

# Alaska LNG Project Update

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Presented to SPE - National Capital Section  
May 11, 2022



# Who is AGDC?

## The Alaska Gasline Development Corporation (AGDC):

- Independent, public corporation owned by the State of Alaska
- Created by the Alaska State Legislature
- Sole owner developing the Alaska LNG Project

**Goal:** Maximize the benefit of Alaska's vast North Slope natural gas resources through the development of infrastructure necessary to move the gas to local and international markets.

# Alaska LNG System

## North Slope Gas Supply

- 40 Trillion cubic feet (tcf) of discovered, conventional, and developed North Slope associated gas from Prudhoe Bay and Point Thomson
- This gas is stranded and can be produced at a low incremental cost

## Gas Treatment Plant

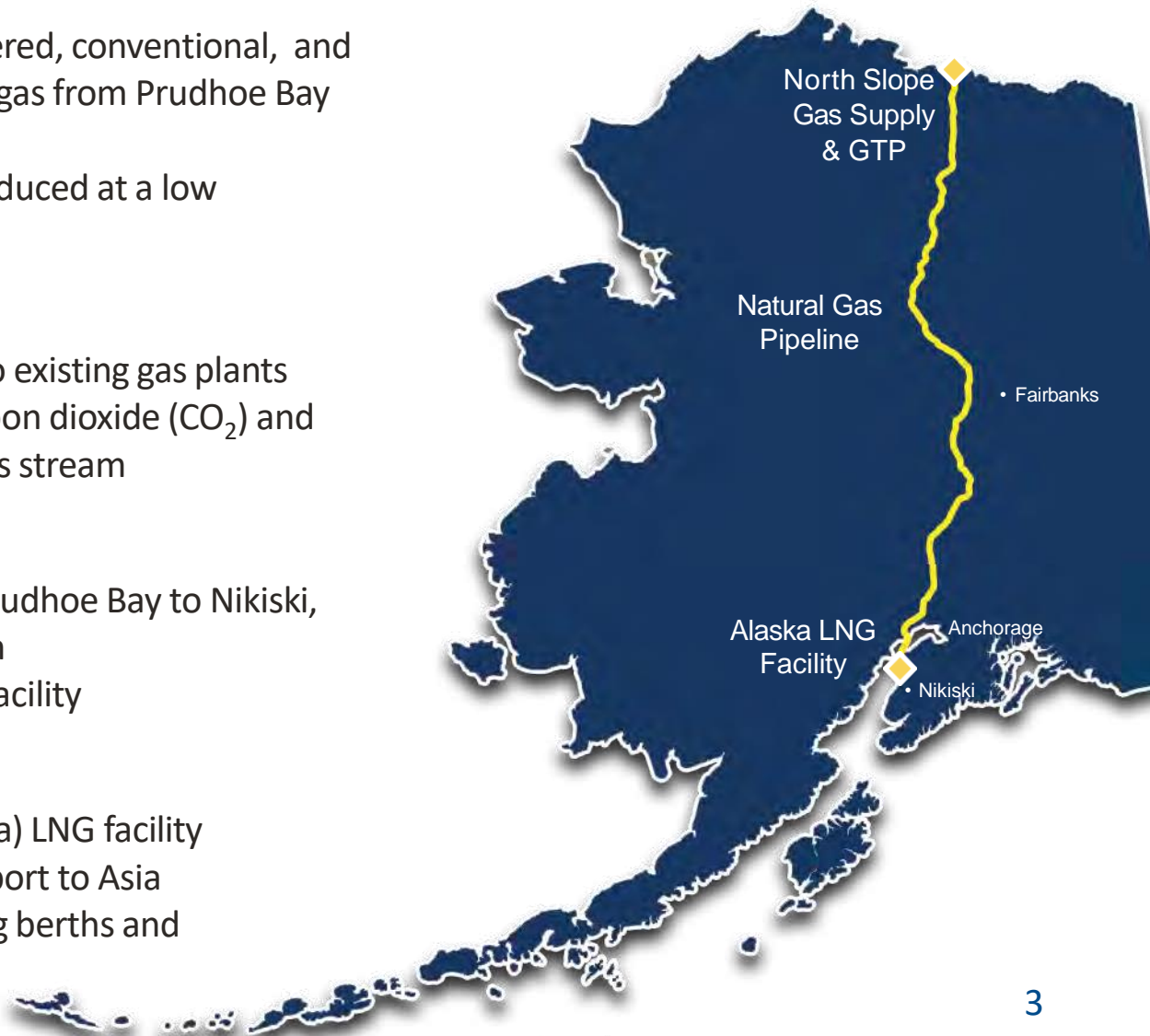
- Located in Prudhoe Bay adjacent to existing gas plants
- Removes and uses/sequesters carbon dioxide (CO<sub>2</sub>) and hydrogen sulfide (H<sub>2</sub>S) from raw gas stream

