

A woman wearing a white hard hat and safety glasses stands next to a large, dark, cylindrical oil tanker. She is looking upwards. In the background, there are yellow industrial structures and a line of trees under a cloudy sky.

Canadian Oil and Gas Export Infrastructure

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Summary of Canadian Oil and Gas Export Infrastructure

Canada is both a significant consumer and supplier of energy. Substantial energy infrastructure has been developed over decades to gather, process, and ship energy to domestic and export markets.

Oil and Natural Gas Liquids Infrastructure Highlights

- There are more than 840,000 km of transmission, gathering, and distribution pipelines in Canada⁽²⁾. The pipeline network delivers natural gas, natural gas liquids, and crude oil for domestic use and export.
- Canada has more than doubled its pipeline and rail flows out of the Western Canadian Sedimentary Basin (WCSB) to nearly 5.0 MMB/d (from ~2 MMB/d) since 2007 to accommodate oil sands growth, however, growth has ultimately been constrained due to limited egress capacity, including the cancellation of three major proposed pipeline projects.
- The Trans Mountain Expansion Project (TMEP), now complete, has added ~590 MB/d of egress capacity, marking a major milestone for Canadian oil producers and providing tidewater access to new markets.

Natural Gas Infrastructure Highlights

- A large network of pipelines moves natural gas from producing regions in Western Canada to Eastern Canada and the US, where Canada represents the largest foreign supplier.
- Starting in 2016/2017, constraints in regional gathering systems and export lines have limited growth and depressed prices, but recent capacity expansions have helped mitigate these issues. Canadian natural gas started to be exported from US LNG terminals in 2023. The first Canadian LNG export facilities are under construction and will provide greater access to higher-priced international markets.

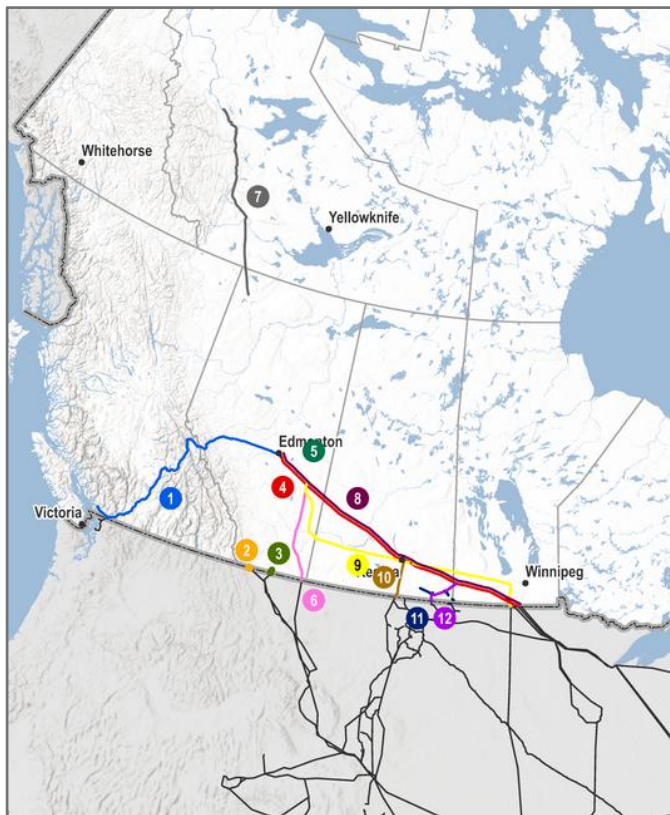
**Western Canada
Pipeline Export Capacity
(2024)**

11.3 Bcf/d
Natural Gas⁽¹⁾

5.0 MMB/d
Crude Oil and NGLs

Liquids Transportation

Western Canadian Sedimentary Basin (WCSB) Crude Oil Export Infrastructure



- In 2024, ~4.6 MMB/d of crude oil and NGLs was exported to the US and Eastern Canada from the WCSB via six major export pipelines, as measured by pipeline throughput data.
- With ~3.1 MMB/d of throughput in 2024, the Enbridge Mainline is the largest export pipeline in Western Canada, transporting crude oil and NGLs to Eastern Canada and the US.
- Five other major export pipelines out of Western Canada account for the remaining crude oil and NGL flows.

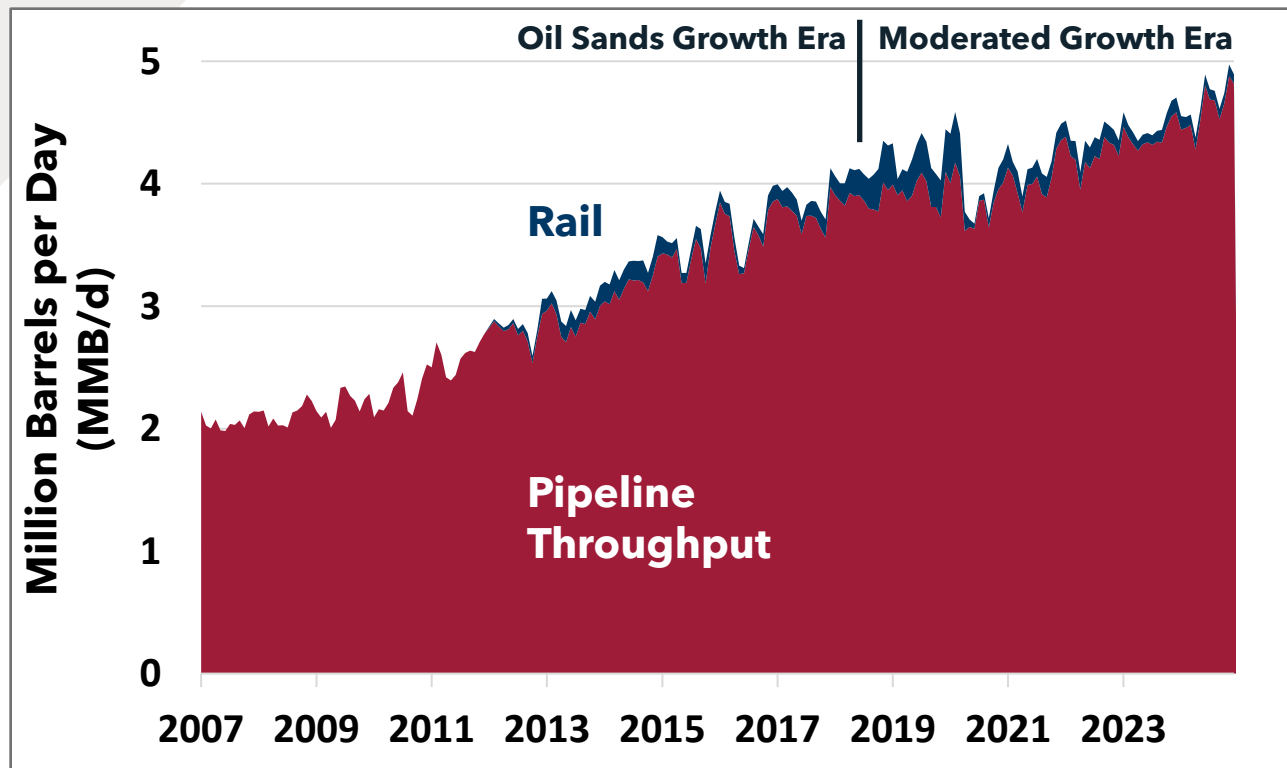
Export Pipelines		
Pipeline	Average Annual Throughput - 2024 ('000s B/d)	Destination
4 Enbridge Mainline ¹	3,060	US Exports, Eastern Canada
1 Trans Mountain	515	Marine Exports, BC
6 Enbridge Express ²	276	US Exports
9 South Bow Keystone	624	US Exports
2 3 Rangeland / Milk River ²	127	US Exports
Total	4,602	

