Commercializing
Alaska LNG

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Commissioner, Alaska Department of Natural Resources

SPOTLIGHT SESSION:
The North American LNG Market—Imports, Exports or Both
LNG17, Wednesday, April 17, 2013

Prudhoe Bay Central Gas Facility
Photo courtesy of BP
PART I:
Progress on North Slope Gas Commercialization

PART II:
Comparative Advantages of Alaska LNG
PART I

Progress on North Slope Gas Commercialization
The State of Alaska is leading two state-backed efforts to commercialize Alaska’s abundant North Slope gas resources.

1. **Alaska Pipeline Project (APP)**
   - Private-sector led
   - State funding and reimbursements up to $500 million as an initial investment

2. **Alaska Gasline Development Corporation (AGDC)**
   - State funded
   - Led by State of Alaska corporation (AGDC) whose mission is to commercialize North Slope gas resources
   - Significant regulatory permitting progress

The State of Alaska has significant financial assets to assist with these two 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
March 30, 2012
Governor Sean Parnell
550 West 7th Avenue, Suite 1700
Anchorage, Alaska 99501

Dear Governor Parnell,

Our three corporations, collectively and individually, value our relationship with Alaska and believe that its citizens across the state, as well as our shareholders around the world, share a common interest in responsible resource development. We write today to inform you of our progress in working together on the next generation of North Slope resource development.

Alaska’s vast North Slope holds over 35 trillion cubic feet of discovered natural gas. To date, this gas has been used to enhance North Slope oil production, adding several billion barrels to Prudhoe and Kuparuk recoveries. However, under the right business climate, the full commercial potential of this world-class resource can be unlocked. North Slope gas commercialization will bring new job opportunities, increased state revenues, reliable in-state energy supplies and new exploration opportunities, which will boost North Slope oil and gas. This will be key toward reaching your goal of delivering gas per day through the Trans-Alaska Pipeline System.

Serious discussions between our companies have taken place over the past several months, along with the Alaska Pipeline Project (APP) parties who are supporting the AGIA License. We have aligned on a structured, stewarable and transparent approach with the aim to commercialize North Slope natural gas resources within an AGIA framework. As a result of the rapidly evolving global market, large-scale liquefied natural gas (LNG) exports from south-central Alaska will be assessed as an alternative to gas line expansion. To broaden market access, a south-central Alaska LNG approach could more closely align with in-state energy demand and needs. We are now working on a comprehensive assessment of major project components including in-state pipeline routes and capacities, global LNG trends, and LNG tidewater site locations, among others.

Commercializing Alaska natural gas resources will not be easy. There are a range of issues that must be resolved, and we cannot do it alone. Unfettered capital for gas development will require competitive and stable long-term policy for Alaska first be established. Appropriately structured, stable fiscal incentives and new opportunities around the world, and will play a pivotal role in unlocking the economic potential of North Slope resources.

Point Thomson is an excellent example of a challenged, world-class resource. With approximately 25% of known North Slope natural gas, Point Thomson development is an important element in consideration of North Slope gas commercialization. However, economic models must span decades into an uncertain future to estimate economic returns. Your Administration has taken the lead in forging a Point Thomson settlement that will bring long-term resources, revenues and jobs to help Alaska’s economy. With settlement now finalized, our companies are moving forward, as participating co-venturers, with the initial development phase at Point Thomson with confidence that North Slope gas development will ultimately bring the Point Thomson resource to market.

We agree the next generation of North Slope resource development is achievable, working together with the APP parties, as well as with the State of Alaska. Thank you for your leadership and your confidence in us to take on these challenges. We join you in a vision of prosperity and promise. There is much work to do and opportunities yet to discover.

Sincerely,

Rex Tillerson  Jim Mulva  Bob Dudley

Serious discussions between our companies have taken place over the past several months, along with the Alaska Pipeline Project (APP) parties who are supporting the AGIA License. We have aligned on a structured, stewarable and transparent approach with the aim to commercialize North Slope natural gas resources within an AGIA framework. As a result of the rapidly evolving global market, large-scale liquefied natural gas (LNG) exports from south-central Alaska will be assessed as an alternative to gas line expansion. In addition to broadening market access, a south-central Alaska LNG approach could more closely align with in-state energy demand and needs. We are now working on a comprehensive assessment of major project components including in-state pipeline routes and capacities, global LNG trends, and LNG tidewater site locations, among others.
• Point Thomson is located approximately 60 miles east of Prudhoe Bay and is adjacent to the Arctic National Wildlife Refuge (ANWR)

• Point Thomson contains about 8tcf of gas and hundreds of millions of barrels of oil; has ~25% of known North Slope gas reserves

• Point Thomson is a multi-billion dollar project

• Construction has already begun

• Producing Point Thomson liquid condensate into Trans-Alaska Pipeline as part of Phase 1

