Exporting Canadian LNG to the World

A Practical Solution for Reducing GHG Emissions

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Executive Summary

- Coal, a major source of greenhouse gas (GHG) emissions, remains a leading energy source in many Asian countries, especially China and India. Some European countries have also turned back to coal as sanctions on Russian energy intensified following the invasion of Ukraine.

- As the world seeks practical solutions for reducing greenhouse-gas emissions, natural gas, with its lower carbon footprint, offers a promising alternative to coal.

- With abundant reserve, Canada is well positioned to help reduce global reliance on coal. By exporting Canadian liquified natural gas (LNG) and helping Asian and European countries reduce their reliance on coal, Canada can lower net global GHG emissions.

- Exporting LNG from Canada to China and substituting LNG for coal in the generation of power there can eliminate between 291 and 687 gCO_2eq per kWh of power generated, a reduction of between 34% and 62%.

- If Canada were to double its current natural gas production and export the additional supply to Asia as LNG to displace an equivalent amount of coal used to generate power, global GHG emissions could be reduced by up to 630 million tonnes annually, a significant reduction equivalent to 89% of Canada's total GHG emissions.

- Canada enjoys several competitive advantages, including cooler temperatures that reduce liquefaction energy costs and a strategic location that offers shorter shipping routes to Europe and Asia compared to many other suppliers.

- Regulatory challenges and a mix of federal and provincial policies, however, have slowed or blocked LNG developments in Canada.

1. Introduction

Coal remains a leading energy source in many Asian countries, especially China and India, and coal-combustion is a major contributor to greenhouse-gas (GHG) emissions. Between 2000 and 2023, coal consumption in the Asia-Pacific region, which includes China and India, rose by 182%; coal accounted for 56% of India's energy consumption in 2023 and 54% of China's (Energy Institute, 2024). India aims to double coal production to 1.5 billion tons by 2030 to meet the demands of its burgeoning economy and population (Rathi, 2024). Similarly, China quadrupled new coal power in 2022 and has six times as many plants under construction as the rest of the world combined (Simon, 2023).

Beyond Asia, coal consumption in parts of Europe spiked following Russia's 2022 invasion of Ukraine and European sanctions limiting natural-gas imports from Russia. The energy shortages in the region, which drove up prices for natural gas to record levels, forced many European countries to revert to cheaper coal-fired power plants to satisfy their energy needs (Overland and Loginova, 2023). Many Central and Eastern European countries still rely heavily on coal for electricity generation and heating. For instance, in 2023, coal accounted for 37% of energy consumption in Poland and 31% in the Czech Republic (Energy Institute, 2024).

As the world seeks practical solutions for reducing greenhouse-gas emissions, natural gas offers a promising alternative to coal because of its lower carbon dioxide (CO_2) emissions per unit of energy produced. With abundant reserves of natural gas, Canada is well positioned to help reduce global reliance on coal. As of January 2024, Canada holds 87 trillion cubic feet (Tcf) of proven natural gas reserves, ranking 15th globally and third in the Western Hemisphere (EIA, 2024b; Natural Resources Canada, 2024). In addition to its vast reserves, Canada is also the fifth-largest natural-gas producer globally, with a production volume of 190.3 billion cubic meters in 2023 (Energy Institute, 2024). This study examines the potential for Canada to play a role in addressing climate change by displacing coal in the global energy mix with Canadian natural gas.

Several European and Japanese leaders have already recognized Canada as a safe and reliable supplier of natural gas to meet their energy demands and enhance energy security. In early 2022, shortly after Russia's invasion of Ukraine, Latvia sought liquefied natural gas (LNG) from Canada, aiming to replace Russia as its sole source of imported gas (Eurostat, 2022; Chase, 2022). Later that year, in June, Ukraine's ambassador in Ottawa urged Canada's oil and gas industries to expand into the European market (Global News, 2022). Similarly, in 2022, German Chancellor Olaf Scholz turned to Canada for a new LNG supplier to replace Russia (Eurostat, 2022). In 2023,

Japanese Prime Minister Fumio Kishida traveled to Canada, hoping to secure a reliable energy source, and in 2024, Greece and Poland also expressed interest in importing Canadian LNG.

Despite this demand, Canada currently lacks any operational LNG export terminals, largely as a result of regulatory barriers (Orenstein, 2023; Vypovska, Bartholameuz, Romaniuk, and Adeyemo, 2020). None of the 18 LNG export facilities proposed in Canada since 2011 are operational, and only one project—LNG Canada Phase 1—is nearing completion, more than 12 years after its initial announcement.

While Canada has missed several opportunities to date, its abundant, low-cost natural gas resources, along with the low GHG emission profile of its LNG, can still position it as a serious player in the global LNG market. LNG produced in British Columbia is expected to have a lower carbon footprint compared to several other LNG sources, with its emission intensity being less than half of the global average (see the details below). Canada also has a significant geographic advantage in supplying LNG to both Asia and Europe due to shorter shipping distances. In addition, Western Canada's colder climate, relative to several other competitors, reduces the amount of energy required to cool and liquefy natural gas, thereby lowering overall costs.

Canada has the opportunity to leverage its natural-gas resources and position itself as a leader in fighting climate change by supplying LNG to the world. However, to date, the government's focus in the country has been on reducing domestic GHG emissions, even though Canada accounts for only 1.5% of global GHG emissions (Environment and Climate Change Canada, 2024b). It is important to recognize that GHG emissions are global and are not confined to a specific region. Rather than focusing on reducing domestic emissions by imposing policies like the GHG cap on the oil and gas sector that would prevent the development of the natural-gas industry, the government in Canada should shift its focus to global emissions and help the country unleash its LNG exports and become a major LNG supplier.

This study starts with an analysis of global energy demand and supply, in particular the market for natural gas and LNG, to show that demand for these energy sources is expected to rise in the coming years, in particular in the Asia-Pacific region, with its growing population, an expanding economy, and the decision in the region to transition to lower-carbon energy sources. We next analyze Canada's potential for becoming a major supplier of LNG. Section 3 analyzes the environmental benefits associated with replacing coal with natural gas. Section 4 discusses Canada's role in enhancing energy security. Section 5 discusses the barriers to expanding and developing Canada's natural-gas market and LNG export capacity. Section 6 offers concluding remarks.

2. Global Energy Demand and Supply

2.1 Natural gas

Natural gas is a reliable energy source known for flexible production as well as convenient storage and transportation—whether through pipelines or by ship in its liquefied form. Moreover, it continues to be a primary global energy source, accounting for 23.3% of the world's total energy consumption in 2023. Between 2000 and 2023, consumption of natural gas rose 67.1%, the highest growth among the world's main energy sources (Energy Institute, 2024). This trend is further confirmed by the International Energy Agency's *Gas Market Report* for 2025, which states that global natural-gas demand grew by 2.8% year-on-year in 2024, significantly surpassing the average growth rate of 2% observed between 2010 and 2020. While in 2025 gas consumption is expected to decrease by 0.7% in Central and South America, it is forecast to increase by 0.4% in North America, 0.6% in Europe, 2.3% in Africa and Eurasia, 3.1% in the Middle East, and 3.7% in Asia Pacific. Globally, for 2025, natural gas demand is expected to increase by 1.9%, with 45% of the surge in gas demand driven by the economic growth in Asian markets, particularly, India and China (IEA, 2025).

The long-term projections of demand for natural gas show continued growth. In its 2024 *World Energy Outlook*, the International Energy Agency (IEA) forecasts a global increase in demand for natural gas through 2030, with demand in 2050 expected to exceed 2023 levels by 4.6%. Demand in the Asia Pacific region is projected to grow by 28.3% by 2050 compared to 2023 (**table 1**), with the region expected to account for over a quarter of global natural-gas demand by that year under the Stated Policies Scenario (STEPS)[1] (IEA, 2024b).

Europe and North America are the only two regions where a decrease in natural gas demand is projected. In contrast, Africa is expected to have the highest growth rate in demand by 2050 compared to 2023 (59.3% increase), followed by the Middle East (52.2%). Moreover, demand in Central and South America is expected to increase by 17.3%, and in Eurasia by 1.4%, by 2050 when compared to 2023 (IEA, 2024b).

The supply of natural gas, the IEA projects, will come principally from North America, Eurasia, and the Middle East, which will account for over 70% of global natural-gas production from 2030 through 2050 under the STEPS, which reflects current policies and announced

1 The Stated Policies Scenario provides a conservative projection according to existing and proposed measures in countries around the world, without assuming full implementation of ambitious goals, such as net-zero emissions.

