agreement to keep resources flowing, the ruling reinforces a point the PPF Energy Future Forum has heard many times – that Indigenous ownership constitutes one of the surest ways to achieve the free, prior and informed consent standard set by the UN Declaration of the Rights of Indigenous Peoples (UNDRIP).

For those facilities not yet electrified, there is a real gap making electrification economic relative to natural gas-powered equipment. This means public financial support of some form or another might be required for a period, just as, for example, Alberta set royalties low until a given project achieved payout, which has happened in many cases.

Federal and provincial governments cannot reasonably ask the industry to electrify if they do not create the necessary conditions for the generation and distribution of additional supplies of electricity. Enabling more electricity at competitive prices needs to become an urgent focus of public policy for all orders of government, including First Nations. A real partnership entails policies that work for overall public policy goals, private sector practicalities and certainties, and reconciliation with Indigenous Peoples.

METHANE REDUCTIONS

The U.S. Energy Information Administration estimates that natural gas emits almost 50 per cent less CO₂ than coal. That is the good news. But at the same time, natural gas extraction, processing and transmission can be a significant source of fugitive methane emissions. Although it persists in the atmosphere for less time than carbon, it possesses a warming potential of more than 25 times that of carbon dioxide. According to studies by the Intergovernmental Panel on Climate Change (IPCC), it is responsible for about 30 per cent of the global rise in temperatures to date. Slashing methane emissions is one of the fastest and lowest cost ways to fight climate change and it is one of the top recommendations made by climate scientists in the most recent report of the IPCC.

Methane accounts for about 13 per cent of Canada's total greenhouse gas emissions, according to the federal government. Oil and gas constitute the largest sources of methane emissions through upstream activities such as exploration, drilling, production and field processing.²³ Although there is much left to do, Canada is in the leadership position of being ahead of many other countries in addressing methane leaks and flaring.

At the November 2021 UN Climate Conference COP26 in Glasgow, Canada and more than 100 other countries signed on to the Global Methane Pledge, an initiative to reduce global methane emissions by 30 per cent below 2020 levels by 2030. Canada committed to developing a plan that would reduce methane emissions across the broader Canadian economy and to reduce oil and gas methane emissions by at least 75 per cent below 2012 levels by 2030, as the IEA has said is necessary to attain net zero by 2050. Canada is the first and only country to make such a far-reaching pledge.

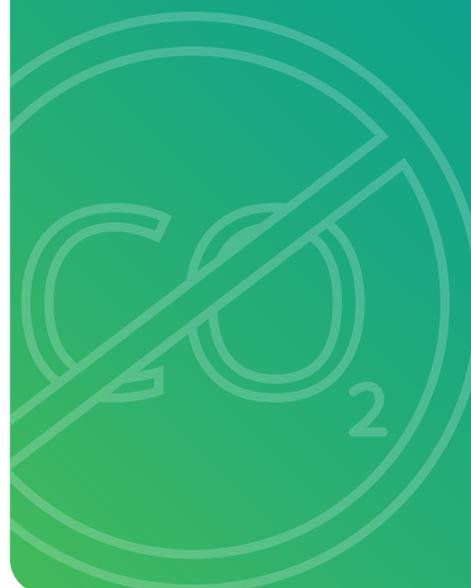
Between 2000 and 2018, methane emissions from the oil and gas sector in Canada fell by 16 per cent. During the same period, methane emissions in China increased by 133 per cent and in Russia by 47 per cent. Moreover, in Alberta, methane emissions have fallen by 34 per cent since 2014.²⁴ The Pembina Institute says 80 per cent is readily achievable from 2012 levels for less than \$25/t CO₂e.²⁵

Jonathan Wilkinson, Canada's minister of natural resources, told the PPF Gas Summit in March that methane reduction projects so far have been encouraging. He emphasized that cutting emissions from methane is one of the fastest and lowest-cost ways to fight climate change. A smart regulatory regime can confer competitive advantage in a decarbonizing world.

In March 2019, an environmental assessment of the impact of an LNG plant in Tacoma, Washington, ruled that it would be beneficial from a GHG emissions standpoint, but only because the gas was coming from Canada. Gas from the United States, the Puget Sound Clean Air Agency said, would produce emissions five to eight times higher than the Canadian gas. The difference had to do with Canada's stricter drilling and processing regulations related to methane emissions.

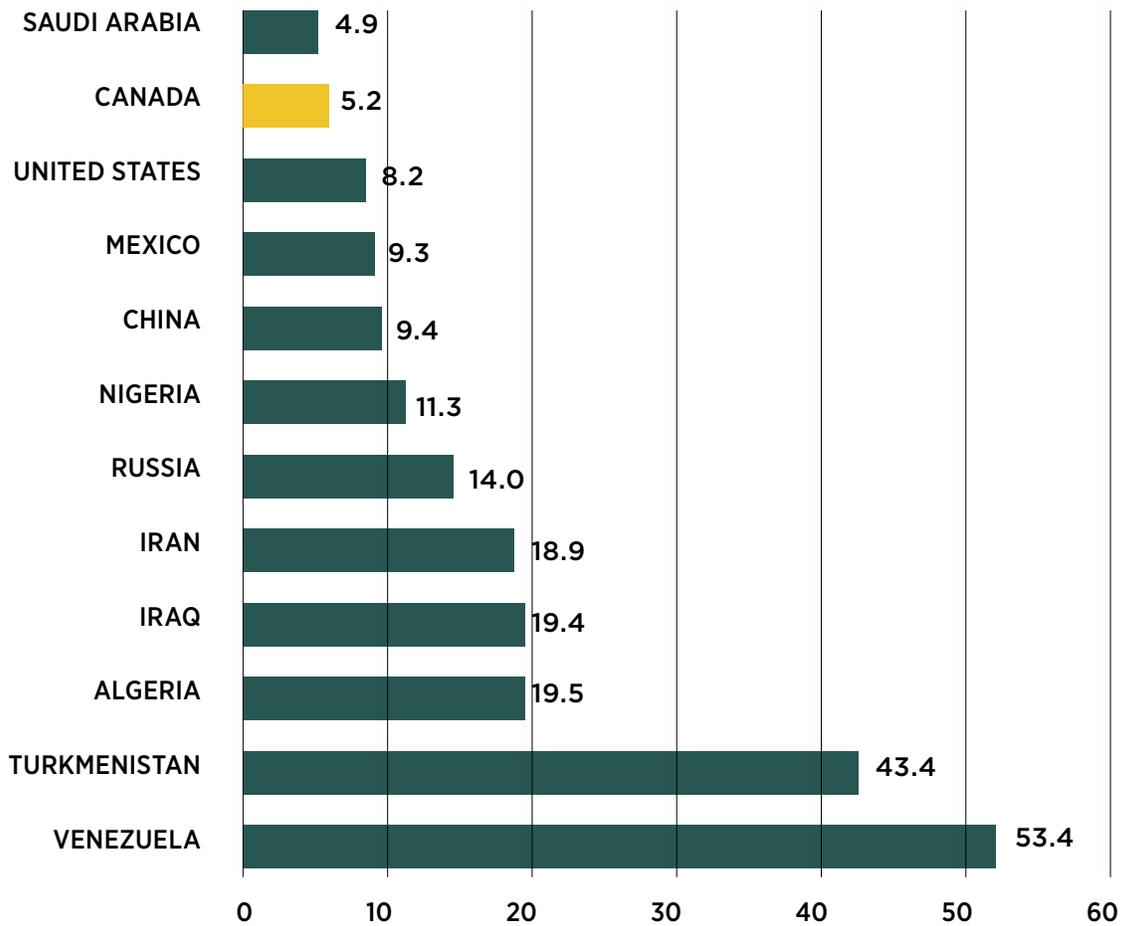
There is considerable contention still over measuring methane emissions, which could be ameliorated through the sort of broad and neutral stakeholder-governed data keeper akin to healthcare's Canadian Institute for Health Information – as proposed for GHG measures in PPF's first Energy Blueprint.

