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QILAK LNG 1: PROJECT BACKDROP

Arctic LNG is a proven concept

- Proven gas reserves of 32.4 TCF across gas fields owned by ExxonMobil, Hilcorp, and ConocoPhillips in the Alaskan North Slope with probable gas reserves of 100 TCF
- Previous efforts to commercialize gas through 800+ mile pipelines to the rest of the US / South Coast Alaskan LNG plants have been too expensive and uncompetitive
- Yamal LNG in Russia has proven the economic viability of Arctic LNG using icebreaking LNG carriers to export LNG throughout the year
- Arctic North American reserves are closer to Asian end markets compared to Gulf of Mexico (via Panama) and Northern Russian coast (e.g. 2,000 miles shorter distance than Yamal)
- NSLNG concept also provides a number of advantages:
 - Uses incremental liquefaction plants built in a shipyard and floated into place
 - Minimal infrastructure required and standardized equipment
 - Flexibility: ability to reposition if necessary

Stranded gas reserves in North American Arctic

A map of the North American Arctic region showing various gas reserves. A box labeled 'AKLNG' contains the following text: '339 Bn, 20 MTPA project', '800-mile pipeline to ice-free port', and 'Over \$500 M spent on Feasibility'. Other reserves shown include Northstar (0.8 tcf, Hilcorp), Prudhoe Bay (24 tcf, Hilcorp), Point Thomson (6 tcf, Exxon), Mackenzie River Delta (~7.5 tcf, Various), and Endicott (1.6 tcf, Hilcorp).

Significantly shorter distance to Asian markets

A map comparing the distance from Yamal LNG in Russia to Asian markets (represented by a star in the Pacific) with the distance from North Slope LNG in Alaska. The distance from Yamal LNG is marked as 2,000 miles, while the distance from North Slope LNG is marked as 2,000 miles. The map shows the Arctic Ocean, Bering Sea, and Chukchi Sea.

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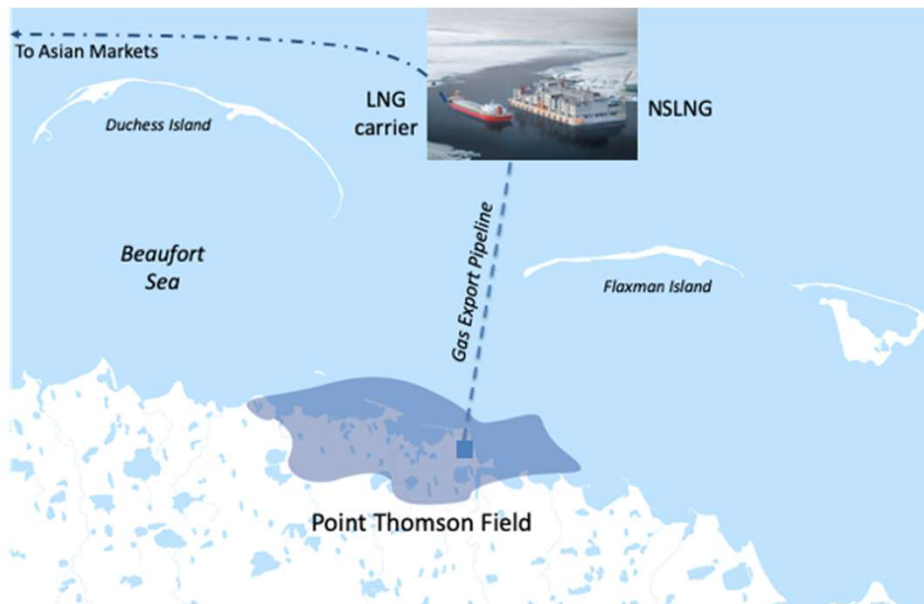
Russian Gas Developments in the Arctic – Yamal LNG, Arctic 1 and 2



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Qilak LNG - Similar GBS concept deployed offshore Point Thomson



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LNG Shipping Solution for Arctic Waters



Christophe de Margerie LNG Carrier



- Ice-class LNG carrier design is based on the double - action concept: the bow has been optimized for navigation in open water and thin ice, while the stern has been optimized to enable navigation in severe ice conditions enabling year-round delivery of LNG produced in the Arctic.
- The Yamal LNG project has 15 Mk 1 vessels in operation and a further 6 of the Mk 2 design are on order for the Arctic LNG 2 project. Qilak LNG will require 3 to 5 vessels depending on destination.

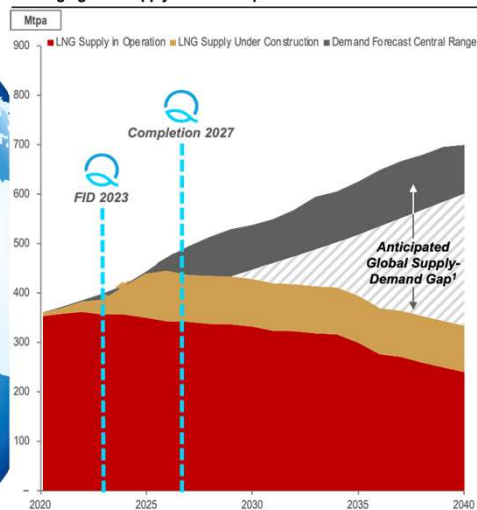
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LNG Shipping to Asian Markets



Emerging LNG Supply-Demand Gap



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Thank You!



Qilak LNG

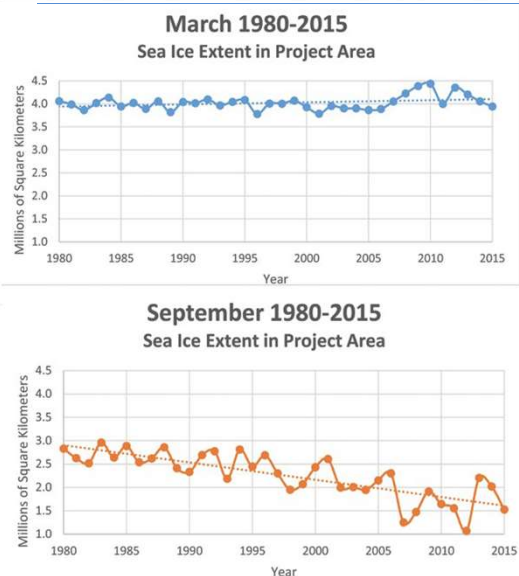
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Significant Changes in Areal Extent of Sea Ice



Bering Sea ice is 1st year ice that is pushed south from higher latitudes by winds. Translating into less change to the sea ice max extent that occurs in March while Sept. sea ice extent has decreased.

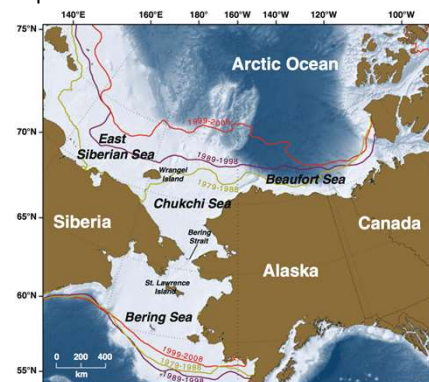


Fig. 3.1 Location of the Pacific Arctic Region (PAR). Isolines (based on SMMR and SSM/I sea ice concentrations) indicate the position of the median sea ice edge (defined by a 15 % sea ice concentration threshold) for 1979–1988, 1989–1998, and 1999–2008 during both March (southern isolines) and September (northern isolines)

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**Relative 100-yr GHG Emissions for Chinese Power Generation:
Local coal versus LNG sourced from USGC, Kitimat and Qilak LNG**