• Big prize—gas commercialization for LNG

• Significant portion of infrastructure being built for Phase 1 is applicable to a gas line or LNG project
- COMMERZIALIZING NORTH SLOPE GAS -

SIGNIFICANT PROGRESS: THIRD QUARTER -

Attachment 1
Southcentral Alaska LNG – Integrated Team

Management Committee
ExxonMobil ConocoPhillips

Commercial Team
Lead: BP

Technical Committee

Technical Team
Lead: ExxonMobil

Producing Fields
Lead: BP

Pipelines
Lead: Alaska Pipeline Project

LNG Plant
Lead: ConocoPhillips

Integration Team
Lead: ExxonMobil

Multimillion Dollar, Four-Company Effort – 125+ Employees, 100+ Contractors
• Joint work commenced March 31, 2012 after completion of the Pt. Thomson Settlement / joint work agreements
• Cooperative effort among the leading North Slope producers and a leading North American pipeline company
• Identified potentially viable LNG project options to monetize ANS natural gas
• Used company strengths, shared information / expertise; built upon past efforts, sought out new ideas
Southcentral Alaska LNG – Work Plans / Key Decision Points

Requirements to Take Next Step:

- Viable Technical Option(s) Identified
- Government Support
- Permits / Land Use Achievable
- Potential Commercial Viability
- Viable technical option
- Government Support
- Permits / Land Use Underway
- Potential Commercial Viability
- Secure Permits / Land Use / Financing / Key Commercial Agreements
- Confirm Commercial Viability
- Execute EPC contracts

Attachment 3

<table>
<thead>
<tr>
<th>Activities</th>
<th>Solicit Interest of Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish Government Support and Advance Regulatory Issues:</td>
<td>Advance Gov’t / Reg. Issues:</td>
</tr>
<tr>
<td>• Competitive oil tax environment; predictable / durable LNG project fiscal terms; AGIA Issues</td>
<td>• Key permit / land use approvals</td>
</tr>
<tr>
<td>• Assure ability to secure regulatory approvals / permits / land use</td>
<td>• Stakeholder engagement</td>
</tr>
<tr>
<td>• Environmental activities / Technical data collection</td>
<td>• Secure DOE Export License</td>
</tr>
<tr>
<td>• Stakeholder engagement</td>
<td>Complete Gov’t / Reg. Issues:</td>
</tr>
<tr>
<td>• File DOE Export License</td>
<td>• Secure remaining construction / operating permits</td>
</tr>
<tr>
<td></td>
<td>• Stakeholder engagement</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Solicit Interest of Others</th>
<th>Activities</th>
</tr>
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<tbody>
<tr>
<td>Start individual gas / LNG sales / shipping efforts</td>
<td>Screen commercial viability</td>
</tr>
<tr>
<td>Execute individual gas / LNG sales / shipping agreements</td>
<td>Assess commercial viability</td>
</tr>
<tr>
<td>Implement business structure &amp; agreements</td>
<td>Confirm commercial viability</td>
</tr>
<tr>
<td>Commission / start-up</td>
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*NOTE: Duration of various phases may be extended by protracted resolution of fiscal terms, permitting and regulatory delays, legal challenges, changes in commodity market outlook, time to secure long-term LNG contracts, labor shortages, material & equipment availability, weather, etc.
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, February 15, 2013
**SCLNG Concept Summary - Upstream**

**PTU (62 miles east of PBU/GTP area)**
- Initial Production System (IPS) project in progress - 2016 SU
- Preliminary SCLNG design basis for PTU:
  - Leverage IPS facilities, add fourteen new wells
  - Add new gas facilities to existing central pad / facilities
  - New 30" gas line from PTU to GTP in Prudhoe Bay
  - Peak workforce – 500-1,500 people

**PBU Tie-in (adjacent to proposed GTP location)**
- Installation / tie-in managed by Prudhoe Bay Operator
  - Tie into existing CGF, deliver gas to new Gas Treatment Plant
  - Gas project / deliveries tied to future PBU operations
- Preliminary plan is to inject CO₂ using existing injection systems as appropriate
COMMERCIALIZING NORTH SLOPE GAS
- CONCEPT SELECTION: MIDSTREAM -

**SCLNG - Concept Summary - Midstream**

**NS Gas Treatment Plant**
- Designed to remove gas impurities
- Four amine trains with compression, dehydration and chilling
- Prime power generation (5 units, 54kHP)
- All required utilities, infrastructure and camps
- Facility will be modularized, sealifted to location
- Peak workforce – 500-2,000 people