Cutting emissions from methane is one of the fastest and lowest-cost ways to fight climate change.



The use of technology is finding new innovative ways to reduce methane emissions. ARC Resources has partnered with Qube Technologies in utilizing artificial intelligence as part of an emissions management program. The technology continuously monitors fugitive methane emissions by using state-of-the-art sensors to autonomously measure a host of gases in real time. ARC Resources has also been improving its methane leak detection through two other technologies: optical gas imaging cameras, which uses thermal imaging technology, and gas mapping light detection and ranging, which identifies and quantifies methane leaks and physical changes by using laser-based remote sensing technology.

METHANE EMISSIONS INTENSITY FROM OIL AND GAS PRODUCTION, BY COUNTRY



Source: Methane Tracker Database, International Energy Agency

CARBON CAPTURE, UTILIZATION AND STORAGE

International agencies agree that a major piece of the puzzle in meeting international climate goals will be found in the various methods of carbon removal, of which carbon capture and storage is most prevalent. Along with electrification and methane control, carbon removal is the foundation upon which a clean and competitive Canadian gas industry will stand. In an earlier PPF paper entitled “*Capturing a Carbon Opportunity*,” carbon capture, utilization and storage (CCUS) was

identified as key in reaching Canada's net-zero goals.²⁶ The IPCC found that on average the cost of achieving global climate goals without carbon capture and storage would be 138 per cent more expensive.²⁷

There are multiple approaches to removing carbon from the atmosphere or preventing it from getting there in the first place. They include nature-based solutions such as afforestation and reforestation, as well as, enhanced natural processes such as the addition of biochar (charcoal produced from biomass) to soils. Technology-based carbon removal solutions are underpinned by carbon capture storage (CCS) or carbon capture utilization and storage (CCUS).

CCUS involves a suite of technologies that capture CO₂ from large point sources, including power generation or industrial facilities that use either fossil fuels or biomass. CO₂ can also be captured directly from the atmosphere by technologies under the general heading of direct air capture (DAC), a nascent area in which Canadian companies are already world leaders.²⁸

Canada enjoyed early-mover advantage in CCUs with major projects launched in the early 2000s at Alberta refineries and a coal-generated power plant in southern Saskatchewan. Those projects have served as models to the world, as has the groundbreaking Alberta Carbon Trunk Line, which collects CO₂ from various locations and transports it for utilization or storage.

These early forays proved expensive, but technological advances and carbon pricing are putting new projects (140 CCS facilities are under development globally) within reach. In an analysis presented to the Energy Future Forum, Boston Consulting Group said that costs in Canada could fall to below \$90-100 a tonne, crossing the axis with the carbon tax in several years.

Some oppose carbon removal on principle because it can make fossil fuels environmentally viable. The question, as raised in PPF's first Energy Blueprint, is whether fossil fuels per se are the enemy, or whether our focus should more clearly be on GHG emissions, including those from fossil fuels. The International

Along with electrification and methane control, carbon removal is the foundation upon which a clean and competitive Canadian gas industry will stand.

Energy Agency commented on this point in its carbon capture study, observing that “CCUS is often viewed as a fossil fuel technology that competes with renewable energy for public and private investment, although in practice it has substantial synergies with renewables.”

In the spring 2022 budget, the federal government followed the lead of the United States by incentivizing the deployment of carbon capture technologies with a refundable tax credit on the purchase and installation of equipment. The federal budget also announced plans for an investment tax credit of up to 30 per cent for net-zero technologies such as hydrogen, with details to be announced in the 2022 fall update.²⁹ There are also four new capital cost allowance (CCA) classes that will be enacted in combination with the CCUS Tax Credit. Gas is well established when it comes to carbon capture. Today, 10 of the 19 existing large-scale CCUS facilities in operation worldwide are associated with natural gas plants.

But the link between CCUS and gas goes far beyond carbon removal. It is a key to emissions reduction in the short term and to the eventual separation of hydrogen and carbon in the production of low-cost, non-emitting hydrogen fuel.

B: THE ECONOMIC STORY

Foreign direct investment (FDI) into Canada has been on the wane since 2008, with net FDI in negative numbers for most of the last 12 years according to a 2021 report by the National Bank of Canada. To a large extent the “capital bleed” was the product of declining investment in oil at the end of the oil sands “gold rush,” which arrived following the 2014 collapse in world oil prices. As a consequence of this and declines in the competitiveness of manufacturing, Canada’s current account, a broad measure of our trading and investing relationship with other nations, went into deficit and stayed there, until the recent rise in oil prices.³⁰ Over time, current account deficits can erode international confidence in the value of the Canadian dollar and increase the current upward pressure on interest rates due to inflationary concerns.