## Natural Gas Pipeline

- 807-mile, 42" dia. mainline from Prudhoe Bay to Nikiski, following TAPS and highway system
- Provides gas to Alaskans and LNG facility

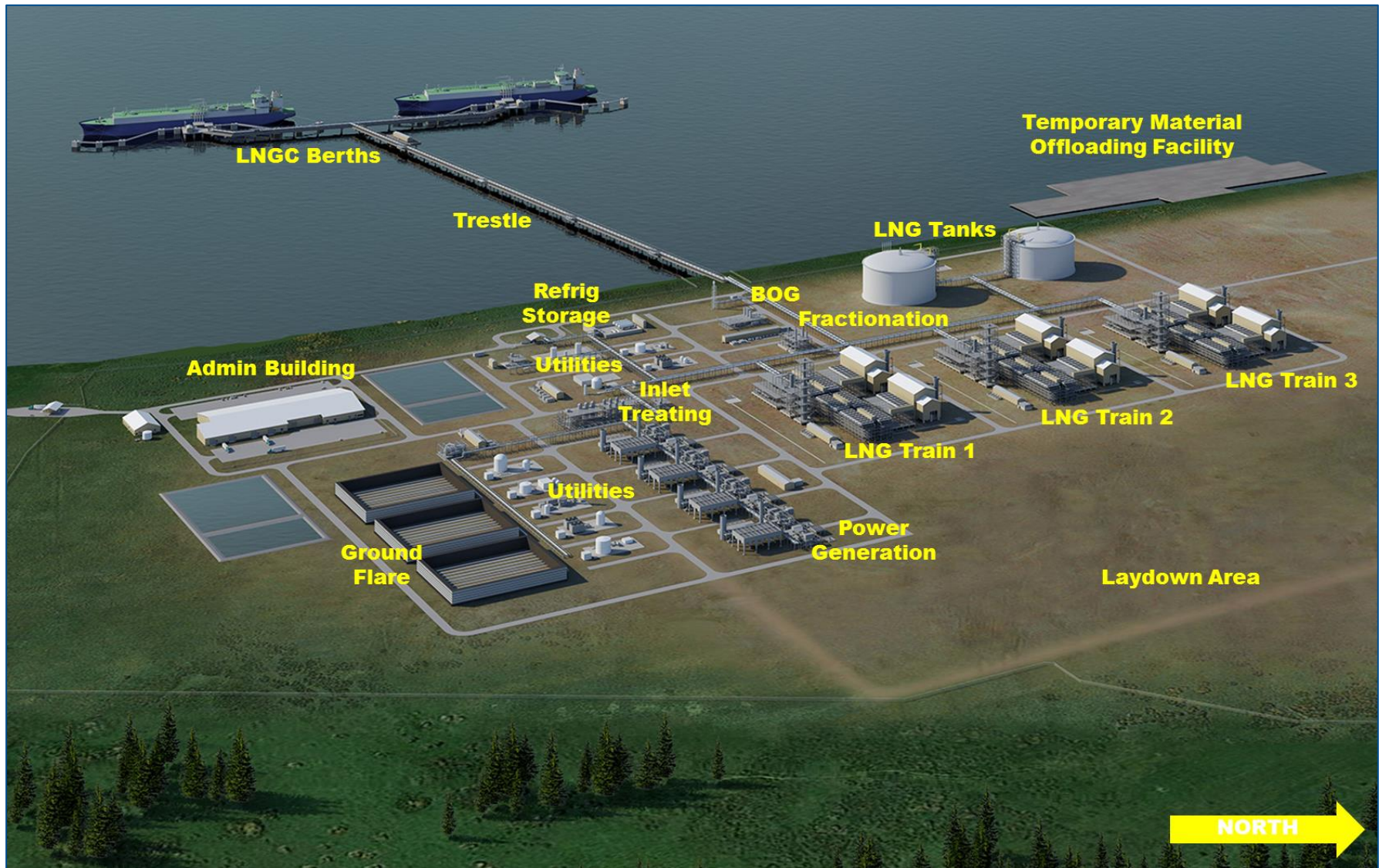
## Alaska LNG Facility

- 20 Million tonnes per annum (Mtpa) LNG facility
- Converts natural gas to LNG for export to Asia
- 3 liquefaction trains, jetty, 2 loading berths and 2 x 240,000 m<sup>3</sup> LNG tanks





