Memo

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| **To:** | Hudson West |
| **Date:** | November 11, 2017 |
| **Re:** | Alaska LNG |

Summary Talking Points

1. In 2016, international business consultant expert, Wood Mackenzie, labeled the Alaska LNG Project as “one of the least competitive” of the proposed LNG plants worldwide.
2. The Alaska LNG project includes three major projects:
   1. Gas Processing Plant
   2. 800-mile pipeline
   3. 20 MTPA LNG export facility
3. In 2012, the state of Alaska and four industry LNG partners (ExxonMobil, BP, ConocoPhillips, and TransCanada) spent over $500MM on the initial engineering for the Alaska LNG export project. At that time, they estimated the total project cost would be $63 billion.
4. In 2016, the state of Alaska’s four industry LNG partners pulled out from the project due to the project costs not being competitive.
5. In late 2016, the state of Alaska took over development of the project. They estimated the project would cost $43 billion (without financing), but have provided little details explaining this reduced calculation.
6. While the LNG shipping cost to Asia for the Alaska LNG project is lower than U.S. Gulf Coast LNG projects, their cost of construction is approximately 900% higher than similar sized U.S. Gulf Cost LNG projects. Alaska LNG’s base cost is approximately $3500 per tonne compared to Monkey Island LNG’s cost of $424 per tonne. The harsh conditions, the remote locations, and excessively long pipeline are part of the reasons for the increased cost of the Alaska LNG project. The lower shipping and natural gas costs cannot offset Alaska LNG’s tremendous construction costs.
7. Asian LNG Buyers have looked at LNG projects on the West Coast of the United States favorably for years because the perceived shipping savings. However, when you amortize the cost differential in the proposed Alaska LNG project against the shipping savings, it would take over 100 years for Alaska LNG to make up the cost difference, not to mention the negative financial returns the investors would incur during that time. Since the opening of the widened Panama Canal and the now reduced shipping cost from the Gulf Coast, Buyer interest in these West Coast projects has dropped considerably.
   1. In November 2017, Alaska reported they have 35 trillion cubic feet of natural gas, which is enough natural gas to produce 20 MTPA of LNG for approximately 37 years, which is 63 years shorter than the approximate breakeven point.
8. The non-binding agreement signed between Sinopec, multiple Chinese LNG companies, and Alaska LNG appears to be similar to the original agreement with ExxonMobil, BP, ConocoPhillips and TransCanada. ExxonMobil, BP, ConocoPhillips and TransCanada walked away from the project because of the excessive costs.

**Conclusion:** The Alaska LNG project cost fundamentals appear to have not changed. Unless Sinopec and China want to buy LNG from one of the world’s most expensive LNG projects in the world, the likelihood of the Alaska LNG project advancing is very low. In short, this project does not appear to make financial sense on any level. See below for more details…

Additional Details

1. The Alaska LNG project is comprised of a natural gas processing plant, an 800-mile pipeline, and up to a 20-MTPA LNG export facility.
2. The original project sponsors for the Alaska LNG project were ExxonMobil, BP, TransCanada and ConocoPhillips, and the state of Alaska. In 2012, the state of Alaska’s four main industry partners estimated the project would cost $63 billion.
3. In 2016, these partners dropped the project because the project was too expensive. At the end of pre-FEED, they had $500 million invested[[1]](#footnote-1), and the next phase of the engineering and design for the project would cost more than $1 billion[[2]](#footnote-2).
   1. They also decided to drop the project because there wasn’t a negotiated royalty and tax agreement with the state of Alaska[[3]](#footnote-3).
   2. The state of Alaska took over the project in late 2016.
4. In 2016, Wood McKenzie issued the Alaska LNG Competitiveness Study[[4]](#footnote-4) (Wood Mackenzie Study”) that concluded the Alaska LNG project was “one of the least competitive” of the proposed LNG plants worldwide.
5. The state of Alaska took over the development of the Alaska LNG project and now estimates the project will cost $43 billion. It is unclear what actions resulted in the $20 billion price decrease. The Wood Mackenzie report concludes the actual cost will be between $45 and $65 Billion.
6. In November 2017, the Alaska Development Corporation signed a non-binding agreement with Sinopec for the development of the pipeline and the Alaska LNG export terminal.
   1. “The natural gas belongs to drillers like Exxon and BP, and gas purchase agreements would need to be made to purchase the gas. These agreements would need to be done separately”, according to Governor Walker.
   2. Exiting the governor’s briefing, U.S. Senator Click Bishop (R) sounded a note of pessimism: “From what I gathered in there, to me, it’s no different than starting from Day 1 with the big three here in Alaska,” said Senator Bishop referring to the “Big Three” oil and gas companies operating on the North Slope that pulled away from the deal originally.

