LIQUIFIED NATURAL GAS (LNG) MARKETS

NOVEMBER 2021

INTRODUCTION

- Global liquefaction capacity increased to 452.9 MTPA (58.9 Bcf/d) in 2020.
- Around 20 MTPA (2.6 Bcf/d) in liquefaction capacity was brought onstream in 2020, all in the United States. In 2020 start-up of several liquefaction projects in Russia, Indonesia, the United States and Malaysia were delayed as a result of the pandemic.
- LNG shipping fleet in 2020 increased on 35 new vessels; the total number of active vessels reached 572 at the end 2020, including 37 Floating Storage and Regasification Units (FSRUs) and 4 Floating Storage Unit (FSUs).
- Global regasification capacity increased by 19 MTPA (2.5 Bcf/d) in 2020, bringing the total to 850.1 MTPA as of February 2021.
- LNG pricing was volatile in 2020 due to COVID-19 impacts on demand. Trading in the Atlantic and Asia Pacific regions dropped to record lows in the first six months of 2020, before reaching record highs at the start of 2021.

Sources:
International Gas Union
Incorrys Analysis
GIIGN
US Energy Information Administration

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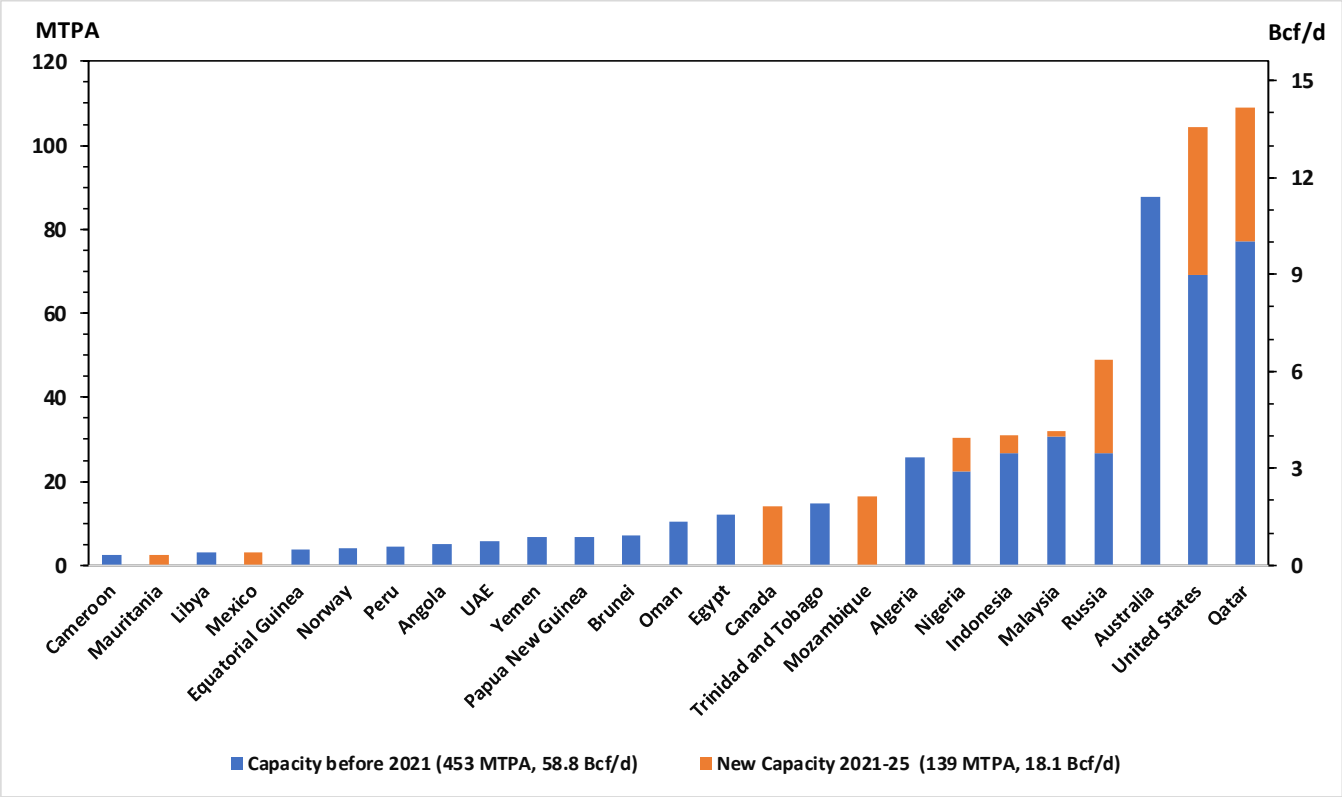
LIQUEFICATION CAPACITY BY COUNTRY



- World total liquefication capacity before 2021 was 452.6 MTPA (58.8 Bcf/d). Before 2026 liquefication capacity is expected to increase on around 139 MTPA (18.1 Bcf/d). Total capacity will reach over 592 MTPA (76.9 Bcf/d).
- In 2025 25 countries will become exporters of LNG* including four new countries: Mauritania, Mozambique, Canada, and Mexico.
- Qatar Petroleum has taken the final investment decision for the North Field East (NFE) – world largest LNG Project with capacity 32 MTPA (4.2 Bcf/d). Qatar will become largest LNG exporter following by US and Australia.

* Yemen is not included since the facility is not operational

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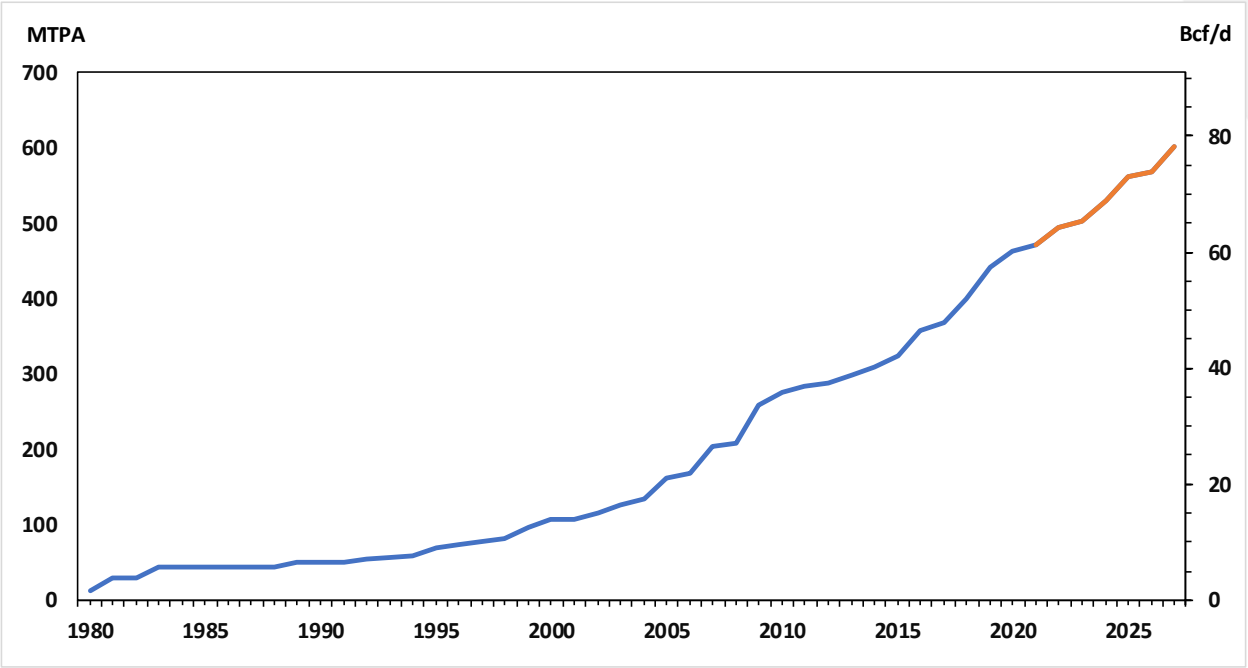
WORLD LNG LIQUEFICATION CAPACITY GROWTH