Interest in new gas investment, particularly in new LNG facilities, alleviates this risk by attracting investment and earning export dollars. Whereas international oil companies have almost all pulled out of the oil sands, global investors are beating a path to British Columbia’s gas fields. They are attracted by the critical role they see gas playing in the coming decades, particularly in Asia, in displacing coal, and by the relative lower emission of Canadian gas. Global companies like Shell and PETRONAS view Canada as among the most appealing gas jurisdictions in the world – though they worry about Canadian ambivalence to a resource they see as a winner. “We see it (Canada) as an opportunity. That’s why we invested in Canada,” says a PETRONAS Senior Executive. “We like the resource in Canada. We see it as an opportunity for Canada ... to show leadership to the world to help in this climate change agenda.”³¹

This would obviously help to rebalance the security risks around the global gas market. On the eve of its invasion of Ukraine, Russia was the world's largest exporter of gas, supplying 32 per cent of total demand in the United Kingdom and Europe. The United States and Qatar ranked second and third, at least until the invasion of Ukraine upended the market. With demand now shifting away from Russia, the United States has emerged as the world's leading supplier of LNG.

As of February 2022, the Canada Energy Regulator had approved 33 export licence applications for Canadian LNG projects, a step that occurs before the environmental assessment process. LNG export projects have been proposed for both the west and east coasts. Data provided to PPF by CIBC show that LNG exports have the potential to add roughly \$7.4 billion a year to Canada's economy over the next three decades and raise national employment by an annual average of 65,000 jobs.³²

Canada has been late to the boom in global gas trade. Along with the Netherlands, Canada is considered atypical for relying exclusively on exports via pipeline to the United States while avoiding the diversified international LNG market the United States and Australia, among others, have embraced.

Canada is well positioned in terms of location, reliability and its low-carbon gas to become a major supplier of LNG as global demand continues to rise, at least in the medium term. Net exports from the United States have tripled since 2019, with the urgent need to find replacements in Europe for supplies from Russia adding impetus to an already well-established trend. Canada is ready to enter the market, however tentatively compared to potential. The \$40 billion LNG Canada site received its final investment decision in 2018 and is scheduled to go on stream around mid-decade.

At the time of the final investment decision on LNG Canada Phase 1, B.C. Premier John Horgan stated: "The critical importance of this project is what it represents – the intersecting of economic development, jobs for local workers, partnerships with Indigenous communities and forward-looking climate leadership. We're

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delighted the global business community sees British Columbia as a natural home for this kind of investment.”³³ At the PPF Gas Summit, he added that the Ukraine situation had changed the game toward a need for more LNG in the world, although if British Columbia were to help satisfy this demand, it would need to do so within the parameters of its climate plan. He challenged industry to help his government figure out how to expand gas within these limits.

The world wants Canada’s low-carbon gas. In a 2019 Ipsos survey, respondents from 31 countries chose Canada as their number one natural gas supplier from among the world’s top 11 energy-exporting nations³⁴. Major news outlets and trade publications are reporting on the rush of importing nations, particularly those in Asia, looking to secure low-carbon energy products to help in their own domestic emission reduction targets. In all cases, Canada’s LNG would be highly favourable on carbon, the new factor in global competitiveness, and would also provide a basis for future hydrogen development.

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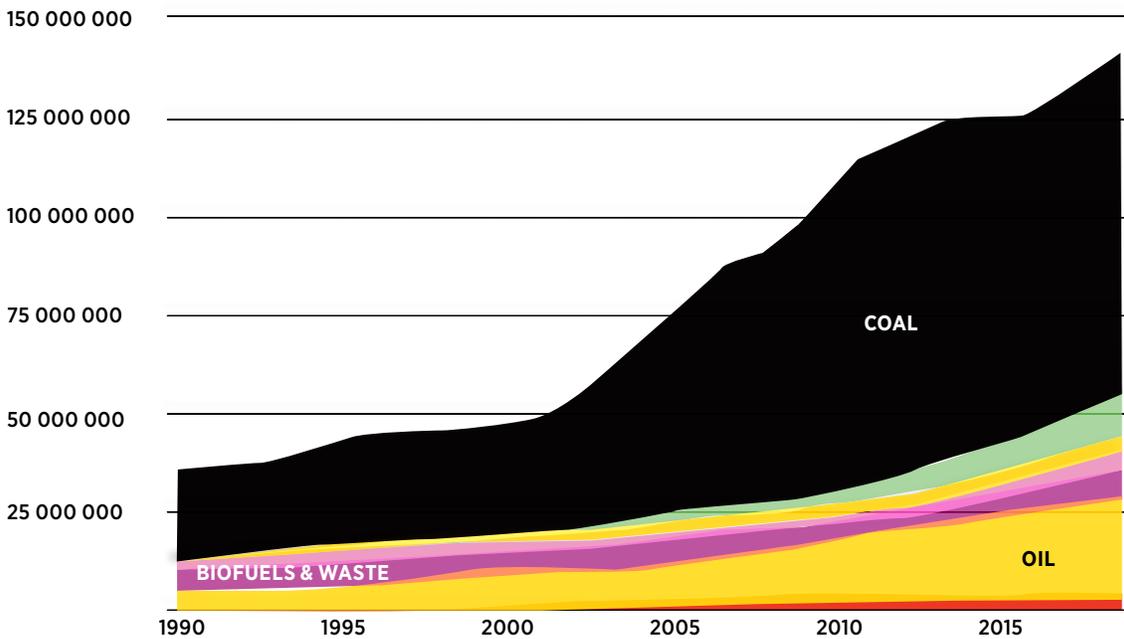
CANADA AND U.S. GLOBAL ENERGY PARTNERSHIP

When war broke out in Ukraine, the U.S. president made a formal agreement with the European Union to dramatically increase U.S. LNG exports to Europe through 2030. Processing capacity is on track to rise, and shipments are being redirected to help meet European demand. Canada’s decisions a decade and more ago have denied us the opportunity to contribute to our full potential. In a more rational world, Canada would focus its sales on Asia, where we enjoy greater proximity, and the United States on sales to Europe. On the demand side of the equation, the market is turning in Canada’s direction. Academic research published in 2022 for the *Journal of Cleaner Production* by Ravihari Kotagodahetti et al. found that the Asian region is poised to increase the natural gas component of its energy imports from 2 per cent today to 28 per cent of the total demand.

The Canadian government has stated that LNG can only be supported if it can establish that the exported gas will actually displace coal. The specificity seems a reach given the fungible nature of gas and power generation generally. It is something that demands further discussion as to whether it is intended as a major obstacle or simply political assurance.

