

ALASKA STATE LEGISLATURE
JOINT MEETING
HOUSE RESOURCES STANDING COMMITTEE
SENATE RESOURCES STANDING COMMITTEE
Anchorage Legislative Information Office (LIO)
716 West Fourth Avenue, Anchorage, Alaska
August 24, 2016
1:00 p.m.

MEMBERS PRESENT

HOUSE RESOURCES

Representative Benjamin Nageak, Co-Chair
Representative David Talerico, Co-Chair
Representative Mike Hawker, Vice Chair
Representative Bob Herron
Representative Paul Seaton
Representative Andy Josephson
Representative Geran Tarr

SENATE RESOURCES

Senator Cathy Giessel, Chair
Senator Mia Costello, Vice Chair
Senator Peter Micciche
Senator Bill Stoltze
Senator Bill Wielechowski

MEMBERS ABSENT

HOUSE RESOURCES

Representative Craig Johnson
Representative Kurt Olson
Representative Mike Chenault

SENATE RESOURCES

Senator John Coghill
Senator Bert Stedman

OTHER LEGISLATORS PRESENT

Representative Dan Saddler
Representative Shelley Hughes
Representative Liz Vazquez
Senator Mike Dunleavy

Senator Lesil McGuire
Senator Anna MacKinnon

COMMITTEE CALENDAR

UPDATE: ALASKA LIQUEFIED NATURAL GAS PROJECT

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

STEVE BUTT, Senior Project Manager
Alaska Liquefied Natural Gas Project
ExxonMobil Development Company
Houston, Texas

POSITION STATEMENT: Provided a PowerPoint presentation titled, "Alaska LNG, Fueling Alaska's Future, AKLNG - Legislative Update."

DAVID BARROWMAN, Vice President Upstream Consulting
Wood Mackenzie
Edinburgh, Scotland, United Kingdom

POSITION STATEMENT: Provided a PowerPoint presentation titled, "Alaska LNG Competitiveness Study."

KEITH MEYER, President
Alaska Gasline Development Corporation (AGDC)
Anchorage, Alaska

POSITION STATEMENT: Provided a PowerPoint presentation titled, "JOINT RESOURCES COMMITTEE HEARING."

HUGH SHORT, Vice Chairman
Board of Directors
Alaska Gasline Development Corporation (AGDC)
Girdwood, Alaska

POSITION STATEMENT: Provided opening remarks during the AGDC PowerPoint presentation, "JOINT RESOURCES COMMITTEE HEARING."

ACTION NARRATIVE

[1:00:10 PM](#)

CHAIR CATHY GIESSEL called the joint meeting of the House and Senate Resources Standing Committees to order at 1:00 p.m.

Representatives Tarr, Josephson, Hawker (via teleconference), Nageak, and Talerico, and Senators Wielechowski, Micciche (via teleconference), Costello, and Giessel were present at the call to order. Representatives Seaton and Herron and Senator Stoltze arrived as the meeting was in progress. Also present were Representatives Saddler, Vazquez, and Hughes, and Senators Dunleavy, MacKinnon, and McGuire.

UPDATE: Alaska Liquefied Natural Gas (AKLNG) Project

1:00:26 PM

CHAIR GIESSEL announced that the only order of business is an update on the Alaska Liquefied Natural Gas Project ("Alaska LNG Project"/"AK LNG Project") as delineated in Senate Bill 138 [passed in 2014, Twenty-Eighth Alaska State Legislature], as well as an update on the Alaska Gasline Development Corporation's (AGDC) new concept plan.

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CHAIR GIESSEL recounted that the Alaska LNG Project was approved by the legislature in 2014 through Senate Bill 138, passed by a vote of 52-8. It has progressed further than any previous gas pipeline project in Alaska's history. She explained that the reason for today's hearing is the recognition of some things since the last project update on 6/29/16. The project, as currently formulated, is unlikely to proceed into Front-End Engineering Design (FEED) at the close of Pre-Front-End Engineering Design (Pre-FEED) under the current timeline. The governor has considered two options. Option 1 would be for the state to take over the project and proceed to FEED as soon as possible. Option 2 would be to stay in Pre-FEED, continue to work with the project's three producer parties to work to reduce cost of supply and to complete the permitting and regulatory processes. The governor has chosen Option 1, so AGDC has been moving forward to take over the Alaska LNG Project after completion of Pre-FEED, which is expected sometime in mid-September. [Members] are told that BP, ConocoPhillips, and ExxonMobil are cooperating and collaborating with the state on this transition. The project would also be moving into a new design, a new concept, for going forward than was outlined in Senate Bill 138. This hearing is not meant to revisit how this point was arrived at, but to focus on the next steps. In that vein, [members] are looking at specific information from today's presentations.