# LNG Site Overview



# Fully Permitted Project

## Completed

- Federal Energy Regulatory Commission (FERC) Environmental Impact Statement (EIS) and Authorization to Construct
- All 36 Major Federal permits & authorizations
- Approved Cultural Resources Management Plan
- Gas Treatment Plant Air Permit
- Federal and State Right-of-Way Agreements Cover 92% of Project Footprint
  - Bureau of Land Management, National Park Service, State of Alaska

## FERC EIS Took Significant Effort

- 'Prefiling' work started in 2014
- Application was submitted in April 2017
  - Over 55,000 pages
- Other federal agencies were 'cooperating agencies'
  - National Marine Fisheries Service, Bureau of Land Management, Corps of Engineers, US Fish and Wildlife Service, National Park Service, Pipeline Hazardous Materials Safety Administration, US Coast Guard, Department of Energy, etc.
- AGDC responded to approximately 2,000 data requests
- Final EIS was published March 2020: 1,500 pages plus 3,500 pages of appendices

## Department of Energy (DOE) Was Cooperating Agency

- Adopted the FERC EIS
- Issued Non-Free Trade Agreement Nation export license
- Sierra Club filed Request for Rehearing

## Supplemental EIS (SEIS)

- DOE announced intentions to prepare a SEIS to include
  - Upstream analysis of potential environmental impacts
  - Lifecycle analysis (LCA) calculating GHG emissions
- DOE's National Energy Technology Laboratory (NETL) is doing the studies with support from Advanced Resources International and Potomac-Hudson Engineering Inc.
- SEIS schedule:
  - July 1, 2022: Draft SEIS, Public Hearings, Public Comment Period
  - November 14, 2022: Final SEIS
  - February 13, 2023: Final Order and NEPA Record of Decision
- AGDC is planning community and stakeholder outreach during the SEIS comment period

# LNG Demand Forecast

## LNG Market is Still Growing

- Demand growth will outpace current and planned LNG capacity
- LNG growth expected as part of energy transition as natural gas emits half the greenhouse gases as coal

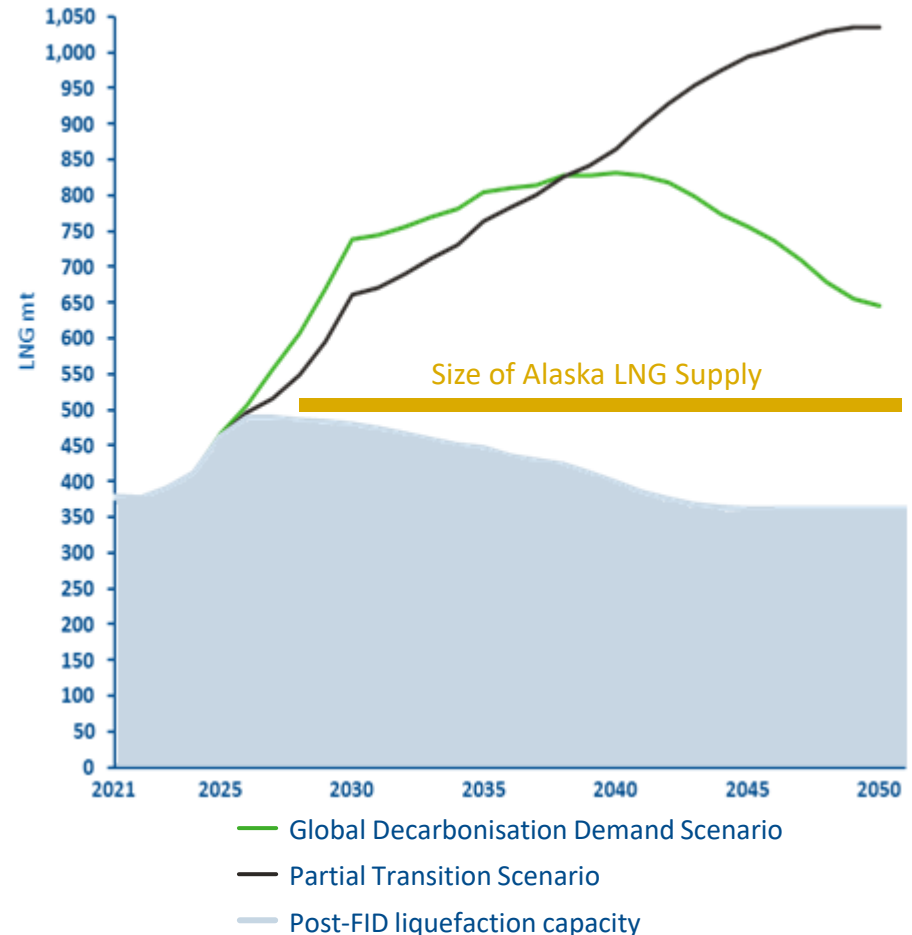
## Investors and Buyers want LNG

- New LNG projects expected to be sanctioned in 2022
- Most new projects have some degree of energy transition planning
- Under both energy transition scenarios, LNG demand exceeds supply for the expected life of the Alaska LNG Project

“...raising capital for these very capital-intensive [LNG] projects has not really been that much of a challenge to the industry. I think that sends a strong signal of confidence that this [LNG] is going to be around for a while.”

