



ALASKA  
**GASLINE**  
DEVELOPMENT CORP.

The background image shows a worker in a green jacket and yellow gloves welding a large, light blue industrial pipe. The pipe has red and yellow markings. The scene is set outdoors with a dense forest of green trees in the background. The image is framed by blue geometric shapes in the corners.

# THE ALASKA LNG OPPORTUNITY:

*DEVELOPING A WORLD-CLASS LNG EXPORT PROJECT*

[www.agdc.us](http://www.agdc.us)



## Alaska Gasline Development Corporation (AGDC)

- Public corporation owned by the State of Alaska.
- Empowered to expedite, finance, and build natural gas infrastructure.

## Objectives of AGDC

- Operate as a State Corporation.
- Develop state resources for the benefit of Alaskans.



## VISION

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

# AGDC CORPORATE HISTORY



- 2009 - Early beginnings
- 2010 - House Bill 369 creating AGDC
- 2013 - House Bill 4 AGDC receives power, authority, and funding to advance the Alaska Stand Alone Pipeline (ASAP) project.
  - ✓ House Bill 4 also established AGDC as an independent, public corporation of the State of Alaska.
- 2014 – Senate Bill 138 expands AGDC’s mission and authority for an Alaska liquefied natural gas (LNG) project on the State’s behalf.
  - ✓ This legislation also directs AGDC to assist the Department of Revenue and the Department of Natural Resources in maximizing the value of the State’s gas.

# AGDC BOARD OF DIRECTORS



**Dave Cruz**  
Chairman



**Hugh Short**  
Vice Chairman



**Joey Merrick**  
Secretary-Treasurer



**Heidi Drygas**



**Marc Luiken**



**Warren Christian**



**David Wight**

# COMMUNITY ADVISORY COUNCIL

- Tim Navarre (Chair)
- Jason Mayrand
- Qaiyaan Harcharek
- Gov. Bill Sheffield
- Dan Coffey
- Don Dyer
- Joe Bovee/Kathryn Martin
- Matt Larkin
- Rocky Riley
- Ron Long
- Sarah Obed
- Terry Hinman



# AGDC'S TWO MAJOR PROJECTS

- AGDC is the owner of two Projects

Alaska LNG

- ✓ State's priority project
- ✓ Below \$45 billion for LNG export project
  - December 2016 became state-led

ASAP

- ✓ State's back-up project
- ✓ \$10 billion in-state gas pipeline
  - Currently 100% state owned

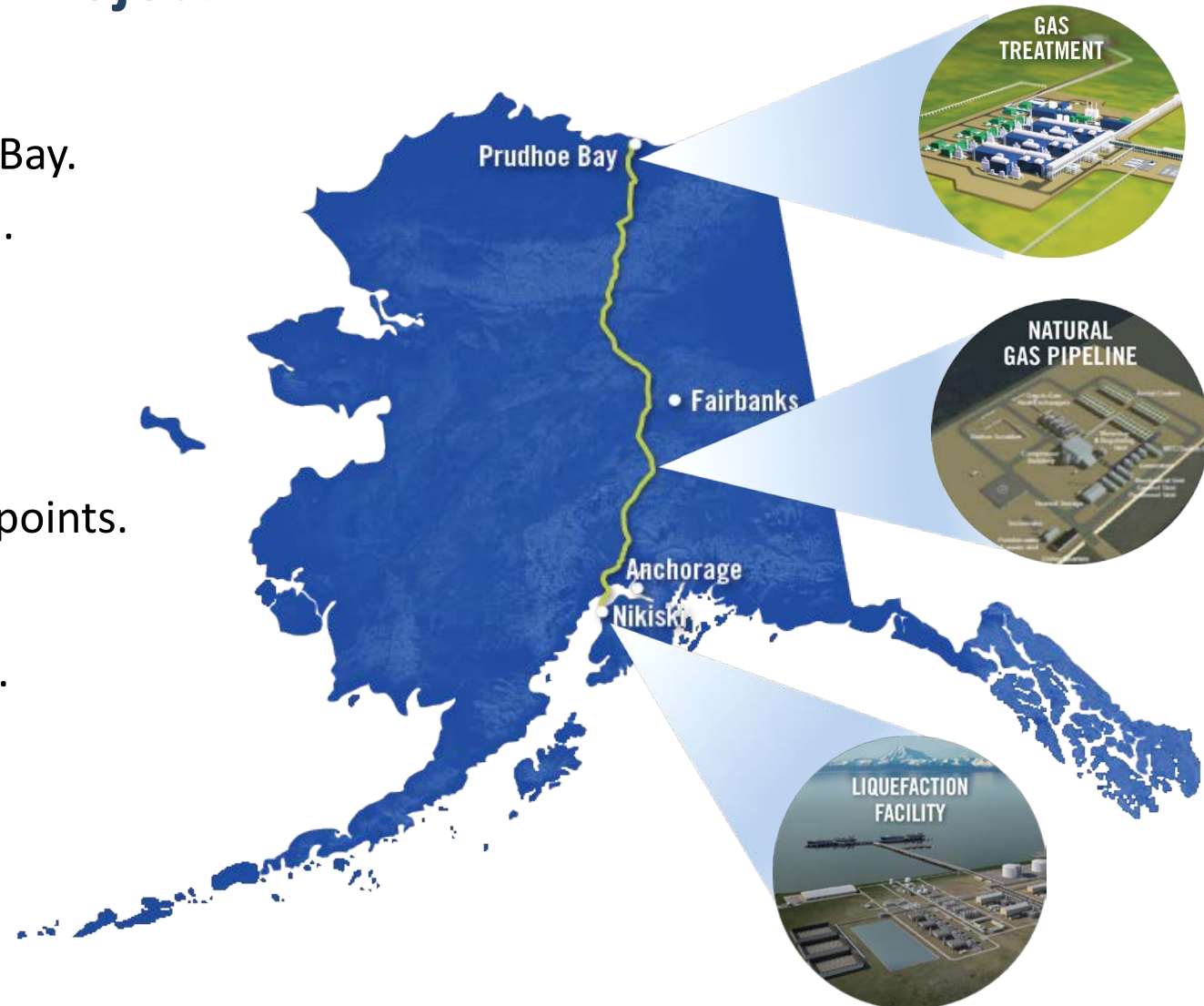
- Either project is capable of delivering gas to Alaskans – but the projects vary significantly in size, scope and cost
- AGDC is also responsible for planning and developing gas off-takes within Alaska regardless of which project is built