CHAIR GIESSEL welcomed the first presenter, Mr. Steve Butt. She said Mr. Butt will provide an update on the technical and regulatory pieces, the technical timeline for the transition, and significant issues or milestones that [members] should be aware of.

1:04:58 PM

STEVE BUTT, Senior Project Manager, Alaska Liquefied Natural Gas Project, ExxonMobil Development Company, provided an update on the Alaska LNG Project via a PowerPoint presentation titled, "Alaska LNG, Fueling Alaska's Future, AKLNG - Legislative Update," dated 8/24/16. He said he will review the work the project team has completed since the last discussion in June 2016 and is before the committees on behalf of the broader project team and is representing the work of many other people.

MR. BUTT drew attention to the cover page of his presentation and reported that hundreds of people over the last four years have done the field work that underpins project's progress on technical and regulatory work. He noted that the pictures are of some of the crews who have done this work, such as waterway work, test pits north of Healy, and an archeology crew in Windy Pass north of Cantwell. He expressed his appreciation to all the people on the work crews, the regulators, and all the landowners, particularly the Native corporations.

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MR. BUTT displayed slide 2, "Overview," and summarized the work that has been done for Pre-FEED under the joint venture agreement (JVA) since the last update in June 2016. He said the project has continued to work free of any safety incidents. Since June the project has spent about \$35 million and as of the end of July the Pre-FEED spend has reached about \$487 million. As of today the spend has exceeded about \$500 million on Pre-FEED since June of 2014. About \$107 million has been spent on scope work that preceded Pre-FEED. In total, the project is well past \$600 million and the engineering work is almost complete. All additional studies and alternatives that were brought into the original scope have all been done. Everything the project has been able to do to drive down costs to the lower end of the range has all been done. All of the summer field work that supports the Resource Reports has been finished. The Resource Reports, 12 in total, are the documents that progress the federal permitting process. Referring to the top right photograph on slide 2, he pointed out that Resource Reports 1-10

include about 33,000 pages, a stack of paper six feet high. These reports represent the millions of hours of work and hundreds of millions of dollars that were spent to get the permits necessary to execute the project. The reports are public and have been summarized, making it unnecessary to have to read all 33,000 pages.

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MR. BUTT noted that the 77 JVA deliverables are expected to be complete in August. Bringing attention to the schematic on slide 2 labeled, "AKLNG Pre-FEED JVA Project Work Process," he pointed out that about 130 people make up the JVA project team. The team has been successful because it has relied on the extensive experience from hundreds of people who are functional support, experts who have specific skills, as well as thousands of contractors and hundreds of subject matter experts. Additionally, through community engagement, the project has heard from thousands of community members about what they think about the project and the project design. All of that information from all those people is brought together to create two important sets of deliverables. First is what is kept in the public domain: the export authorizations that include the free trade country and non-free trade country authorizations, the Federal Energy Regulatory Commission (FERC) docket, and community interaction. All of that information is provided to federal and state regulators to get the licenses to permit the project. Second is the competitively sensitive information that has been created and that is not in the public domain. This information is kept proprietary within the project so that the project can be as competitive as possible. The competitiveness of the project is what is really important and is what determines how to move forward. Some of those deliverables are Pre-FEED deliverables, such as how to build the project, what does it look like, how many trains, where are the trains, where is the pipe, how to make the gas cold, and how to put it all together in a way that it is reliable. That is provided to the JVA participants - the Alaska Gasline development Corporation (AGDC), BP [BP Alaska LNG LLC], ConocoPhillips [ConocoPhillips Alaska LNG Company], and ExxonMobil [ExxonMobil Alaska LNG LLC].

MR. BUTT related that over 5,000 reports were done behind these deliverables and there has been thousands of years of experience in these meetings. Almost 200 workshops on design were held over the last two years. Through that process the project has been able to tap into this very deep base of knowledge on how to design this work. All of the best practices for how to design a

project of this nature have been brought into these work products. The ability to complete this work reflects the knowledge of having done this type of work before. The ability to tap into experts who have done this type of work many times has provided a lot of long foresight. The project's success is a reflection of the quality of that work team.