By the end of 2026 world liquefication capacity is expected to reach 600 MTPA (78 Bcf/d).
As of February 2021, projects with LNG liquefication capacity almost 900 MTPA were proposed. Most of these project will be uneconomical and will not be built. The majority of these projects are in the United States and Canada.

The liquefaction projects (all in the United States) that came online in 2020 were:

- Freeport LNG T2-T3 (10.2 MTPA, 1.3 Bcf/d)
- Cameron LNG T2-T3 (8.0 MTPA, 1.0 Bcf/d)
- Elba Island T4-T10 (1.75 MTPA , 0.2 Bcf/d)

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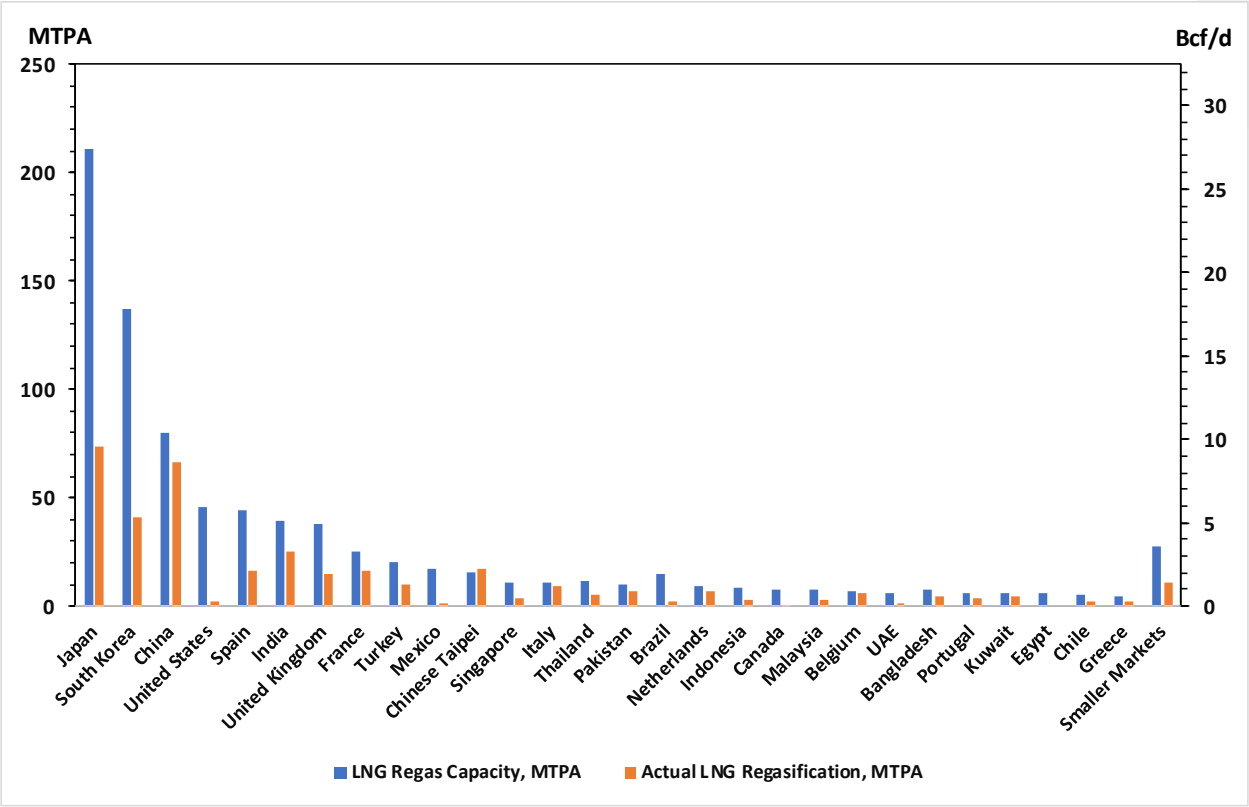
LNG REGASIFICATION BY COUNTRY

2020 Data



- Japan has the largest regasification capacity of 210.5 MTPA (27.4 Bcf/d), followed by South Korea with 136.8 MTPA (17.8 Bcf/d) and China 79.9 MTPA (10.4 Bcf/d).
- As of February 2021, 39 countries had LNG receiving capabilities.
- In 2020 Average utilization of LNG regasification facilities was 43%. The lowest utilization was in Egypt (0%), US (5%), Mexico (7%), and Canada (8%).
- As of February 2021, 147.3 MTPA (19.1 Bcf/d) of new regasification capacity is under construction. It includes including 19 new onshore terminals, 10 Floating Storage and Regasification Units (FSRUs) and 8 expansion projects at existing terminals.