## Integrated Gas Infrastructure Project

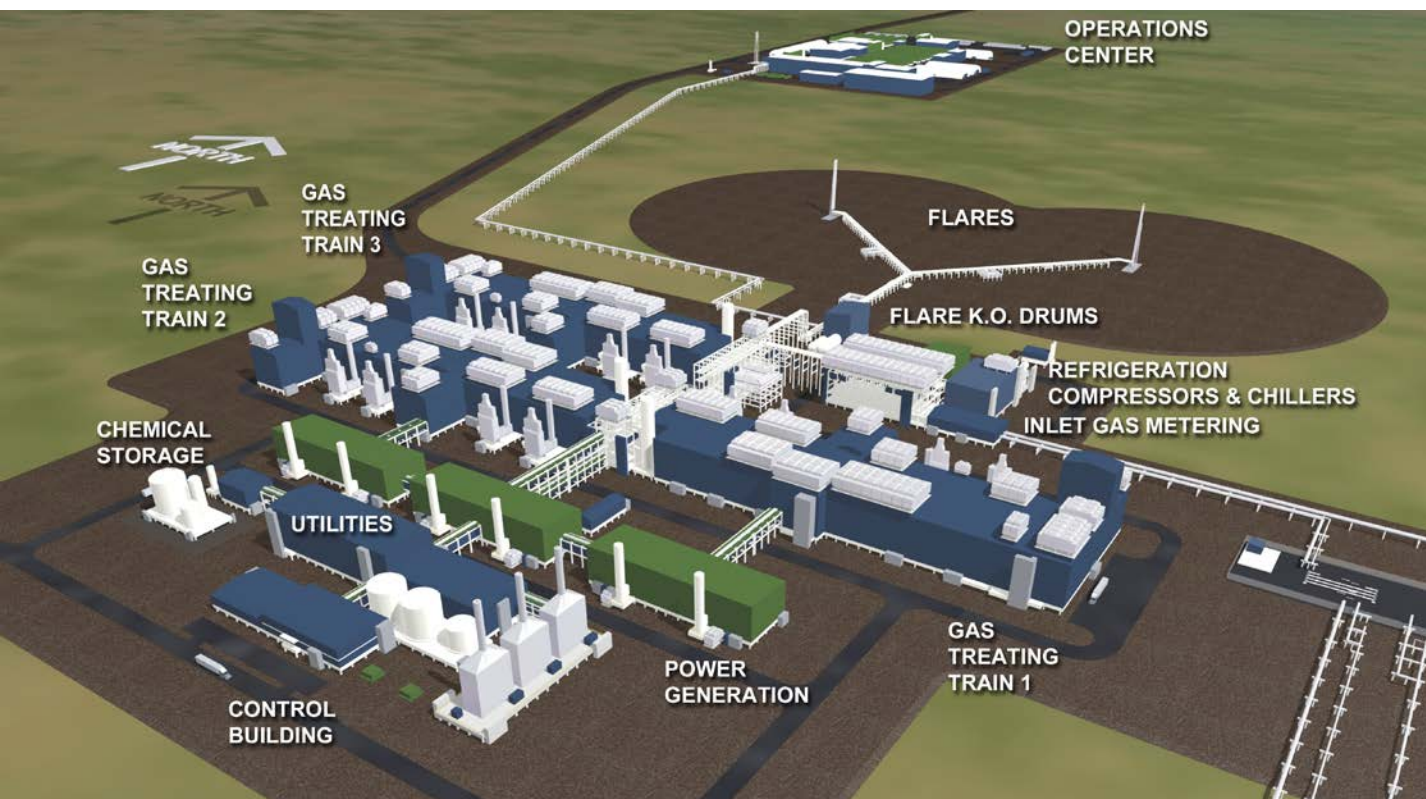
- **Gas Treatment Plant**
  - ✓ 200 acre site at Prudhoe Bay.
  - ✓ Condition up to 3.5 Bcf/d.
- **Pipeline**
  - ✓ 800-miles (1,287 km).
  - ✓ 42-inch pipe (1.1m).
  - ✓ Multiple in-state offtake points.
- **LNG Production Facility**
  - ✓ Located in Nikiski, Alaska.
  - ✓ 600-900 acre site.

**Produce up to 20 MMTPA**



Bcf = Billion cubic feet    MMTPA = Million Metric Tons Per Annum

# GTP OVERVIEW



## Summary

- 8 year execution phase schedule, with 4 major sealifts.
- Highly Modularized .
- About 200 acres of land required.
- Treatment to remove CO<sub>2</sub> and H<sub>2</sub>S.
- Glycol dehydration to remove water from CO<sub>2</sub> and treated gas .
- Power plant: decentralized distribution system optimized to reduce capex and increase uptime.
- Compression optimized to reduce capex and increase uptime.
- Waste heat recovered from gas turbines.
- Common propane refrigeration system to chill treated gas for permafrost protection.