Table 1: Forecast demand (billions of cubic metres) for natural gas and share (%) of demand in various regions, 2023, 2030, 2035, 2050

	Historic	Demand under Stated Policies Scenario*			Share of demand under Stated Policies Scenario*				Growth rate of demand
	2023	2030	2035	2050	2023	2030	2035	2050	2023–2050
World	4,186	4,430	4,422	4,377					4.6%
North America	1,175	1,121	1,028	811	28.1%	25.3%	23.2%	18.5%	–31.0%
Central and South America	156	168	180	183	3.7%	3.8%	4.1%	4.2%	17.3%
Europe	507	462	407	301	12.1%	10.4%	9.2%	6.9%	–40.6%
Africa	182	203	219	290	4.3%	4.6%	5.0%	6.6%	59.3%
Middle East	578	702	750	880	13.8%	15.8%	17.0%	20.1%	52.2%
Eurasia	660	671	671	669	15.8%	15.1%	15.2%	15.3%	1.4%
Asia Pacific	928	1,075	1,131	1,191	22.2%	24.3%	25.6%	27.2%	28.3%
International bunkers	–	27	36	51	–	–	–	–	–

Note: *The Stated Policies Scenario (STEPS) provides a conservative projection according to existing and proposed measures in countries around the world, without assuming full implementation of ambitious goals, such as net-zero emissions.

Source: International Energy Agency, 2024b; calculations by authors.

commitments worldwide (**table 2**). While 2023 historic data shows North America leading the world for its share of natural-gas production, under the stated policies scenario, the region is expected to decrease its production by 2050 and yield to the Middle East as the world's region that produces the largest proportion of natural gas (IEA, 2024b).

The IEA's historic numbers and projections suggest a gap between demand and local supply in Europe, Asia Pacific, and Central and South America. Specifically, in 2023, Asia Pacific faced a deficit of 240 billion cubic meters (bcm) of natural gas. For Asia Pacific, the gap between natural gas production and demand is projected to grow by 68.3% by 2030, with a further increase of 32.7% from 2030 to 2050, reaching a deficit of 536 bcm by 2050. While Europe's natural gas demand is projected to decrease in the next decades, the gap between demand and local production will reach 264 bcm by 2030 and 168 bcm by 2050. Central and South America will also have a deficit of 4 bcm of natural gas by 2030 and 7 bcm by 2050. The IEA predicts that imports will have to fill a gap between domestic production and demand (IEA, 2024b).

Furthermore, other long-term outlooks suggest a continued growth for global natural gas demand. For instance, according to BP's forecast, under the current trajectory, demand for natural gas is set to increase by 15.6%, from 4,090 bcm in 2025 to 4,729 bcm in 2050, reaching

Table 2: Forecast production (billions of cubic metres) for natural gas and share (%) of production in various regions, 2023, 2030, 2035, 2050

	Historic	Production under Stated Policies Scenario*			Share of production under Stated Policies Scenario*				Growth rate (%) of production
	2023	2030	2035	2050	2023	2030	2035	2050	2023–2050
North America	1,323	1,319	1,241	1,073	31.4%	29.9%	28.1%	24.5%	−18.90%
Central and South America	160	164	170	176	3.8%	3.7%	3.8%	4.0%	10.00%
Europe	236	198	181	133	5.6%	4.5%	4.1%	3.0%	−43.64%
Africa	262	284	298	314	6.2%	6.4%	6.7%	7.2%	19.85%
Middle East	698	903	962	1,152	16.5%	20.4%	21.8%	26.3%	65.04%
Eurasia	851	891	896	873	20.2%	20.1%	20.3%	19.9%	2.59%
Asia Pacific	688	671	675	655	16.3%	15.1%	15.3%	15.0%	−4.80%

Note: *The Stated Policies Scenario (STEPS) provides a conservative projection according to existing and proposed measures in countries around the world, without assuming full implementation of ambitious goals, such as net-zero emissions.

Source: International Energy Agency, 2024b; calculations by authors

a plateau in 2040 (BP, 2024). Similarly, McKinsey & Company projects an increase in global demand for natural-gas from 3,948 bcm in 2023 to 4,335 bcm by 2030, reaching 4,996 bcm by 2050 under a "slow evolution scenario", where energy affordability and supply security take priority over sustainability (McKinsey & Company, 2024b).

Overall, there is a huge and growing demand for natural gas globally, a demand that is expected to continue for at least the next three decades.

2.2 Liquified natural gas (LNG)

Because liquified natural gas (LNG) can reach markets with limited pipeline infrastructure, it has become a key component of the global energy mix. The Energy Information Administration (EIA) estimates that from 2013 to 2022, global LNG import capacity—also known as regassification capacity—expanded by 49% across 48 countries (EIA, 2023). The growing importance of LNG became more evident in 2022 after Russia's invasion of Ukraine, which dramatically shifted the outlook for natural gas. As sanctions on Russia grew stricter, European countries that traditionally relied on pipelines for natural-gas imports began exploring alternatives to decrease their dependence on Russian gas.

The LNG market suffered a new shift as Europe became a major competitor for imported LNG. By the end of 2022, LNG's share of the European Union's (EU) gas supply increased to 33%, up from 19% in 2021 (Savcenko, 2023). In addition, according to the European Council, Russia's share of both LNG and pipeline gas in EU imports fell from over 40% in 2021 to less than 15% in 2023 (European Council, 2024). As a result, the United States became a major supplier of LNG for Europe. Between 2021 and 2023, the EU's LNG imports from the United States nearly tripled, reaching almost 50% of the total in 2023 (European Council, 2024).

Moreover, Europe's urgent need to replace Russian gas has driven significant investment in global LNG export capacity. According to the IEA, nearly US$80 billion in investment was announced between 2022 and mid-2024, which would account for adding approximately 140 bcm per year of new export capacity. By 2030, an additional 250 bcm of export capacity is expected to be added, with about a third coming from Qatar and almost half from the United States (IEA, 2024a).

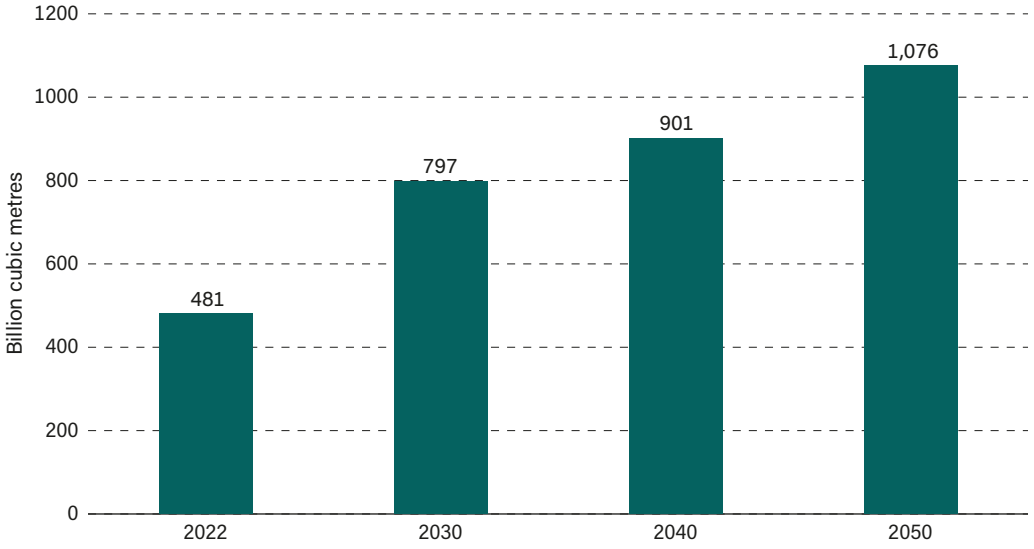
In 2023, Germany, the Philippines, and Vietnam began importing LNG for the first time (EIA, 2023). Australia is also set to start importing LNG by the end of 2025, while Europe is expected to increase its LNG imports by 12 bcm that same year (Major, 2025; Buli and Abnett, 2025). Similarly, it is projected that China and India will expand their LNG import capacity in 2025, with India alone planning a 10% capacity increase compared to 2024 (EIA, 2024d; Sahu, 2024).

The long-term outlook for LNG demand shows steady growth. According to the IEA, LNG demand is expected to grow by more than 2.5% annually through 2035 under the STEPS, which reflects current policies and announced commitments worldwide, and after 2040, demand is projected to exceed supply capacity. And, by 2050, global LNG demand is expected to head toward 900 bcm, requiring an additional 180 bcm in export capacity to meet this demand (IEA, 2024b).