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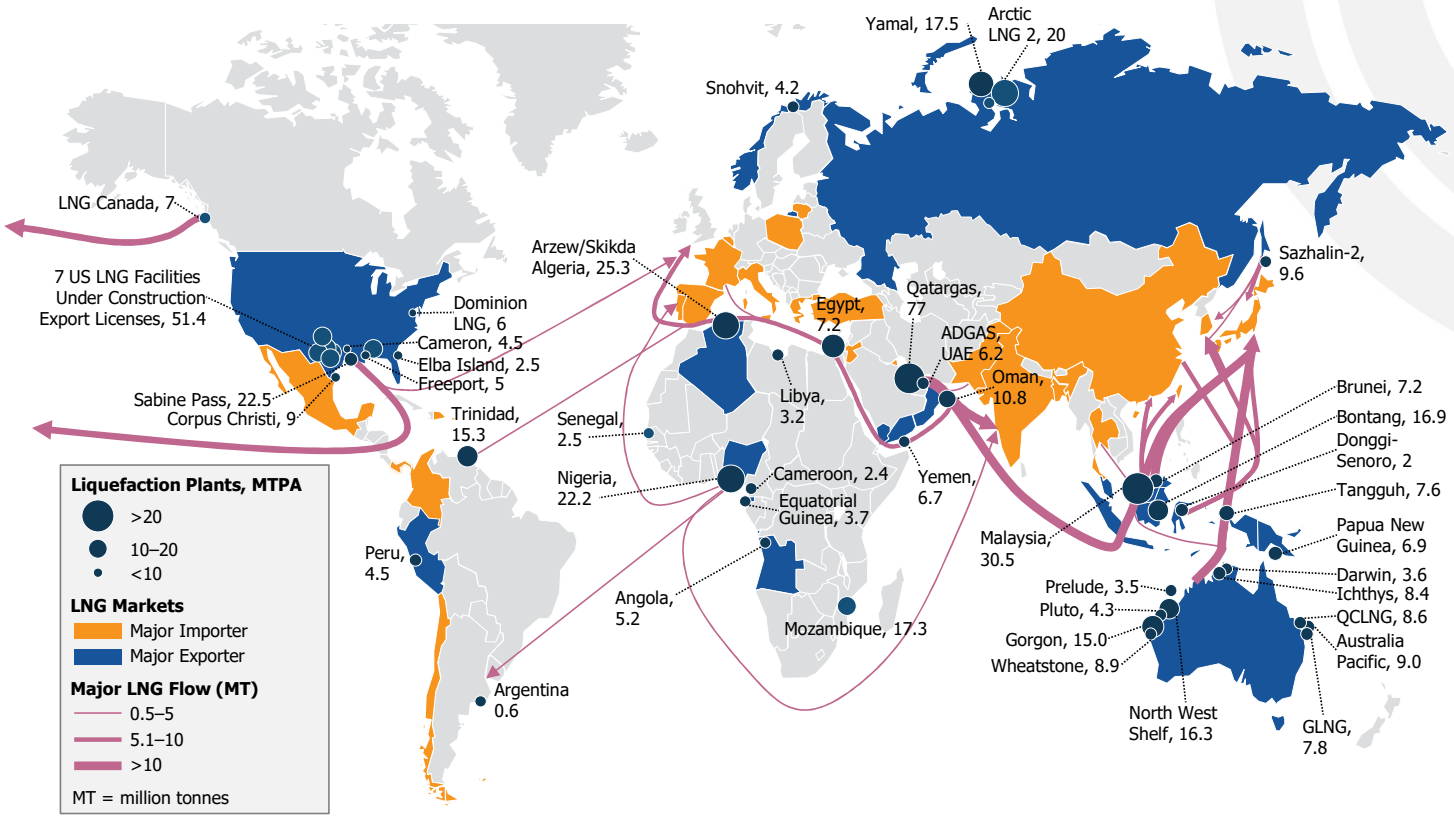
LNG EXPORT IMPORT COUNTRIES



The figure shows the location of major operational and under construction liquefaction facilities and LNG shipping routes worldwide. The varying dot sizes indicate the facilities' capacities. LNG is coming to European and East Asian markets primarily from the Middle East, Indonesia, Malaysia, Australia, and recently, the United States.

- Approximate Locations (as of Nov 2021); Under construction project with start date before 2026. Not all facilities are operating at capacity due to declining gas production, operational issues, and other factors.

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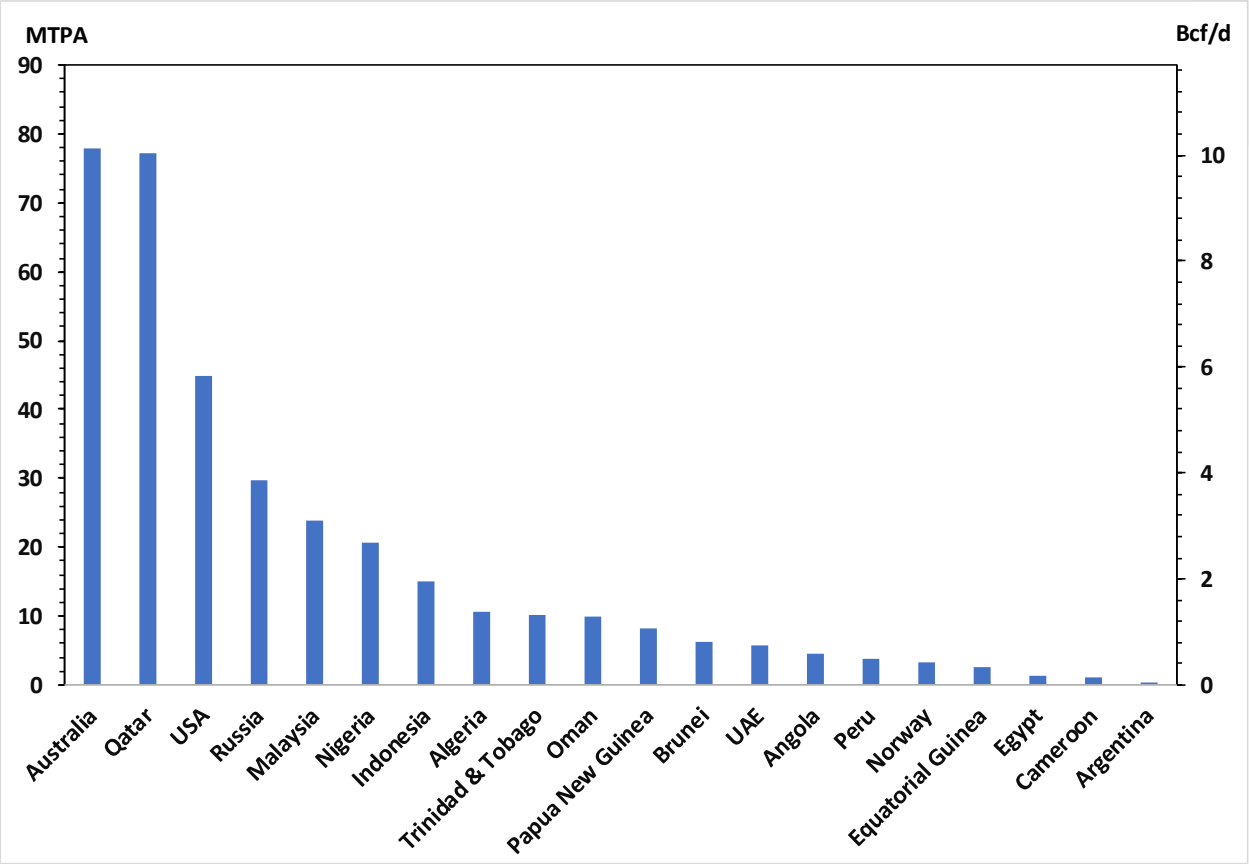
LNG EXPORT



- In 2020 twenty countries were exporters of LNG, top five have 71% of total market share:
  - Australia 77.8 MTPA, 10.1 Bcf/d
  - Qatar 77.1 MTPA , 10.0 Bcf/d
  - USA 44.8 MTPA, 5.8 Bcf/d
  - Russia 29.6 MTPA, 3.8 Bcf/d
  - Malaysia 23.9 MTPA, 3.1 Bcf/d
- In 2020 the largest global LNG trade flow route continues to be intra-Asia Pacific trade (84.3 MTPA , 11 Bcf/d), which includes exports from Australia to Japan, and South Korea.
- Export from the Middle East to Asia Pacific was 33.9 MTPA (4.4 Bcf/d). It includes exports from Qatar.