When it comes to China, it is the industrial and residential heating market – not power generation where clean Canadian gas can have the greatest impact. The study found that 80 per cent of China’s district heating and industries are powered by coal. Their transition would, translate into an overall reduction in coal usage of 26 per cent to 60 per cent, a material difference to China’s carbon footprint. There is no energy source other than LNG that can displace coal at this scale.³⁵

TOTAL ENERGY SUPPLY (TES) BY SOURCE, PEOPLE’S REPUBLIC OF CHINA 1990 – 2019



Source: International Energy Agency

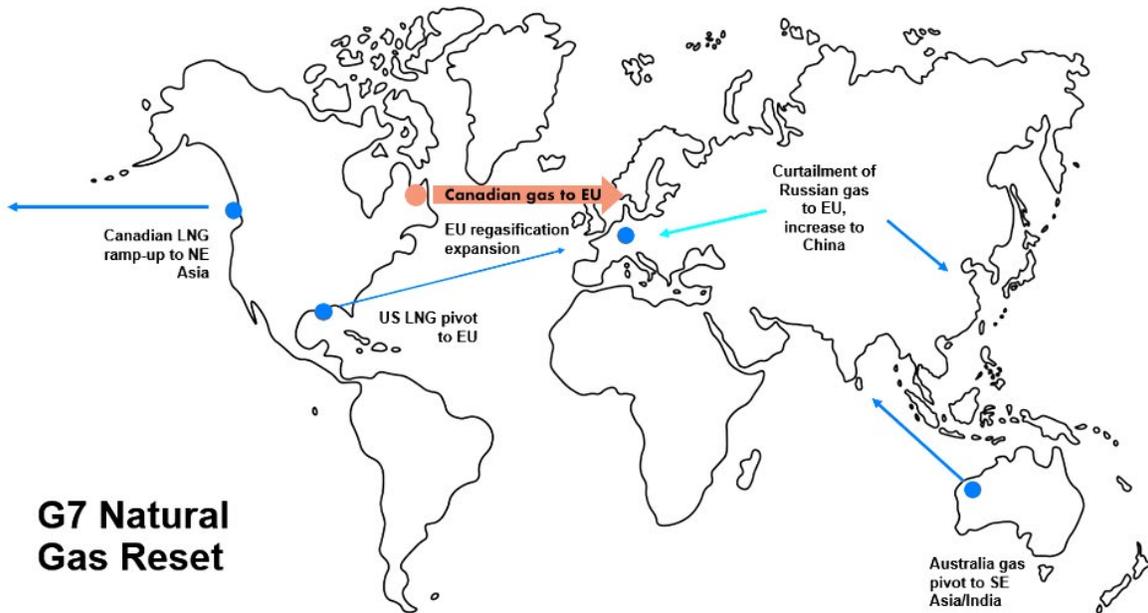
According to the IEA’s 2020 Gas Market Report, one of every four tons of coal currently used globally is burned to produce electricity in China.³⁶ Canada is a major part of the solution to this global problem due to our clean gas deposits and shipping routes that are 50 per cent shorter than from the U.S. Gulf Coast. We have massive potential to enter the Asian market and free up supply from the U.S. Gulf Coast and potentially Canada’s East Coast to service Europe.

The bottom line is that Canada is far closer to Asia and possesses the means to help the fast-growing and largest continent meet its climate obligations.

New Brunswick already has an LNG import facility in Saint John owned by Spain's national oil company, Repsol SA. The federal and provincial governments are examining whether the facility could be retrofitted for export. Premier Blaine Higgs said the facility could export LNG within the next three years. Moreover, the Saint John facility could be converted to export liquefied hydrogen down the road.³⁷

Canada can assist the world from both its west and east coasts, thus realizing our national interests while serving the global interest, as well. To move at the maximum reasonable speed under current global security circumstances will require absolute policy clarity and determination. Necessity being the mother of invention, a hard-pressed Germany plans to build two new LNG import facilities in just two years.

LEVELING THE EXPORT PLAYING FIELD



Source: Columbia Center on Global Energy Policy

The Paris Agreement is organized in such a way as to charge emissions against the national accounts of the producing nation, whether that production is for domestic consumption or is exported for consumption in another country. This creates a disincentive for exports and an advantage to importers. The Paris Agreement contemplated this imbalance in its Article 6, which created a market mechanism to encourage both importers and exporters to voluntarily cooperate in achieving national targets while protecting against the danger of double counting.

In a fall 2021 PPF report, **CLIMATETIVENESS: What it Takes for Canada to Thrive in a Net Zero Exporting World**, it was pointed out that Canada enjoys some pre-existing low carbon advantages (such as gas and aluminum) while needing to establish advantages in other sectors.³⁸

Climativeness reported on a McKinsey study for the federal government's industry strategy council showing that 45 per cent of Canada's carbon footprint leaves the country in the form of exports while 32 per cent comes into the country through imports. The net effect is that Canada subsidizes the nations that import and consume our goods to the tune of 13 per cent of our total emissions (about 90 million tonnes worth), which is enough to bridge the difference between Canada's earlier 30 per cent emissions reduction target under the Paris Agreement and a new target adopted around the Glasgow COP of 40 to 45 per cent. In classic trade terms, Canada benefits economically from every export it makes. In carbon terms, though – a critical new factor in competitiveness – it loses, even when Canadian goods are less carbon intensive than the global alternatives.

Canada has sought in the past to address this matter multilaterally without success.

Article 6.2 of the Paris Agreement created a mechanism called Internationally Transferred Mitigation Outcomes (ITMOs) that allow for voluntary bilateral arrangements on transferring carbon credit between trading partners – a cooperative, country-specific approach to so-called nationally determined contributions (NDC) goals.

The *Climativeness* report explored the example of what such an agreement between Japan and Canada could look like. Canada benefits in terms of jobs and economic activity from the export; Japan benefits throughout the lifecycle of the low-carbon product. This might show up in emissions tied to power output but also in the products derived from that clean energy.

Canada has already entered the ITMO arena through a partnership with Chile for emissions reduction in the waste sector.³⁹ As a result, Canada will receive emissions credits as part of ITMOs established by Article 6 of the 2015 Paris Agreement. The partnership agreement will support Chile's efforts to reduce methane emissions from its landfill sites.

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In the study by Ravihari Kotagodahetti et al, the recommended tool to affect emissions reductions in China with liquefied natural gas and meet domestic targets in Canada is to create ITMOs between Canada and China based on replacing coal use in China with British Columbia's LNG. If our domestic emissions targets are a challenge to meet, and they are, ITMOs should be pursued as a mechanism for emissions mitigation.

The analysis clearly demonstrates the benefits of Canadian LNG displacing coal; the challenge is to translate those benefits not just into better economic outcomes for Canada but also into lower domestic emissions reductions targets.⁴⁰ As recommended in the *Climatetiveness* report, Canada should mandate its skilled trade negotiators to the task as a key objective of domestic emissions efforts and a lower-cost pathway for carbon abatement. That includes linking trade agreements to Canada's low carbon content exports.