The latest LNG demand forecast by McKinsey & Company (2024a) projects that global LNG demand will increase from 481 bcm in 2022 to 797 bcm by 2030, 901 bcm by 2040, and 1,076 bcm by 2050 (**figure 1**). These same projections estimate that LNG demand will grow at a compound annual rate of 1.5% to 3.0% from 2023 to 2035, mainly driven by the Asia-Pacific region. Starting in 2030, the gap between LNG demand and projected supply capacity is expected to widen, reaching as much as 71 bcm by 2035 and 75 bcm by 2045 (McKinsey & Company, 2024a). This growing gap will require the development of increased production and additional projects to export LNG and expand liquefaction capacity.

In its latest LNG outlook, Shell, referencing data from Wood Mackenzie, forecasts global LNG demand will increase to as much as 685 million tonnes (≈ 944.615 bcm) by 2040 when compared to 2023 levels, reflecting an increase of over 50%. Moreover, despite Europe's decreasing gas demand, Shell projects a supply-demand gap of nearly 70 million tonnes per annum (MTPA) by 2025, declining to about 50 MTPA by 2030 (Shell, 2024).

Figure 1: Forecast of LNG demand (bcm), 2030–2050 relative to 2022

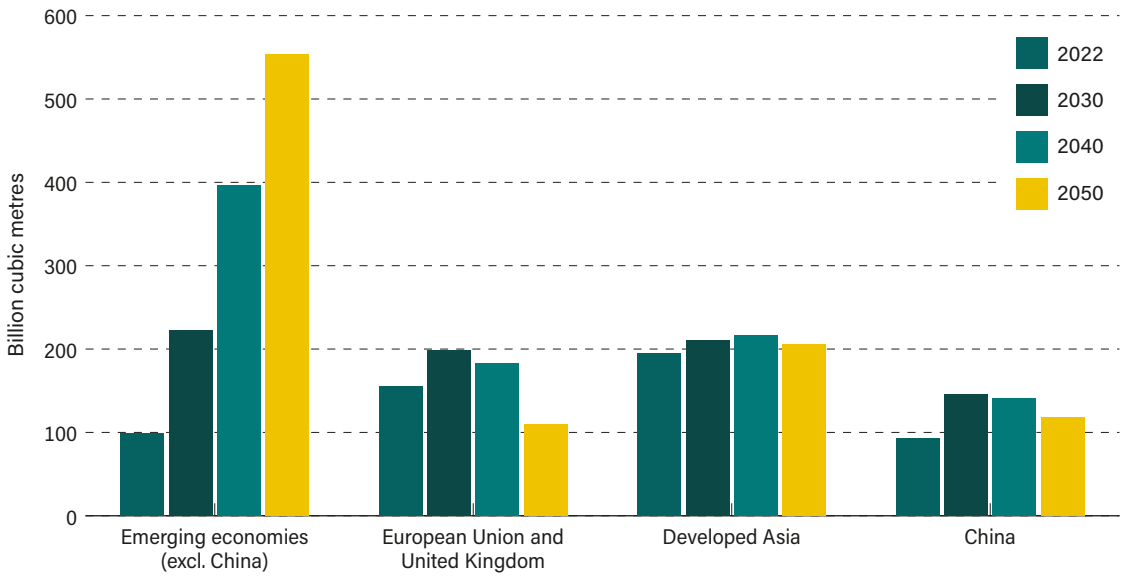


Source: McKinsey & Company, 2024a.

Other projections also suggest that Asia will play a leading role in the expansion of LNG import capacity over the medium to long term. Over the next 10 years, Fitch Solutions forecasts an increase of 170 MTPA in regasification capacity for Asia, nearly double Europe's forecast of 90 MTPA (Richards, 2022). Furthermore, according to BP's forecast (**figure 2**), emerging economies (excluding China) will experience growth in LNG demand through 2050, with a growth rate of 460%. While Europe and the United Kingdom are projected to decrease their LNG imports by 29% by 2050 compared to 2022, in the same period of time developed Asia (including Japan, Singapore, and South Korea) is expected to increase the volume imported by 6%, and China, by 27% (BP, 2024).

In the long term, LNG's advantage for reaching markets with limited pipeline infrastructure will play a key role—particularly for regions where strong growth in population and energy consumption is projected, and where domestic natural-gas production is declining.

Figure 2: Forecast of LNG imports (bcm), by region, 2022–2050



Source: BP, 2024.

3. Canada's LNG Potential

Canada has massive natural gas reserves, with 87 trillion cubic feet (Tcf) of proven reserves as of January 2024, 15th globally for reserves and third among Western Hemisphere (EIA, 2024b; Natural Resources Canada, 2024). While most of Canada's reserves are found in the Western Canadian Sedimentary Basin, other regions also show great potential.

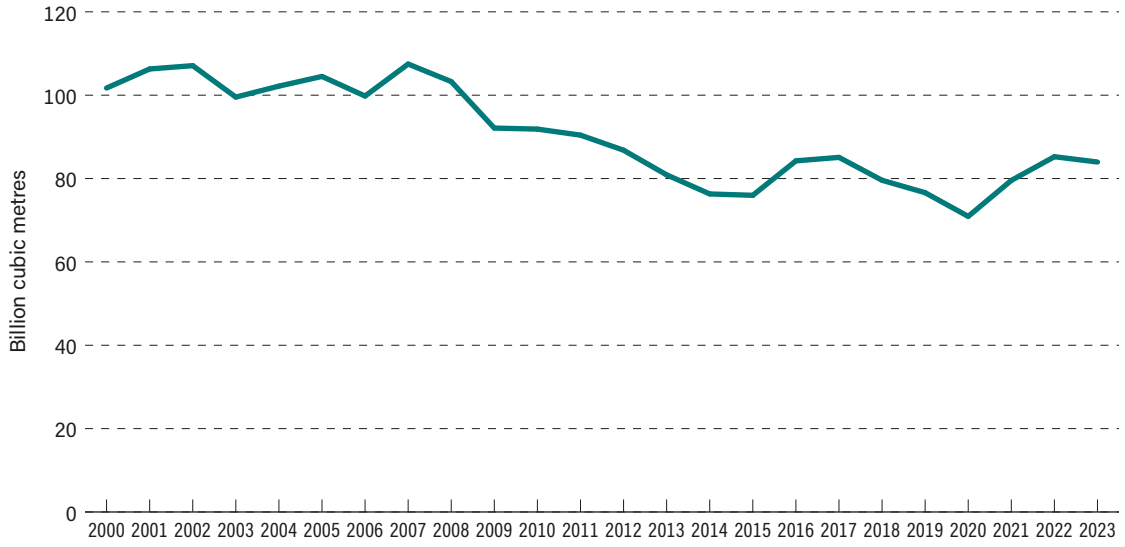
According to a report published by the Canada Energy Regulator (2016), which studied the Liard Basin—located in northwest Canada, spanning the borders of British Columbia, Yukon, and the Northwest Territories—the region contained 219 Tcf of marketable unconventional natural gas, making it the world's 9th largest shale-gas reserve holder (EIA, 2024b). While Newfoundland & Labrador's potential has no definitive estimates, Atlantic Canada is estimated to have between 84.3 Tcf and 149 Tcf of unconventional natural gas reserves, with Nova Scotia holding 17 Tcf to 69 Tcf and New Brunswick between 67.3 Tcf and 80 Tcf (Green, 2025).

In addition to its reserves, Canada is the fifth largest natural-gas producer worldwide, with 190.3 billion cubic meters of production in 2023 (Energy Institute, 2024). Yet, despite having massive resources, Canada has yet to diversify its natural-gas export market and relies entirely on the United States.[2] In 2023, Canada exported approximately 84 billion cubic meters of natural gas, all of which was sent to US regions in the Midwest, East, and West (Canada Energy Regulator, 2024a) via 39 pipelines (Canadian Chamber of Commerce, 2023). The absence of any operational LNG export infrastructure has limited Canada's ability to reach international markets, leaving Canadian natural-gas producers vulnerable to US policy changes (as seen with the recent threat of US tariffs on Canadian energy). According to the Canadian Energy Center, limited market access for Canadian natural gas has contributed to price discounts for Canadian natural gas compared to benchmarks in North America in recent years. Specifically, in 2022, limited market access contributed to AECO-C, Canada's benchmark price for natural gas, trading at just 60% of the US Henry Hub price (Canadian Energy Centre, 2022).