# PIPELINE DESIGN BASIS

## Point Thomson Transmission Line

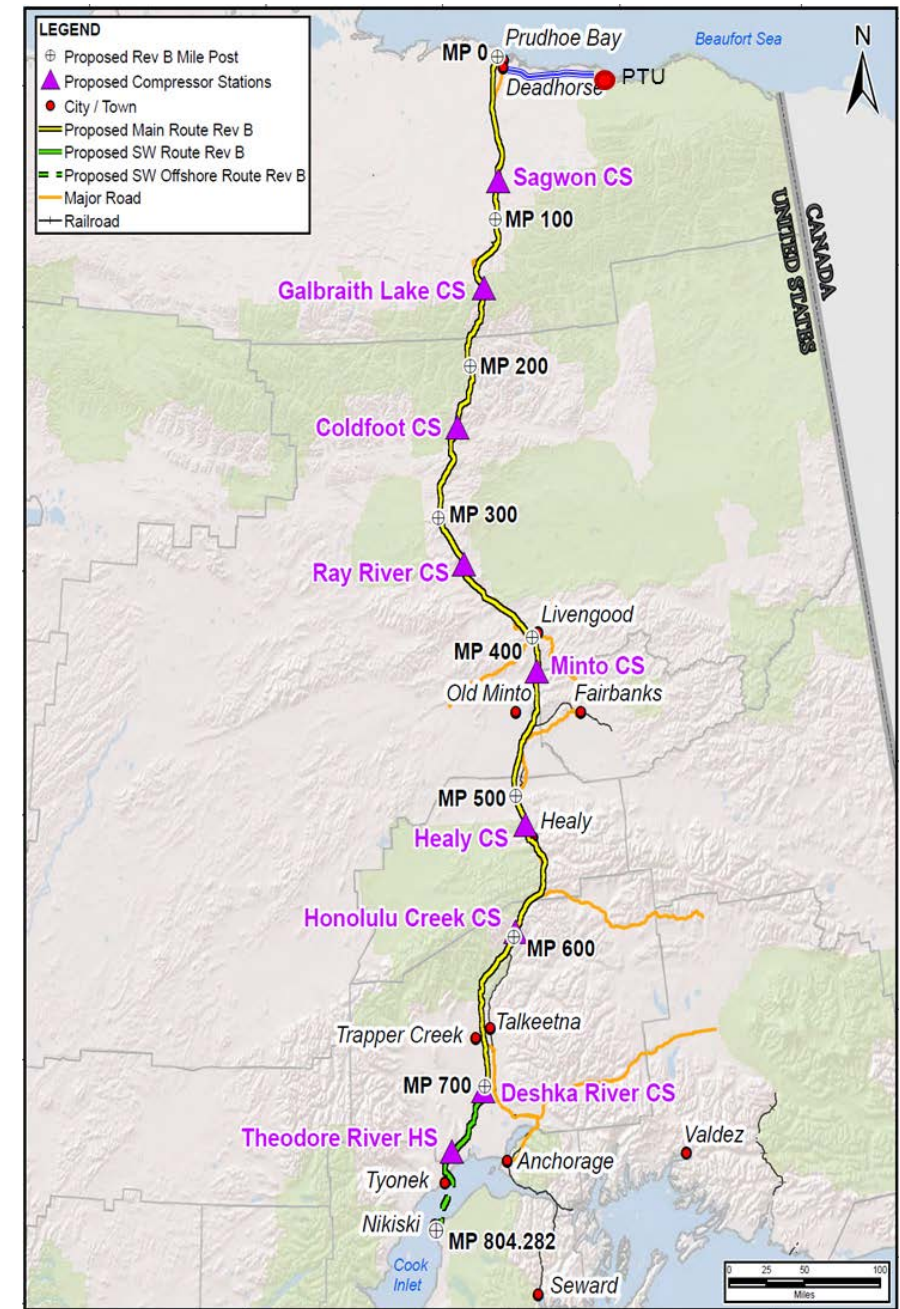
- 63 miles from PTU to GTP (above-ground).
- 32-inch outside diameter, MAOP 1,130 psig.

## Onshore Mainline & Facilities

- 800 miles from GTP to LNG Plant.
  - ✓ Buried except at fault crossings, etc.
- 60-inch x 1 mile above ground pipeline to transport feed gas from existing PBU Central Gas Facility.
- 32-inch x 53 mile above ground pipeline to transport feed gas from new PTU Gas Expansion Facility.
- 42-inch outside diameter, MAOP 2,075 psig.
- Eight compressor stations, one heater station.
- Meter stations.
- 31 mainline block valve stations.
- Offtake valves for in-state supply.
- Common routing with ASAP to Trapper Creek.

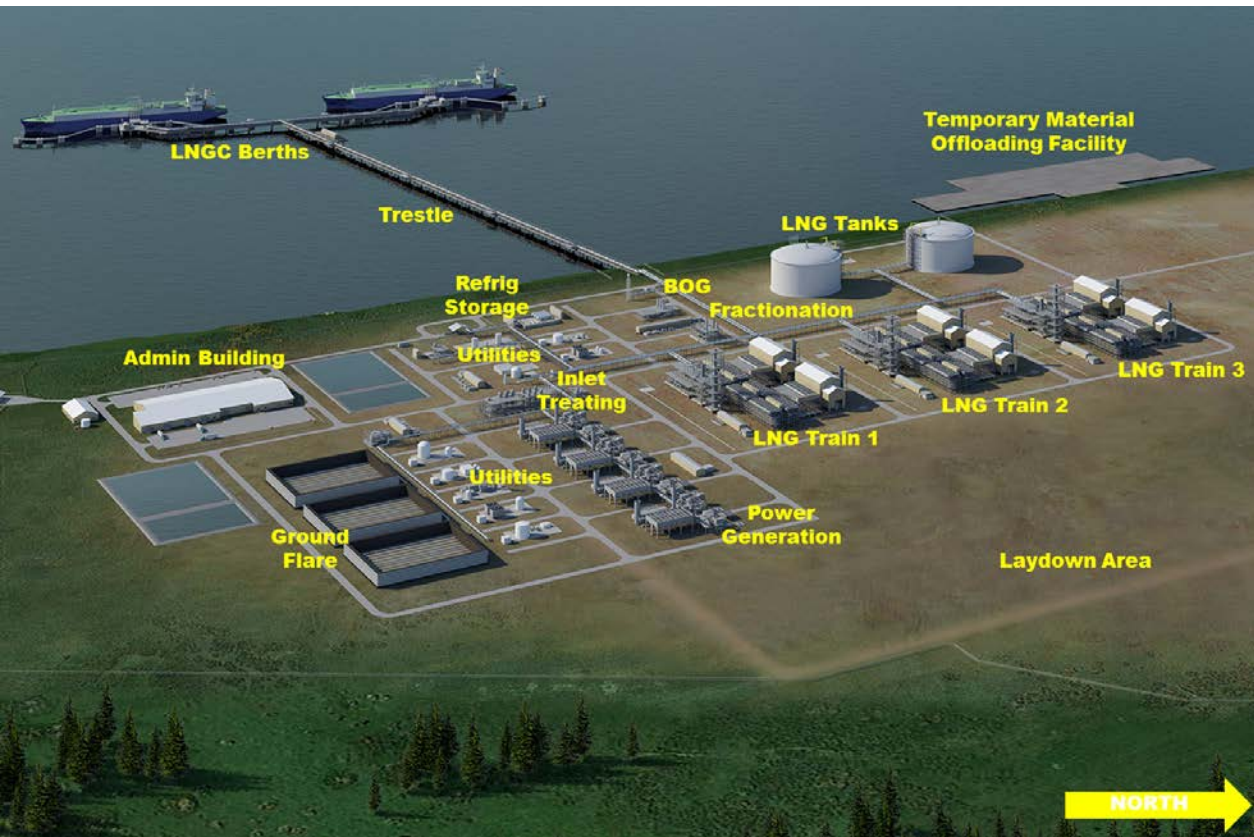
## Offshore Mainline

- ~28 miles across Cook Inlet.
- 42-inch outside diameter, MAOP 2,075 psig.
- Heavy-wall pipe with additional wall thickness.
- 6-inch concrete coating.