-Dan Brouillette, President of Sempra Infrastructure on NPR's Marketplace (Jan 3, 2022)

Global LNG Supply/Demand Balance Forecast,  
2021-2050



Source: Gas Strategies



# Focus on US LNG for Energy Security

## US LNG Can Replace All Russia Gas to Europe

- 15 Billion cubic feet/day (Bcfd) of gas delivered from Russia to Europe

## But It Will Take Time

- 3.7 Bcfd of LNG is under construction in the Gulf Coast
- Another 24.9 Bcfd is permitted for construction in the Gulf Coast
- Alaska, at 2.63 Bcfd is the only Pacific Basin project permitted for construction

### North American LNG Export Terminals Approved, Not Yet Built



#### Export Terminals

##### UNITED STATES

##### FERC – APPROVED, UNDER CONSTRUCTION

1. Cameron Parish, LA: 1.41 Bcfd (Venture Global Calcasieu Pass) (CP15-550)
2. Sabine Pass, TX: 2.26 Bcfd (ExxonMobil – Golden Pass) (CP14-517, CP20-459)

##### FERC – APPROVED, NOT UNDER CONSTRUCTION

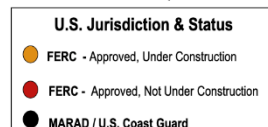
- A. Lake Charles, LA: 2.2 Bcfd (Lake Charles LNG) (CP14-120)
- B. Lake Charles, LA: 1.186 Bcfd (Magnolia LNG) (CP14-347)
- C. Hackberry, LA: 1.41 Bcfd (Semptra - Cameron LNG Trains 4 & 5) (CP15-560)
- D. Calcasieu Parish, LA: 4.0 Bcfd (Driftwood LNG) (CP17-117)
- E. Port Arthur, TX: 1.86 Bcfd (Port Arthur LNG Trains 1 & 2) (CP17-20)
- F. Freeport, TX: 0.72 Bcfd (Freeport LNG Dev Train 4) (CP17-470)
- G. Pascagoula, MS: 1.5 Bcfd (Gulf LNG Liquefaction) (CP15-521)
- H. Jacksonville, FL: 0.132 Bcfd (Eagle LNG Partners) (CP17-41)
- I. Plaquemines Parish, LA: 3.40 Bcfd (Venture Global Plaquemines) (CP17-66)
- J. Brownsville, TX: 0.55 Bcfd (Texas LNG Brownsville) (CP16-116)
- K. Brownsville, TX: 3.6 Bcfd (Rio Grande LNG – NextDecade) (CP16-454)
- L. Corpus Christi, TX: 1.86 Bcfd (Cheniere Corpus Christi Stage III) (CP18-512)
- M. Nikiski, AK: 2.63 Bcfd (Alaska Gasline) (CP17-178)

##### MARAD/USCG – APPROVED, NOT UNDER CONSTRUCTION

- MC. Gulf of Mexico: 1.8 Bcfd (Delfin LNG)

##### CANADA - LNG IMPORT AND PROPOSED EXPORT FACILITIES

<https://www.nrncan.gc.ca/energy/natural-gas/5683>



2.6 Bcfd  
(20 MTPA) to Asia

Up to 28.6 Bcfd  
(220 MTPA) to  
Europe

As of February 16, 2022



# Wood Mackenzie Cost of Supply

## Wood Mackenzie Updated their 2016 Alaska LNG Competitiveness Analysis

- Wood Mac independently calculated Alaska LNG cost of supply
- AGDC took on the recommendations from the 2016 report to reduce the cost of supply

## Wood Mackenzie's 2022 Report Verified that Alaska LNG Cost of Supply is now Competitive

- Transition from 100% equity funding to non-recourse project finance with a tolling model largest driver of cost reduction
- Since 2016 report, this sort of commercial model has been used to finance the growth of the U.S. LNG industry