Estimated Financial Analysis

1. Alaska LNG is likely to save around $1 per MMBTU in natural gas costs and $1 per MMBTU in shipping costs compared to Monkey Island LNG. When you combine these decreased costs against their $70 billion increased construction cost (base construction cost plus financing), it is highly likely the cost savings on the natural gas and shipping will never offset the increased construction costs. See below illustrations and analysis:
   1. If Alaska LNG were to match Monkey Island LNG’s projected liquefaction fee of $2.50, Alaska LNG would lose approximately $4 billion dollars in cash flow after debt service annually until 2041, their 17th year of operation (for a cumulative loss of approximately $67 billion).
      1. Their investors would receive approximately a -4% return on their investment.
      2. It would take over 100 years for the $2.00 savings to offset the $67 billion negative cash flow and the original construction cost, all things being equal.
   2. If Alaska LNG were to match Monkey Island LNG’s projected delivered price of $7.49 per MMBTU, then Alaska LNG would lose approximately $2 billion annually after debt service until 2041, and the investors would still have a negative return.
   3. In order to avoid having a negative cash after debt service in any year, Alaska LNG would require an approximate liquefaction fee of $9.38. This structure would deliver LNG to Asian customers at approximately $12.23 per MMBTU.
   4. To produce a 12% investor return, Alaska LNG’s liquefaction fee needs to be approximately $14.86 per MMBtu, which results in a delivered LNG price to Asian customers at approximately $17.71 per MMBtu.
2. If the Engineering, Procurement, and Construction (EPC) cost were on the low end at $45B (plus financed capital cost), as originally illustrated by Wood Mackenzie Study, with investor returns at 12% IRR, 70/30 debt to equity, 15-year loan tenor and interest rate at Libor + 3.5%, the forecasted delivered LNG price/MMBTU would be $13.18, based upon the following:
   1. $2.00/MMBTU Natural gas
   2. $10.33/MMBTU Liquefaction, O&M and pipeline fees
   3. $0.60/MMBTU Shipping to Guangzhou
   4. 11% natural gas fuel retainage
3. If the EPC cost were on the high end at $65B (plus financed capital cost) with the same financial terms described above, the forecasted delivered LNG price/MMBTU would be $17.71/MMBTU based upon the following:
   1. $ 2.00/MMBTU Natural gas
   2. $14.86/MMBTU Liquefaction, O&M and pipeline fees
   3. $ 0.60/MMBTU Shipping to Guangzhou
   4. 11% natural gas fuel retainage

Monkey Island LNG Financial Analysis

1. The MILNG EPC cost is $6.7B (8.4B total financed capital cost). MILNG’s forecasted delivered LNG price is $7.32/MMBTU
   1. $3.15/MMBTU Natural gas and pipeline fee
   2. $0.32/MMBTU Operations and maintenance fee
   3. $2.16/MMBTU Liquefaction Fee
   4. $1.66/MMBTU Shipping to Guangzhou
   5. 10% natural gas fuel retainage

1. “AGDC takes over Alaska LNG project leadership”, LNG World News, January 4, 2017, as seen on the internet on 09-Nov-17 at: <http://www.lngworldnews.com/agdc-takes-over-alaska-lng-project-leadership/> [↑](#footnote-ref-1)
2. “ExxonMobil, BP, ConocoPhilips back out of Alaska LNG”, LNG World News, August 30,2016, as seen on the interent on 09-Nov-17 at: <http://www.lngworldnews.com/exxonmobil-bp-conocophilips-back-out-of-alaska-lng/> [↑](#footnote-ref-2)
3. Exxon Mobil Backs Out of Proposed Alaska LNG Project”, Chester Dawson, Wall Street Journal, August 26, 2016, as seen on the internet on 09-Nov-17 at: <http://www.wsj.com/article_email/exxon-mobil-backs-out-of-proposed-alaska-lng-project-1472263173-lMyQjAxMTA3ODA4OTAwNDkxWj/> [↑](#footnote-ref-3)
4. “Alaska LNG Competitiveness Study”, Wood Mackenzie, August 2016 (Slide 24) as seen on the internet on 09-Nov-11 at: <http://www.angtl.com/pdfs/Wood%20MacKenzie%20Alaska%20LNG%20Competitiveness%20Study-%20%20Aug%202016.pdf> [↑](#footnote-ref-4)