It was made clear to us from government officials that if LNG is to be exported to other markets, its use must be directly tied to the displacement of heavier hydrocarbon fuels such as coal or, as in the current situation in Europe, it must displace natural gas currently being supplied by Russia. Furthermore, there must be a pathway to transition to hydrogen in line with an overall move to net zero by 2050. This is all achievable with the leadership that Canada can offer should it choose this path.

Of course, bilateralism means that both sides are willing to play. Within Canada, government and the private sector would have to be prepared to work together to pursue functional goals. Contractual agreements with other nations or their corporations providing that displacement is actually occurring will require full engagement, not just standard setting by Canada's government.

There is also a more contentious approach should agreement on Article 6, or some facsimile, prove impossible to secure, and Canada feels the need to vigorously pursue its national interest. Unilateralism is not a mode of operation that a consensual middle power such as Canada likes to employ. But there is a precedent from the Pierre Trudeau government's handling of the Law of the Sea negotiations.⁴¹

At the outset of decades-long negotiations, Canada's position was to echo the worldview of our larger world partners, particularly the United States and United Kingdom. Given that both were great maritime powers, they preferred the then operative three-mile territorial control accorded to independent states. Everything else constituted the high seas.

As the nation with the longest coastline in the world, Canada's national interest fell outside those of its allies. Canada chose in the 1960s to go unilateral. Allan Gotlieb, Canada's one-time under-secretary for external affairs and ambassador to the United States, began his public service career as legal adviser on Law of the Sea. In a 2004 paper called *Romanticism and Realism in Canada's Foreign Policy*, he recounted how Canada, frustrated by its inability to secure the control it sought over the waters contiguous to the east and west coasts, unilaterally imposed a 200-mile zone for

fisheries conservation and pollution control purposes. Fearing a legal challenge, Canada went so far, as nations may, as to withdraw from the compulsory jurisdiction of the international court regarding all matters relating to our adjacent coastal waters.

“In renouncing recourse to law,” Gotlieb wrote, “Canada determined that its national interest, as it was conceived, took precedence over its commitment to broader international goals.” Ultimately, the world came around to Canada’s unilateral position. The innovative 200-mile economic zone became the norm in international affairs. In the so-called turbot war in the mid-1990s, Canada went outside the 200-miles limit to seize a Spanish trawler. It again acted unilaterally – and again renounced International Court jurisdiction – to defend its economic interests against what it considered harmful overfishing in international waters off Canada’s east coast. In today’s case of Canadian natural gas, there is no conflict between Canada’s national interest and broader international climate goals. The two, in fact, are aligned.

So, there is a history and a bargaining lever at our disposal. Whether one wants to wield it or not is a different and obviously sensitive question. In this case, it would be a matter of Canada unilaterally deciding, with or without Article 6 agreement, not to count low-carbon exports that in fact reduced global emissions against our nationally determined contributions under Paris. This assertion of national interests would naturally create controversy in the country and the world.

C: THE INDIGENOUS STORY

Discussions at the PPF Gas Summit made it clear that many First Nations are highly engaged in natural resource development generally and in gas development, specifically the Haisla, Squamish and Nisga’a nations in British Columbia and the Miawpukek First Nation in Newfoundland and Labrador. On the eve of the PPF Gas Summit, 16 B.C. First Nations signed option agreements to purchase a 10 per cent equity interest in the Coastal GasLink pipeline project from TC Energy. At the same time, the government of Canada is seeking to transfer the Trans-Mountain pipeline to Indigenous ownership.

“This is about the communities. It’s about being able to have employment opportunities and benefits to the community, as well as ensuring we develop this project in a responsible way,”

INDIGENOUS RELATIONS DIRECTOR TIFFANY MURRAY.

The story of the past several decades is one of Indigenous Peoples having their rights affirmed by courts and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and are now negotiating from a position of greater strength. An increasing number of First Nations' leaders on both coasts and throughout the country (though not all) view natural resource development as a step toward reconciliation and a bridge to economic self-sufficiency.

True consultations, which go well beyond begrudging nods at the duty to consult, are belatedly occurring across Canada. They are particularly unlocking developments in British Columbia. Not all First Nations agree on any given project. First off, different First Nations, depending on geography, history, culture and leadership, will harbour different economic ambitions – just as provinces do. British Columbia is not Alberta. Quebec is not New Brunswick. The residents within these communities will also differ among themselves, as citizens do in all parts of Canada. It is not incumbent on them to agree. Such is the messiness of democracy. But each jurisdiction enjoys sovereignty over its own lands and waters, and it is both necessary and just that the residents of each community ultimately accept the considered decisions of the duly constituted authorities.

Many of those living around gas deposits, though clearly not all, see an opportunity for the economic advancement of their communities. Beyond benefits sharing, they view skills training, development agreements and increasingly equity ownership as a way to secure opportunities for people in their communities. This thinking has been brought home multiple times and in multiple ways within the discussions of the Energy Future Forum and at the Gas Summit itself. The point has been made in our sessions that nothing better speaks to the free, prior and informed consent (FPIC) requirement under the UN Declaration on the Rights of Indigenous Peoples.

In a PPF paper, **We Want Real Partnership**, Indigenous leaders Alicia Dubois, Tabatha Bull, Mark Podlasly, J.P. Gladu and Kim

The point has been made in our sessions that nothing better speaks to the free, prior and informed consent (FPIC) requirement under the UN Declaration on the Rights of Indigenous Peoples.

Baird said: “As witnessed by Canada’s history, legislating takes time. For instance, defining the duty to consult and accommodate took more than 10 years. However, there is consensus and a desire for active partnership and ownership between Indigenous Canadians and industries. The best way of getting free, prior and informed consent is to have true partnership and true ownership with Indigenous partners.”⁴²

In the area around Kitimat, British Columbia, the Haisla First Nation has advanced to the feasibility stage on the Indigenous-owned Cedar LNG initiative. And from British Columbia to Labrador, other First Nations have entered into agreements to develop their storehouses of gas as they seek to deliver on the promise of economic sovereignty. These First Nations, with millennia of lived experience as stewards of the land and waters, want to see these projects undertaken in an environmentally sensitive manner consistent with their values. Investors are paying attention, as they well understand how important First Nations support can be to the success or failure of a project.