¹ Ex-Gretna

² Express/Rangeland/Milk River throughput assumed equal to capacity

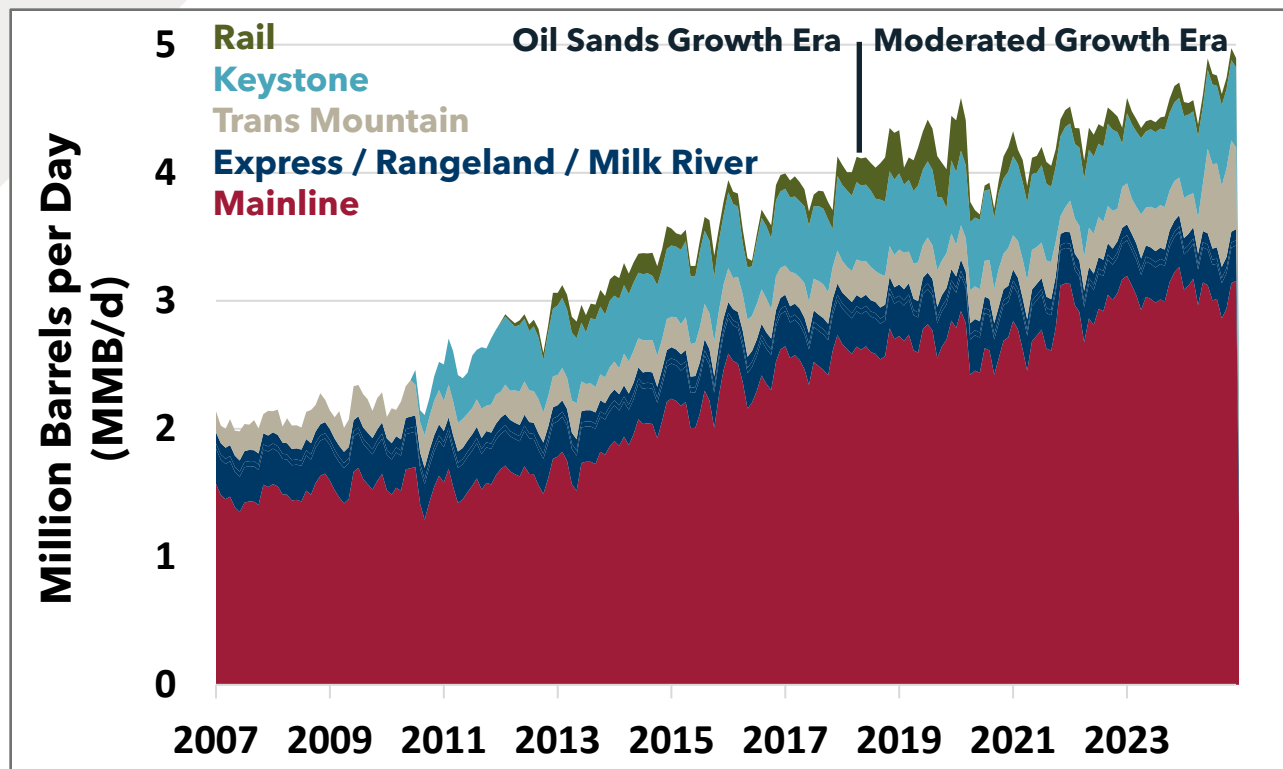
Note: The above list is comprised of crude oil export pipelines only

WCSB Canadian Oil Exports by Pipeline Throughput and Rail | Monthly | 2007 to Dec 2024



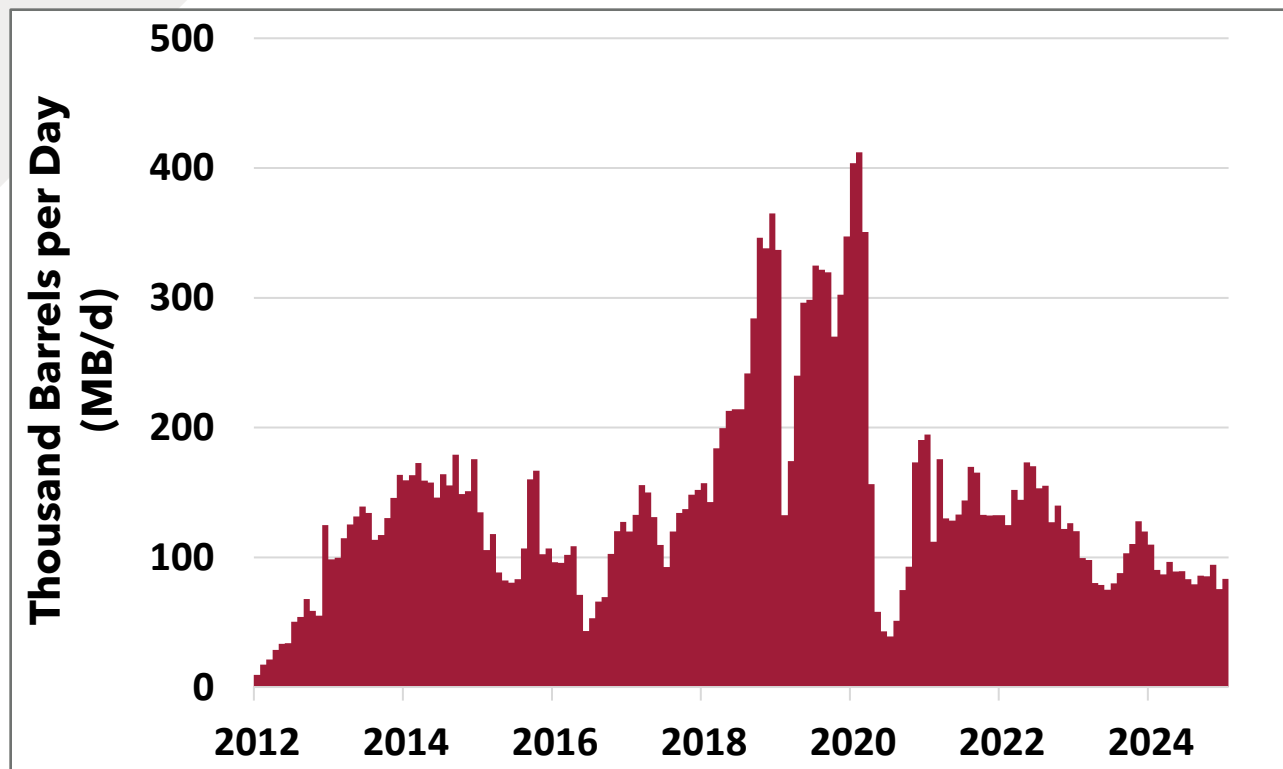
- Since 2007, Canada has more than doubled its export flows (pipeline and rail) out of the Western Canadian Sedimentary Basin (WCSB) to nearly 5.0 MMB/d (from ~2 MMB/d) to accommodate oil sands growth.
- However, growth has ultimately been constrained due to limited egress capacity, including the cancellation of three major pipeline projects (Keystone XL, Northern Gateway, and Energy East).
- When insufficient pipeline capacity exists, oil can also be exported by rail. Even with sufficient takeaway capacity, some volumes still flow on rail due to advantaged rail economics in certain regions.

WCSB Canadian Oil Exports by Pipeline Throughput and Rail | Monthly | 2007 to Dec 2024



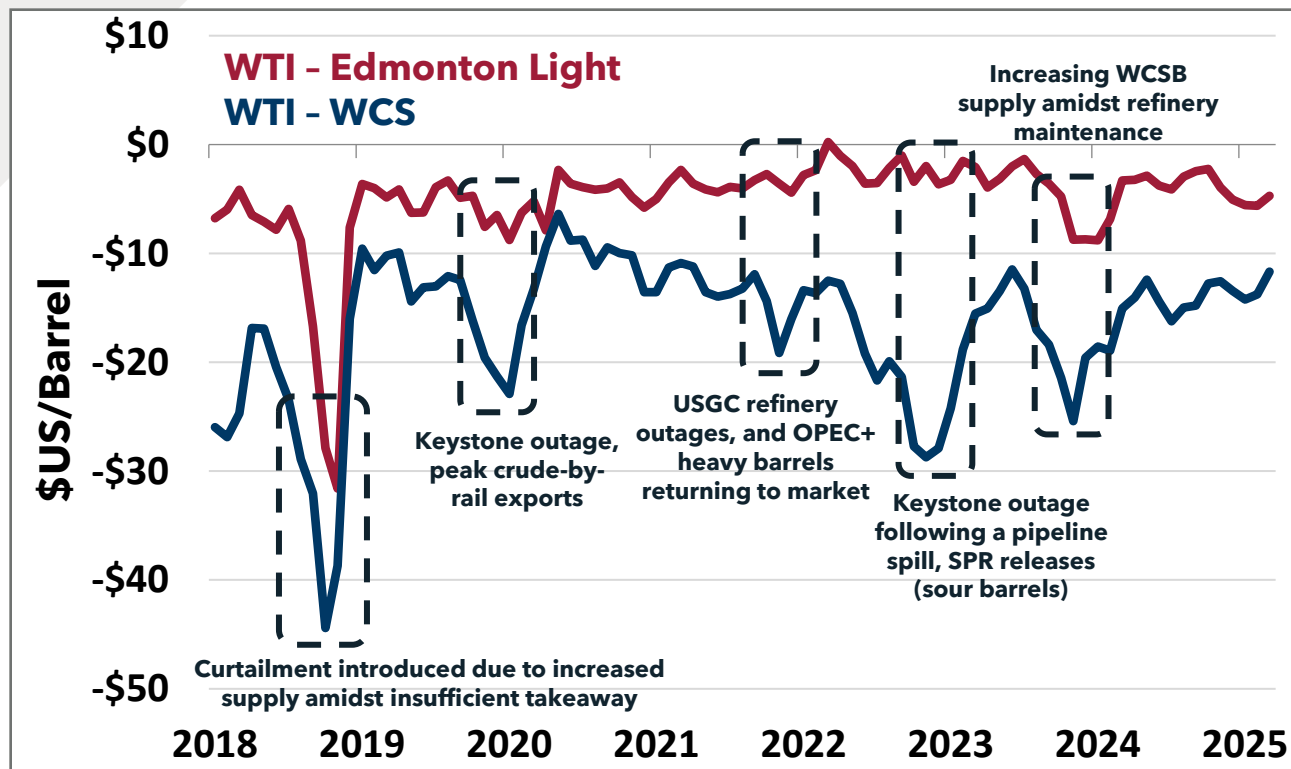
- Of note, Enbridge has doubled pipeline throughput on the Mainline from ~1.5 MMB/d in 2007 to ~3.1 MMB/d currently, owing to debottlenecking initiatives and the recently completed Line 3 Replacement.
- The Trans Mountain Expansion Project (TMEP) reached commercial operation in May 2024, adding 590 MB/d of export pipeline capacity.
- Based on monthly pipeline throughput data from the Canada Energy Regulator, domestic heavy and light crude oil flows on the Trans Mountain Pipeline system averaged 515 MB/d in 2024, up from 313 MB/d in 2023.