With the shale revolution in the United States and the expansion of its domestic natural-gas production, the United States has become less reliant on natural-gas imports from Canada in recent years. **Figure 3** shows Canada's natural-gas exports to the United States from 2000 to 2023.

2 Note, however, that the first LNG terminal, LNG Canada, which will open overseas markets, is nearing completion. LNG Canada will be discussed below.

Figure 3: Canada's exports (bcm) of natural gas to the United States, 2000–2023



Source: Canada Energy Regulator, 2024a.

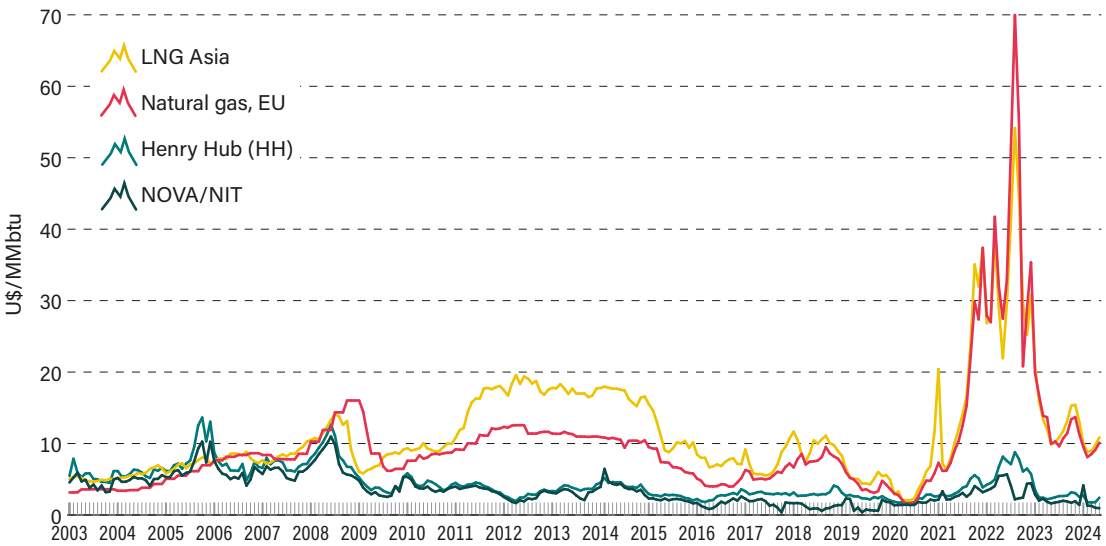
As shown, Canada's exports have been declining in recent years, after peaking in 2007 at 107.5 billion cubic meters. This decline is primarily the result of the growth of US natural gas production, which has displaced Canadian natural gas in the US market. Without diversifying the destinations of Canadian natural-gas exports, Canada risks eroding its export revenues. However, between 2000 and 2023, Canada's natural-gas production and local consumption increased (Energy Institute, 2024).

Canada needs to develop LNG export terminals in order to reduce its reliance on the US market and reach overseas markets in Asia and Europe, where the prices for natural gas and LNG are significantly higher than the prices in North America. **Figure 4** displays global LNG and natural-gas prices in the United States (Henry Hub), European Union (EU), Asia, and Canada (NOVA/NIT)[3] from 2003 to 2024. Since 2008, natural gas prices in Europe and LNG prices in Asia have consistently been significantly higher than prices in the United States and Canada. Asian LNG and EU natural-gas prices typically range from $7 to $15 USD/MMBtu,[4] while Henry Hub and NIT generally range from $2 to $3 USD/MMBtu. In 2022, after Russia's invasion of Ukraine and the consequent energy crisis in Europe and Asia, there was a sharp increase in natural-gas prices in these regions. During 2022, a period of soaring demand, Asian LNG spot prices and EU natural-gas prices frequently exceeded $30 per MMBtu, while gas prices in North America

3 NOVA/NIT is a pricing point for natural gas produced in the western Canadian Sedimentary Basin (WCSB).

4 MMBtu = one million British Thermal Units.

Figure 4: Global prices (U$/MMbtu) for natural gas and LNG, 2000–2024



Notes: [1] NOVA/NIT is a pricing point for natural gas produced in the western Canadian Sedimentary Basin (WCSB). [2] MMBtu = one million British Thermal Units.
Source: Canada Energy Regulator, 2024c.

remained below $9 per MMBtu. As of May 2024, which is the latest data, prices in Europe and Asia were more than four times the prices in the United States and more than ten times the prices in Canada (Canada Energy Regulator, 2024c).

Canada currently has seven LNG export projects, all in different stages of development and all located on the West Coast. **Table 3** shows these projects along with their status, timeline, and capacity. LNG Canada Phase 1 is set to become Canada's first large-scale LNG export facility, with expectations of the first exports by mid-2025. Most of the other projects are anticipated to be operational between 2027 and 2030. These projects represent a potential production capacity of 50.3 million tonnes per annum (MTPA) (≈ 69.36 bcm) of LNG (Natural Resources Canada, 2025a).

Canada has several advantages in the production and shipping of LNG compared to major exporters such as the United States and Qatar, that would allow Canada to become a major supplier of LNG. Lower ambient temperatures in Canada's western provinces compared to competing regions reduce the energy—and thereby the cost—required for liquefaction. Specifically, British Columbia has an energy efficiency advantage of over 26% compared to the United States for LNG liquefaction. Similarly, it has a 32% energy efficiency advantage over Qatar and 34% over Australia (Canadian Energy Centre, 2023; Canada Energy Regulator, 2017).

In addition, the shipping of Canadian LNG is competitive: according to Natural Resources Canada, LNG shipments from Canada's West Coast to Asia take roughly 10 days, compared to shipments from the US Gulf Coast, which take about 20 days (Natural Resources Canada, 2025a)

Table 3: LNG export projects proposed and under construction in Canada, 2025

Project	Status	Timeline	Capacity (million tonnes per annum)
LNG Canada Phase 1 (Kitimat, BC)	Nearing completion (95% complete)	First exports by mid-2025	14
LNG Canada Phase 2 (Kitimat, BC)	Final investment decision to be made	To be decided	14
Woodfibre LNG (Squamish, BC)	Under construction	Operational by 2027	2.1
Ceder LNG (Kitimat, BC)	Early construction	Operational by 2028	3.0
Ksi Lisims LNG (Gingolx, BC)	Regulatory Review	Operational by 2029	12.0
Tilbury LNG Phase 2 (Delta, BC)	Regulatory Review	Operational by 2028	2.5
Summit Lake PG LNG (Prince George, BC)	Regulatory Review	To be decided	2.7

Sources: Cedar LNG, n.d.; Enbridge Inc., n.d.; Energy for a Secure Future, 2023; FortisBC, 2025; Government of British Columbia, Environmental Assessment Office, 2024; Ksi Lisims LNG (n.d.); Natural Resources Canada (n.d.).

Additionally, shipments from the US Gulf Coast must pass through the Panama Canal, further increasing shipping times and transportation costs. In addition, Canada is about 1,000 nautical miles closer to Asia than significant African LNG players such as Nigeria (Canada Energy Regulator, 2022). Similarly, Canadian East Coast projects are closer to European import markets by 2,000 nautical miles than shippers on the US Gulf Coast, as well as other LNG exporters such as Qatar, Australia, and Malaysia (Canada Energy Regulator, 2022).

