

ALASKA GAS OPPORTUNITIES

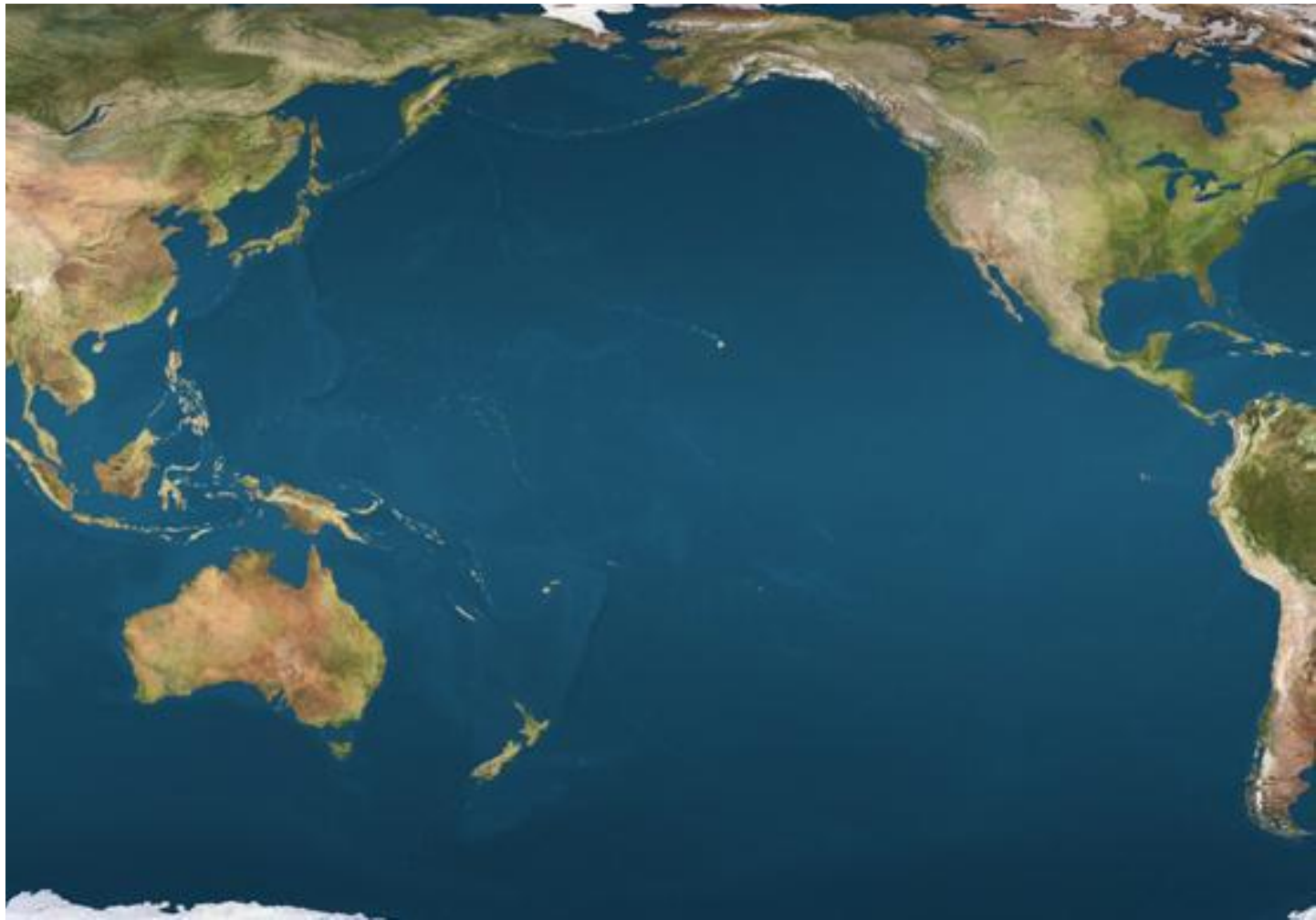
2ND LNG
PRODUCER-
CONSUMER
CONFERENCE

Tokyo, Japan

September 10, 2013

**Commissioner
Daniel S. Sullivan**

Alaska Department of
Natural Resources



ALASKA'S MASSIVE HYDROCARBON BASINS

North Slope

U.S. Geological Survey (USGS) estimates that Alaska's North Slope and Arctic Outer Continental Shelf have more oil than any other Arctic nation:

- **OIL:** Estimated 40 billion barrels of conventional oil.
- **GAS:** Estimated over 200 trillion cubic feet (TCF) of conventional natural gas.

Alaska has world-class unconventional resources, including tens of billions of barrels of heavy oil, shale oil, and viscous oil, and hundreds of trillions of cubic feet of shale gas, tight gas, and gas hydrates.

- The mean estimated onshore gas hydrate resource is 590 TCF of gas-in-place, with a mean of 85.4 TCF potentially recoverable with current technology (USGS, 2008).