Canadian Oil Exports to the US by Rail | Monthly | 2012 to Jan 2025



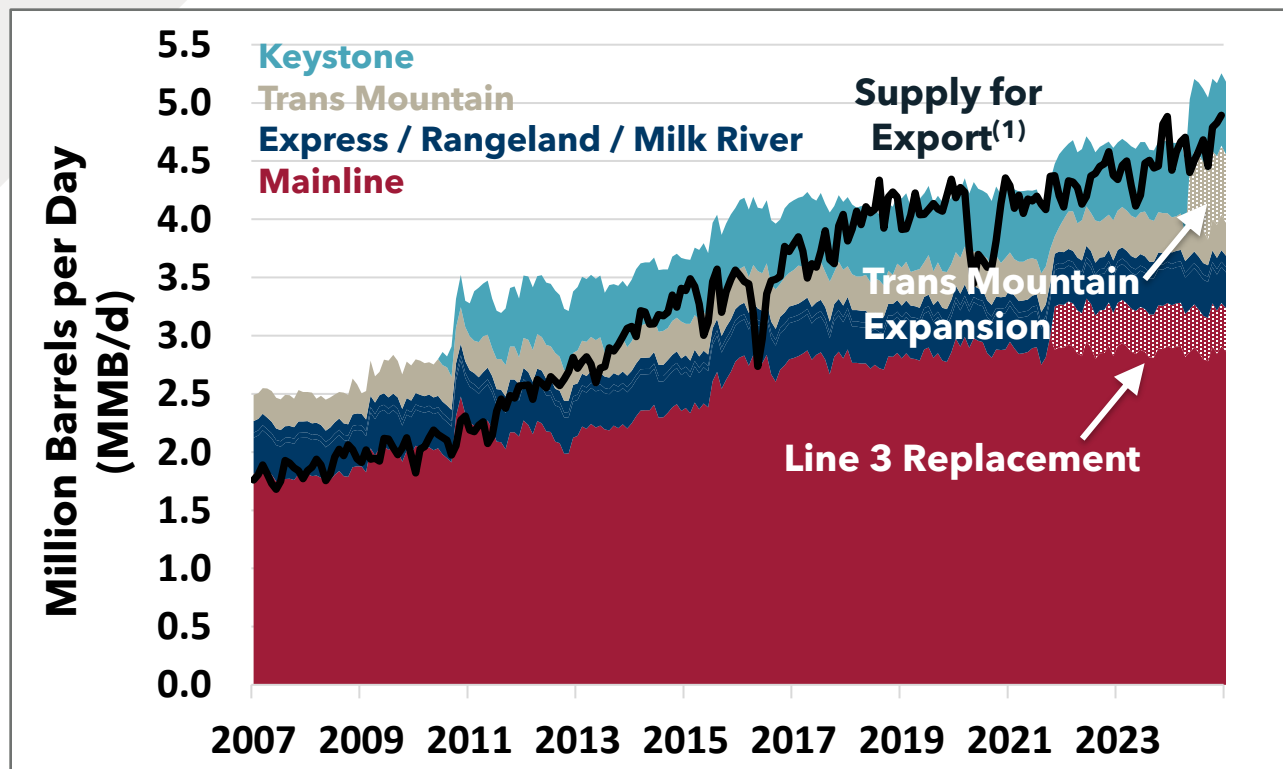
- Rail exports act as an important relief valve at times of insufficient pipeline capacity. The interconnected North American rail network allows access to the many important export markets.
- Rail exports peaked at 412 MB/d in early 2020 due to a lack of pipeline egress but fell shortly after when supply fell due to the COVID-related price drop.
- Crude-by-rail remains in place as the marginal transport option should pipeline disruptions occur. However, it is generally a more expensive alternative to pipelines.

Western Canada Crude Oil Differentials to WTI | Monthly | 2018 to Mar 2025



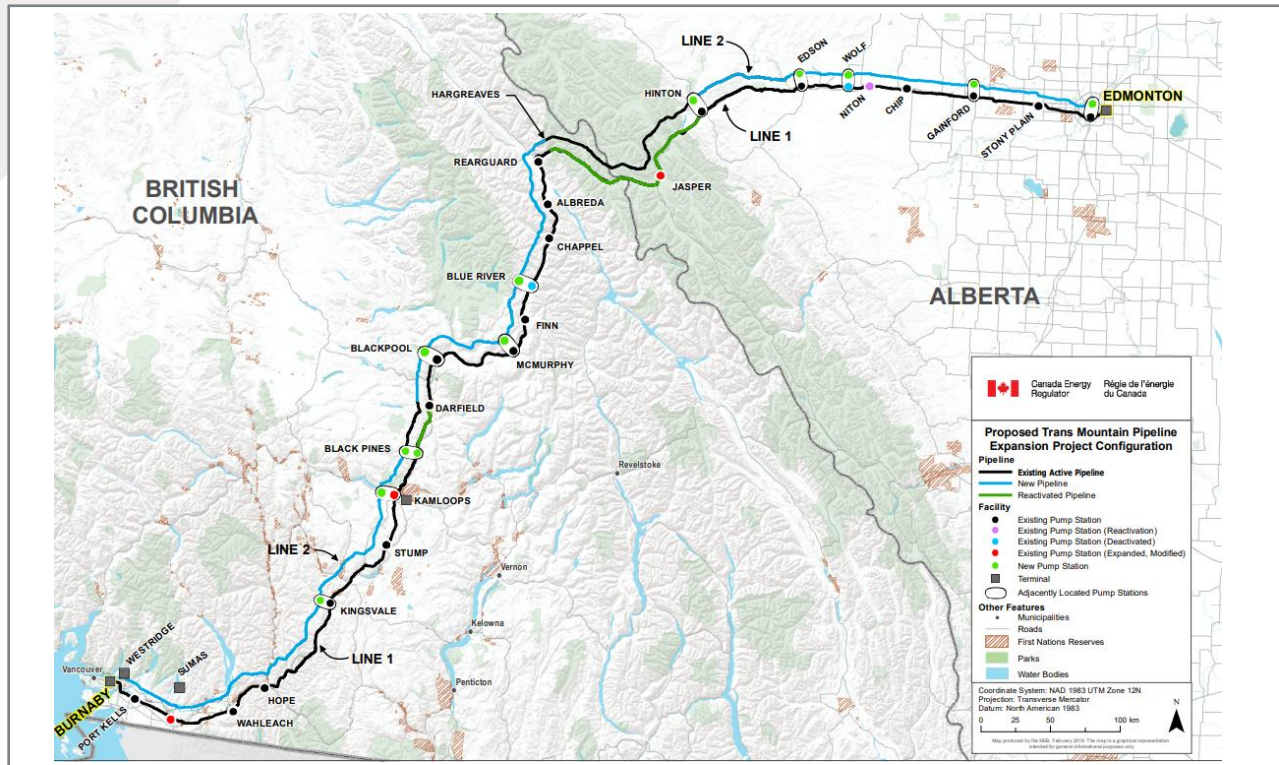
- In Canada, the two most common crude oil benchmarks are Western Canadian Select (WCS) and Edmonton Light, which both trade in reference to WTI.
- Canadian price discounts blew out during the fall of 2018 as new oil sands supply came to market amidst insufficient pipeline takeaway capacity.
- During times of insufficient pipeline capacity, price differentials for Canadian crude oil widen against WTI. The Alberta government introduced a production curtailment program to alleviate the oversupply.
- Since mid-2020, incremental capacity has helped keep discounts relatively narrow, although outages and other anomalies can still lead to a temporary widening. The Trans Mountain Expansion Project (TMEP) has provided additional pipeline capacity, helping tighten price differentials and mitigating the risk of future differential blowouts.