### 2016 Report



### 2022 Update



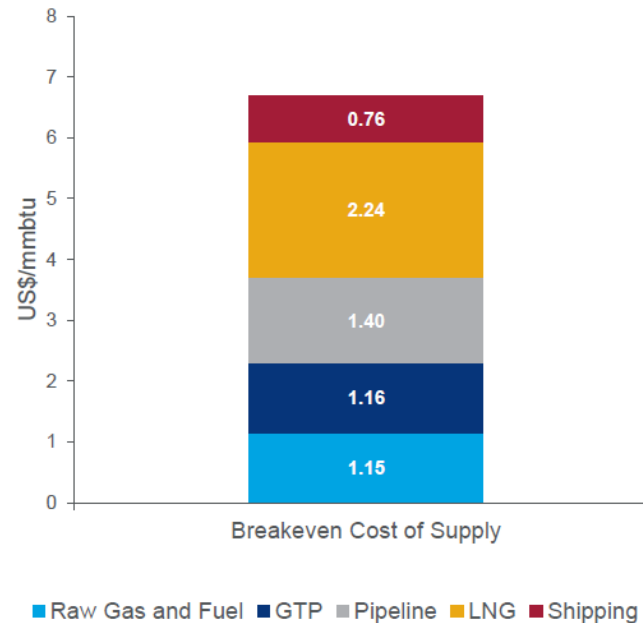
# Wood Mackenzie Cost of Supply

The new optimized CoS is estimated to be ~US\$6.7/mmbtu

## Assumptions

- The following capital costs in our base case use data provided by AGDC
  - LNG Facility – US\$16.8 billion
  - Pipeline – US\$12.7 billion
  - GTP – US\$9.2 billion
- The capex for the LNG facility, Pipeline and GTP have been financed with a 70:30 debt to equity ratio. Debt has an 18-year term at a 5% interest
- Raw gas purchased from Prudhoe Bay and Point Thomson for US\$1.0/mmbtu\* with no commodity price link. Assumed to escalate at 2% per year. Including fuel usage this is US\$1.15/mmbtu
- Shipping Costs from Alaska to East Asia assumed at US\$0.76/mmbtu, which is the average shipping costs of potential destinations in Japan, China, and Thailand
- Volumes of 3 bcf/d with ~13% used as fuel
- Domestic Market allocation: 300 mmcf/day

## Breakeven cost of supply



Note: Capital costs are in 2019 real terms; Refer to Appendix for shipping costs; \*Raw gas prices provided by AGDC and are subject to negotiation