At least three First Nations-led organizations have emerged in recent years to promote environmentally sound and climate-smart economic development, including LNGs, other resources and renewables. The First Nations Major Projects Coalition (FNMPC), the First Nations Climate Initiative (FNCI) and the First Nations LNG Alliance (FNLNGA) are lending added weight to Indigenous participation in sustainable and responsible LNG development.

The FNMPC states that major projects are one of the few development opportunities that could bring meaningful change to rural and remote communities. The FNMPC is creating pathways to reconciliation by advancing opportunities for First Nations to obtain ownership stakes in major projects that run through their territories and by advocating for sovereign loan guarantees and other avenues to access reasonably priced capital.

The FNCI was established in October 2019 by the leadership of the Lax Kw’alaams, Metlakatla, Nisga’a and Haisla First Nations to serve as a forum for collaboration in the fight against climate change and poverty in First Nations’ communities. Since then, the Initiative has expanded dramatically through science-based collaboration on globally significant strategies to mitigate climate change. FNCI has entered into memorandums of understanding with FNMPC, FNLNGA and the Business Council of British Columbia, and is collaborating with hundreds of representatives of businesses, associations, post-secondary institutions, think tanks and civil society organizations. Together with many of these collaborators, they have developed a blueprint for key pathways to net zero and beyond into negative emissions that features:

- Export of net-zero LNG to be used as a transition fuel and eventually as a feedstock for hydrogen and black carbon production using pyrolysis
- Development of nature-based solutions that restore and protect the capacity of First Nations to exercise their rights while sequestering carbon, generating offsets and fostering an Indigenous-led restoration economy

- Proactive construction of renewable energy generation and transmission infrastructure that will increase the amount of renewable energy in northwest British Columbia by six times, in keeping with the expected requirements of a decarbonized economy
- Development and implementation of CCUS technologies to expedite net-zero and negative emission objectives in tandem with nature-based solutions

Progress isn't limited to the coasts. In February 2022, Enbridge announced an agreement with the First Nation Capital Investment Partnership (FNCIP), a recently formed partnership of four First Nations, to advance the proposed Open Access Wabamun Carbon Hub (the Hub) west of Edmonton. The recently formed FNCIP is pursuing ownership in major infrastructure projects with commercial partners that share Indigenous values. The Hub is being developed as an innovative combination of carbon transportation and storage solutions to support recently announced carbon capture projects from Capital Power Corporation (Capital Power), Lehigh Hanson Materials Limited (Lehigh Cement) and potentially others.

Once built, the Hub will be among the largest integrated carbon transportation and storage projects in the world. Capital Power and Lehigh Cement's planned carbon capture projects represent an opportunity to eliminate nearly four million tonnes of atmospheric CO₂ emissions.⁴³ The four partnering First Nations see this as an opportunity to generate wealth, but more importantly it allows sustainable economic sovereignty for their communities.

Our consultations made clear that Indigenous partnerships and Indigenous-led projects are one of the non-negotiables for resource development – and that inclusion needs to be reflected at every step. Both industry and First Nations leaders we spoke with see Indigenous People as part of the solution to Canada's lack-of-speed-to-market issue; that is, our struggle to develop new projects at pace. Regulatory processes will need to be reformed if Canada is going to do all it must do in energy transition in time to ward off the worse effects of climate change. Moreover, there is a need for policy alignment between the needs and aspirations of Indigenous People and the climate and economic interests of Canada. This requires Indigenous People to be engaged at the outset of the decision-making process for projects that affect their communities.

When First Nations support given projects, the support should add a great deal of confidence for regulators, investors and the public at large. Canadians are going to have to decide how serious we are about economic reconciliation, and who gets to

Indigenous partnerships and Indigenous-led projects are one of the non-negotiables for resource development – and that inclusion needs to be reflected at every step.

determine what counts and doesn't? We should take the lead as much as possible from First Nations seeking development (subject, of course, to environmental review), without causing harm for those preferring a more traditional economic path. The single most impactful thing governments at the federal and provincial level can do is to follow the lead of the Alberta Indigenous Opportunities Corporation and provide potential Indigenous partners with access to reasonably costed capital so they can invest in and share the wealth generated by natural resource development in Canada.

D: THE HYDROGEN STORY

Hydrogen has been called the fuel of the future, a zero-emission energy carrier that alongside battery storage and renewables can play a crucial role to create carbon-neutral societies and economies. The benefits are many. Hydrogen can tackle critical and daunting energy challenges that are key to unlocking a truly clean energy future. It is a means to decarbonize long-haul transport, chemicals, and iron and steel, where meaningful emission reductions prove difficult. In the words of the International Energy Authority “the time is ripe to tap into hydrogen’s potential contribution to a sustainable energy future.”⁴⁴ The IEA’s 2021 Global Hydrogen Review found that 17 governments have hydrogen strategies in place, more than 20 others are working to develop strategies, and companies worldwide are pursuing hydrogen business opportunities.⁴⁵ In other words, the future for hydrogen is now – even if the returns will take time to reach scale.

Hydrogen is light, storable, energy-dense and produces no direct greenhouse gas emissions. It can be extracted from fossil fuels and biomass, from water, or from a mix of both. Natural gas is currently the primary source of hydrogen production. By blending hydrogen with natural gas, the emissions content can be significantly reduced. But the concentrations of hydrogen that can be safely used is contingent on the age and integrity of pipelines and other systems. In July, NRCan issued a request for proposal (RFP) seeking proposals on “a policy/regulatory, technical and economic assessment” for the blending of hydrogen into natural gas infrastructure system.⁴⁶

The IEA’s Net Zero by 2050 report released in the Spring of 2021 proposed pathways to a required “technological revolution” – including electrification, carbon capture and storage, and natural-gas based hydrogen supported by CCUS (so-called blue hydrogen, which the IEA says will likely lead the hydrogen charge while prices to process green hydrogen from renewable sources fall). The IEA is clear this is “a” scenario not “the” scenario – and that it comes with more than 400 milestones to achieve. Much depends on the pace of innovation in new and emerging technologies, the extent to which citizens are able or willing to change behaviour, the availability of sustainable bioenergy and the extent and effectiveness of international collaboration. Viewed one way, the IEA Net Zero report is a wake-up call for Canada to decisively lean into our strengths. Germany, Japan and other countries are already speaking to Canada about our plans for non-emitting hydrogen. The time to gain advantage is now.