MAOP = Maximum Allowable Operating Pressure; PSIG = Pounds Per Square Inch

# LNG PLANT FACILITIES



## Summary

- Highly modularized – max weight about 6,400 tons.
- 3 train liquefaction plant – 6.7 MMTPA each.
- About 600-900 acres of land required.

## Design Basis

- APCI –C3MR™ process.
- Power plant (combined cycle), with distribution system optimized to reduce capex; Black-Start tie in to local utility.
- 2 x 240,000 cubic meter LNG storage tanks.
- Marine jetty with 2 loading berths, LNG loading rate 12,500 cubic meters per hour.
- Jetty to accommodate LNG carriers (LNGCs) from 125,000 cubic meters to 217,000 cubic meters.

## Execution Basis

- Material Offloading Facility to support the unloading of bulk materials, modules, and construction equipment; Temporary facility.

MMTPA = Million Metric Tons Per Annum

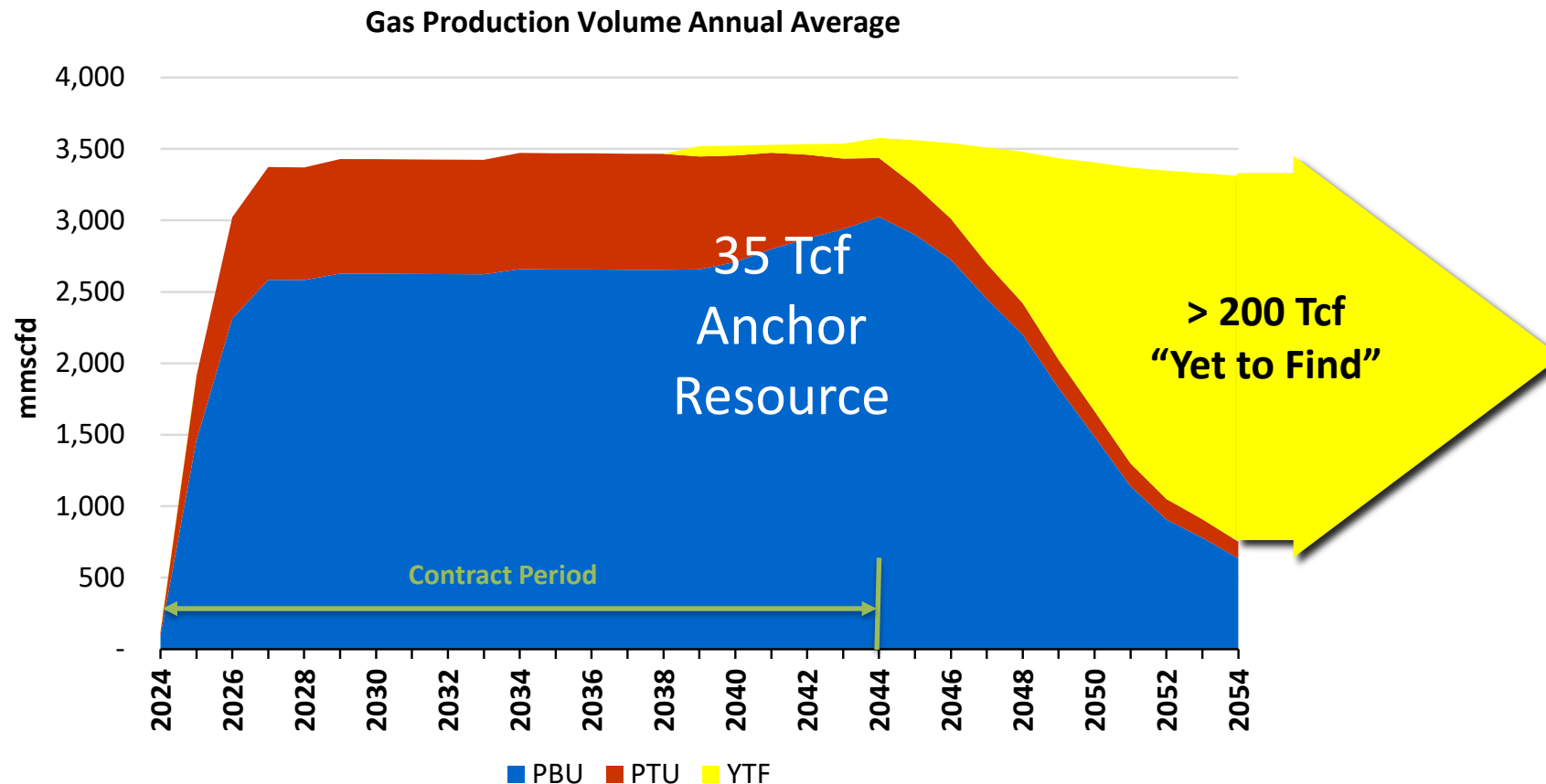
# ALASKA LNG'S ADVANTAGES



- Ability to offer flexible pricing structures.
- Enormous well-proven, low-risk, producible gas resource.
- Known and stable regulatory and governmental process; plus royalty regime.
- Proximate, country-to-country direct transport; four decades of uninterrupted LNG exports.
- Sites, pipeline route extensively studied and engineered.
- Ability for phased development.
- Cold climate increases LNG production efficiency.
- Valuable contributor to bilateral trade relationships.