Slide from 2022  
Wood Mackenzie  
Alaska LNG  
Competitiveness  
Analysis

\* Mmbtu = one  
million British  
thermal units

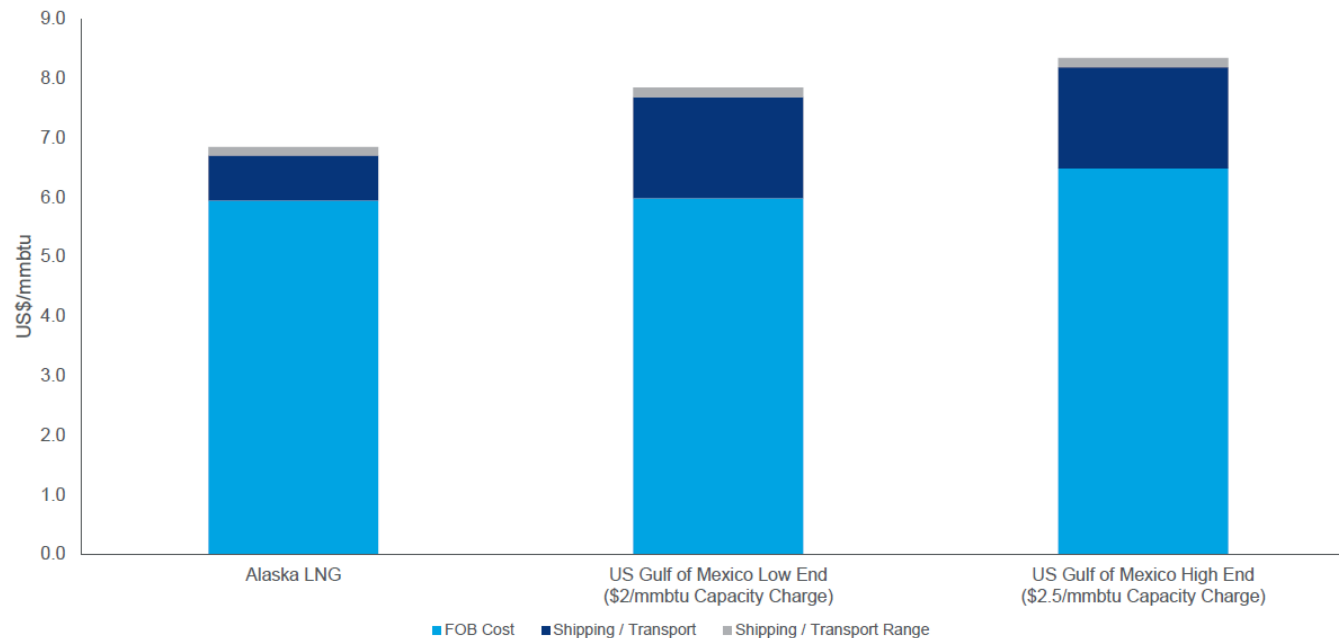
# Wood Mackenzie Cost of Supply

**With the cost optimization and new debt structure, Alaska LNG is competitive against US Gulf Coast LNG Projects**

woodmac.com



Comparison of Breakeven cost of supply for delivery into North Asia



Source: Wood Mackenzie

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*Slide from 2022  
Wood Mackenzie  
Alaska LNG  
Competitiveness  
Analysis*

# Federal Loan Guarantee

**The full faith and credit of the United States will be pledged to pay the principal and interest on \$26.3 billion of Alaska LNG debt in the event of a default**

## The Infrastructure Bill includes a loan guarantee for Alaska LNG

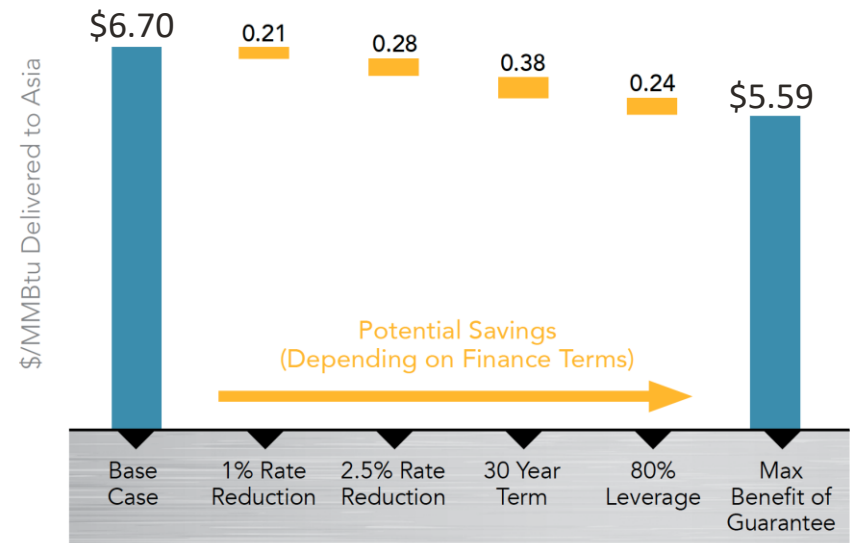
- Principle amount of debt guaranteed up to \$26.3 billion (adjusted for inflation)
- Up to 80% of the capital cost
- Term of up to 30 years
- Loan guarantee will be subject to credit terms and requirements of the loan program

## Benefits of the loan guarantee

- Reduced cost of supply
- Completion risk mitigation
- Federal government support and “skin in the game”

### Reduced Cost of Supply

- Interest rate reduction of between 1 and 2.5%
- Potential for longer term debt
- Potential for higher debt/equity ratio





# Greenhouse Gas Emissions

A lifecycle analysis of Alaska LNG shows it reduces greenhouse gas emissions for electric power generation by more than 77 million metric tons of CO<sub>2</sub>e per year in comparison to Asian coal derived power

Alaska LNG will have the same GHG impact as:

Eliminating



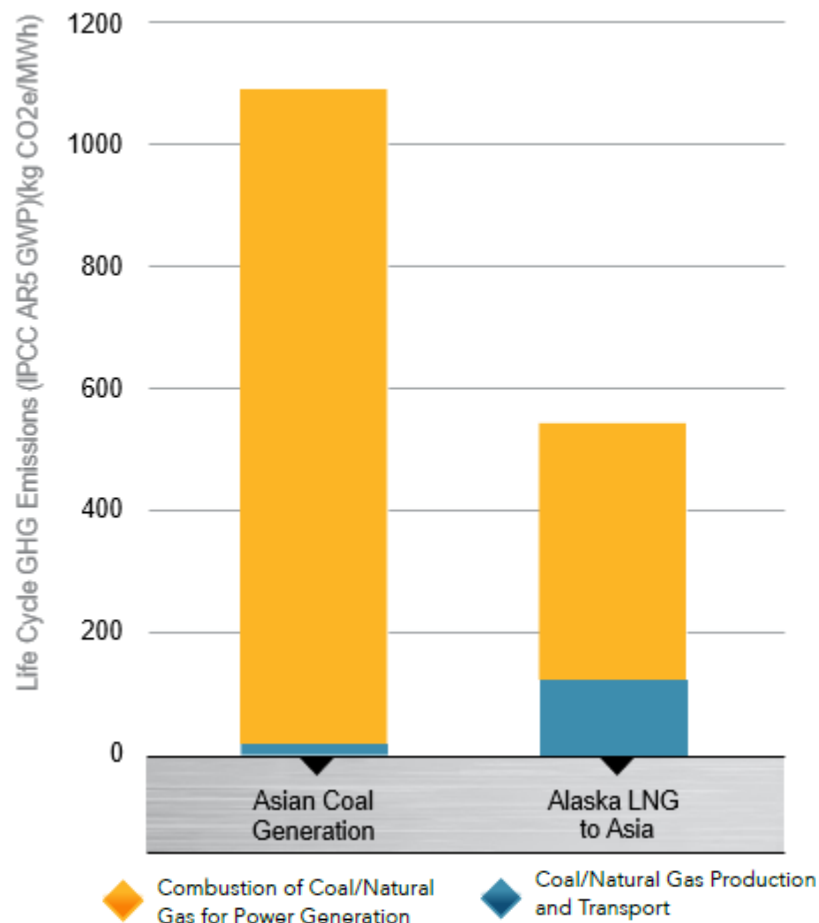
19 coal  
power  
plants

Constructing



16,000  
Wind  
Turbines

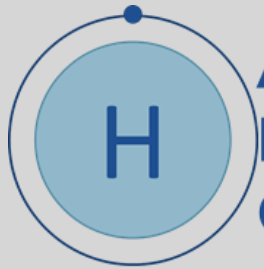
## Lifecycle GHG Emissions for Natural Gas vs. Coal Power



Source: Greenhouse Gas Lifecycle Assessment: Alaska LNG Project

- Transitioning to Private Developers
- Advancing the structure and leadership of the project with Strategic Parties consisting of:
  - North Slope producers
  - A major pipeline developer
  - LNG buyers
  - Banks and financial corporations
- These parties have the technical and financial capacity to bring this project to completion
- Strategic parties have a combined market capitalization of \$1.25 trillion
- Focus is an LNG Facility Strategic Party with significant market capitalization and an LNG development track record

# Alaska Hydrogen Opportunity



## Alaska Hydrogen Opportunity

50 years ago, the modern LNG industry was created in Alaska. For many of the same reasons, the clean hydrogen industry can also be created in Alaska.

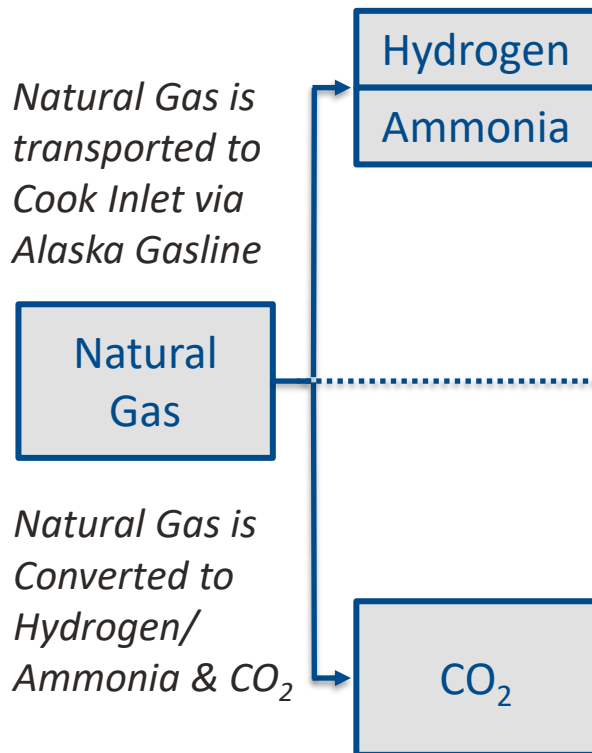
**Carbon Storage and  
Sequestration at the Project Site  
on Tidewater**

**Short Distance to Growing Clean  
Hydrogen Markets in Asia**

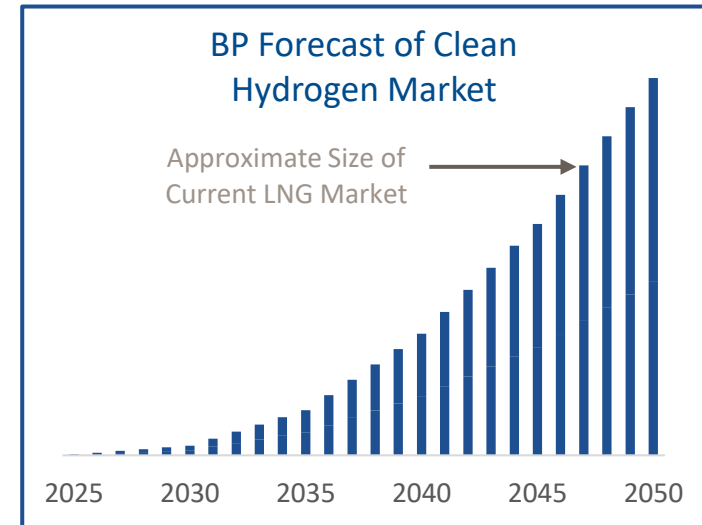
**Low-GHG Natural Gas from  
Conventional Supply**