WCSB Oil Pipeline Capacity vs. Supply for Export | Monthly | 2007 to Dec 2024



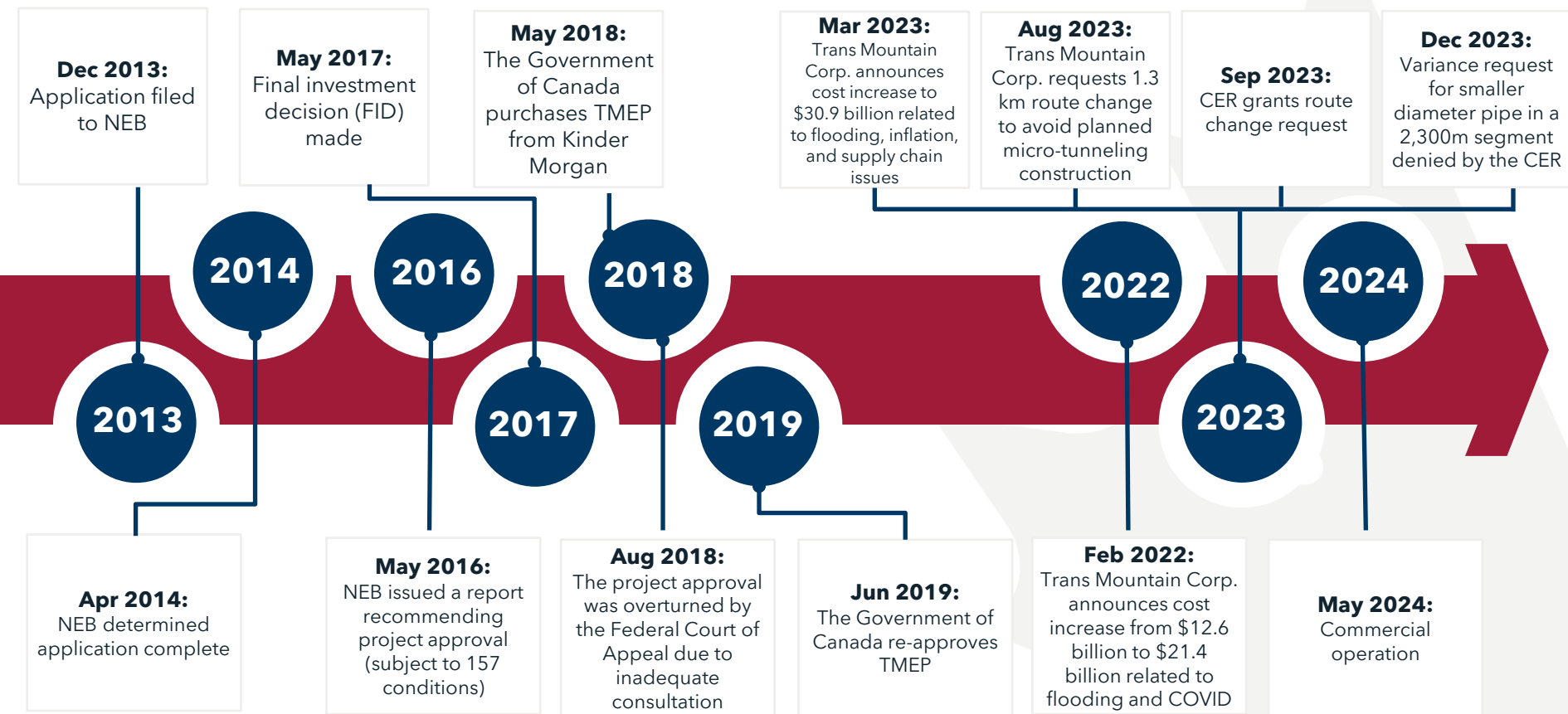
- The Western Canadian Sedimentary Basin (WCSB) reached a point of insufficient egress capacity in 2018 following a period of oil sands growth.
- The Enbridge Line 3 Replacement in 2021 (+370 MB/d) provided a temporary buffer for pipeline takeaway capacity.
- The recently completed Trans Mountain Expansion Project (TMEP) has added 590 MB/d of takeaway capacity. Supply out of the WCSB has grown in anticipation of TMEP completion.
- The TMEP commenced commercial operation in May 2024 and is needed to accommodate future production growth and mitigate further differential blowouts.

Trans Mountain Expansion Project (TMEP) Overview

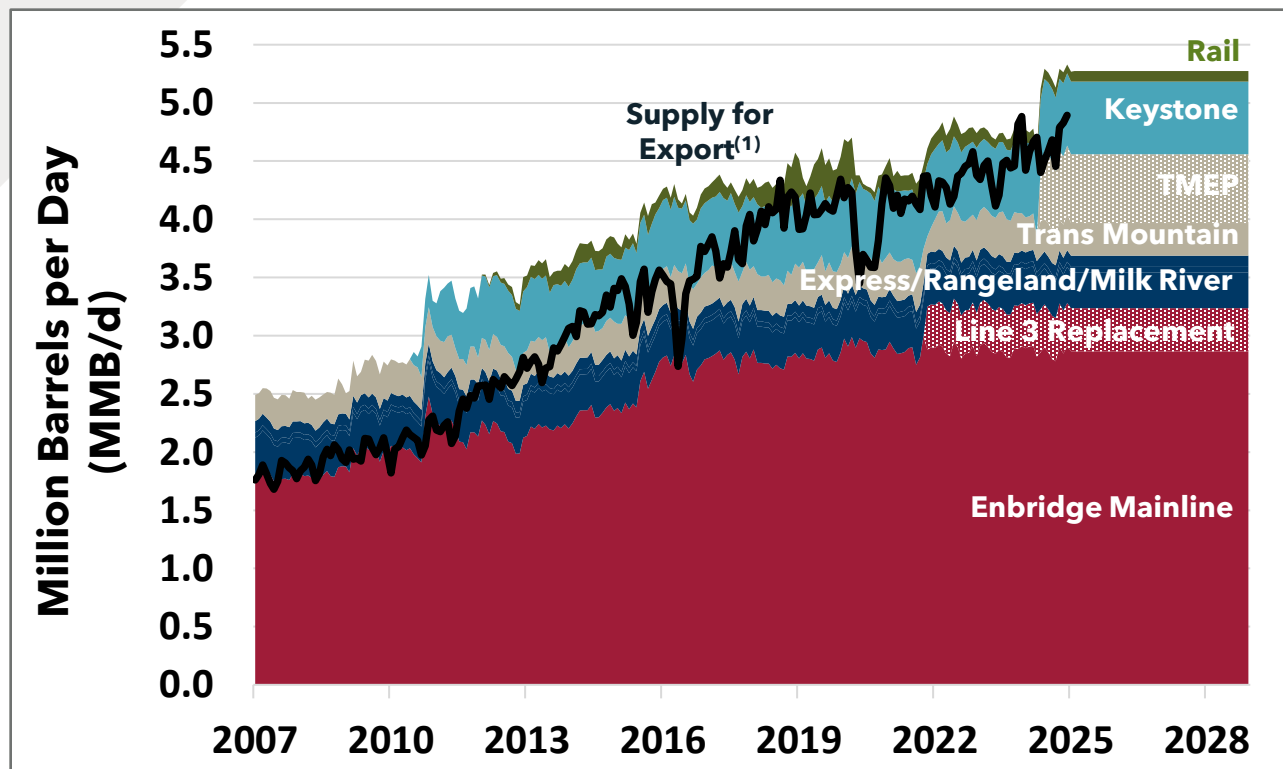


- **Location:** Edmonton, AB to Burnaby, BC
- **Capacity:** 590 MB/d
- **Committed shippers:** 10 (incl. Canadian Natural Resources, Cenovus, Suncor, etc.) representing ~80% of the total pipeline capacity
- **Commercial operation date:** May 2024
- **Project Description:** The TMEP pipeline is a twinning of the existing ~1,150 km Trans Mountain pipeline and has added 590 MB/d of export capacity. Importantly, the pipeline will provide shippers with increased tidewater access to key export markets in California and Asia.