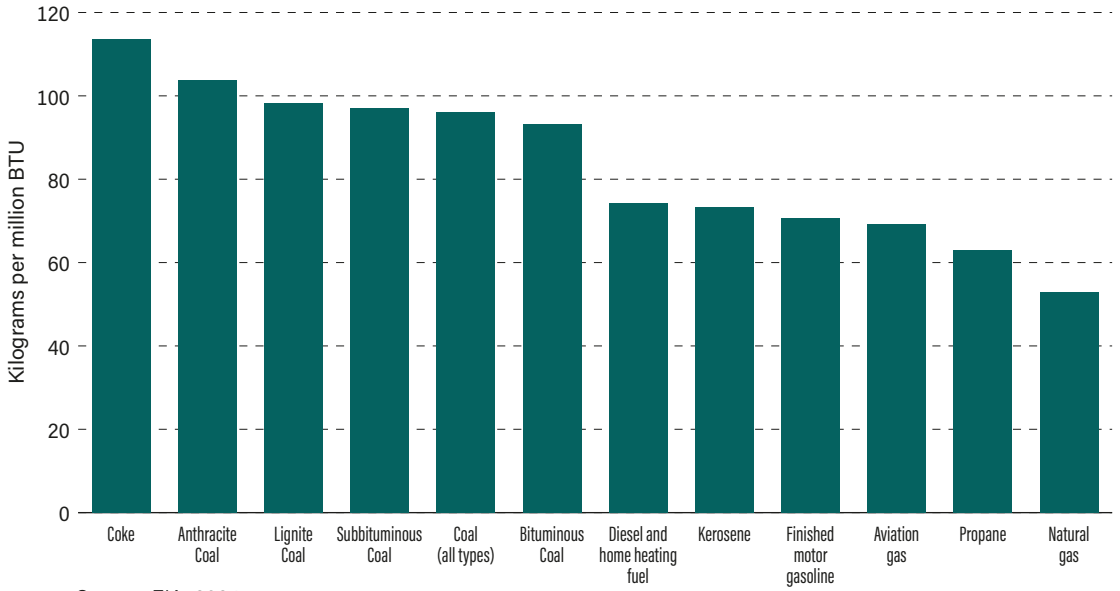
Low-cost production is another key advantage for Canadian LNG. Most of Canada's current natural-gas production is based in three gas regions located in the West, namely the Deep Basin, Montney, and Horn River, which provide relatively low-cost production compared to several other international LNG projects that rely on higher-cost gas supplies, such as offshore deep-water gas basins (Canada Energy Regulator, 2022).

Overall, the lower production and liquefaction costs, as well as shorter shipping distances and reduced transit times to customers in Asia and Europe, provide an advantage for Canadian LNG, enabling Canada to compete with major suppliers such as the United States and Qatar.

4. Environmental Benefits of Using Natural Gas

Combustion of natural gas produces fewer GHG emissions than other forms of fossil fuels, particularly coal, and thereby is a promising alternative for reducing GHG emissions. **Figure 5** shows carbon-dioxide emission coefficients by fuel, which measure how much CO_2 is emitted per unit of fuel consumed. While natural gas emits almost 53 kilograms of carbon dioxide per million British thermal units (BTU), coal (all types) emits 96 kilograms, and anthracite coal emits almost double that of natural gas at 104 kilogram.[5]

Figure 5: Kilograms of CO_2 emitted per unit (million BTU) of fuel consumed, 2022



Source: EIA, 2024a.

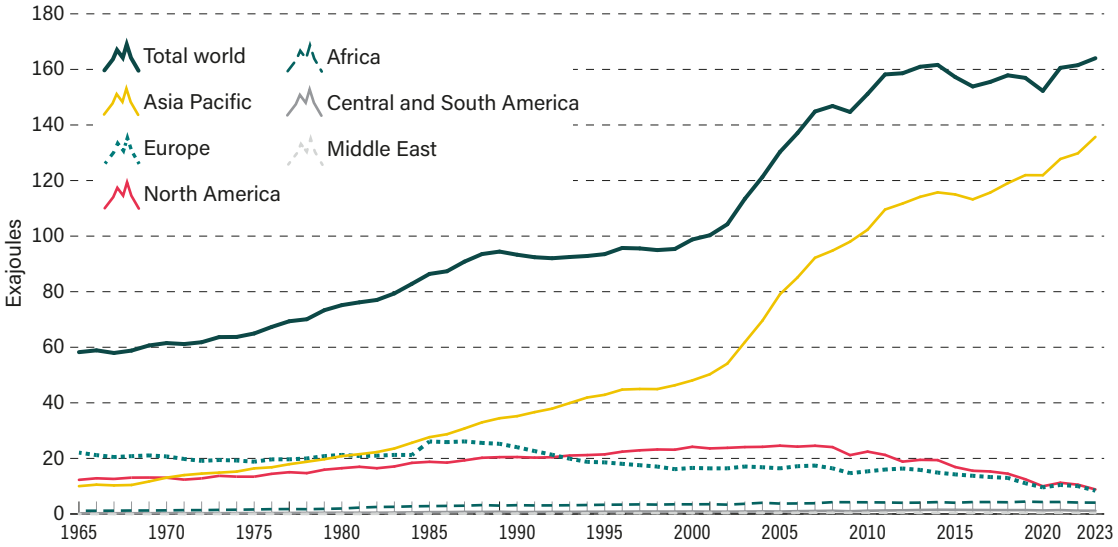
Despite being the most carbon-intensive fuel, coal remains a major global energy source. In 2023, which is the latest data provided by the Energy Institute's Statistical Review, global coal consumption reached 164.03 exajoules (EJ; one quintillion joules), accounting for 26.5% of global

5 In addition to its environmental benefits, natural gas (including LNG, once it is regasified) plays an important role in providing backup power to intermittent energy sources, such as wind and solar, ensuring reliability and flexibility for the power grid. According to the US Energy Information Administration, nearly all natural-gas power plants are dispatchable, meaning they can reliably be called upon to meet electricity demand when needed. This characteristic of natural gas makes it critical in markets with an increasing concentration of intermittent energy sources (EIA, 2024f).

energy consumption (Energy Institute, 2024). In 2023 alone, according to the IEA's latest report, 65 GW of new capacity of coal was added, mostly in developing economies and emerging markets, with China accounting for 73% of these new capacity additions (IEA, 2024b).

Figure 6 shows coal consumption globally and by region from 1965 to 2023, highlighting regional differences. Since 2000, global coal consumption has increased significantly, largely driven by increases in the Asia-Pacific region, which includes countries such as China and India. While regions such as North America and Europe have reduced their coal consumption since 2000, these decreases were more than offset by increases elsewhere, particularly in the Asia-Pacific. Overall, from 2000 to 2023, global coal consumption rose by 66%, while coal consumption in the Asia-Pacific region rose by 182% (Energy Institute, 2024).

Figure 6: Coal consumption (exajoules), globally and by region, 1965–2023



Note: One exajoule (EJ) is equal to 10^{18} (one quintillion) joules.
Source: Energy Institute, 2024.

Table 4 shows energy consumption by fuel type and share in selected countries—China, India, and Japan—in 2023. As of 2023, coal consumption is China's largest energy source, accounting for nearly 54% of its energy consumption. Similarly, coal consumption in India is the largest energy source, representing 56% of the country's energy consumption. The share in Japan (26% of energy consumption) and Taiwan (33%) remains significant.

Evidence from the United States and Europe highlights the environmental benefits that can be achieved when GHG emissions are reduced by switching from coal to natural gas. According to a 2021 report by the Energy Information Administration, in 2019, the US electrical power sector produced 32% lower GHG emissions compared to 2005, largely as a result of a shift from

Table 4: Energy consumption (exajoules[1]) by type of fuel and share (%) of each type in China, India, Japan, and Taiwan, 2023

	Type of fuel	Energy consumption (exajoules)	Share (%)		Type of fuel	Energy consumption (exajoules)	Share (%)
China	Oil	32.73	19.2	Japan	Oil	6.65	38.2
	Natural gas	14.57	8.5		Natural gas	3.33	19.1
	Coal	91.94	53.8		Coal	4.54	26.1
	Nuclear	3.90	2.3		Nuclear	0.70	4.0
	Hydro	11.46	6.7		Hydro	0.70	4.0
	Renewables[2]	16.13	9.4		Renewables[2]	1.49	8.6
	Total	170.74	100		Total	17.40	100
India	Oil	10.57	27.1	Taiwan	Oil	1.63	36.0
	Natural gas	2.25	5.8		Natural gas	1.01	22.3
	Coal	21.98	56.3		Coal	1.49	32.9
	Nuclear	0.43	1.1		Nuclear	0.16	3.5
	Hydro	1.39	3.6		Hydro	0.04	0.9
	Renewables[2]	2.38	6.1		Renewables[2]	0.2	4.4
	Total	39.02	100		Total	4.53	100.0

Note: [1] One exajoule (EJ) is equal to 10^{18} (one quintillion) joules. [2] Excluding hydro.
Sources: Energy Institute, 2024; calculations by authors.

coal to natural gas in the electricity generation mix. More specifically, between 2005 and 2019, emissions in the sector declined by 819 million metric tons, with 532 million metric tons (65%) of this reduction directly attributable to the shift from coal-fired plants to natural-gas-fired generation of electricity (EIA, 2021). While coal was used for 50% of the United States' electricity generation in 2005, that share declined to 23% in 2019. Conversely, the share of natural gas in the electricity generation mix increased from 19% in 2005 to 38% in 2019. Recent data from 2023 shows a similar pattern, with more than 80% of the reductions in energy-related emissions observed in the United States coming from the power sector, largely as a result of replacing coal-fired plants with natural gas and solar power (EIA, 2024e).