# ANCHORED BY SECURE RESOURCE



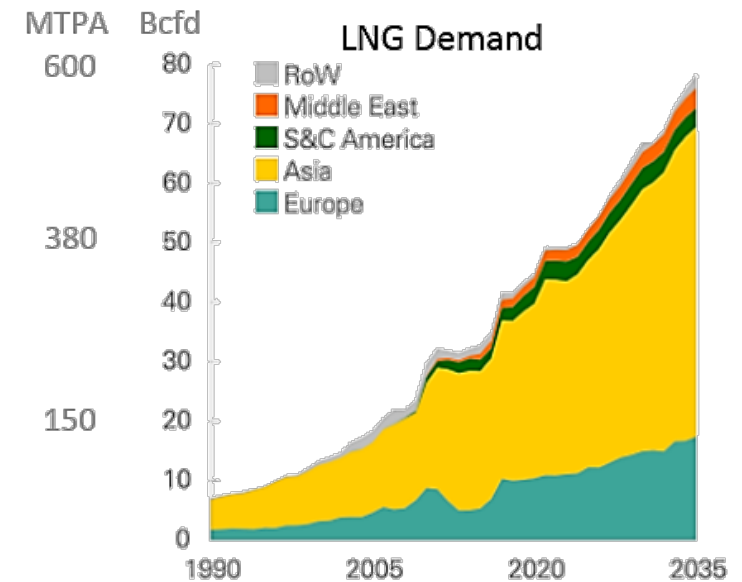
Note: Anchor Resource includes PBU (24.8 Tcf), PTU (8 Tcf), Other developed fields (1.8 Tcf)  
For illustration purposes, Other developed fields are included under PBU as developed resources.

- Secure, known resources in Prudhoe Bay (PBU) and Point Thomson (PTU) fill the project for 20 years and continue to anchor the project beyond 25 years.
- Even a ten percent success in Yet-to-Find discoveries would back-fill the spare capacity for another 25 years.

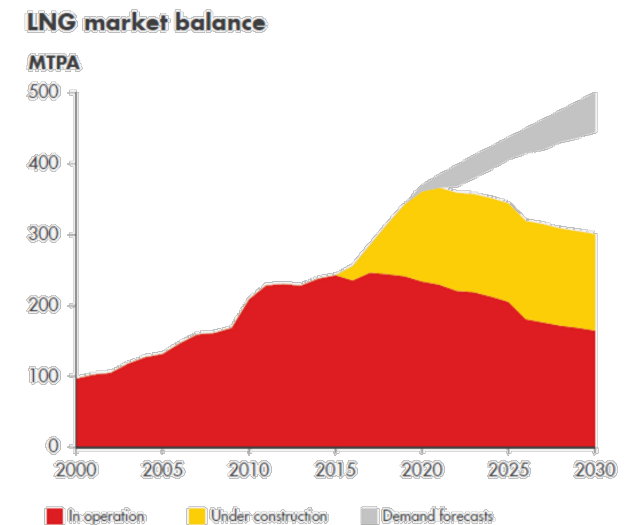
Tcf = Trillion Cubic Feet

## LNG Demand is Growing

- New sources of LNG will be needed at the same time Alaska LNG starts operation.
- Most new demand will be in Asia where Alaska LNG has a geographic shipping advantage.
- Competition from projects across the globe:
  - ✓ **US Gulf Coast:** numerous projects underway and planned.
  - ✓ **Canada / Pacific Northwest:** Complex land, access and regulatory issues have caused delays.
  - ✓ **Russian Arctic:** First icebreaker class LNG vessels undergoing sea trials.
  - ✓ **East Africa:** Coral Floating LNG moves toward final approval with BP buying the offtake.
  - ✓ **Oceana:** Cost overruns have plagued Australia as Papua New Guinea moves toward expanded capacity.