Trans Mountain Expansion Project (TMEP) Historical Timeline - Key Dates



WCSB Egress Outlook | Pipeline Capacity vs. Supply | Monthly | 2007 to Dec 2024



- The Trans Mountain Expansion Project (TMEP) should have a positive impact on crude differentials.
- Firm service will occupy 80% of the overall pipeline system (equating to ~700 MB/d), which will reallocate barrels otherwise destined for Ontario and the US Midwest (PADD II), creating scarcity in those markets.
- Presently, no further major crude oil export pipelines are planned beyond the TMEP. However, Enbridge can increase the Mainline by another ~200 MB/d (not pictured) via optimizations.⁽²⁾
- On January 6th, 2025, the Government of Alberta, with partners, announced plans to evaluate the potential to increase pipeline capacity to facilitate production growth.⁽³⁾

WCSB Oil Export Pipeline Tolls

Pipeline Tolls for Light Oil (US \$ per Barrel)		Low		High
Edmonton to:	Burnaby (Trans Mountain)	7.00 ^v	-	9.15
	Anacortes (Trans Mountain/Puget)	7.25 ^v	-	9.30
	Sarnia (Enbridge)			4.73 ^{iv}
	Montréal (Enbridge)			8.05 ^{iv}
	Chicago (Enbridge)			4.16 ^{iv}
	Cushing (Enbridge)	5.93 ⁱⁱⁱ	-	7.56 ^{iv}
	Wood River (Enbridge/Mustang/Capwood)			6.18 ^{iv}
	USGC (Enbridge/Seaway)*			10.90 ^{iv}
Hardisty to:	Westridge† (Trans Mountain)*	7.55 ^v	-	9.80
	Guernsey (Express/Platte)			3.94 ⁱ
	Wood River (Express Platte)			6.04 ⁱ
	Cushing (Keystone‡)	5.47 ⁱⁱ	-	12.28
	Wood River (Keystone‡)	4.72 ⁱⁱ	-	10.94
	USGC (Keystone‡)*	7.73 ⁱⁱ	-	17.39
USEC to:				10.70 ^{iv}
Montreal (Portland/Montreal)		1.60		
Pipeline Tolls for Heavy Oil (US \$ per Barrel)		Low		High
Edmonton to:	Westridge† (Trans Mountain)*	7.65 ^v	-	9.85
Hardisty to:	Chicago (Enbridge)			4.61 ^{iv}
	Cushing (Enbridge)	6.38 ⁱⁱⁱ	-	8.01 ^{iv}
	Cushing (Keystone)	6.19 ⁱⁱ	-	13.25
	Wood River (Enbridge/Mustang/Capwood)			6.64 ^{iv}
	Wood River (Keystone‡)	5.48 ⁱⁱ	-	11.98
	Wood River (Express/Platte)			6.74 ⁱ
	USGC (Enbridge/Seaway)*			9.9 ^{iv}
	USGC (Keystone‡)*	8.70 ⁱⁱ	-	19.38

- Tolls partially determine the difference between prices in export markets and what Canadian producers receive.
- Tolls vary based on several factors, including crude quality, pipeline route, length of commitment, and volume.
- Canadian crude oil is exported predominantly to the US Midwest, the US Gulf Coast, and Eastern Canada. Coastal markets generally offer the strongest pricing, but access has historically been limited.

*Paths to tidewater

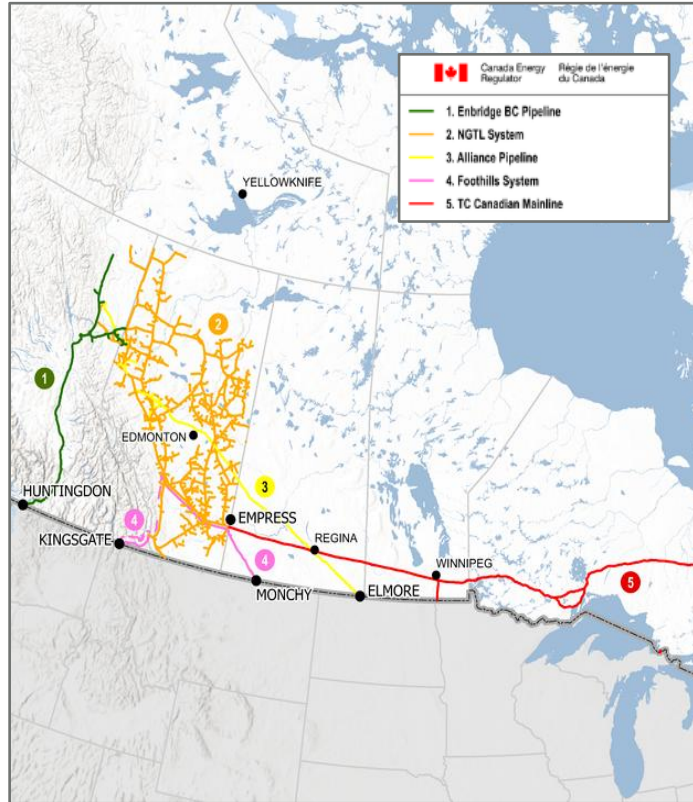
Major Cancelled Crude Oil Pipeline Projects

Proposed Pipeline	Capacity ('000s B/d)	From	To	Date of Cancellation	Reason
Enbridge Northern Gateway	525	Bruderheim, AB	Kitimat, BC	Nov 2016	Cancelled by the Government of Canada due to environment effects and banned oil tanker traffic on the north coast of BC.
TC Energy Energy East	1,100	Hardisty, AB	Saint John, NB	Oct 2017	Project application withdrawn by TC Energy due to potential cost implications associated with the regulatory process
TC Energy Keystone XL	830	Hardisty, AB	Steel City, Nebraska	June 2021	Project cancelled by TC Energy due to its cross-border permit being revoked by the Biden administration
Total	2,455				

- Despite the cancellation of three major pipeline projects (Keystone XL, Northern Gateway, and Energy East), Canada has more than doubled its export flows out of the WCSB to ~4.6 MMB/d (from ~2 MMB/d) since 2017.
- These projects were canceled due to regulatory impediments and environmental concerns.

Natural Gas Transportation

WCSB Natural Gas Export Infrastructure



- The Western Canadian Sedimentary Basin (WCSB) has a large network of natural gas gathering and export infrastructure. In 2024, over 9.9 Bcf/d of natural gas left the basin via four main export systems, traveling to markets in Canada and the US.
- The NOVA Gas Transmissions Ltd system (NGTL) is the main gas gathering system for Alberta. While it does not export gas directly, it connects with other export lines.
- Although capacity on export lines technically exceeds annual throughput, constraints upstream on the NGTL System as a result of a shift in where natural gas is produced currently limit the amount of gas that can reach these other systems and ultimately move to export markets.

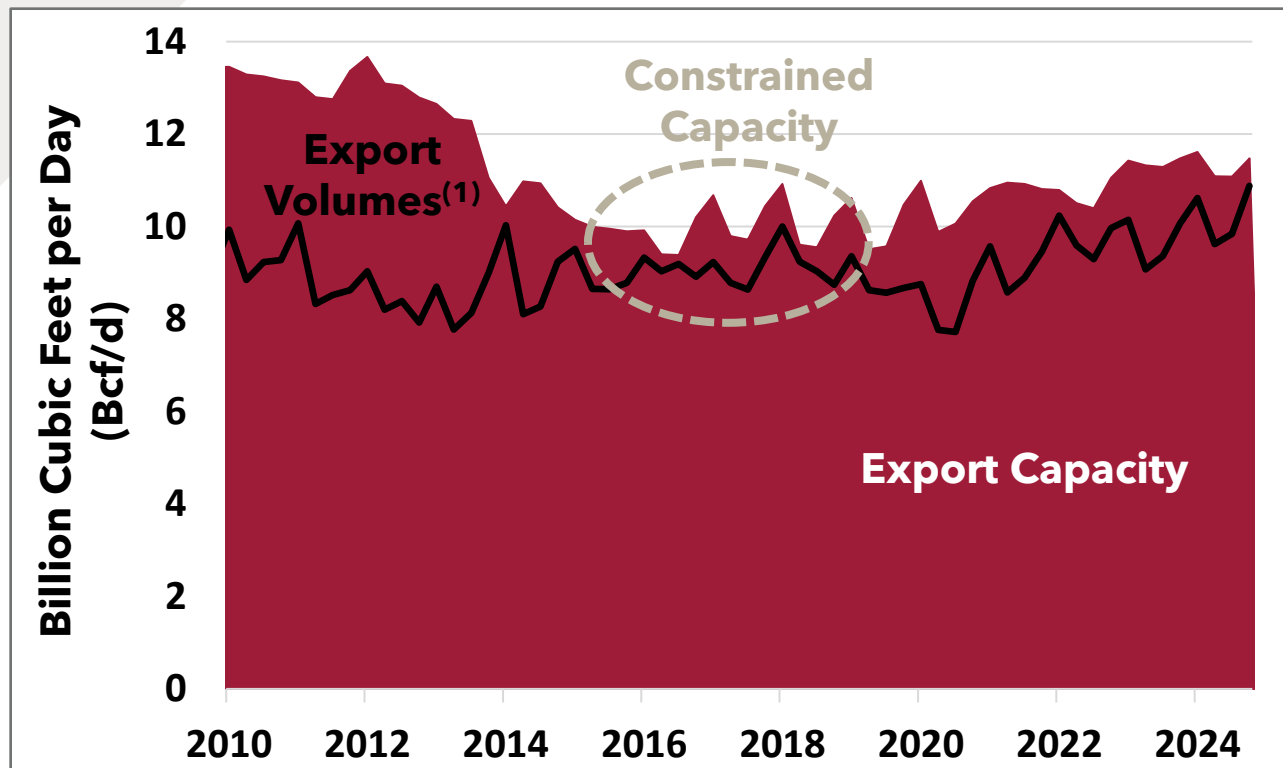
CER Regulated Natural Gas Export Pipelines and Gathering Infrastructure

Pipeline	Avg Annual Capacity - 2024* (Bcf/d)	Avg Annual Throughput - 2024* (Bcf/d)	Destination
1 Enbridge BC Pipeline	1.71	1.19	US Exports, Western-Canada
2 NGTL System**	-	-	Local Use and Other Pipelines
3 Alliance Pipeline	1.60	1.55	US Exports
4 Foothills System	5.29	2.90	US Exports
5 TC Energy Mainline	6.21	4.25	US Exports, Eastern-Canada
Total	14.81	9.89	