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MR. BUTT turned to slide 3, "Pre-FEED Deliverables," and said it is a summary of what the work team has accomplished. He noted the state has paid about 25 percent, \$150 million, of the \$600 million and said slide 3 is a summary of what has been delivered as a result of that spend. First, he explained, the project team has progressed the environmental impact statement (EIS) and has completed all the Resource Reports with FERC to complete the pre-filing process with the two sets of different drafts. This is incredibly important because it helps define how to execute the project in an environmentally responsible manner and for a project this size one wants to demonstrate the least environmentally damaging method possible. The project has filed Resource Reports 11 and 13 with the participants that are currently finishing up filing and they will be filed this month. These reports are safety plans and detailed technical plans and will not become part of the public domain because they are very detailed competitively sensitive information. For example, a certain piece of equipment obtained in a certain manner would have certain impacts and that defines how it would be sourced/how it would be bid. This type of information does not go into the public domain and FERC treats it differently. The work is done, the project team is working with FERC, and FERC is currently in Alaska. All the data from the 2016 summer field season will be put in. The project team will keep building that repository of knowledge. Many comments are expected back from FERC and those will have to be catalogued.

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MR. BUTT drew attention to the upper right graph on slide 3 labeled, "Deliverables Issued For Review." He explained that these deliverables define how the project would be done; talk about project scope and safety, regulatory, technology, and execution plans; how and from where everything would be purchased; how to manage labor; and most importantly how much it would cost and how to manage the schedule estimates. Through the team's work, the cost estimate has been driven to the bottom of the \$45-\$65 billion range that has always been talked about.

MR. BUTT discussed the lower right graph labeled, "AKLNG - Total Project Team - Total FTEs [full-time equivalents]." Over time, he said, the project team was built up from about 50-60 people, differentiating between full dedicated project support people and functional support people from the companies who provide help. This graph is based on the hours that people have billed for the project and based on those hours the project built up to about 150 people through 2015 to deliver the 77 deliverables demonstrated in the top right graph. Since starting to complete that work in March [2016], alternative ideas and ways to move forward have been looked at. As work gets completed, people are demobilized to keep the costs down. This graph also provides an outlook on what is expected to happen from August [2016] through year's end, during which time demobilization will continue and costs will be kept down. The people represented in the graph are spread out all over: all of the regulatory team is in Anchorage, the team that designed the gas treatment plant is in Denver, the pipeline work was done in Calgary, and the LNG plant design was done by a small group of people in Houston. Those locations were picked because that was where the majority of the contractors were and it allowed for keeping costs down. The expertise and skill of the people reflected by the bars in the graph has allowed for getting all this work done in a relatively short amount of time and will allow the management of costs going forward.

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MR. BUTT moved to slide 4, "Summary," and discussed the stage gate process depicted in graphic form at the top of the slide. He said the Pre-FEED phase has been largely completed, so the JVA parties are now testing the requirements to move through the FEED decision gate. To frame the issue, he brought attention to the status summary of the three key factors depicted at the bottom of slide 4: alignment, risks, and cost. In regard to alignment, he noted it can safely be said that the project team has successfully built alignment on the design basis regarding what would be built, where, and how. However, he continued, as has been discussed before, there is not alignment on the commercial and fiscal terms. In regard to risks, the project team has progressed all the regulatory work required to reduce permitting risks, but a large change has been seen in the LNG market. In regard to cost, that market change has impacted the project's cost competitiveness. The project team has driven the capital cost estimate down by 15-20 percent, bringing it to the lower end of the [\$45-\$65 billion] range, but at the same time

the LNG market has reduced the product prices 67 percent. So, the project's cost competitiveness is still at issue.

MR. BUTT pointed out that honoring this stage gate process is an industry best practice. Successful project management is about reducing risks while increasing certainty, so that as the project makes resource commitments the project has confidence that it can manage risks and manage costs. In the concept stage the project spent about \$30 million a year to do the early design work and in the Pre-FEED stage the project spent about \$30 million a month. Once in FEED a project of this size would spend \$30 million a week and in construction a project of this size would spend \$30 million a day. Those stages and that spend pattern are what drives [the team's] thinking about why these gates are important, because as the team works through the uncertainties, it wants to do it at lower spend levels. Having misalignment at a spend rate of \$30 million a day is much more expensive than \$30 million a year, so it is that thinking that shapes this process.