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LNG SHIPPING

Charter rates per day:

Shipping Technology	Beginning of 2020	End of 2020
Steam turbine	$70,000	$20,000
Duel and Triple-Fuel Diesel Electric (DFDE/TFDE)	$90,000	$30,000
Low-pressure slow-speed dual-fuel (X-DF), high-pressure slow-speed dual-fuel (ME-GI)	$105,000	$40,000

- In 2020 approximately 15 vessels were laid up
- LNG vessels under construction is 130
- 64 LNG vessels and scheduled for Delivery in 2021

- LNG shipping fleet in 2020 increased on 35 new vessels; the total number of active vessels reached 572 at the end 2020, including 37 Floating Storage and Regasification Units (FSRUs) and 4 Floating Storage Unit (FSUs).
- In 2020 number on LNG voyages grew modestly on 1% versus 2019, due to demand reductions as result of the COVID-19 pandemic and alongside a mild winter. Total number of voyages in 2020 is 5,757
- In 2020 global LNG Trade increased on 0.4%.

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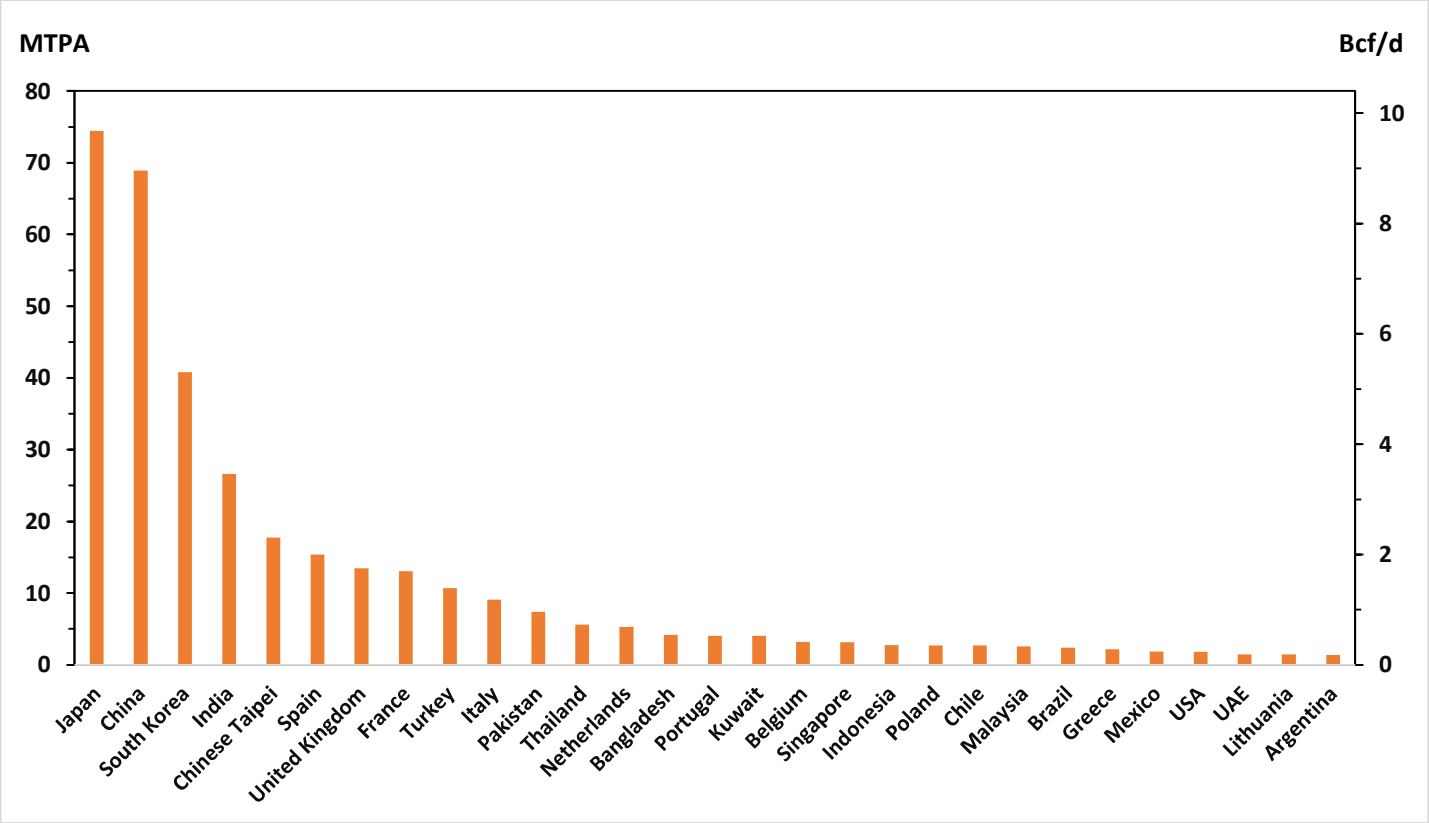
LNG IMPORT



- Total volume of LNG trade in 2020 was 356 MTPA (46.3 Bcf/d).
- 42 countries imported LNG in 2020
- In 2020 Japan was the largest importer of LNG with 74.5 MTPA (9.7 Bcf/d), followed by China (69 MTPA, 9.0 Bcf/d) and South Korea (40.8 MTPA, 5.3 Bcf/d)
- Global LNG trade increased on 1.4 MTPA versus 2019, despite COVID-19 related impacts on the supply and demand sides.