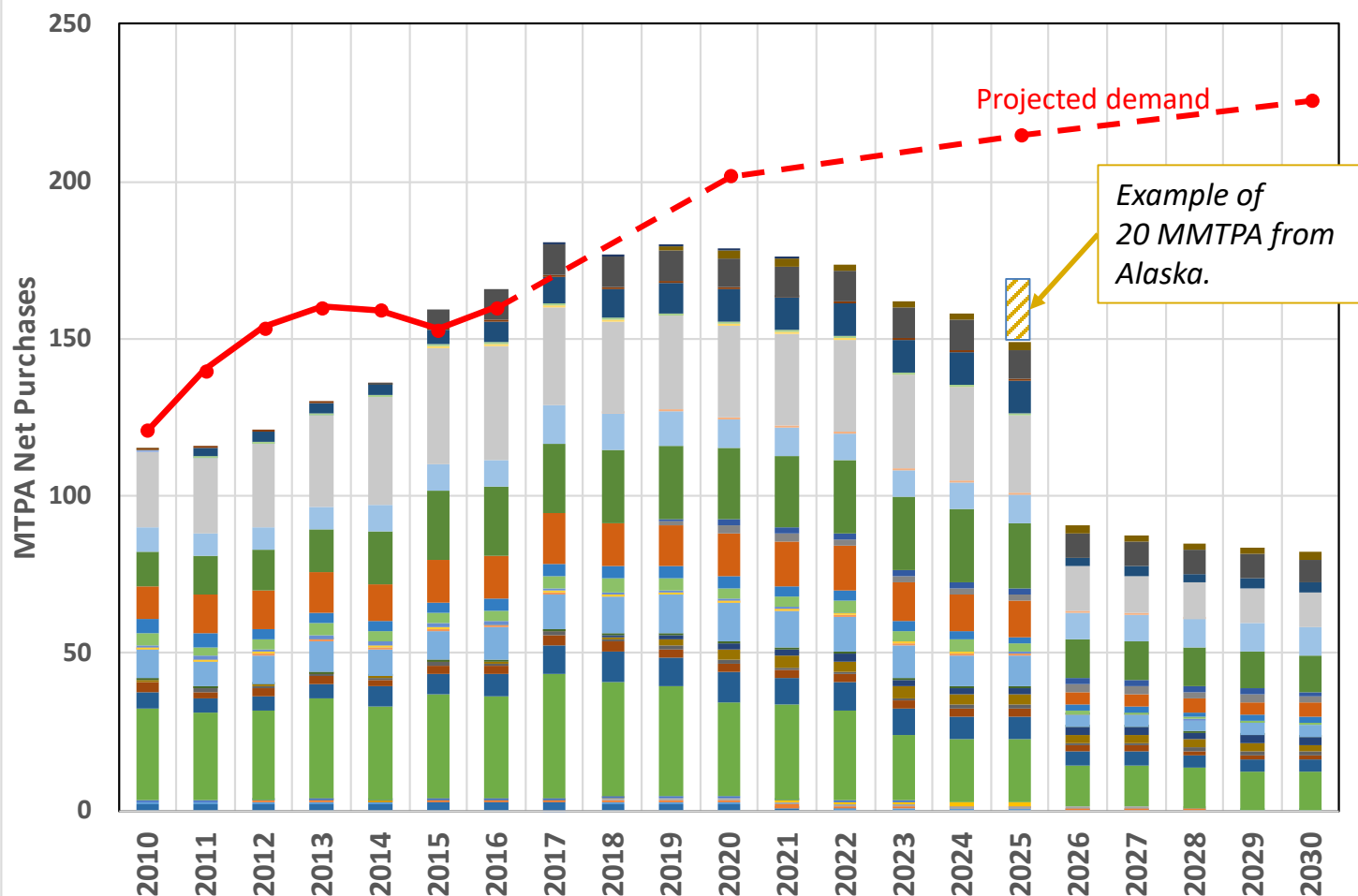
Source: BP plc



Source: Royal Dutch Shell plc

# ASIA LNG CONTRACTS EXPIRING MID-2020'S

Japan, Korea, Taiwan, China LNG Contracts and Demand



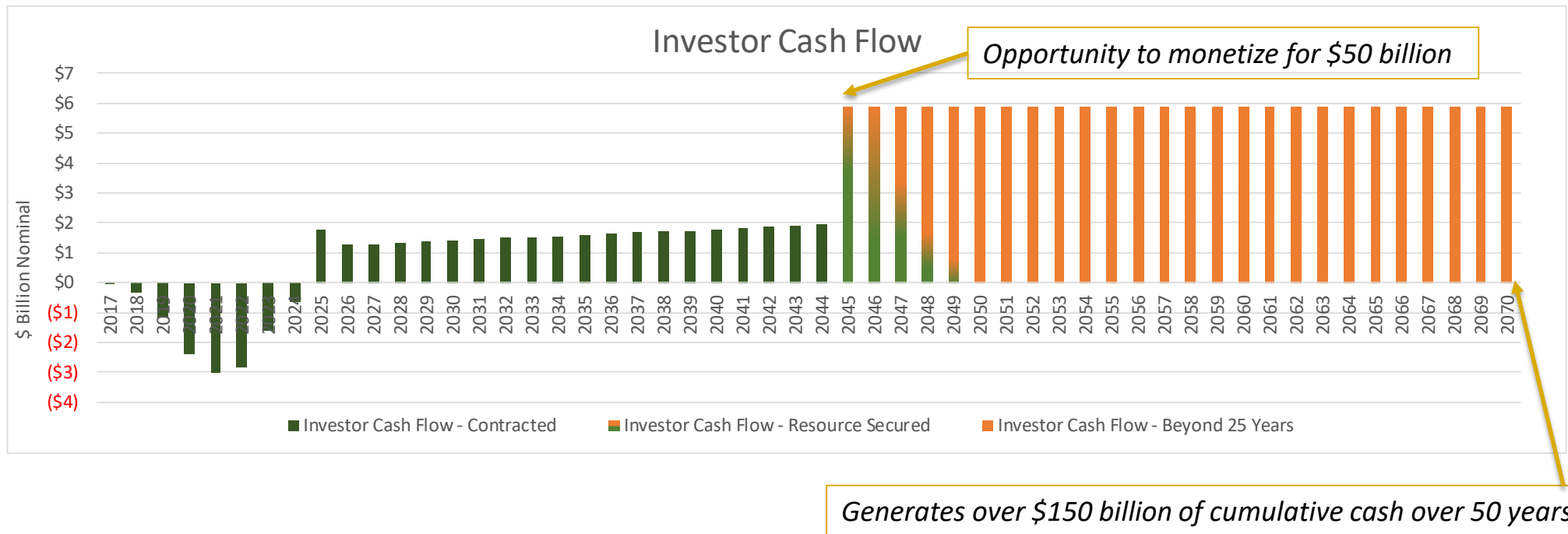
Note: Colored bar segments represent individual Asian LNG buyers

Source: Global NatGas Advisors LLC Analysis

- Market opportunity for Alaska LNG exists across Asia.
- Existing contracts expire in the same timeframe as a projected global shortfall in LNG supply.
- Japan, Korea, Taiwan and China together have contracted supply gaps of over 70 MTPA by 2025.
- Global demand grew 7.5% in 2016, with Japan, Korea, Taiwan and China collectively up 4.6%.

MMTPA = Million Metric Tons Per Annum





## Contract Period

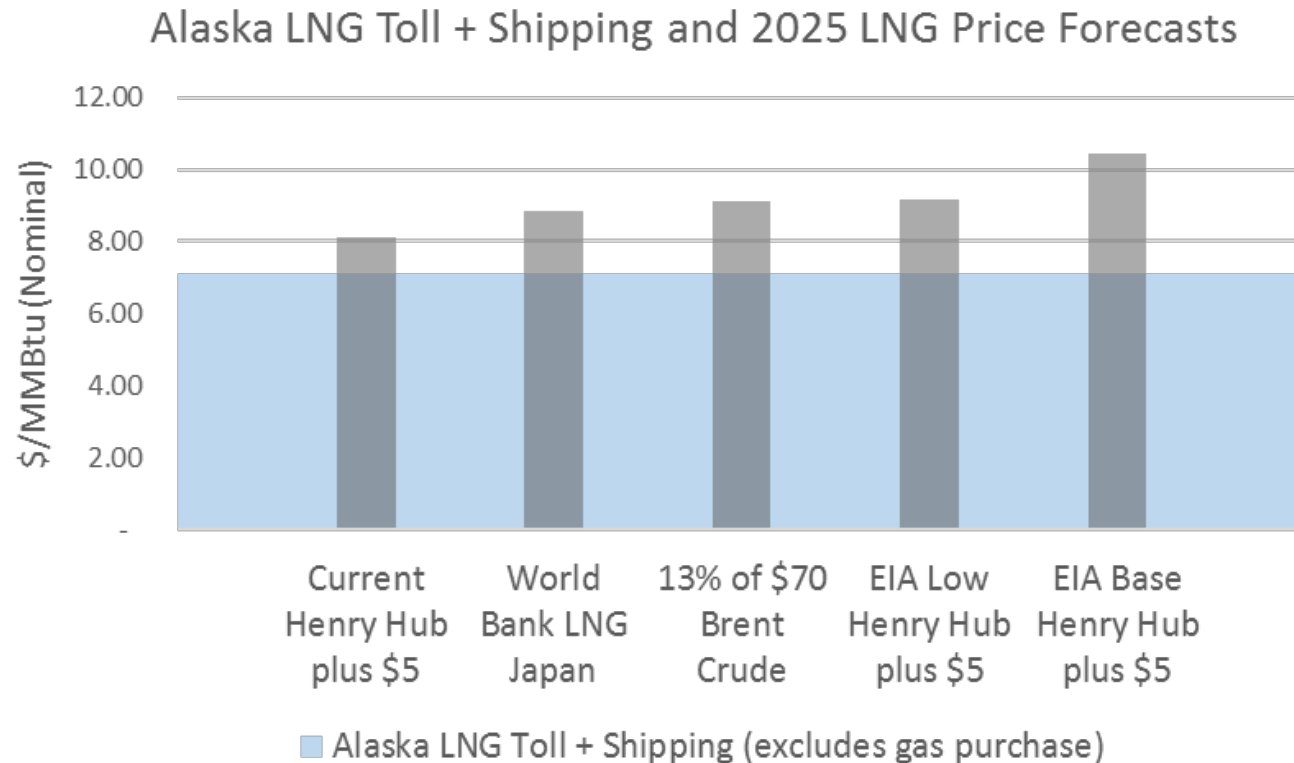
- A 20 year firm contact period.
- Acceptable return on investment.
- Secured by “ship or pay” terms.
- Approx. 25 Tcf of gas.