MR. BUTT concluded by noting that the stage gates and completing the right work are key to managing cost control and managing cost control is key to having a successful project. Project team members having those right skills and leveraging those through this right process is what has been helping the project team to be successful. It has been a privilege to advance the Alaska LNG Project, he said, and to get to know the legislative members. He offered his hope and trust that the work has met legislators' expectations. The project team feels that it has been able to deliver on the commitments that were within the Pre-FEED agreements, do the work it agreed to do, and make sure that it advanced the deliverables that were critical. He thanked the committees for their interest, questions, and passion, and noted that the project team members have felt they were part of something that really mattered to Alaska.

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SENATOR DUNLEAVY inquired whether industry views the market changes as just being a cyclical issue of supply and demand like it has over the past 10-50 years, or as being a technology issue that has changed the paradigm of the system.

MR. BUTT replied that every time he has talked to members about market windows and how the supply and demand works in the LNG business, he has made the point that it comes down to cost of supply - if the project has a low enough cost of supply to

manage the risks it can be competitive. Regarding whether there has been a structural change in the market, he said he does not consider himself an expert in that and he therefore suggests that this question be asked of the forthcoming witnesses who are well versed in that. However, he reiterated, the key is always about competitiveness.

[1:22:13 PM](#)

REPRESENTATIVE SEATON asked whether there has been any progress on the unresolved commercial issues in balancing agreements or whether things are essentially at the same stage as they were at the last update.

MR. BUTT recommended that the producer parties and the state representative be asked directly how they feel about the commercial project.

[1:22:50 PM](#)

REPRESENTATIVE HAWKER requested Mr. Butt to reiterate the spend rate for the Pre-FEED, FEED, and construction periods. He further inquired how large of a team would need to be either continued or assembled to move into FEED.

MR. BUTT responded that the spend profile has been studied in many ways. In the concept stage, the project spent \$30 million a year to say how this would be put together. In the Pre-FEED stage, \$30 million a month was spent to get the permits and do the design work necessary to say how it would all be executed and fit together. The spend for FEED would be \$30 million a week and for the construction phase it would be \$30 million a day. This is known based on the work done in the Pre-FEED stage since one of the Pre-FEED deliverables is the design of an organization to execute FEED as well as the engineering, procurement, and construction (EPC). The project team has looked at and talked about the number of different skill sets in construction. In regard to labor, it is 9,000-12,000 people over a 4-7 year period depending on how the tops of the peaks are measured. From a team perspective, about 30 people were involved during concept and about 150 people are involved in Pre-FEED, so an increase by a factor of 5. A similar increase by a factor of 4-5 would be expected going from Pre-FEED to FEED, a team of owner representatives of 600-700 people would be needed. Thousands of contractors would then be needed to help get the really detailed design work done. But, with that said, he continued, it is always important to differentiate paradigms.

He is a representative of the project team working on behalf of the State of Alaska and the other parties, which is called an owners paradigm. "There is no benefit in me to work the issue," he said, "the party's only benefit when the work delivers some revenue." Other parties have a different paradigm; they get paid as they do work, they do not have that same owner paradigm, they do not benefit until the project is online and revenue. Those structures and those teams are important. Needing to be thought about are the spend, the size, the number of people, and also the alignment.

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REPRESENTATIVE SADDLER observed on slide 4 that most of the stoplights under alignment, risks, and cost are colored yellow rather than red or green. He asked whether the yellow stoplights indicate that those are in progression. He further asked whether all of the yellow stoplights must be turned to green in order to make the FEED decision.

MR. BUTT answered it is really best to try to move them to green. He explained it is a decision for each party that would be committing the resources for FEED to say at what juncture the party is comfortable to move through that gate. There are shades of green and shades of yellow, but red is usually a pretty scary color for folks. Moving them all towards green would be wanted, and then it is up to each party to say what it needs as an individual party to make that decision.

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SENATOR WIELECHOWSKI inquired whether Mr. Butt still thinks the project is viable commercially such that it should go forward to the next stage.

MR. BUTT replied that as an individual he believes the project has the opportunity to be commercially viable. It is a low risk known resource of gas; it has some structural advantages as well as some structural disadvantages. At the point at which the project costs get to be competitive, the project can be moved forward. Whether that is right now, he continued, he does not know. Sometimes things need to be worked a little bit harder to get to that place, but it is known what that place looks like in its commercially viable, technically feasible form, with all the right regulatory permits in place, and the project does not have all those boxes right now, but the project can get to them.