Similarly, Europe has made significant progress in reducing GHG emissions by switching from coal to natural gas. The International Energy Agency has emphasized the critical role that switching from coal to gas has played in reducing GHG emissions in this region. Specifically, between 2010 and 2018, switching from coal to gas accounted for saving 66 Mt CO_2 in Europe (IEA, 2019). Over a longer period, from 1990 to 2023, the share of coal in Europe's energy

generation declined by 59.4 percentage points, while the share of natural gas increased by 11.5 percentage points. While renewables have seen substantial growth during the same period, they still represent a smaller share relative to natural gas. Greenhouse gas emissions in Europe declined by 33.6% during the same period (Energy institute, 2024).

Overall, both the United States and Europe have made progress in reducing GHG emissions by switching from coal to natural gas. This approach could be implemented in Asia-Pacific regions, including countries such as China, India, and Japan, where reliance on coal remains significant.

Several studies have examined and measured the environmental benefits associated with switching from coal to natural gas. According to the 2019 analysis by the IEA, which used four case studies covering the European Union, the United States, China, and India, switching from coal to gas has already helped limit the rise in global emissions since 2010, and there are significant opportunities for further GHG emission reductions in the power sector. Overall, the analysis found that switching from coal to gas reduces, on average, GHG emissions by 50% per unit of electricity generated and by 33% per unit of heat used (IEA, 2019).

Life-cycle assessments

Kasumu and colleagues (2018)

Kasumu and colleagues (2018) conducted a comprehensive life-cycle assessment (LCA) of GHG emissions from LNG exports from British Columbia to several destinations in Asia-Pacific countries, including China, India, South Korea, Japan, and Taiwan. The LCA accounts for both upstream emissions (production, processing, and liquefaction) and downstream emissions (transportation, regasification, and combustion). The authors examined three emissions displacement scenarios, which assume that imported LNG from British Columbia is used in electricity generation and displaces: [1] the total electricity mix, where LNG replaces a mix of all power sources; [2] dispatchable electricity, where LNG replaces electricity that can quickly adjust to changing demand; and [3] marginal electricity, where LNG replaces the fuel that is most easily substituted in the importing country (Kasumu, Li, Coleman, Liendo, and Jordaan, 2018).

Table 5 and **Figure 7** show the expected change in GHG emissions in the selected five countries that would result from the displacement of [1] the whole electricity mix, dispatchable electricity, and marginal electricity with LNG. When LNG displaces the whole electricity generation mix, with the exception of South Korea, the net GHG reduction would range from 5.9 gCO_2e/kWh[6] or 6.5 megatonnes (Mt) CO_2e/year in Japan to 40.6 gCO_2e/kWh or 9.9 megatonnes (Mt) CO_2e/

6 gCO_2e/kWh = grams of carbon-dioxide equivalents emitted per kilowatt-hour of electricity generated.

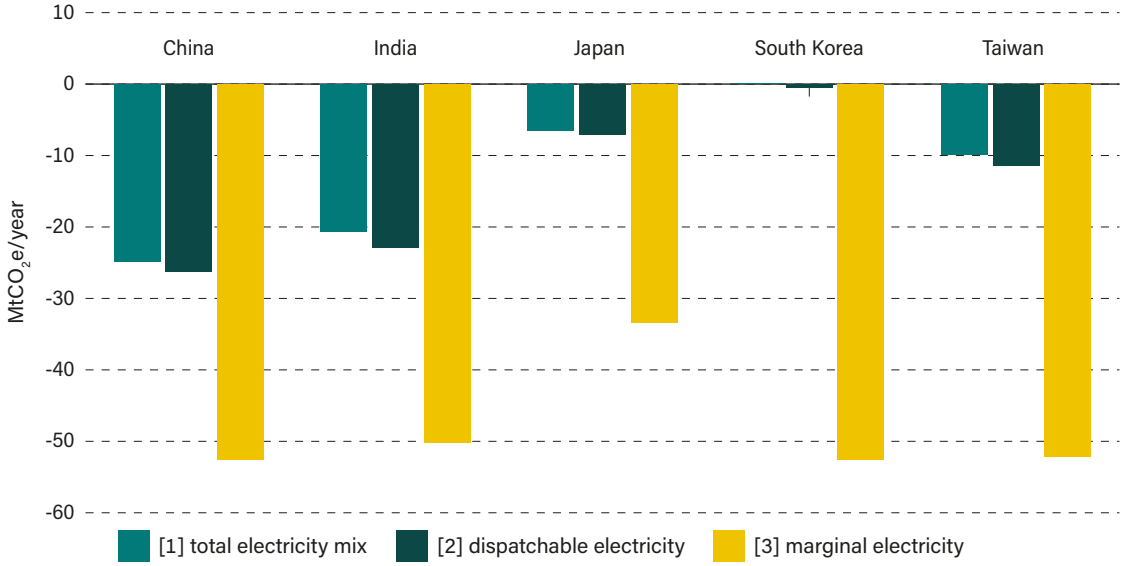
Table 5: Expected change in GHG emissions from the displacement with LNG of [1] the total electricity mix, [2] dispatchable electricity, and [3] marginal electricity, China, India, Japan, South Korea, Taiwan

	[1] Total electricity mix		[2] Dispatchable electricity		[3] Marginal electricity	
	gCO_2e/kWh	Mton/yr	gCO_2e/kWh	Mton/yr	gCO_2e/kWh	Mton/yr
China	−6.4	−24.9	−6.7	−26.3	−13.5	−52.6
India	−22.8	−20.6	−25.3	−22.9	−55.6	−50.2
Japan	−5.9	−6.5	−6.4	−7.0	−30.5	−33.4
South Korea	−0.1	0.05	−1.0	−0.5	−105.9	−52.6
Taiwan	−40.6	−9.9	−46.8	−11.4	−213.5	−52.1

Note: In the original study, **Japan** has two estimates as a result of significant changes in its electricity mix before and after the 2011 Fukushima disaster. The results presented in this table for Japan reflect conditions after Fukushima.

Source: Kasumu, Li, Coleman, Liendo, and Jordaan, 2018.

Figure 7: Expected change in GHG emissions ($MtCO_2e$/year) from the displacement of [1] the total electricity mix, [2] dispatchable electricity, and [3] marginal electricity, China, India, Japan, South Korea, Taiwan



Note: In the original study, **Japan** has two estimates as a result of significant changes in its electricity mix before and after the 2011 Fukushima disaster. The results presented in this table for Japan reflect conditions after Fukushima.
Source: Kasumu, Li, Coleman, Liendo, and Jordaan, 2018.

year in Taiwan. The GHG reduction in India is higher than in China (22.8 gCO_2e/kWh compared to 6.4 gCO_2e/kWh) largely because a higher percentage of India's electricity generation was displaced relative to China (Kasumu, Li, Coleman, Liendo, and Jordaan, 2018).

When LNG displaces [2] dispatchable electricity, the environmental benefit will be the highest in Taiwan (46.8 gCO_2e/kWh), followed by India (25.3 gCO_2e/kWh) and China (6.7 gCO_2e/kWh). Similarly, when LNG displaces [3] marginal electricity, the GHG reduction is highest in Taiwan (213.5 gCO_2e/kWh), followed by South Korea (105.9 gCO_2e/kWh) and India (55.6 gCO_2e/kWh). Overall, the study finds that there is a net environmental benefit when importing Canadian LNG for electricity generation in the five countries although the magnitude of the benefits depends on the type of electricity that is displaced.

Kotagodahetti and colleagues (2022)

Kotagodahetti and colleagues (2022) used a life-cycle assessment to evaluate the environmental impact of exporting LNG from British Columbia to China as a substitute for coal in different end-use sectors, namely the textile industry, chemical industry, and district heating. The study used the Tilbury Plant, an LNG facility operated by FortisBC, a natural-gas supplier in British Columba, as a case study to analyze LNG exports to China, following a five-stage LNG pathway. These stages include: [1] upstream—extraction, production, and processing in the Montney Gas Basin; [2] midstream—transporting natural gas to a processing facility in British Columbia, applying pre-treatment and deep-cut processing to meet LNG feed requirements; [3] liquefaction—converting natural gas into LNG, delivering the LNG to Roberts Bank, British Columbia, using diesel-powered tanker trucks, and loading the LNG onto a marine tanker; [4] transport—shipping LNG from Roberts Bank to Shanghai, China, and regasification at the Shanghai port; [5] downstream—distributing the regasified natural gas to various end users, such as the textile and chemical industries, through a hypothetical plant in China (Kotagodahetti et al., 2022).