**Existing Ammonia Plant well  
Positioned to be First Mover in  
Market**

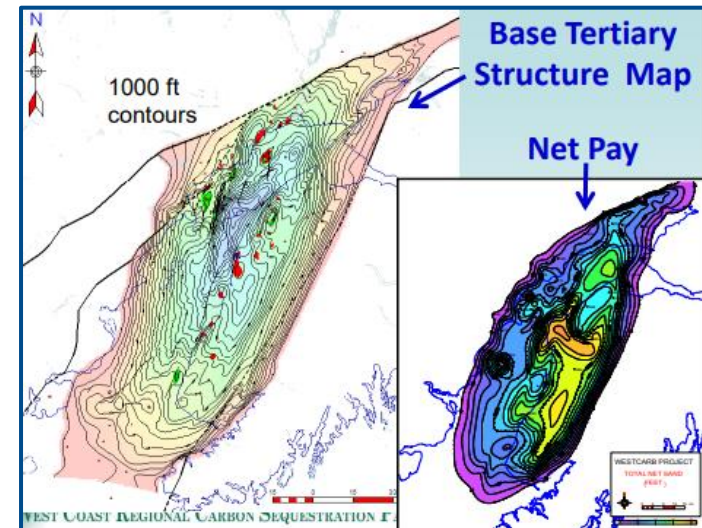
# Future-Proofing the Project



- Hydrogen/ammonia are clean energy sources
- Key Asian markets forecast rapid demand growth
- Infrastructure funding available for investment in Alaska



- Cook Inlet has the best carbon sequestration potential on the Pacific Coast of North America
- Allows for “future-proofing” Alaska LNG with transition to net-zero hydrogen/ammonia production



Source: West Coast Regional Carbon Sequestration Partnership



## America's national security solution, energy

BY MICHAEL J. DUNLEAVY, OPINION CONTRIBUTOR — 03/03/22 03:30 PM EST  
THE VIEWS EXPRESSED BY CONTRIBUTORS ARE THEIR OWN AND NOT THE VIEW OF THE HILL

2 SHARES



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Alaska is the answer to a number of critical national security questions in our nation's history. For example, during World War II, the 1,800-mile Alaska highway was built in just eight months to pry open military access to the North Pacific theater. In 1973, the OPEC oil embargo drove up the price of gasoline more than 40 percent; [Congress quickly authorized the Trans-Alaska Pipeline](#) and Alaska went on to start producing 20 percent of the nation's oil.

Energy security equals national security and now Russia's invasion of Ukraine threatens the world's energy supply. [Europe draws 40 percent of its natural gas from Russia](#), perhaps why Russia chose to invade in the dead of winter.

And although the U.S. recently became the world's largest exporter of liquefied natural gas (LNG), serving allies across both the Atlantic and Pacific, our supply is still stretched thin. Today we have limited ability to meet additional European energy needs if the Russian spigot closes. A recent Wall Street Journal report [notes](#) "Given that U.S. LNG cargoes have Asian customers, where supply is also tight, there isn't infinite wiggle room."

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## As Russian energy falls out of favor, a push for an Alaska gas pipeline

Amanda Bohman Mar 6, 2022 Updated 1 hr ago



A \$60 million public works project — a huge tank for storing natural gas — was completed in 2020 near Fairbanks.

Amanda Bohman/News-Miner

At the "world's premier energy event" CERAweek, starting Monday in Houston, Texas, Gov. Mike Dunleavy will be promoting the Alaska natural gas pipeline project with new hope.

World leaders are talking about sanctioning energy exports from Russia, a major global liquefied natural

# Alaska LNG Status - Summary

## Strong Economics

- Alaska LNG has lower costs than key competitors
- Cost of supply independently verified
- Increases energy security
- Project is being developed with eye to the future: potential hydrogen and ammonia

## Fully Permitted

- Federal government has approved construction of Alaska LNG
- Acquiring permits took significant effort and they are valuable

## Environmental Benefits

- Provides reduction in global greenhouse gas emissions
- Will be done under stringent US and Alaska legal requirements
- LNG will continue to be an important energy source through energy transition





ALASKA  
GASLINE  
DEVELOPMENT CORP.