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US LNG PROJECTS

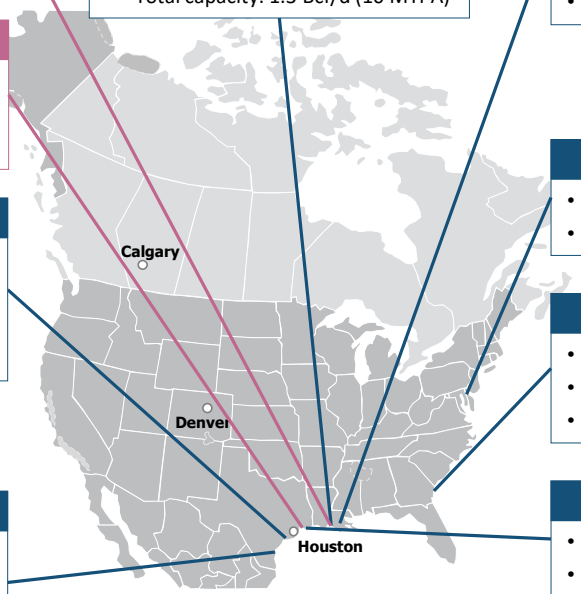
Driftwood LNG, LA
- Tellurian Inc.
- Production starts 2027
- 3.6 Bcf/d (27.6 MTPA)

Golden Pass, TX
- ExxonMobil and Qatar Petroleum
- Production starts 2024-2025
- 2.1 Bcf/d (16 MTPA)

Freeport, TX
- Freeport LNG
- 0.7 Bcf/d (5 MTPA) – Train 1
- 1.4 Bcf/d (10 MTPA) – Train 2-3
- Completed in 2020

Corpus Christi, TX
- Cheniere
- 1.2 Bcf/d (9 MTPA) –Train 1-2
- 0.6 Bcf/d (4.5 MTPA) – Train 3
- Completed in 2021

Calcasieu Pass, LA
- Venture Global LNG
- Total of 18 modular trains, first 2 trains start 2022 (~0.15 Bcf/d)
- Total capacity: 1.3 Bcf/d (10 MTPA)



Cameron LNG, LA
- Sempra
- 0.6 Bcf/d (4.5 MTPA) –Train 1
- 1.4 Bcf/d (9 MTPA) – Train 2-3
- Completed in 2020

Cove Point, MD
- Dominion Resources
- 0.8 Bcf/d (6 MTPA)

Elba Island, GA
- Kinder Morgan
- 0.35 Bcf/d (2.5 MTPA)
- Full capacity is reached in 2020

Sabine Pass, LA
- Cheniere
- 3.0 Bcf/d (22.5 MTPA) – 5 Trains

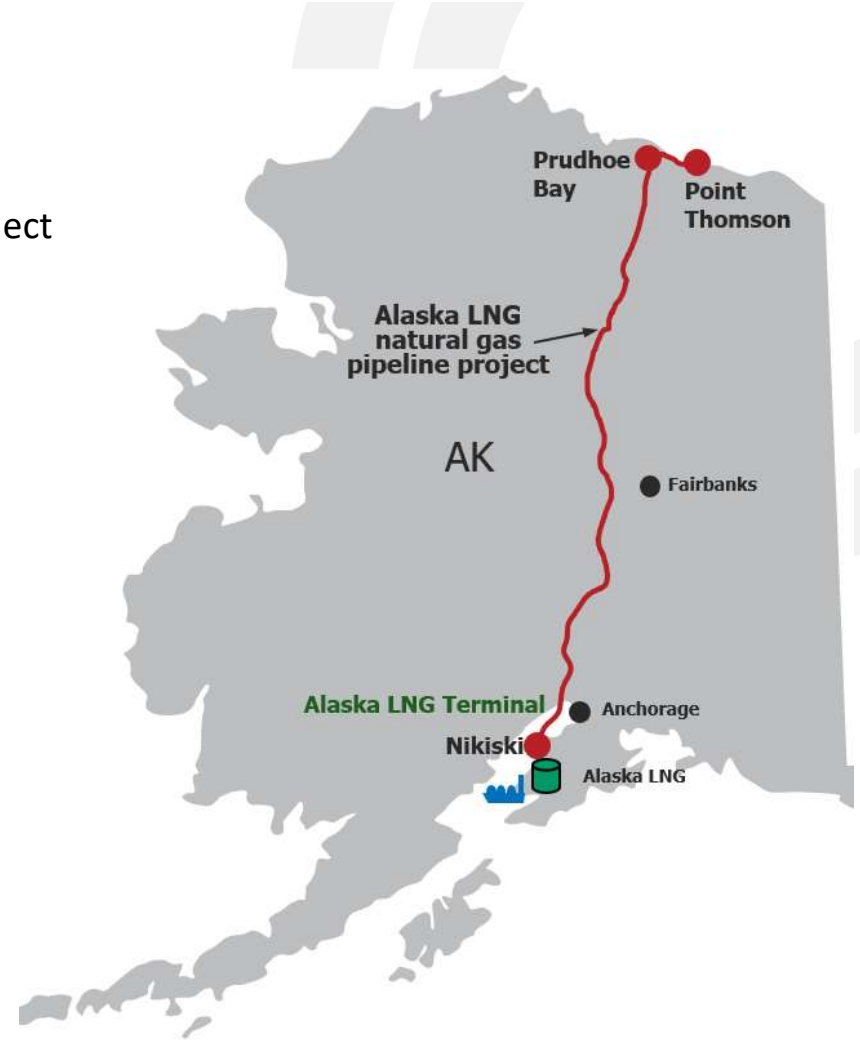
Sabine Pass, Train 6
- 0.6 Bcf/d (4.5 MTPA)
- Completion 2023

Operational Under Construction

ALASKA LNG

The proposed $43.4 billion 20 MTPA Alaska LNG project from North Slope to Southcentral Alaska

- Proponent: Alaska Gasline Development Corporation (AGDC)
- The Prudhoe Bay and Point Thomson fields are expected to produce 3.5 Bcf/d of gas.
- 2.6 Bcf/d (20.0 MTPA) – 3 Trains, Gas Treatment Plant (3.3 Bcf/d capacity) at Prudhoe Bay, 3 × 160,000 m3 Storage Tanks, and 800-mile 42-inch pipeline (3.3 Bcf/d capacity). Cost 45–65B USD.
- The project received FERC authorization in Q2 2020 and Army Corps approval in Q4 2021
- US Government has provided a 30-year, US$25.6 Billion loan guarantee at 80-20 debt to equity which will reduce the cost of debt in increase project economics.