According to the study, "significant global life-cycle GHG reductions can be achieved if China displaces coal equivalent to the amount of LNG imported from Canada" (Kotagodahetti et al., 2022: 10). Specifically, replacing conventional coal in China with BC LNG could result in a 40 to 45% reduction in GHG emissions in the textile industry and a 26 to 32% reduction in the chemical industry. When LNG is used to displace coal in district heating applications, the highest emission reduction of approximately 60% was observed.

Nie and colleagues (2020)

Nie and colleagues (2020) conducted three life-cycle assessments of the same planned LNG supply chain from Canada to China, using three independent, parallel research groups from the University of Calgary, University of British Columbia, and Stanford University. Each team

developed their own LCA models to measure the GHG emissions from exporting LNG from British Columbia to China for power generation and district heating applications. The teams also compared the findings with the LCA model of Chinese coal for power generation to assess the potential for reducing emissions.

The LNG pathway that was examined in the study included five stages: [1] upstream, which includes extraction and production of natural gas in the Montney Play of Northern Alberta; [2] midstream, which includes the transmission of natural gas to a hypothetical LNG plant in Prince Rupert in British Columbia; [3] liquefaction, which encompasses natural gas conversion to LNG; [4] transport, which includes shipping LNG to Shenzhen Port in China and regasification; [5] downstream, which includes the distribution of natural gas to a district heating plant or power plant in Huizhou, China, and end use (Nie et al., 2020). The study examined four stages for measuring the LCA of coal power generation in China: [1] coal mine construction; [2] coal mining; [3] transportation; and [4] end use. Each team used the same base-case scenario but applied different methods and assumed the project life to be 30 years, from 2022 to 2050.

All three teams found consistent results despite using different methods for assessing the life-cycle GHG emissions of Canadian LNG exported to China for power generation and home heating. Results ranged from 427 to 556 gCO_2eq/kWh for power and 81 to 92 gCO_2eq/Megajoule (MJ) for home heating. In comparison, the study found the life-cycle GHG emissions of Chinese coal for power generation to be from 848 to 1,114 gCO_2eq/kWh.

Overall, the study found that exporting LNG from Canada to China and substituting it for power generated with coal can achieve a 291-to-687 gCO_2eq reduction per kWh of power generated, equivalent to a reduction of 34% to 62%. The analysis also suggests that producing 1 billion cubic feet of natural gas daily (bcf/d) in Canada and shipping it to China —where it could displace[7] an equivalent amount of coal for power generation—could eliminate 14.9 to 35.2 million tonnes (Mt) CO_2eq annually on a life-cycle basis. To put this into perspective, Canada's production of natural gas averaged 17.9 billion cubic feet of per day (bcf/d) in 2023 (Canada Energy Regulator, 2024b). So, producing 1 billion cubic feet of natural gas accounts for 5.6% of the country's current production capacity.

The latest data shows that, in 2022, Canada's total GHG emissions reached approximately 708 million tonnes (Mt) of CO_2 equivalent. The economic sectors of oil and gas were the largest contributors at 216.7 $MtCO_2e$, followed by transportation (156.3 $MtCO_2e$), buildings (88.8 $MtCO_2e$), heavy industry (77.9 $MtCO_2e$). Agriculture contributed 70.2 $MtCO_2e$, waste added 50.5 $MtCO_2e$, and the electricity sector accounted for 47.3 $MtCO_2e$ (Environment and Climate Change Canada, 2024a).

7 While some studies suggest that LNG may not displace coal but instead be used alongside it, the assumption of displacement in this study rests on pledges by countries like China and India to reduce GHG emissions under international agreements such as the Paris Agreement.

If Canada were to boost its current gas production capacity by 5.6% and ship the additional supply to China in the form of LNG to displace an equivalent amount of coal for power generation, the resulting net global reduction of GHG emissions would be as much as 35.2 million tonnes annually. Now, let us aim higher and assume that Canada were to double its domestic natural-gas production and send the surplus (17.9 bcf/d) to Asia to displace coal. Based on the findings from Nie and colleagues (2020), which found that producing 1 billion cubic feet of natural gas daily (bcf/d) from Canada and shipping it to China could reduce 14.9-to-35.2 million tonnes $MtCO_2eq$ annually on a life-cycle basis, scaling up to 17.9 bcf/d suggests a potential for a reduction of 267-to-630 $MtCO_2e$ per year. This is a significant reduction, as it equals 38% to 89% of Canada's total emissions in 2022. To put that into perspective, since a typical passenger vehicle emits about 4.6 metric tonnes of CO_2 per year (US EPA, 2025),[8] avoiding 630 Mt of emissions annually would be like taking approximately 137 million cars off the road. Alternatively, it would be equivalent to eliminating 47.2 million commercial flights[9] or removing the emissions from approximately 57.4 million homes (FAA, 2024; US EPA, 2024a, 2024b).[10]

Finally, Canadian LNG, as a result of the shorter shipping distance to customers in Asia and Europe, the use of hydroelectricity for powering production and liquefaction, a colder climate, and reduced methane emissions, has a lower GHG emissions profile than American competitors and the global average (Canadian Energy Centre, 2022). A 2021 report written by researchers at the University of Toronto and the University of Calgary compared the GHG intensity of the LNG Canada facility in Kitimat, BC, with that of American competitors such as Jordan Cove LNG and Sabine Pass LNG and found that Canadian LNG has lower GHG intensity (Esquivias, Marion, Zhao, Hernandez Borbon, and Brookson, 2021). In addition, a 2019 report published by the Oxford Institute for Energy Studies estimated the global average emissions intensity for LNG (focused on the liquefaction stage) to be 0.35% CO_2 per tonne of LNG, while the LNG Canada project, which is near completion, is expected to have 0.15% CO_2 per tonne (less than half) (Findlay, 2019).

Overall, as shown by several studies, Canadian LNG can play a meaningful role in reducing global GHG emissions by aiding the transition of China and other Asia–Pacific countries away from coal. In addition, Canadian LNG's lower GHG emissions relative to competitors provide an environmental advantage for the country, further strengthening its position in the global LNG market.

8 This assumes that the average gasoline vehicle on the road drives around 11,500 miles per year and has a fuel economy of about 22.2 miles per gallon (US EPA, 2025).

9 According to the US EPA, US commercial aviation produced 130.7 million metric tonnes of CO_2 in 2022. That same year, the Federal Aviation Administration reported approximately 9.8 million commercial flights (FAA, 2024; US EPA, 2024a;)

10 The US EPA estimates that a typical household generates 10.97 metric tons of CO_2 annually (USA EPA, 2024b).

5. Energy Security and Canada's Role

Russia's invasion of Ukraine in February 2022 intensified the focus on energy security. Before the war, more than 40% of Europe's natural gas imports came from Russia, delivered via four main pipelines (Gross and Stelzenmüller, 2024). However, following the war, growing sanctions and import bans shifted Russia's natural-gas supply away from Europe, disrupting access to reliable and affordable energy. Russia's pipeline exports of natural gas to the European Union decreased by 80.7%, from 140 bcm in 2021 to around 27 bcm in 2023 (Corbeau and Mitrova, 2024).

Natural gas plays a crucial role in Europe's energy security. In 2021, natural gas accounted for 24.8% of Europe's energy consumption, and in 2022, nearly 20% of European electricity was generated from burning gas (Energy Institute, 2024; Savcenko, 2023). Phasing out Russian gas imports forced Europeans to urgently store gas, cut gas consumption, scramble for new gas suppliers and restart coal-fired power plants to survive through the winter and offset the energy crisis (Singh, Bernstien, and Hopton, 2022). To date, many Central and Eastern European countries continue to rely heavily on coal for generating electricity and heating. For instance, in 2023, coal accounted for 37% of energy consumption in Poland and 31% in the Czech Republic (Energy Institute, 2024).

While the immediate gas-supply crunch that escalated after Russia's war has been easing, the region's challenges in providing energy are far from over. As of January 2025, as a result of cold weather in the region and increased energy consumption coupled with the loss of Russian gas, European gas storage levels depleted at the fastest rate since the 2022 energy crisis. Gas storage was at 59%, which was 15% below the same time last year (Sheppard and Hume, 2025). The fast depletion of stored gas prompted several LNG tankers that were originally destined for Asia and Colombia to redirect to Europe. In addition, as of January 2025, the European Union is planning to extend its target to fill gas storage ahead of winter by at least another year because of concerns about potential supply shocks and increased prices. These binding storage-filling targets were set by Brussels following the war to create a buffer of stored gas, with the goal of filling EU underground storage caverns to 90% by November with intermediate targets for September, July, May, and February. However, these targets, which were originally expected to expire in December 2025, are now expected to be extended due to ongoing concerns surrounding energy security (Abnett and Payne, 2025).