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CHAIR GIESSEL noted that 146 people are listening online to the meeting. She said the next witness, David Barrowman of Wood Mackenzie, will be presenting a report that was commissioned by BP, ExxonMobil, and AGDC regarding the economic feasibility of the Alaska LNG Project under various scenarios and in today's market condition.

DAVID BARROWMAN, Vice President Upstream Consulting, Wood Mackenzie, stated that his company is a global energy, metals, and mining research consulting firm of over 1,300 people in offices around the world. Wood Mackenzie started covering the North Sea in 1973 and since then has grown its coverage from that. He noted he is a chartered accountant, has been with Wood Mackenzie for over 30 years, has worked across the globe for a variety of companies and governments, and has been involved in valuation and fiscal work.

MR. BARROWMAN displayed slide 3, "Agenda," and noted it provides an outline of the areas he will be discussing in his report to the committees. Moving to slide 4, "Scope of Project," he explained that Wood Mackenzie was asked by BP, ExxonMobil, and AGDC to undertake an analysis of the competitiveness of the Alaska LNG Project. The work carried out relied upon Wood Mackenzie's own internal databases and publicly available information. Wood Mackenzie was not provided with any information by any of the companies. The areas looked at in the report are: 1) establish a base cost of supply (CoS) and define the competitiveness of the CoS for Alaska LNG; 2) identify what viable options there might be, excluding cost savings, to reduce the project's CoS; and 3) consider the way forward to allow for a globally competitive LNG project in Alaska.

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REPRESENTATIVE HAWKER complimented Wood Mackenzie for its upfront willingness to describe the basis upon which it is rendering its opinions. Regarding the notation that Wood Mackenzie was not been provided with any proprietary information and used its own internal databases and publicly available information, he asked how confident Mr. Barrowman is that the conclusions reached in this report actually are applicable to the unique specifics of the Alaska LNG Project.

MR. BARROWMAN replied that Wood Mackenzie feels very confident on it. He said Wood Mackenzie's own databases are recognized

internationally as being a fairly accurate starting point for undertaking a review of analysis. Wood Mackenzie markets its databases to many subscribers within industry and government across the globe and Wood Mackenzie builds the databases up from discussions that it has with companies. These discussions give Wood Mackenzie confidence in the reliability of the information that it uses. He said Wood Mackenzie also crosschecks the information against publically available sources to give itself an additional level of comfort.

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REPRESENTATIVE HAWKER surmised that according to the international standards used by Wood Mackenzie to compare this project, the Alaska LNG Project is not so unique that it deviates much from the international standards and experiences.

MR. BARROWMAN responded that in its research databases, Wood Mackenzie has modeled a large number of LNG projects internationally and has modeled for Alaska as well. The basis of putting those models together is standard and aligns with what Wood Mackenzie does elsewhere. So, he confirmed, it is not really different.

[1:34:40 PM](#)

MR. BARROWMAN returned to his presentation and reviewed slide 5, "Executive Summary." He advised that the competitiveness of the Alaska LNG Project does not rank well when compared to other peer jurisdictions or peer projects that could supply North Asia. The ranking means that under current pricing assumptions the project would certainly struggle and even if oil prices rose to around about \$70 a barrel it would be difficult to make acceptable returns. However, he continued, there are certain levers that could be used and this presentation and the report look further at the available levers.

MR. BARROWMAN moved to the world map shown on slide 7, "Several projects targeting 2016 FID have already pushed their timetable back," to address the topic of cost of supply competitiveness. He explained that a global look was taken to give a flavor of what is happening around the world. A plot was done of the projects that Wood Mackenzie believed at the start of the year were likely to receive final investment decision (FID) during 2016. The blue circles on the map are those where Wood Mackenzie expected FID and those highlighted with yellow are what Wood Mackenzie called a wild card, meaning a project that

was a bit more tentative but could still possibly move ahead. The takeaway from slide 7 is that there are a lot of challenges to LNG projects worldwide. Some of the developments have been pushed back and some have been canceled for a variety of reasons, including market concerns, market conditions, and issues of regulation and permitting. The Alaska LNG Project is not alone in having problems in moving the project through to FID. For example, so far this year only one project, the Tangguh Train 3 in Indonesia, has taken FID.

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MR. BARROWMAN quickly noted that slide 8, "Alaska LNG - Project Overview," is a highlight of some of the publicly available information that was used by Wood Mackenzie.