**Gas Pipeline and Compression Stations**
- 800+ mile 42" x 80 pipeline
- 3-3.5 billion cubic feet gas per day
- Eight compressor stations (30kHP each)
- Pipeline contents will be treated gas, impurities removed
- Designed to manage continuous and discontinuous permafrost regions
- Expansion potential with additional compression if appropriate
- Five off-take points for Alaska gas delivery
- Peak workforce – 3,500 - 5,000 people
COMMERCIALIZING NORTH SLOPE GAS
- CONCEPT SELECTION: DOWNSTREAM -

SCLNG - Concept Summary – Downstream

LNG Plant and Storage
- Three 5.8 million tons per annum (MTA) LNG trains
  - Plant receives 2.2 - 2.5 billion cubic feet per day to liquefy
  - LNG production varies with ambient temp (4.9 - 6.3 MTA)
  - Small volume of stabilized condensate produced (~1,000 bbl/day)
- Integrated utility system with all utilities on site
- Two-three 160,000 cubic meter LNG storage tanks
- Peak workforce – 3,500 – 5,000 people

Marine Offloading Facility
- Conventional jetty and trestle design
- Two berths
- Design based on 15-20 LNG carriers
- Marine support system includes required tugs, security boats
- Peak workforce – 1,000 – 1,500 people
Comparative Advantages of Alaska LNG
The North Slope of Alaska is estimated to have over 200 trillion cubic feet of conventional gas.

Conventional gas is not controversial—unconventional gas in the Lower 48 U.S. states remains controversial.

35 trillion cubic feet of known reserves.

Prudhoe Bay reinjects 8 billion cubic feet of gas per day, which is enough to meet Canada’s daily gas needs.

These numbers do not include the trillions of cubic feet of shale gas, tight gas, and gas hydrates estimated for the North Slope.

This is an almost inexhaustible supply of gas with new technology.

North Slope gas is “wet” gas with a high energy content (BTU value).

An Alaska LNG project has complete certainty of supply; not all other projects do.
COMPARATIVE ADVANTAGES OF AK LNG
- EXCEPTIONAL RECORD OF RELIABILITY -

• Alaska has a longstanding tradition of reliably exporting LNG to Asia
  o Alaska has been exporting LNG to Japan for over 40 years
  o Alaska has transported 2.5 trillion cubic feet of gas to Asia (the majority to Japan) over this time
  o Alaska has never missed a LNG cargo shipment to Asia
• Alaska is the only place in the United States exporting LNG
• Alaska does not use gas supplies for political purposes
**Comparative Advantages of AK LNG**
- Geographic Proximity, Political/Legal Stability, & Cost Competitiveness -

- Close proximity to Asia
- Avoids strategic shipping choke points that other sources of LNG must traverse
- Benefits from American legal and political stability and the rule of law
- No looming conflicts in the region
- Proximity/shipping costs are very low
- Use of existing infrastructure and pipeline routes reduces costs
- Cold weather efficiencies significantly decrease processing costs compared to warmer climates
Wood Mackenzie (2011), the global research and consulting firm, completed a study for the State of Alaska to evaluate the economic competitiveness of Alaskan LNG exports relative to other projects.

- Alaskan LNG exports would be competitive and could generate between $220 and $419 billion.
- Alaskan LNG exports have a delivered cost structure below $10/MMBtu.
- Most competing Australian projects and proposed North American LNG exports yet to secure Final Investment Decision are expected to deliver LNG to Asia at a cost of $10-$12/MMBtu under current gas price assumptions.

Recent Studies To Support Competitiveness

Brookings Institution (2012), the public policy organization, published a policy brief that discussed the strong competitive position of a potential, large-scale Alaska LNG to Asia project.

- 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.


Existing oil and gas infrastructure on the North Slope can be utilized for a large-scale LNG project.

The route for a large-scale LNG project would be the same or similar to the existing Trans-Alaska Oil Pipeline route, which will save on costs and have a limited impact on the environment.

World-class businesses and LNG producers have already invested billions of dollars on LNG studies and oil and gas infrastructure in Alaska.

Companies are working closely together/integrating efforts.

Highly trained workforce in Alaska can ensure competitive labor costs.

Strong oil and gas service support industry already in place.
Comparative Advantages of AK LNG
- Significant Progress on Export License and Other Regulatory Matters -

- Alaska has been reliably exporting LNG to Asia for over 40 years under various federal permits and export licenses

- Not part of Lower 48 shale debate and controversy
  - Stranded gas—no effect on national gas market in the Lower 48 U.S. states
  - Large LNG Alaska project will get more gas to Americans, not less

- First Nation and Native land claim issues have already been resolved

- Previous and upcoming Environmental Impact Statements (EIS)—Yukon Pacific/AGDC

- Federal Energy Regulatory Commission (FERC) filing/resource reports

- State regulatory approvals are in place to produce and transport gas
CONCLUSION

• Significant progress

• Full commitment by the State of Alaska: financing, permitting, and advocacy

• Significant comparative advantages