Meanwhile, the rise in energy demand in the Asia-Pacific region is driving countries in the region to seek affordable energy resources, with Russia increasing its role as a key supplier. In particular, the Power of Siberia 1 pipeline has helped boost Russia's natural-gas exports to China by 127%, from 10 bcm in 2021 to an estimated 22.7 bcm in 2023. As of June 2024, discussions

on the construction of the Power of Siberia 2 pipeline are stalled because of disagreements over pricing and supply levels. If completed, the pipeline would connect Russia's western gas fields—previously supplying Europe—to China. Estimates suggest that the pipeline could enable natural-gas exports to reach 15 bcm by 2030 and 50 bcm by 2050 (Corbeau and Mitrova, 2024; Seddon, Stognei, Foy, and Leahy, 2024).

In addition to China, Russia is aiming to supply its natural-gas resources to the South Asia region. In 2023, Russian Energy Minister Nikolay Shulginov expressed interest in participating in a pipeline project that would connect Turkmenistan, Afghanistan, Pakistan, and India. In addition, Russian Deputy Prime Minister Alexander Novak suggested that Russia could supply gas to northern Iran, which could then send gas to Pakistan and India through the Iran-Pakistan-India pipeline, which has yet to be built (Corbeau and Mitrova, 2024).

While these pipeline projects are still in the planning stages, the sanctions imposed on Russia as a result of the invasion of Ukraine provide an added incentive for their completion. Moreover, there are geopolitical concerns for Canada and its allies if Russia successfully establishes stronger, long-term energy ties with Asian economies, which are expected to drive future increases in natural-gas demand.

As Russia tries to find new markets for its gas exports and Europe seeks to find new gas suppliers, there are significant opportunities for Canada. Shortly after the energy crisis began in Europe in 2022, Latvia sought LNG from Canada to replace Russia as its primary source of imported gas (Eurostat, 2022; Chase, 2022). Later that year, in June, Ukraine's ambassador urged Canada's oil and gas industries to expand into the European market (Stephenson, 2022). Similarly, with 66.4% of Germany's gas imports coming from Russia in 2021, German Chancellor Olaf Scholz turned to Canada in search of a new LNG supplier (Eurostat, 2022). More recently, in 2024, Greece and Poland also expressed interest in importing Canadian LNG.

However, Canada has yet to develop the necessary infrastructure to capitalize on the opportunity presented by LNG demand across the Atlantic and beyond. Regulatory hurdles have largely prevented Canada from becoming a major LNG player (Findlay, 2019). None of the 18 LNG export facilities proposed in Canada since 2011 are operational, with only one project—LNG Canada Phase 1—nearing completion more than 12 years after its initial announcement (Aliakbari and Yunis, 2022; Aliakbari and Clemens, 2025). In contrast, the United States, as of January 2025, has built 8 LNG export terminals, approved 20 more, and has seven projects under construction, making it a significant supplier of LNG globally (Federal Energy Regulatory Commission, 2025).

Overall, Canada has the natural-gas resources to become a major supplier of reliable energy for its allies. Furthermore, Canada has the opportunity to reduce geopolitical concerns over Russia's efforts to establish stronger, long-term energy ties with Asian economies—projected to drive the rise in global natural-gas demand in the mid- and long term—benefiting both the country and its allies.

6. Barriers to Expanding Canada's Capacity to Export LNG

Several LNG projects in Canada in recent years have been either cancelled or delayed partly as a result of onerous regulations. For instance, in 2017, the $36-billion Pacific NorthWest project was cancelled, in part because of regulatory delays (Candian Press, 2017). Similarly, the $9-billion Énergie Saguenay project was cancelled in 2020 amid regulatory challenges and railway blockades (Morgan, 2020). In 2021, the joint-venture partners Woodside and Chevron cancelled the Kitimat LNG project as a result of slow regulatory approval (Carrigg, 2021). And, in 2024, Repsol decided against developing an LNG terminal on Canada's east coast as a result of high infrastructure costs, particularly those arising from regulatory hurdles to pipeline development (Williams, 2023).

A 2020 paper assessed the competitiveness of Canada's regulatory frameworks (at both federal and provincial levels) compared to that of the United States and found that Canada has a comparative disadvantage in the regulatory process for LNG projects as well as interprovincial oil and gas pipelines. Specifically, the study found that LNG projects take approximately 12 more months to get approval in Canada than in the United States. Similarly, major gas and oil pipeline projects in Canada take approximately 13 additional months for approval compared to projects in the United States (Vypovska, Bartholameuz, Romaniuk, and Adeyemo, 2020).

In 2019, the federal government introduced Bill C-69, or the Impact Assessment Act (IAA), to replace the previous federal project approval process. This bill overhauled the environmental assessment process for major projects in Canada and introduced several subjective criteria, such as the consideration of "gender implications" and "social" impacts, which have made the regulatory process less certain and more subjective (Green, 2018; Aliakbari and Finlayson, 2024). A 2023 report by the Canada West Foundation evaluated the effectiveness of the new regulatory system by analyzing the time-lines of 25 major projects, including LNG projects, subjected to the process. The report found that almost all the project submissions between 2019 and 2023 have remained stuck in the early stages (Phase 1 or 2) of the four-phase process. There are significant delays associated with the planning phase (a new component added to the IAA that sets the stage for assessment by identifying the scope of the issues that need to be addressed). While the agency has a legislated limit of 180 days to complete the planning phase, the average time spent was 323 days, with some projects, such as the Tilbury 2 LNG expansion project, taking up to 693 days (Orenstein, 2023). Not surprisingly, some experts have identified regulatory uncertainty as a major barrier to LNG development in the country.

For instance, Timothy Egan, CEO of the Canadian Gas Association, has highlighted regulatory uncertainty as a major deterrent to developing LNG export facilities on Canada's East Coast (Chase and Scholz, 2022).

In addition to regulatory challenges, several federal and provincial policies have presented hurdles to LNG development in the country. For instance, the federal government has proposed a GHG cap on the oil and gas industry to reduce emissions in this sector by 35% below 2019 levels by 2030–2032 (Environment and Climate Change, 2024c). This cap, which will increase compliance costs for producers, will inevitably reduce oil and gas production in the country, as shown by several studies (Deloitte, 2024; Government of Alberta, 2024; Ammar, Scholz, and Laurin, 2025). Similarly, British Columbia's CleanBC regulations place a cap on GHG emissions for the oil and gas sector and require all new LNG projects to have a plan to reach net zero by 2050 (Government of British Columbia, 2021). In addition, the federal government has implemented stringent methane regulations aimed at reducing GHG emissions from the sector by at least 75% by 2030 relative to 2012 (Environment and Climate Change, 2023). Moreover, several Canadian provinces, such as Quebec, New Brunswick, and Newfoundland & Labrador, have imposed fracking bans, which restrict access to gas reserves and make it impossible to develop local supplies in the east (Canada Energy Regulator, 2024d; Green, 2025).

Overcoming these barriers—removing regulatory uncertainty, streamlining the process for LNG project approvals, and revising several federal and provincial policies—is critical for Canada to become a major LNG supplier for Asia and Europe.

7. Conclusion

As the world seeks practical solutions for reducing greenhouse gas emissions while ensuring energy security, natural gas offers a promising alternative to coal because of its lower carbon footprint. Canada, with its vast, low-cost natural-gas resources, low-carbon footprint LNG, and shorter shipping distance to key markets, can play a meaningful role in reducing global GHG emissions by decreasing reliance on coal in Asia and Europe. Exporting Canadian natural gas also provides an alternative to energy suppliers such as Russia, which has historically used energy exports as a geopolitical tool, thereby enhancing energy security.

However, regulatory challenges, as well as several federal and provincial policies, have retarded LNG development in the country. The federal government's Impact Assessment Act, which was intended to streamline project approvals and was introduced in 2019, has instead created more uncertainty and complexity in the review process. In addition, the federal government's GHG cap imposed on the oil and gas sector, strict methane regulations, and several provincial fracking bans that limit access to gas reserves are other barriers to unlocking the country's LNG potential.

It is important to recognize that GHG emissions are global and are not confined by borders. Instead of focusing on reducing domestic GHG emissions in Canada by implementing various policies that hinder economic growth, governments must shift their focus toward global GHG reductions and help the country cut emissions worldwide by expanding its LNG exports.

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