MR. BARROWMAN showed slide 9, "Approach to Analysis - Breakeven Cost of Supply," and noted that the analysis done by Wood Mackenzie is a breakeven cost of supply. He explained what Wood Mackenzie goes through in doing this. In the analysis in this report, Wood Mackenzie has not looked at standard economics of net present values (NPVs) or internal rates of return (IRRs). When people are looking at LNG projects, they tend more often to look at cost of supply and comparisons typically are done on a cost of supply basis. The cost of supply is trying to determine what the price would be for a project to break even and the definition of breakeven is making a hurdle-based return. Wood Mackenzie has used a return here of 12 percent, so this an internal rate of return within the project of 12 percent. Twelve percent is the typical rate used by upstream oil and gas companies when making go/no-go decisions. Wood Mackenzie has seen this rate come down; when prices were higher, the hurdle rates were higher as well. For an LNG project at the present time, 12 percent is reasonable and is what Wood Mackenzie uses in its standard research databases.

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MR. BARROWMAN displayed slide 10, "Assumptions - Costs and Volumes," and outlined the assumptions used by Wood Mackenzie. For the transmission lines, gas treatment plant, pipeline, and LNG liquefaction plant costs, Wood Mackenzie ran two cases - one of \$45 billion and one of \$65 billion. For upstream costs, Wood Mackenzie used the assumption of \$10 billion, and this amount covers both Point Thomson and Prudhoe Bay. Future capital expenditure ("capex") on those two projects is split about 50/50. For Point Thomson it is the costs that are required in

the development of the gas. For Prudhoe Bay it is more in terms of cost to maintain the facilities. Prudhoe Bay by the mid-2020s will have been producing for 50 years, so it has aging infrastructure. Wood Mackenzie took the view that over the period of several years up to the end of the 2020s there will need to be a material amount of spend. For shipping costs, Wood Mackenzie used the assumption that the shipping costs will be 60 cents per million British thermal units (MMBtu) to transfer the gas from Alaska to North Asia. The markets being targeted are in Japan, South Korea, China, and Taiwan. To provide context, he noted that shipping costs from LNG projects located in the U.S. Gulf Coast are closer to about \$2 [per MMBtu].

MR. BARROWMAN continued outlining the assumptions provided on slide 10. For upstream production, Wood Mackenzie used the assumption of 3 billion cubic feet a day (Bcf/d). For losses through the system, Wood Mackenzie used the assumption of 11 percent. "Losses" means loss of molecules, use of the gas in power generation for the pipeline, and use for the liquefaction plant. For the domestic market allocation, Wood Mackenzie used the assumption of 300 million cubic feet a day (MMcf/d), about the same number as by AGDC. About 200 MMcf/d of that allocation will be for industrial uses and the rest for household uses.

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MR. BARROWMAN addressed the graph on slide 11, "Comparison of Breakeven cost of supply for delivery into North Asia." To come up with the graph, he said, Wood Mackenzie looked at six projects, as well as the Alaska LNG Project, that are Pre-FID and then built up the cost of supply for each of those project groups. He explained that within each bar on the graph the light blue is the cost of gas, which is the upstream cost. He further explained that the bar depicting the U.S. Gulf Coast (labeled "Other USGC") is a Henry Hub derived number; it is not what the Henry Hub price is today, but rather Wood Mackenzie's forecast that the Henry Hub is going to rise over the next few years. The average Henry Hub price from 2019-2030 is forecast to be, in real terms, about \$3.41. That price was then grossed up to account for losses, coming to a gas cost of about \$4. That \$4 compares with Alaska LNG which is just over \$2.

MR. BARROWMAN noted that standing out on this chart is that the gas cost for Alaska LNG is much lower than that for other areas. This is because the gas production is pretty much dominated by Prudhoe Bay where the gas is getting produced each day in any event, so it is not as though a lot of new wells, if any, need

to be drilled. That really drives the comparatively low upstream gas costs for Alaska LNG.

MR. BARROWMAN pointed out, however, that the difference is in the cost of the gas treatment plant, pipelines, and anything else downstream of the field, which is represented by the dark blue color within each bar on the graph. Alaska LNG has a cost of supply significantly higher than that for other jurisdictions because it has the liquefaction and gas treatment plants, as well as an 800-mile-long gas pipeline. All of these things push up the cost of supply.