In the PPF Gas Summit and other discussions for this paper, no topic generated as much urgency and enthusiasm for Canada's net-zero path as hydrogen. A number of hydrogen proposals have already come forward from coast to coast. In British Columbia, Ekona Power recently raised \$79 million to ramp up commercialization of its methane pyrolysis reactor that can produce hydrogen and solid carbon from natural gas, without the carbon capture and storage.⁴⁷ FortisBC, Suncor and Hazer have partnered to build an \$11 million hydrogen pilot project in Port Moody. If fully commercialized, it could produce up to 2,500 tonnes of hydrogen a year, which would replace the equivalent annual natural gas usage of about 3,300 households.⁴⁸ In Alberta, Suncor and ATCO have announced plans to collaborate on a hydrogen production facility, near Fort Saskatchewan, capable of producing 300,000 tonnes of hydrogen annually. In Ontario, Enbridge is involved in a pilot project that will blend hydrogen with conventional natural gas that would be distributed to about 3,600 customers as a means to reduce greenhouse gas (GHG) emissions. In Quebec, Hydro-Québec announced the construction of an electrolyzer facility with a capacity of about 90 megawatts, becoming one of the most powerful electrolyzers in the world to produce some 11,100 metric tonnes of green hydrogen.⁴⁹

The world is excited about the prospect of hydrogen. Canada has a strong head start in what many consider the fuel of the future thanks to our oil and gas and petrochemical industries in some areas of the country and our hydro in others. Alberta, which has the most at stake in the energy transition, is arguably Canada's national leader in hydrogen, dangling the possibility of converting our overall energy strength into hydrogen strength.

But time is clearly of the essence. Other countries are further advanced on hydrogen production than Canada. Australia has established seven regional clean hydrogen hubs. In the United States, Oklahoma, Louisiana and Arkansas have recently joined forces to create a regional clean hydrogen hub, accessing the Biden administration's \$8 billion program for clean hydrogen development.

Germany, Japan and other countries are already speaking to Canada about our plans for non-emitting hydrogen. The time to gain advantage is now.



In the wake of Europe's energy crisis, Germany has earmarked \$220 billion to fund industrial transformation until 2026, which includes climate protection, hydrogen technology and the deployment of electric vehicle charging networks.⁵⁰ In January, ahead of the Russian invasion of Ukraine, Robert Habeck, Germany's economy minister, announced an ambitious target to double domestic production capacity of green hydrogen by 2030. As Germany seeks to expand its domestic production, it is also looking abroad to Ireland, Saudi Arabia, Oman, Chile, Namibia, Australia and Canada to import hydrogen. In April, Germany's state secretary for financial market policy and European policy, Jörg Kukies, came to Ottawa to discuss how Canada could supply hydrogen to Germany, reinforced by the chancellor's visit in August to speak about gas and hydrogen.

The world is excited about the prospect of hydrogen. Canada has a strong head start in what many consider the fuel of the future thanks to our oil and gas and petrochemical industries in some areas of the country and our hydro in others.

Part of the attraction of hydrogen lies in its continuity. As Australia's chief scientist put it, "The most marvelous application of hydrogen of all is the ability for us to continue what we've been doing for hundreds of years – ship energy from a continent where it is plentiful to the continents where it is in short supply."⁵¹ Australia is already hard at work to establish its hydrogen distribution networks, including a project involving Calgary-based ATCO. In Southeast Australia, an AUD\$500 million pilot project is set to begin producing hydrogen for export.⁵²

Analysts often speak of hydrogen in terms of a palate of colours related to different production methods. Green hydrogen comes from the electrolysis of water, using emission-free power generation sources, of which Canada has many. Fort Nelson First Nation and Hydrogen Naturally Inc. have partnered to explore the feasibility of "a bright green" hydrogen facility, which would process residual wood fibres that are not being used for solid wood products into carbon-negative hydrogen.⁵³

CANADA IS UNIQUELY POSITIONED TO EXPORT CLEAN HYDROGEN TO ASIA AND EUROPE

Note: Distances refer to Yokohama and Rotterdam

Source: [Searates.com](https://www.searates.com/); BCG Analysis



Image attribution: CC BY-SA 3.0. Strebe. The world on azimuthal equidistant projection. 15° graticule, polar aspect. Imagery is a derivative of NASA's Blue Marble summer month composite with oceans lightened to enhance legibility and contrast. Image created with the Geocart map projection software.

 SUPPLY  DEMAND

The production of grey hydrogen via steam methane reforming (SMR) technologies is currently the most cost-competitive and common hydrogen production process used globally. This hydrogen is used mainly for the production of ammonia for fertilizers and the upgrading of petroleum products in refineries and has to overcome the challenge of high carbon intensity. But when the CO₂ stream from grey hydrogen production is captured and sequestered or used, the resulting hydrogen is called blue hydrogen.

Blue hydrogen has the twin benefits of separating out the hydrogen and carbon molecules that make up hydrocarbons before the carbon is burned and can reach the atmosphere. It also has the necessary energy density required for many high-temperature industrial processes.

Turquoise hydrogen is a more recent addition to the colour spectrum for hydrogen and holds great promise. It is produced by breaking down methane within a natural gas stream into hydrogen and solid amorphous carbon. The process is called pyrolysis and has the potential to produce a relatively low carbon intensity hydrogen.

Clearly, hydrogen is on the move and carries enormous promise. Among its attributes:



- First, because of the different methods of production, hydrogen can be produced in all regions of Canada. It can be a national energy unifier after too many years of energy being used to divide Canadians.



- Second, a diverse portfolio is always a good way to manage technology and market risks and differing paces of development, a principle that applies within hydrogen, too.



- Third, the key matter for the environment is not the colour of the hydrogen but its level of carbon intensity. This is what governments should examine in terms of both domestic production and for international hydrogen markets.

The Canadian government should move with speed to promote a universally respected hydrogen emissions intensity standard, recognizing it is not the colour but the controlling for emissions that is important. If carbon removal or other innovations bring down the intensity of one method further than another, then it should be able to compete, regardless of whether the starting point is gas or

water. What's critical is the carbon content of hydrogen production, not the mode of production. It will likely require a great deal of experimentation and improvement – with hydrogen from natural gas currently holding an early cost and energy density advantage. Other technologies, including many in the early stages of development, will undoubtedly compete over time. When all is said and done, this should not be treated as a colouring box with good and bad hues. Hydrogen is the future, and it needs room to maneuver and objective measuring of its contribution to domestic and global energy needs.