## Beyond Contract Period

- Debt paid off during contract period releasing more revenue to equity owners.
- 30 Tcf (10 Tcf of known, 20 Tcf of Yet-to-Find) needed to operate an additional 25 years – 10% of potential Yet-to-Find.
- Asset Value at 2045 could be \$50 billion.  
(Assumes 10% return over following 20 years, same tolls and volumes)

Tcf = Trillion Cubic Feet

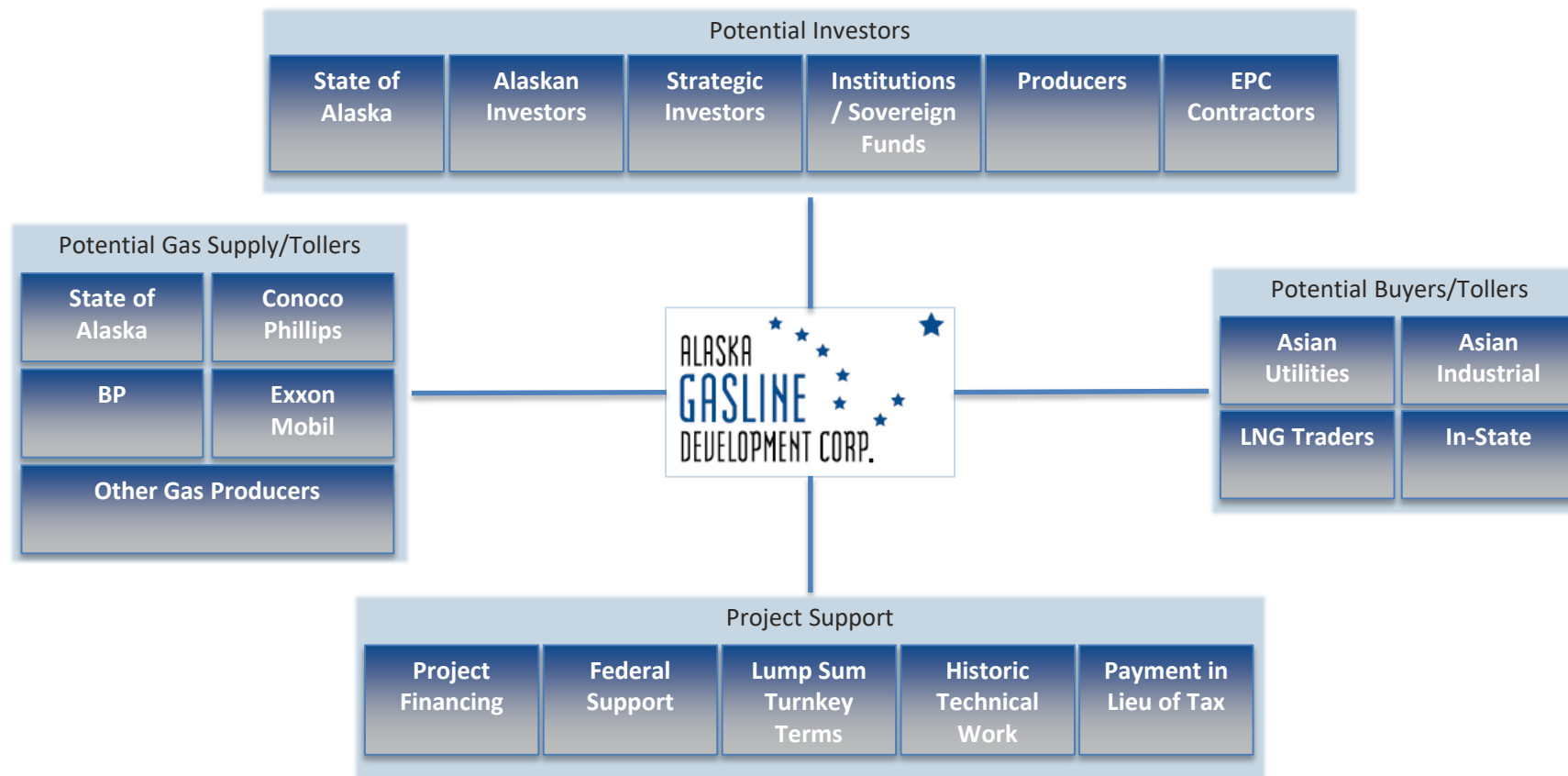
# ALASKA LNG IS COMPETITIVE



**LNG Price less Alaska LNG Toll + Shipping results in a reasonable netback**

- Alaska LNG toll and shipping costs are below market prices to deliver a reasonable netback.
- North Slope gas supply is stranded and not connected to other markets.
- The larger the difference between LNG market price and delivery costs (Alaska LNG tolls + shipping) the more potential profit for project participants.

# AGDC BRINGS THE PIECES TOGETHER



## AGDC is positioned to act as a developer, pulling together:

- Appropriate allocation of risk.
- Ability to attract a wider range of investors.
- A stronger focus on the Asia market.
- Best in class project management approach through engagement with Engineering, Procurement, Construction (EPC) firms to manage construction risk.