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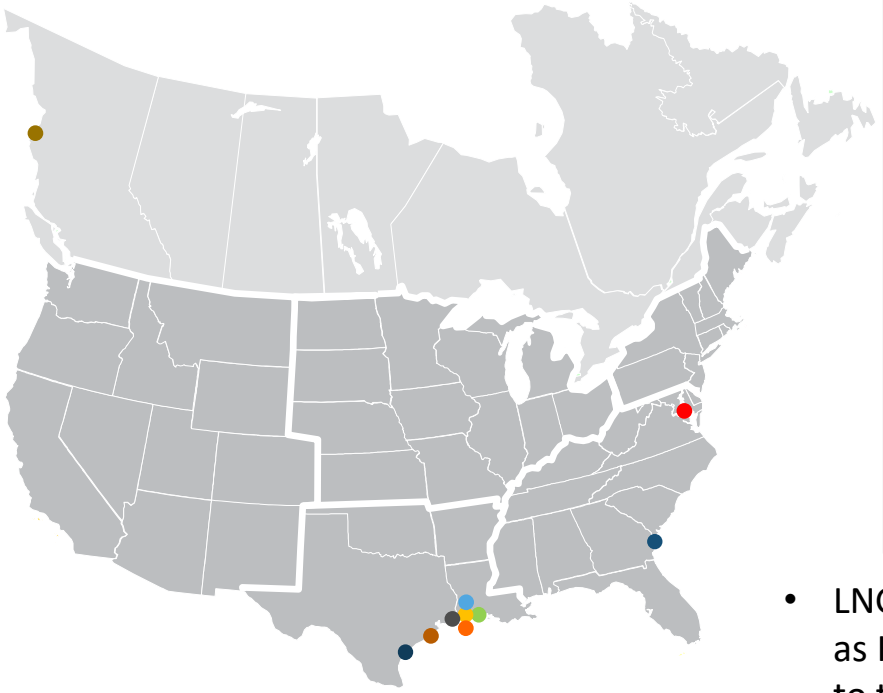
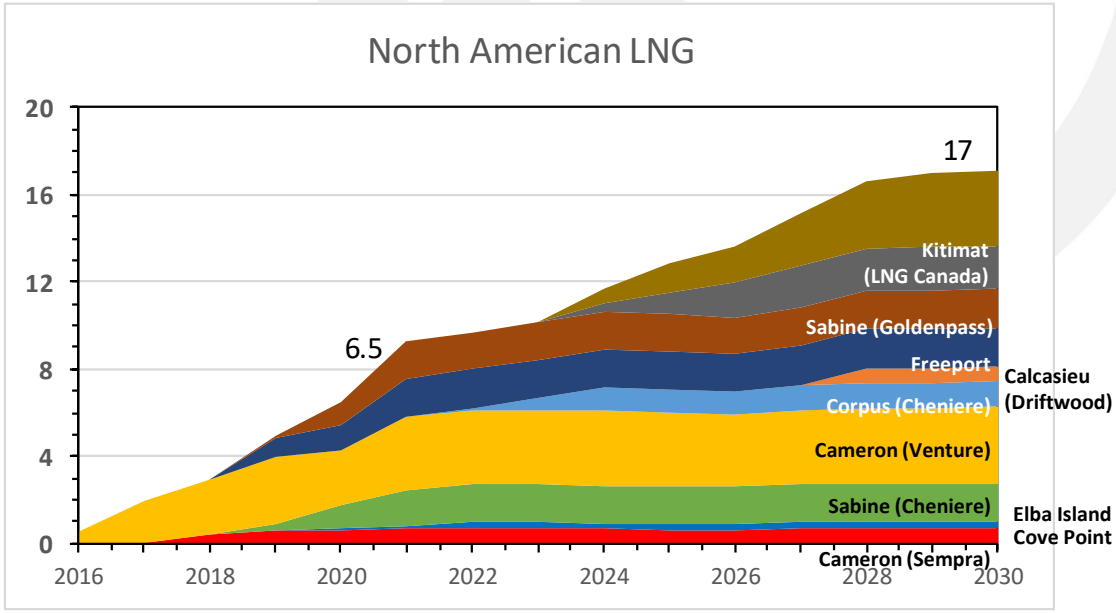
NORTH AMERICAN LNG EXPORTS TO 2030





- LNG Exports are expected to increase 10.5 Bcf/d over the next decade as Henry Hub pricing continues to offer worldwide buyers the ability to transact in a highly liquid and transparent market.
- Although there are many more projects proposed, Incorrys believes the ability of developers to source high quality credit for the next trench of worldwide demand growth will be limited by risks of emerging carbon uncertainties over the next decade.

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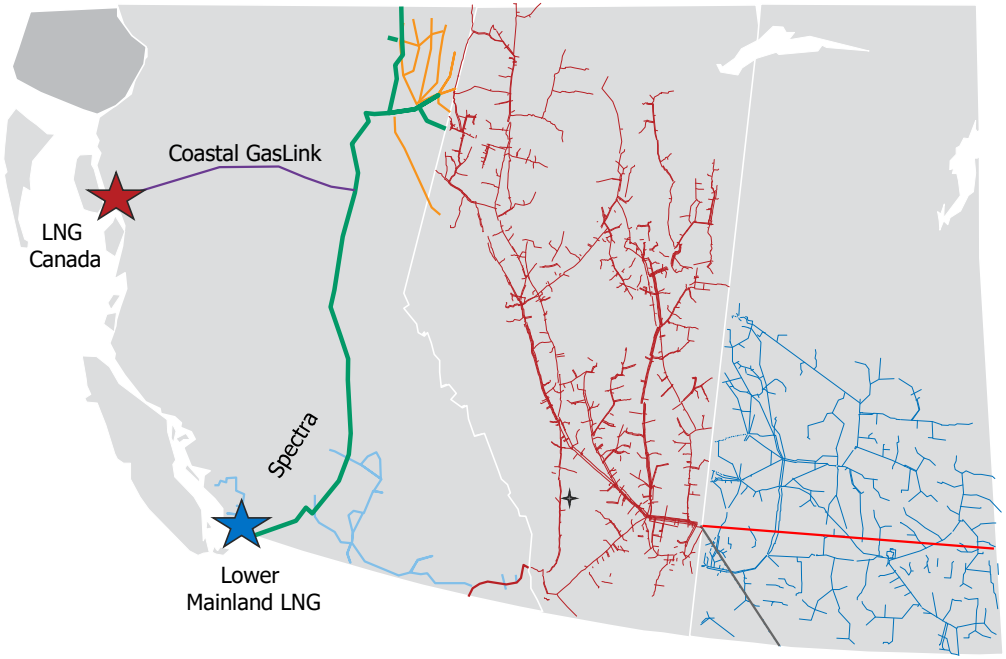
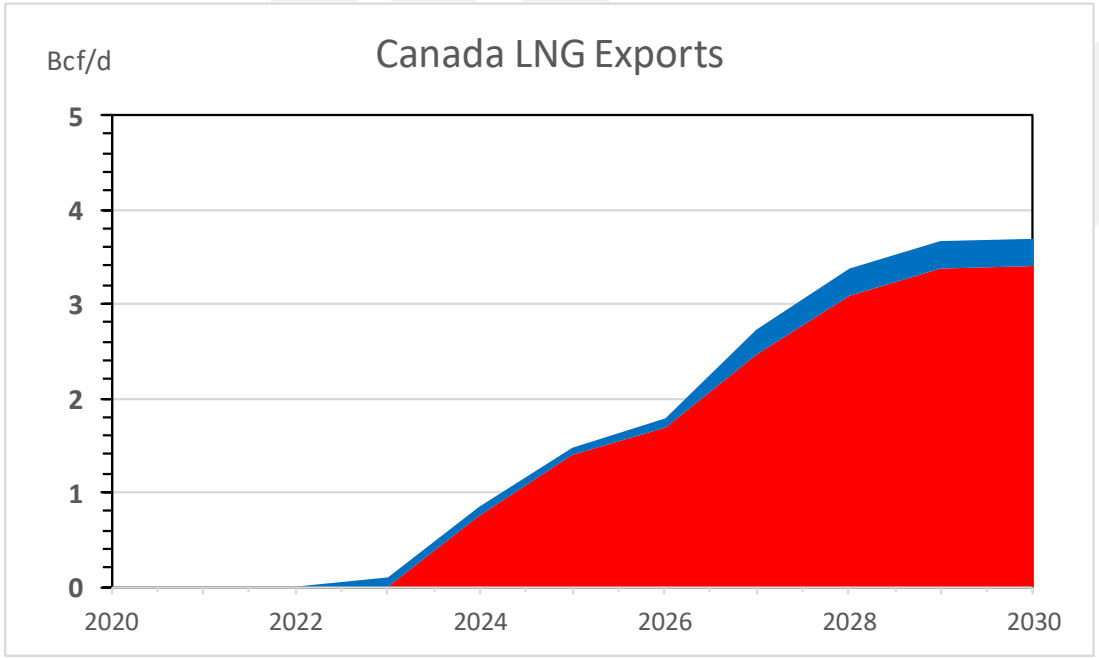
CANADIAN LNG EXPORTS GROWTH