To reach net zero by 2050, hydrogen production will need to increase six-fold, an equivalent of 530 million tonnes of GHGs, which will require a rapid scaling up of manufacturing and transport infrastructure.⁵⁴ Several countries around the world are publishing plans to launch manufacturing and distribution. According to the International Energy Agency's *Global Hydrogen Review 2021* released in October 2021, countries with hydrogen strategies have allocated at least \$37 billion to the cause.⁵⁵ Germany, which has supported hydrogen research since the 1980s, is committing over \$10 billion with 38 concrete measures to get to market ramp up. Europe is the leader in capacity deployment. Australia's detailed plan, coordinated across all state governments, sees it moving quickly, and is attracting Canadian investment. The United States has released a strategy for what it calls a "Hydrogen Earthshot" in tribute to the space program. France is committing over \$8 billion, Japan over \$6 billion⁵⁶.

In December 2020, Canada published the *Hydrogen Strategy for Canada*, designed to spur investment in hydrogen production, distribution and use, as well as create partnerships that establish Canada as a global supplier of hydrogen. It says that by 2050, hydrogen could contribute up to 30 per cent of Canada's energy mix.⁵⁷ In addition to the federal government's hydrogen strategy, British Columbia, Alberta, Ontario and Quebec have released their own strategies to advance their hydrogen industries. Greater policy alignment between the federal and provincial governments is needed to ensure coordination of incentives, infrastructure financing and building, and workable regulations.

At the PPF Gas Summit, Nancy Southern, ATCO chair and chief executive officer, emphasized that her company is focused on hydrogen both in its Alberta and Australia operations. ATCO is agnostic about hydrogen production whether via electrolysis, as in its Australian operations, or via natural gas, as it is pursuing in Alberta. Whatever the base, she emphasized that Canada needs to move quickly or risk falling behind jurisdictions such as Australia and Chile, which are already building pipelines and ports to transport hydrogen and have begun adapting heating and cooling appliances for residential usages.⁵⁸

Hydrogen won't go from near zero to winning the race overnight. Widespread adoption across the economy will require deployment in particular sectors first as a way of building expertise, attracting investment, and honing technologies and processes. Blending hydrogen into natural gas networks represents a promising place to begin, though low blending levels are currently required in order to leverage existing natural gas infrastructure. Given that blending hydrogen with natural gas will raise costs initially in the quest to lower emissions, government might need to provide some transitional assistance.

Canada's gas industry – and its LNG export arm – has an incredible market opening to evolve into hydrogen producers. In so doing, it will ameliorate any risks associated with gas and LNG production through the energy transition. With the return on investment showing up much more prominently in 2050 than 2030, industry needs to show investors it is serious today, which will probably require a favourable nudge from the public sector.

The time has arrived for decisive action. Canada enjoys some in-built strengths. Now we need to leapfrog our competitors with an action-oriented plan that overcomes any reticence and puts us ahead on the hydrogen curve.





SUMMING UP: IT IS DECISION TIME

At the start of this paper, we observed that Canadians have an important decision to make about our gas gifts, a decision that impacts the environment, economic prospects, energy reliability and affordability, Indigenous sovereignty and – now acknowledged – global security. Do we increase our gas contribution to the world while decarbonizing it? Or do we forsake the development of clean gas for which there is demand from some of our longest serving allies in Europe and Asia?

Today, in the midst of a global climate crisis, our European allies find themselves mired in an energy security crisis. Leaving aside the well-intentioned mistakes that got them to this point, does Canada, with the cleanest gas in the world and multiple pathways to a hydrogen-powered future, feel an obligation to help our allies in their time of need and to help ourselves along with the global good? Competitors with inferior ESG records are taking to the field – Europe is seeking additional supplies from Qatar, encouraging Israeli-Egyptian co-operation on gas

Does Canada, with the cleanest gas in the world and multiple pathways to a hydrogen-powered future, feel an obligation to help our allies in their time of need and to help ourselves along with the global good?

supplies from the eastern Mediterranean and LNG development in North and West Africa. Asia and Europe are increasingly competing for new sources of gas. For how long, as renewables mature, remains a point of considerable debate. Though the risks of stranded assets can be ameliorated by LNG-to-hydrogen switching and by situating that risk largely with bullish private sector investors.

The question for policymakers is whether Canada wants to sit on the sidelines waiting for a clear picture to emerge even if that means leaving it to others to supply higher-emitting, less-ESG friendly gas? Other countries are having more open discussions about the true trade-offs. A top Norwegian energy official has bluntly stated: “Our plan, basically, is to make sure that the Norwegian continental shelf has the last drops, the last molecules, the last barrels to survive in that competition.”⁵⁹ Dutch climate minister Rob Jetten, speaking to the decision of his country and Germany to restart gas exploration, said: “I think it’s better to use the fossil fuels in the North Sea with less CO2 impact than new production fields in the United States or in the Middle East.”⁶⁰ These are countries that are prepared to speak up for high ESG standards and their own interests in the same breath.

In the 2010s, Canada chose to leave much of its gas in the ground or at least discourage its development through policy choices – rather than exploiting our LNG potential. At one point, 18 proposals were on the table, with only a single plant in Kitimat scheduled to come on stream this decade.⁶¹ Today, this new global energy crisis calls upon us to re-evaluate. Gas offers us an opening to make the sort of disproportionate contribution to our allies and the global good that Canadians have always craved. Like all decisions, it bears risks. These need to be weighed in what is clearly a changed context.

Beyond security, if Canada can displace coal, we – and the world – win. If Canada can merely displace rival gas with higher emissions, we still contribute to global wins on the three capital letters in ESG – Environment, Social and Governance. Add to that a higher degree of economic sovereignty for favourably disposed First Nations and a head start on the hydrogen-powered future. Consumers win, too, through the enhanced energy reliability and affordability gas and gas and electricity combinations provide.

In 1984, former Liberal cabinet minister Donald Macdonald, the author of a royal commission that unofficially bears his name and which influenced Canadian economic policy for two generations, stated that “Canadians want uncertainty replaced by leadership with a clear sense of national direction.”

Amid an unprecedented climate crisis, in the lingering aftermath of a global pandemic and while grappling with the fallout from Russia's unprovoked invasion of Ukraine, the time is ripe for leadership with a clear sense of national direction within a global system. Canada needs to settle on a clear picture of the role it seeks for gas and for itself – in the decarbonized future nearly everyone in this country embraces.

There is no reason for Canadians to feel tentative or apologetic about our gas if it helps solve global problems on the way to a net-zero world and beyond. Canada's friends and trading partners are asking for our partnership.

This is truly one of those times when the world does need more Canada. Both Asia across the Pacific and Europe across the Atlantic are looking to us for leadership. They are also looking elsewhere.

Canadians have a decision to make.



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