# FERC REGULATORY PROCESS



- Submitted April 17, 2017.
- ~50,000 pages.
- **FERC's Next steps:**
  - ✓ 90 days to review.
  - ✓ Prepare Notice of Schedule for EIS.
  - ✓ Prepare Draft EIS.
    - Public Meetings.
    - Respond to Comments.
  - ✓ Issue Final EIS.
  - ✓ FERC issues order authorizing construction.



EIS = Environmental Impact Statement

- FERC ensures the safe operation and reliability of LNG terminals in the U.S.
- FERC comprehensive siting process requires close collaboration between Federal, State, and local regulatory agencies.
- FERC review process ensures LNG terminals and associated LNG vessel traffic meet safety and environmental requirements during construction and operation.
- FERC is the lead federal agency that will prepare an Environmental Impact Statement (EIS) for the integrated Alaska LNG project.

## Resource Reports

- Project Description.
- Environmental Impacts Analysis:
  - ✓ *The Physical Environment*: Water, Soils, Geology, Air Quality, Noise.
  - ✓ *The Biological Environment*: Wetlands, Vegetation, Fish, Terrestrial and Marine Wildlife.
  - ✓ *The Human Environment*: Socioeconomics, Cultural Resources, Land Use, Recreation, Public Health & Safety.
- Alternatives.
- Engineering & Design.

## Federal Permit Applications

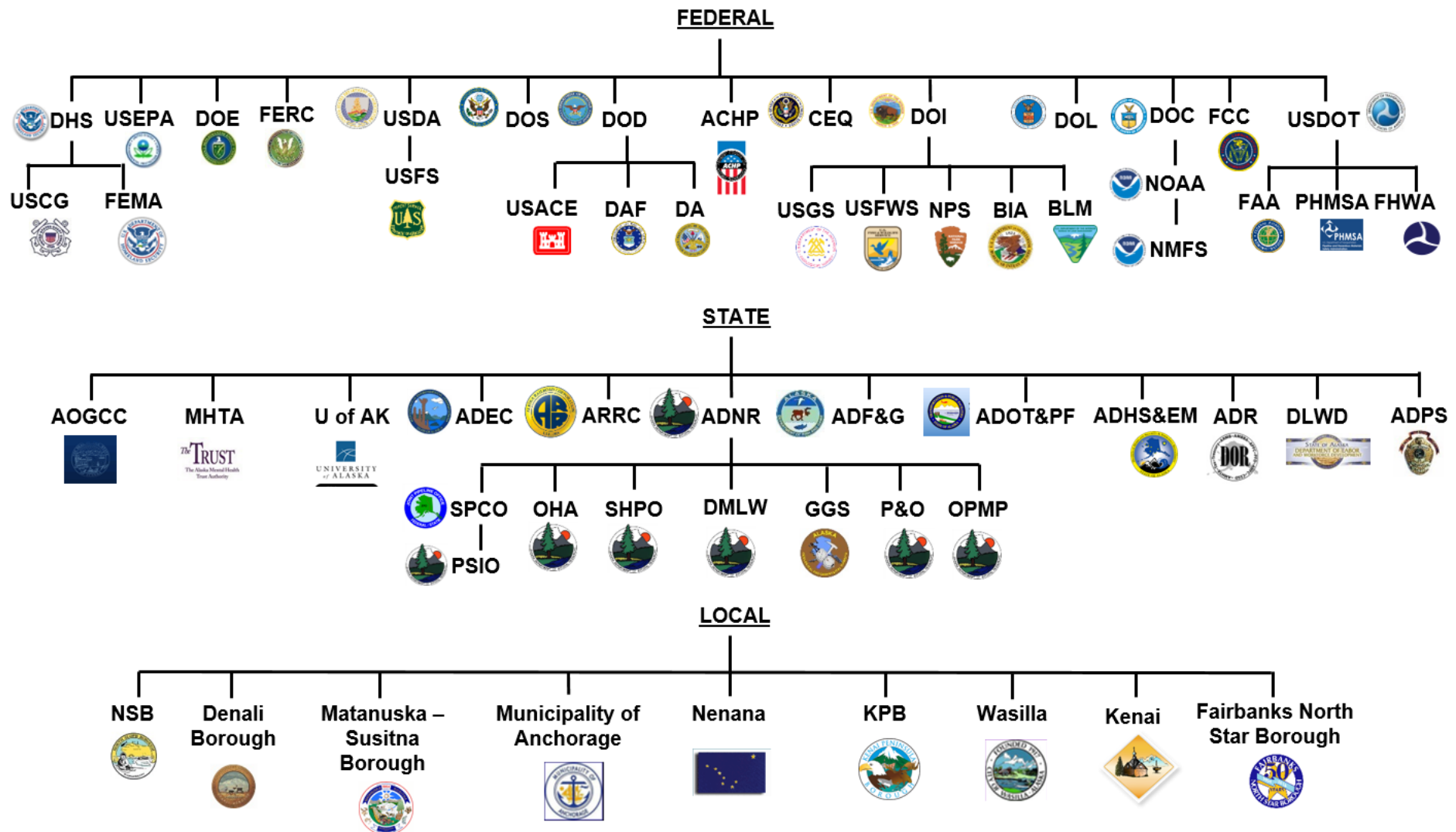
- U.S. Army Corps of Engineers 404/10.
- PHMSA Special Permit Application.
- BLM – Federal Grant of Right-of-Way.
- USCG Waterway Suitability.

## Additional Federal Consultations

- National Historic Preservation Act.
- Endangered Species Act species - USFWS & NMFS.
- Essential Fish Habitat – NMFS.

# REGULATORY PROCESS - FERC

FERC leads NEPA process – umbrella for creation of all other permit applications; requires collaboration with cooperating and reviewing federal, state, Alaska Native and local entities.



## Creates construction and long-term jobs

- During the peak of construction Alaska LNG could create between 9,000 to 12,000 direct jobs.
- 700 to 1,000 long-term jobs created during the project operating phase (+ 30 years).

## Long-term secure source of natural gas for in-state demand

- Alaska LNG can supply stable, low price natural gas for all current and future Alaska demand.
- Mitigates risk of Cook Inlet decline.
- Allows new communities and industries to use natural gas.

## Increase North Slope oil production

- Extends the period Prudhoe Bay is economic to operate.
- Gas sales an additional source of revenue for new fields, improving their economics.
- Gasline will increase the probability of finding oil while exploring for gas that can be monetized.

## Increase revenue to the State of Alaska



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## ALASKA MOVING FORWARD



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