- LNG Exports are the largest growth driver for Canadian Demand. Completion of the LNG Canada's second train moves this sector's demand to reach 3.4 Bcf/d by 2030
- LNG Canada: The Shell-led 3.2 Bcf/d project is currently under construction, having received NEB export approval and both federal and provincial environmental assessment certificates. First exports are expected in 2024.
- A smaller lower mainland project is expected to begin exports in 2023 reaching 0.3 Bcf/d by 2030.

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WEST COAST CANADA LNG EXPORT PROJECTS

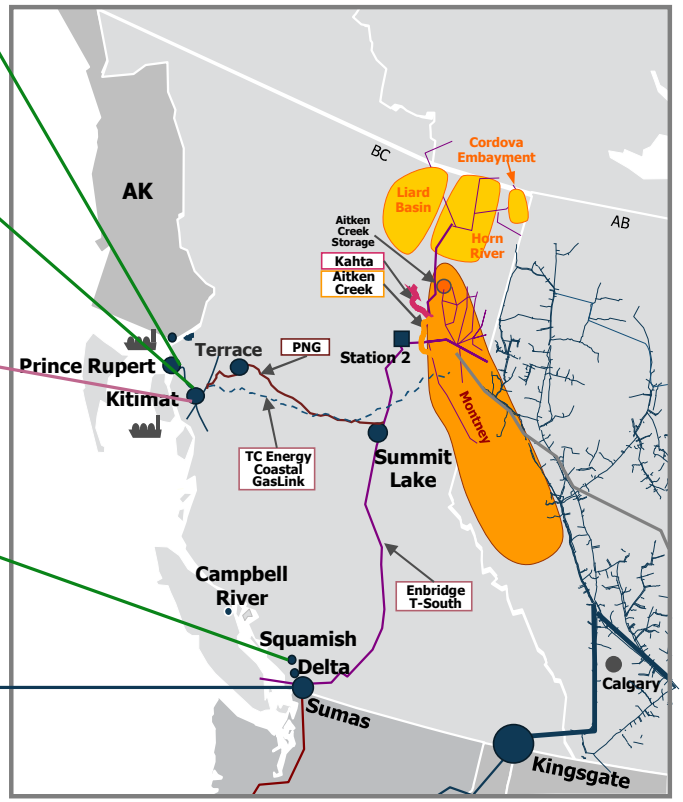
Ksi Lisims LNG
- Nisga Nation, Rockies LNG and Western LNG
- 1.8 Bcf/d (12 Mtpa), pipeline options being evaluated
- In-service 2028

Cedar LNG
- Haisla/Pembina 0.4 Bcf/d (3 Mtpa) floating terminal.
- In-service H2 2027
- Option for capacity on Coastal Gaslink

LNG Canada
- Shell (40%), Petronas (25%),CNPC (15%), Mitsubishi (15%), & KOGAS (5%)
- 3.5 Bcf/d (26 Mtpa)
- Under Construction, 2024 in service
- 100% offtake (by equity partners)

Woodfibre LNG
- Woodfibre LNG
- 0.3 Bcf/d (2.1 Mtpa)
- 50% MOU with Chinese gas distributor

Tilbury LNG
- Current operating FortisBC LNG Storage 0.1 Bcf/d for LDC requirements
- Expanding to 0.4 Bcf/d



- Access to pipeline connectivity a very important piece for developing Western Canada LNG export liquefaction projects:
  - $6.7 billion+ Coastal Gaslink pipeline is under construction with expected in-service of 2024.
    - LNG Canada long-term commitment
    - Cedar LNG has an option for capacity
  - Enbridge T-South operates at 2.3 Bcf/d of capacity.
    - FortisBC LDC has firm transport to service the Vancouver/lower mainland region.
    - Nov 2021 Woodfibre LNG has acquired over 400 MMcf/d transport.
- Cedar LNG recently awarded its FEED contract and filed for both Federal and Provincial Environmental Impact Assessments.
- Ksi Lisims LNG is assessing pipeline options.