Cook Inlet

U.S. Geological Survey estimates that significant undiscovered volumes of hydrocarbons remain to be found in the Cook Inlet in Southcentral Alaska:

- 19 TCF of natural gas, 600 million barrels of oil, and 46 million barrels of natural gas liquids.

Successful 30-day Gas Hydrate Test on Alaska's North Slope

In 2012, the U.S. Department of Energy (DOE), in cooperation with ConocoPhillips and Japan Oil, Gas, and Metals National Corporation (JOGMEC), successfully completed a 30-day flow test from sub-permafrost gas hydrates on Alaska's North Slope. Under a Memorandum of Understanding, the State of Alaska and DOE are taking concrete steps to further assess the vast resource potential of methane hydrates and other unconventional energy resources in Arctic Alaska, including plans to establish a long-term gas hydrate test facility. Activities associated with this program could begin as early as this winter.



Photo Courtesy of DOE

COMMERCIALIZING ALASKA'S NORTH SLOPE GAS

The State of Alaska is leading two state-backed efforts to commercialize Alaska's abundant North Slope gas resources:

- The Alaska Pipeline Project (*private-sector led*)
- The Alaska Gasline Development Corporation (*state-led*)

The State of Alaska has significant financial assets to assist with these efforts:

- Alaska owns royalty gas—12.5% to 20%—as part of the state's oil and gas leases to companies.
- Alaska has the largest sovereign wealth fund in the United States—the Alaska Permanent Fund Corporation: \$40 billion.
- Alaska has a budget reserve of \$20 billion.
- Alaska has a retirement fund worth \$18 billion.
- Alaska is triple-A rated.

The State of Alaska is considering how to leverage its royalty position to advance commercialization of its North Slope gas.

- The Alaska Department of Natural Resources commissioned a Royalty Study, scheduled to be completed in October, to look at:
 - LNG Markets
 - Supply Chain
 - Fiscal Framework
 - Risk Allocation/Commercial Structure
- The State of Alaska may take a direct equity interest in the project, take its royalty share in-kind, or both.
- If the State of Alaska does either (or both) it will be looking for partners to bring value to the State of Alaska—equity partners with low cost capital or buyers who will share risks.

COMMERCIALIZING ALASKA'S NORTH SLOPE GAS - *PROGRESS*

2012 Accomplishments

- **Producers align on an Alaska LNG Project:**

ExxonMobil, ConocoPhillips, BP, and TransCanada formally aligned and are working together to evaluate a LNG project from Southcentral Alaska; the companies had previously pursued different directions on Alaska's gas.

- **Development of multi-billion dollar Point Thomson field:**

Point Thomson holds approximately 8 TCF of known gas reserves, plus hundreds of millions of barrels of liquid condensates and oil; significant hydrocarbon production will be online within three years.

2013 Accomplishments

- **State of Alaska achieves significant tax and permitting reform:**

Oil tax reform incentivizes more production and has fueled new discoveries and investment.

- **Producers select concept on an Alaska pipeline to tidewater:**

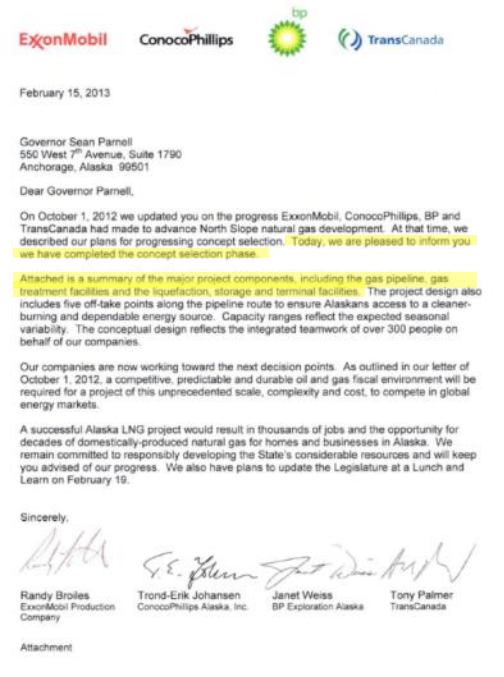
Concept selection includes a summary of major project components, including the gas pipeline, gas treatment facilities and the liquefaction, storage and terminal facilities. This project would be one of the largest LNG projects in the world.

- **Producers undergoing a full summer field season:**

As part of a staged pre-FEED effort, summer field work and other activities are underway, which will enable the companies to evaluate major future engineering commitments.