*WCSB export volumes only. Capacity based on average daily available capacity, not nameplate

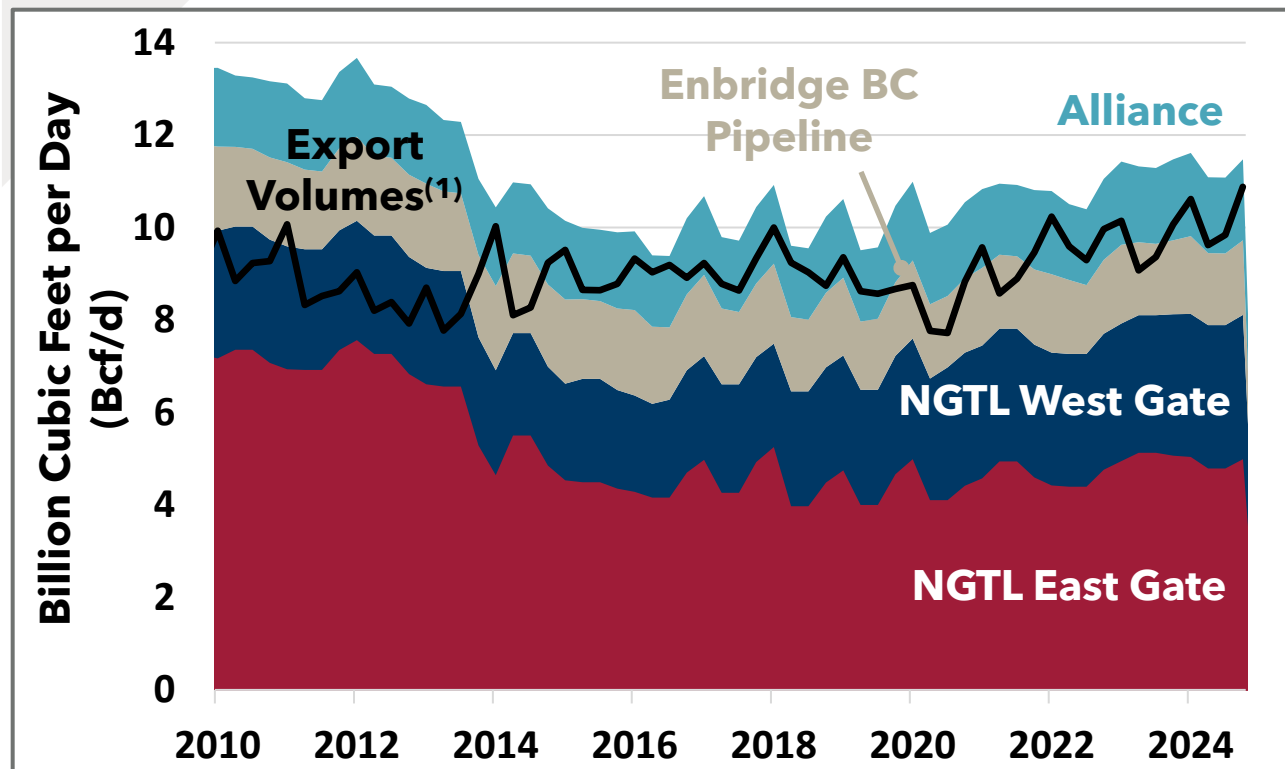
**NOVA Gas Transmission Ltd. (NGTL) System does not export directly from the WCSB, but interconnects with other export pipelines: Foothills System & TC Energy Mainline via West Gate and East Gate

WCSB Effective Gas Export Capacity vs. Export Volume | Quarterly | 2010 to Dec 2024



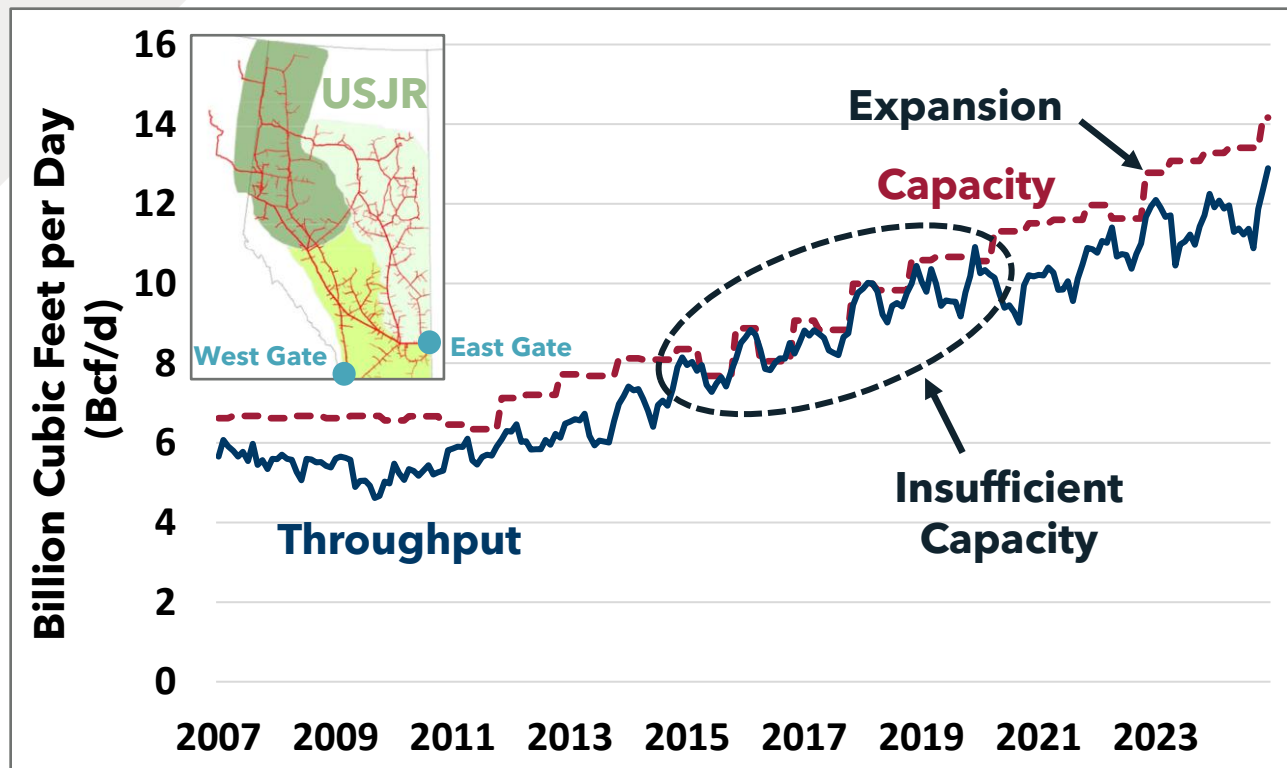
- Total effective export capacity in the Western Canadian Sedimentary Basin (WCSB) was higher in the early 2010s but fell due to a number of operational constraints. Capacity has been gradually increasing after hitting a bottom in 2016.
- Export volumes have varied over this period, sometimes reaching over 10 Bcf/d. When pipeline capacity utilization exceeds 90% the system is less able to accommodate for disruptions, creating constrained capacity.
- Capacity was tight from 2016 to 2019, and again in the summer of 2022. However, new capacity in late 2022 has helped to alleviate constraints. Future expansions are also expected.

WCSB Effective Gas Export Capacity vs. Export Volume | Quarterly | 2010 to Dec 2024