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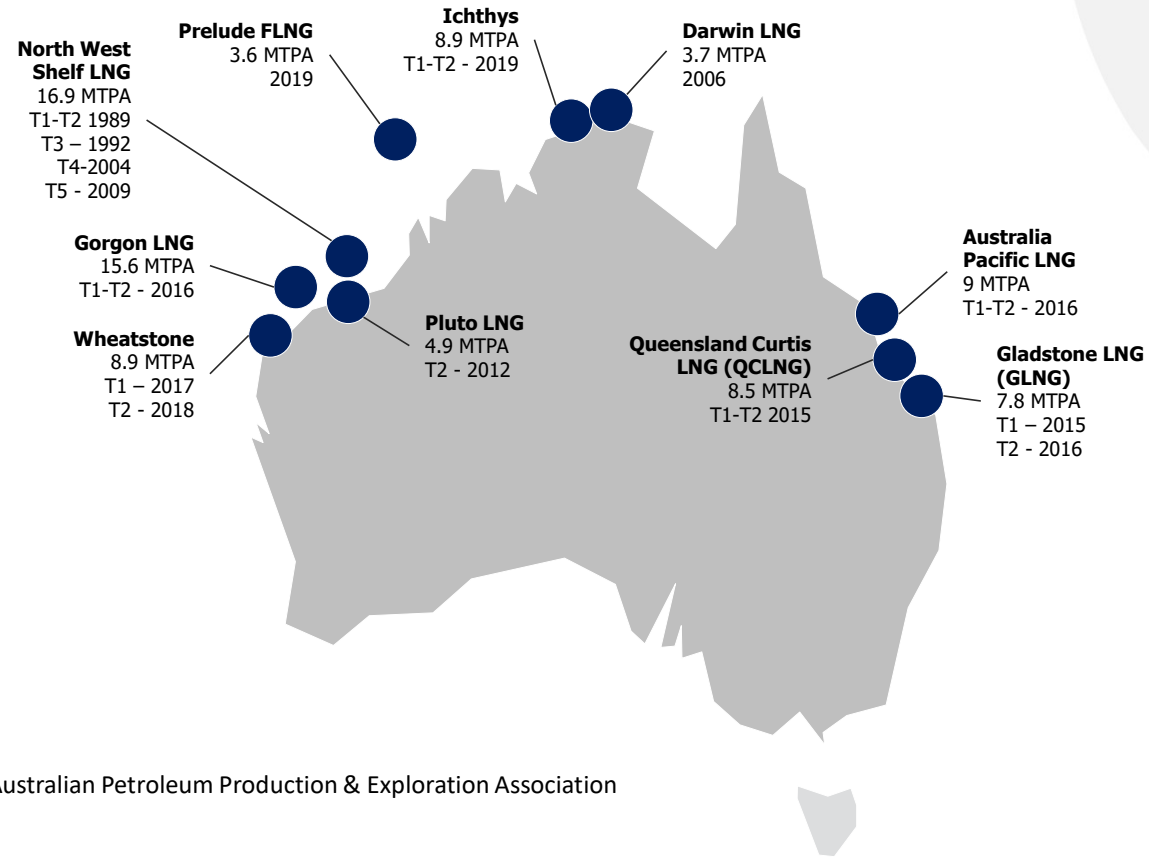
AUSTRALIAN LNG PROJECTS



Source: The Australian Petroleum Production & Exploration Association (APPEA)

- The figure shows Australia's LNG projects. Currently, Australia has ten operating LNG projects. Other projects are also being considered.
- Australia's largest project is Gorgon, developed by Chevron, ExxonMobil, and Shell.
- The Greater Gorgon area field has more than 35 trillion cubic feet (Tcf) of resources. Gorgon's project capacity is 15 million tons per annum (MTPA). Project cost is 54 billion Australian dollars (B AUD). Gorgon shipped its first cargo in March 2016.
- Another large Australian project is Wheatstone, with a capacity of 8.9 MTPA and budget of 34B AUD.

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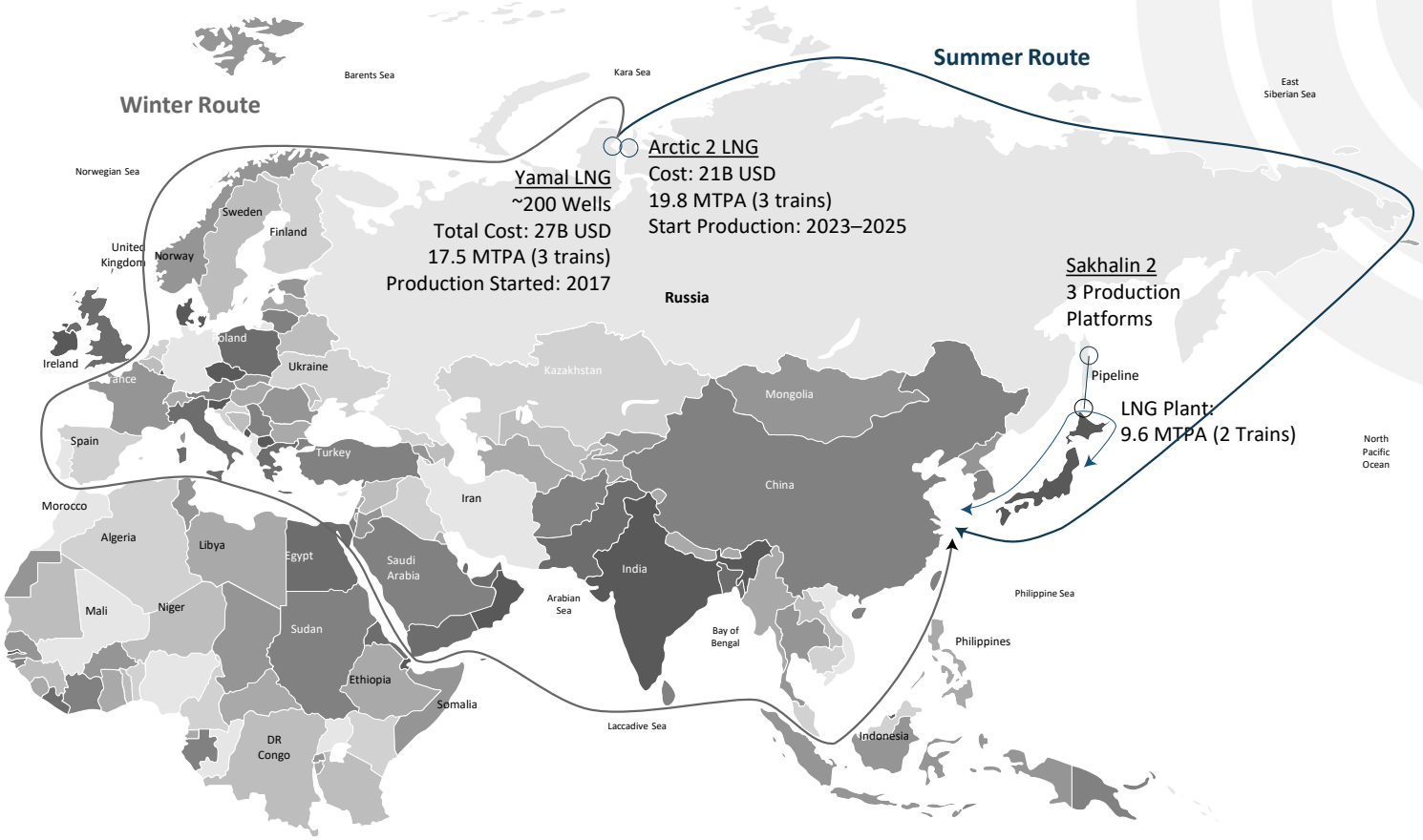
RUSSIAN LNG PROJECTS



The map shows Russian LNG projects. Eighty-six percent of the LNG produced will be shipped to the Asia/Pacific region (mostly China) through the Bering Strait in the summer and the Suez Canal in the winter, as shown in the map. Special LNG tankers will be required to operate in icy conditions without icebreakers. The remaining volume of gas will be shipped to Europe. The Yamal LNG project is owned by Novatek, Total, China National Petroleum Corporation, and Silk Road Fund.

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THANK YOU !

SALES@INCORRYS.COM

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