COMMERCIALIZING ALASKA'S NORTH SLOPE GAS - *PROGRESS*

“Today, we are pleased to inform you we have completed the concept selection phase. Attached is a summary of the major project components, including the gas pipeline, gas treatment facilities and the liquefaction, storage and terminal facilities.” – Producers’ letter to Governor Parnell, 2/15/13



Alaska Southcentral LNG – Project Concept Description

Liquefaction Plant

- Capacity: 15 – 18 million tonnes per annum (MTA)
3 trains (5-6 MTA / train)
- Potential areas: 22 sites assessed in Cook Inlet, Prince William Sound and other Southcentral sites
- Footprint: 400 - 500 acres
- Peak Workforce: 3,500 - 5,000 people
- Required Steel: 100,000-150,000 tons



Producing Fields

- ~35 TCF discovered North Slope resource
- Additional exploration potential
- Anchored by Prudhoe Bay and Pt. Thomson with ~20 years supply available
- Use of existing and new North Slope facilities
- Confirmed range of gas blends from PBU/PTU can generate marketable LNG product
- Peak Workforce: 500 – 1,500 people



Storage / Loading

- LNG Storage Tanks, Terminal
- Dock; 1 - 2 Jetties
- Design based on 15– 20 tankers
- Peak Workforce: 1,000-1,500 people



Pipeline

- Large diameter: 42"- 48" operating at >2,000 psi
- Capacity: 3 - 3.5 billion cubic feet per day
- Length: ~800 miles (similar to TAPS)
- Peak Workforce: 3,500 - 5,000 people
- Required Steel: 600,000 - 1,200,000 tons
- State off-take: ~5 points, 300-350 million cubic feet per day, based on demand



Gas Treating

- Located at North Slope or Southcentral LNG site
- Remove CO₂ and other gases and dispose / use
- Footprint: 150 - 250 acres
- Peak Workforce: 500 - 2,000 people
- Required Steel: 250,000 - 300,000 tons
- Among largest in world

Estimated Total Cost: \$45 – \$65+ Billion

Peak Construction Workforce: 9,000 – 15,000 jobs

Operations Workforce: ~1000 jobs in Alaska

Descriptions and costs are preliminary in nature and subject to change. Cost range excludes inflation.

COMPARATIVE ADVANTAGES of ALASKA GAS

Geostrategic & Regulatory Advantages:

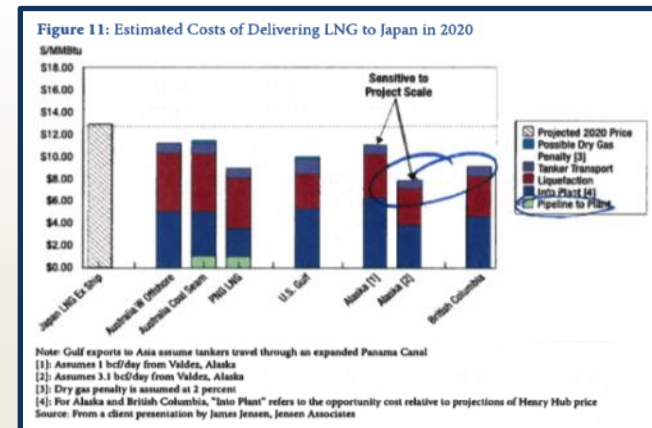
- Diversification of supply
- Proximity/shipping costs are very low
- Avoids strategic shipping choke points that other sources of LNG must traverse
- No political or security risks
- Exceptional record of reliability—40 years of LNG exports to Japan
- Non-controversial export license compared to Lower 48 U.S. states
- First Nation and Native land claim issues have already been resolved

Current Infrastructure & Operators:

- Existing oil and gas infrastructure can support an LNG project
- Route for LNG line would be the same or similar to existing Trans-Alaska Oil Pipeline route
- World-class businesses and LNG producers have already invested billions on LNG studies and oil and gas infrastructure in Alaska
- Strong oil and gas service support industry is already in place

Cost Competitiveness:

- Brookings Institution (2012) – “Alaskan exports may prove to be a source of strong competition at the margin for U.S. LNG in the Pacific Basin. An Alaska project may be one of the least costly alternatives for delivering LNG to Japan in 2020.”
- Wood Mackenzie (2011) – “Proposed Alaskan LNG exports have a substantial cost advantage relative to possible competing LNG supply projects.” “Alaska LNG exports have delivered a cost structure below \$10/MMBtu.”



Brookings Institution, “*Liquid Markets: Assessing the Case for U.S. Exports of Liquefied Natural Gas*,” May 2012; Wood Mackenzie “*Alaskan LNG Exports Competitiveness Study, AGPA, Final Report, July 27, 2011*”

CONCLUSION

- Alaska has made significant progress toward commercializing its massive North Slope gas resources.
- Alaska has a 40-year record of reliably exporting LNG to Japan.
- Alaska LNG increases security of supply for Japan and avoids strategic shipping choke points.
- Alaska LNG is cost competitive.
- Deepening U.S.-Japan energy relationship is a key recommendation from the Center for Strategic & International Studies (CSIS) 2012 Report: *“The U.S.-Japan Alliance: Anchoring Stability in Asia.”*