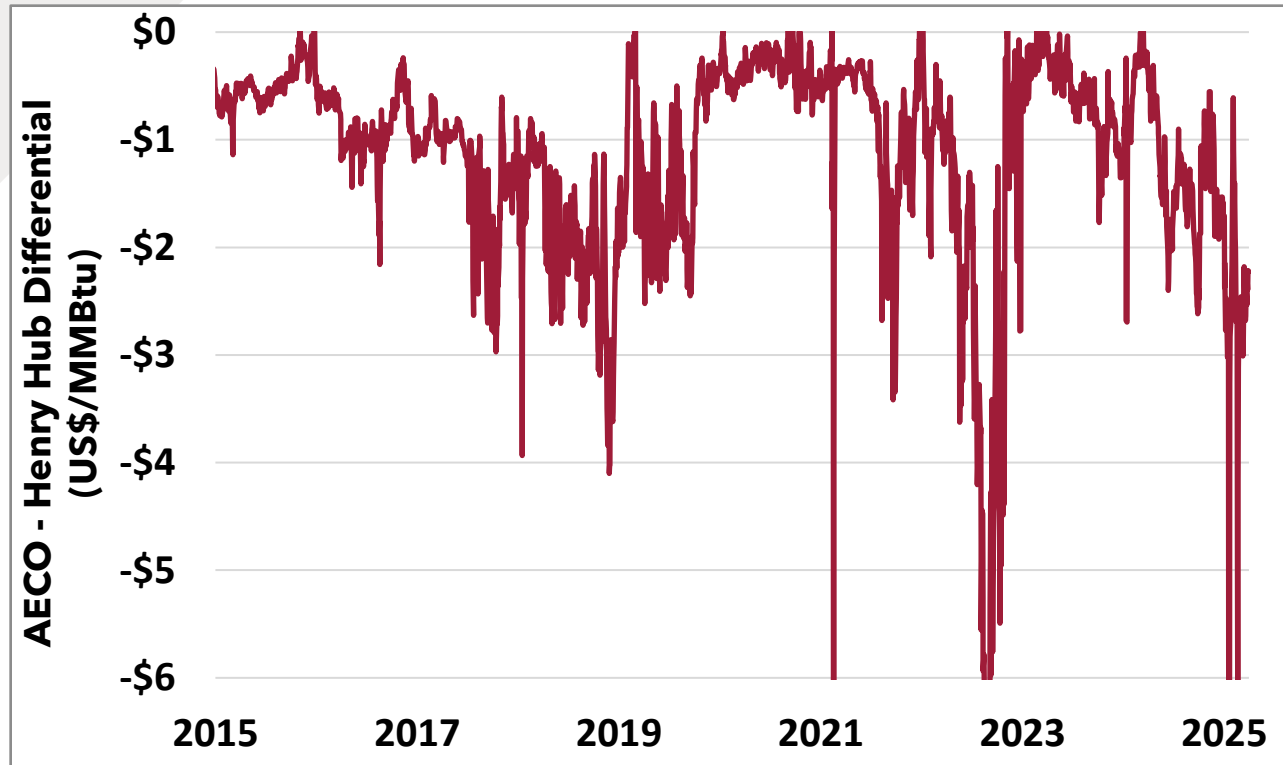
- The total effective capacity to export gas from the Western Canadian Sedimentary Basin (WCSB) depends on the available capacity to leave the NGTL System (West and East Gate), plus the Alliance and Enbridge BC systems.
- The drop in effective capacity from 2010 to 2016 was largely driven by constraints in the NGTL System delivering to other pipelines.
- A large expansion at the end of 2022 has helped to mitigate these constraints.

NGTL Natural Gas Transportation Capacity | Upstream of James River | Monthly | 2006 to Dec 2024



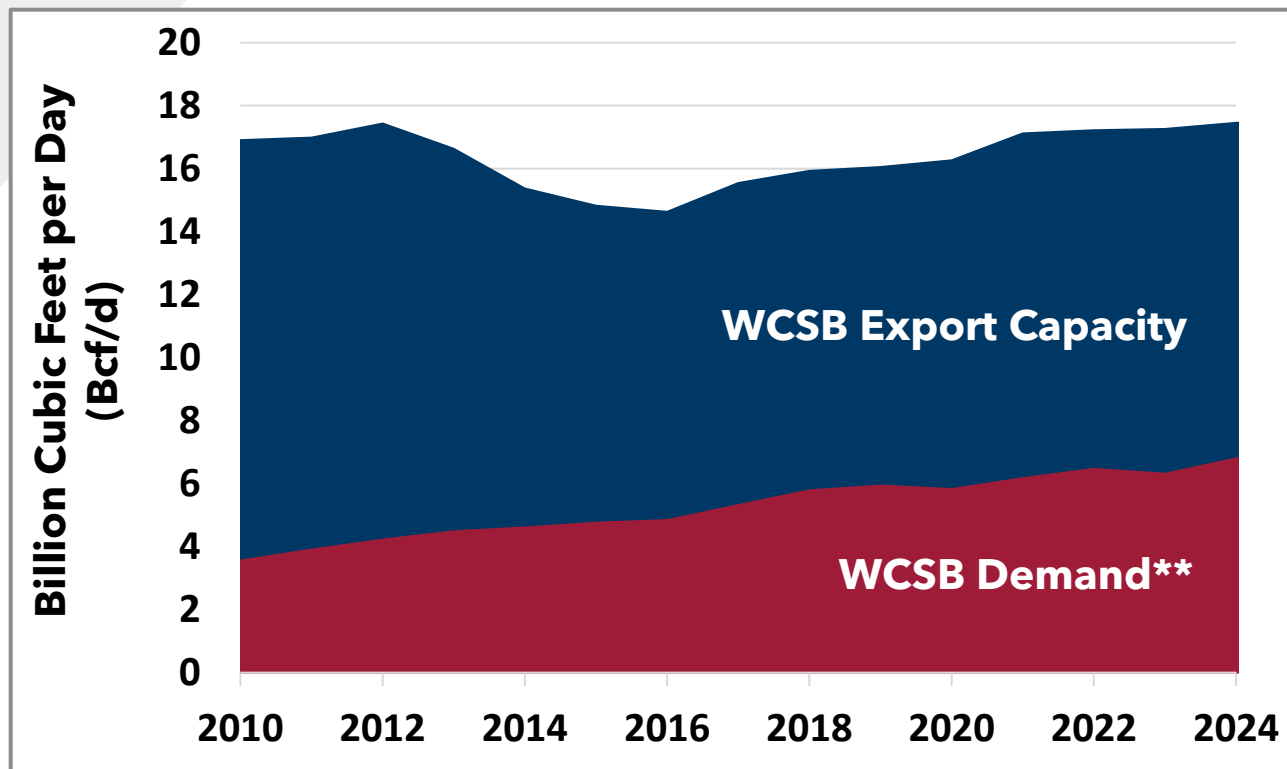
- NGTL export constraints were partially driven by a shift in where natural gas is produced.
- The NGTL System is split into five regions. The NW region is called the Upstream of James River area (USJR). This area is home to the most prolific shale plays. Over the past 15+ years, gas production in the area has nearly doubled.
- Capacity has also grown substantially, but at times, has lagged the significant supply growth, leading to constraints that impacted prices.
- A large capacity addition at the end of 2022 has helped to relieve these constraints.

AECO Differential | Daily Spot Price | Jan 1st, 2015 to March 31st, 2025



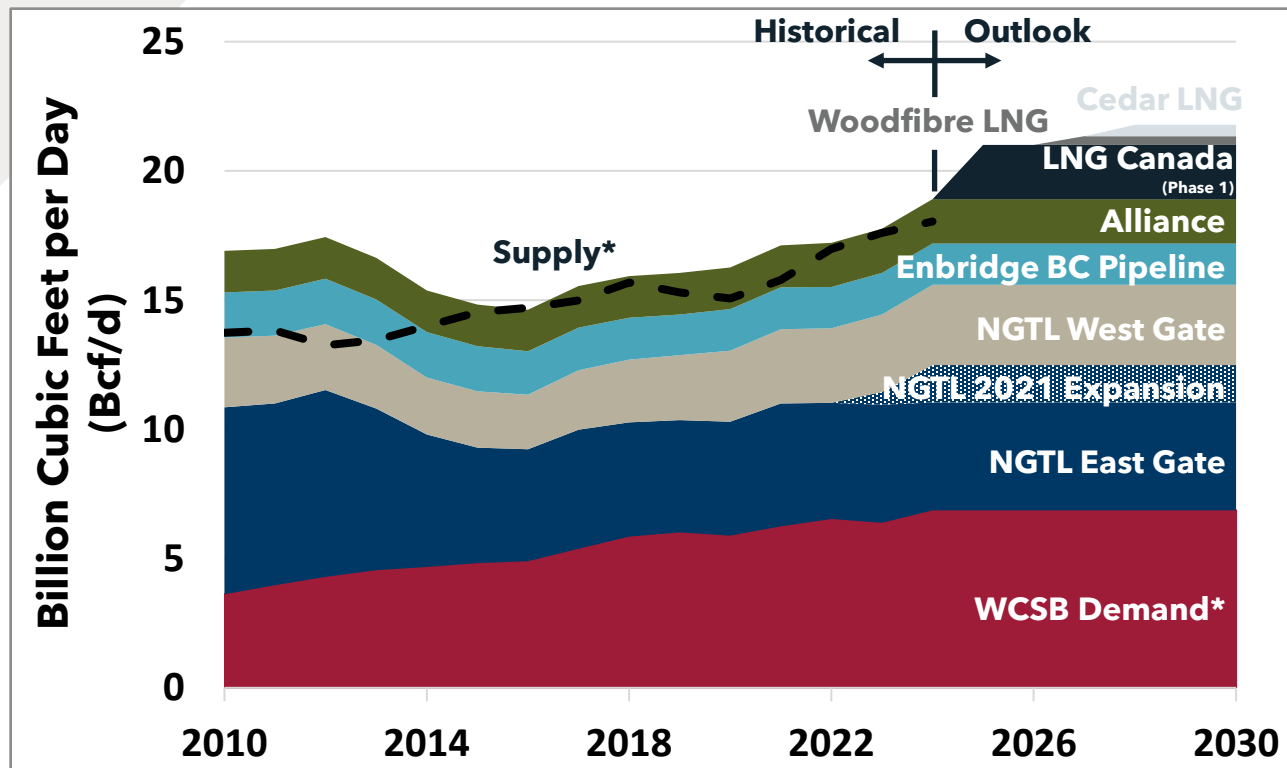
- During periods of pipeline capacity constraint, price discounts at the AECO hub (Alberta's main pricing point) relative to Henry Hub grow dramatically. This is measured by the AECO differential, where a negative value indicates AECO prices are lower than Henry Hub.
- Pipeline constraints were partially driven by a shift in where natural gas is produced, as production in NW Alberta and NE BC has nearly doubled over the past 15+ years. Capacity has grown substantially, but at times, has lagged the significant supply growth.
- Since the NGTL expansion in late 2022, differentials have narrowed, while initiatives undertaken on the NGTL System to improve access to storage during curtailments also seem to be helping.

WCSB Natural Gas Demand and Egress Capacity | Annual | 2010 to 2024



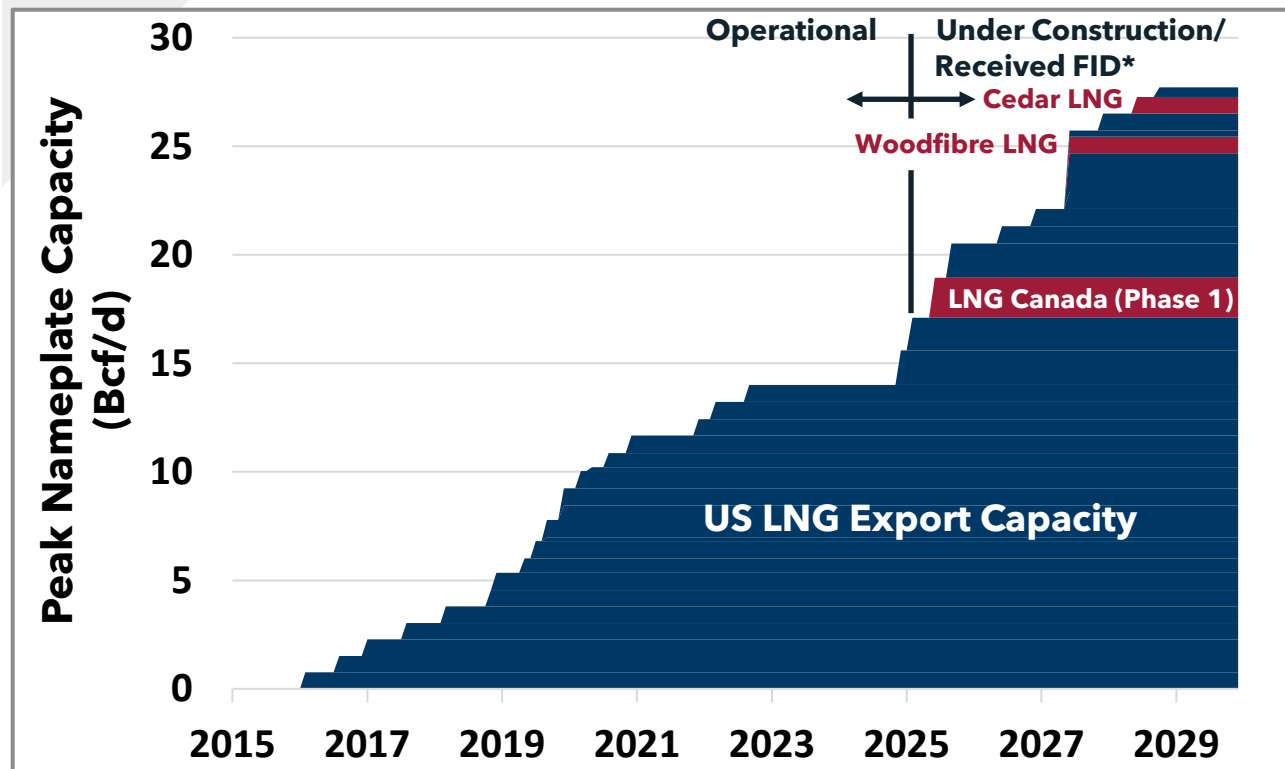
- Demand for natural gas in the provinces that make up the Western Canadian Sedimentary Basin (WCSB) has grown over the past decade.
- This growth has been driven primarily by increased use in the oil sands and the switch from coal power generation towards cleaner-burning natural gas.
- Higher domestic demand in Western Canada has supported production increases even during periods of export constraints.

WCSB Natural Gas Demand and Egress Capacity vs. Supply | Incl. Expected Export Capacity | Annual



- Since the mid-2010s, supply has often approached export capacity, but the situation should improve going forward.
- The NGTL Expansion Project, which came online in late 2022, increased capacity throughout the NGTL System and relieved export constraints.
- The next major increase in capacity will come when LNG Canada Phase 1 comes online, followed by Woodfibre LNG and Cedar LNG. Other future LNG projects have yet to reach a final investment decision.
- These projects will allow Canadian gas to reach global markets amidst growing LNG demand.

North American LNG Export Capacity | Operational and Under Construction/Received FID*



- Since 2016, the US has added ~17 bcf/d of operational/commissioning LNG nameplate capacity via 8 export facilities, and ~8 Bcf/d of additional capacity is under construction.
- Comparatively, three projects in Canada are currently under construction, equating to ~2.5 Bcf/d of nameplate export capacity.
- Due to the interconnected North American gas market, Canadian gas was exported from US LNG terminals for the first time in 2023. Select Canadian natural gas producers have signed +0.4 Bcf/d of long-term supply agreements with LNG facilities in the US Gulf Coast.

Selected West Coast Canada LNG Projects Under Development

LNG Canada

- 🚩 **Location:** Kitimat, BC
- 🚩 **Export Capacity:** Phase I - 1.8 Bcf/d, Phase II - 1.8 Bcf/d
- 🚩 **Pipeline:** Coastal GasLink (complete - late 2023)
- 🚩 **Project Proponents:** Shell, PETRONAS, PetroChina, Mitsubishi Corporation and KOGAS
- 🚩 **FID:** Phase 1 (Oct 1, 2018), Phase 2 TBD
- 🚩 **Commercial operation date:** Est. 2025

Woodfibre LNG

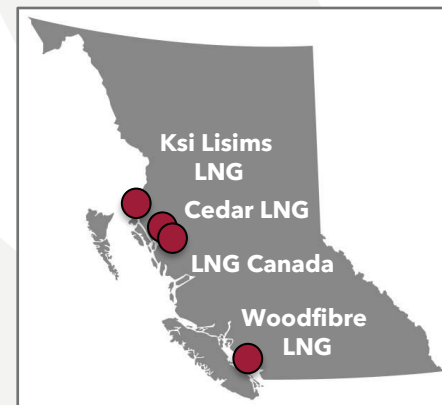
- 🚩 **Location:** Squamish, BC
- 🚩 **Export Capacity:** 0.29 Bcf/d
- 🚩 **Pipeline:** Eagle Mountain (under construction)
- 🚩 **Project Proponents:** Pacific Energy Corporation, Enbridge Inc.
- 🚩 **Notice to Proceed:** April 2022
- 🚩 **Commercial operation date:** Est. 2027

Cedar LNG

- 🚩 **Location:** Kitimat, BC
- 🚩 **Export Capacity:** 0.4 Bcf/d
- 🚩 **Pipeline:** Coastal GasLink (complete - late 2023)
- 🚩 **Project Proponents:** Pembina, Haisla Nation
- 🚩 **FID:** Positive FID announced on June 25th, 2024 [LINK](#)
- 🚩 **Commercial operation date:** Est. 2028

Ksi Lisims LNG

- 🚩 **Location:** Wil Mili, BC
- 🚩 **Export Capacity:** 1.6 Bcf/d
- 🚩 **Pipeline:** TC Prince Rupert Gas Transmission
- 🚩 **Project Proponents:** Nisga'a Nation, Western LNG, Rockies LNG (Canadian producer consortium)
- 🚩 **FID / Commercial Operation Date:** TBD; Environmental Assessment Certificate application filed; Announced in Jan 2024 a signed 20-year LNG sale and purchase agreement with Shell



LNG Canada Project Overview



- **Location:** Kitimat, BC
- **Capacity:** Phase I – 1.8 Bcf/d, Phase II – 1.8 Bcf/d
- **Feedgas Requirement:** Phase I – 2.1 Bcf/d, Phase II – TBD
- **Pipeline:** Coastal GasLink (complete – late 2023)
- **Project Proponents:** Shell, PETRONAS, PetroChina, Mitsubishi Corporation and KOGAS
- **FID:** Phase 1 (Oct 1, 2018), Phase 2 TBD
- **Commercial operation date:** Est. 2025
- **Project Description:** LNG Canada will bring BC and Alberta natural gas to the West Coast for sale in higher-priced Asian markets. LNG Canada is the largest private sector investment in Canadian history.

LNG Canada Historical Timeline - Key Dates