MR. BARROWMAN said the shipping cost for Alaska LNG is about 60 cents per MMBtu, which is represented by the grey color within each bar. He explained that the [dashed lines] on top of each of the bars represent a range. The ranges for the different projects are on the basis of a number of different projects, such as for Asian brownfields or for niche floating LNG (FLNG) where the liquefaction facility is located on a vessel. The range is plotted by the lowest cost of supply and the highest cost of supply project for each of the different areas. The range for Alaska LNG is between \$45 billion and \$65 billion.

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MR. BARROWMAN reiterated that the breakeven costs are calculated on the basis of a 12 percent internal rate of return. He explained that the two horizontal bars across the graph are the illustrative prices. Wood Mackenzie calculated what the price in Asia might be on the basis of today's oil price of \$45 a barrel and a long-term oil price of \$70 a barrel, because Wood Mackenzie is also expecting by the end of the decade that the price of crude oil will have risen to about \$70 a barrel. So, Wood Mackenzie applied the formula, 12-14 percent of the oil price, plus 80 cents per MMBtu as being a delivered price in Asia. The horizontal price bars are not just a line, he said, because of the range of 12-14 percent. At the moment, it is probably closer to 12 percent and possibly even the "high elevens." He noted that a lot of deals have been signed on a Henry Hub basis. This was the case, he explained, because as the oil price was over \$100 a barrel, then these price-linked cases were becoming quite expensive for producers. However, the reverse is now true - with falling prices it is probably potentially a bit more attractive for buyers to start using the oil price-linked contracts. There is still the Henry Hub, but more of the oil price-linked contracts are being seen coming to the fore.

MR. BARROWMAN showed slide 12 and said he will skip it because it is mostly what he has just explained.

1:49:16 PM

MR. BARROWMAN returned to the graph on slide 11 and reiterated that Alaska LNG has the highest cost of supply (depicted in far right bar). He clarified the chart is not saying that buyers will always work from left to right of the chart, such that the Asian brownfields would be signed up first, then the niche FLNG projects, and so on. Instead, there are many other drivers that gas purchasers will take into account, three of which are listed on the left side of slide 13.

MR. BARROWMAN then moved to slide 13, "North Asia has a significant requirement for additional LNG, but price is not the only factor that buyers take into consideration." He said one important driver to buyers is to maintain a geographically diverse portfolio, so buyers will tend to buy from different producing countries. For example, many purchases of Australian LNG have recently been made. An increasingly important driver is contractual flexibility, he advised. For example, some contracts are Henry Hub prices and some are linked to crude prices. It is important for buyers to have a balance between Henry Hub and oil-price-linked contracts. Buyers also probably want to have contracts of different lengths, he continued. Buyers can underpin their purchases by having 20-year or 25-year contracts as well as some shorter contracts of 5-10 years. Another important driver, he said, is reliability and longevity of supply. A buyer wants to sign a contract with someone the buyer knows is going to give stable production over the period of the contract. A buyer does not want to buy with someone in a country that may turn into a conflict zone pretty quickly. So, he summarized, there are issues that will be taken into account and the challenge is trying to quantify the value that is placed on those.

1:51:37 PM

MR. BARROWMAN continued addressing slide 13, explaining that the chart puts into context what is available for Alaska LNG in these competing projects. The total North Asian demand for LNG is depicted by the red line moving across the chart, he explained. This demand has been rising quite significantly over the last few years. While it has started to flatten out, it is still rising over the next few years. Contracted demand, a

signed sale and purchase agreement (SPA), is represented in light blue. Contracted demand, a Heads of Agreement (HOA) (shown in dark blue), is not a firm contract, but something that Wood Mackenzie believes will move through to being a firm contract. Competing areas are represented in yellow; the competing projects included on slide 11 are plotted in yellow according to when Wood Mackenzie expects them to start producing LNG. Alaska LNG was put on top in red; that is not to say that Alaska LNG will be the last one people go to, but to highlight what the comparative volumes could be from Alaska LNG. An additional consideration not plotted on this chart is that some of the wedge located between the blue area and the red line may be uncontracted areas, so that is the size of the prize that is being looked at. There will be some existing LNG projects where contracts run out and they will be looking to re-sign contracts. Maybe somewhere between 25 and 33 percent of that area potentially could go to rollover projects, but Wood Mackenzie's view is that new projects are attractive for buyers because they will give a long-term stream of production. The challenge for existing LNG projects is that they may have been producing for 20 years and so there may be a limited supply from some of these projects.

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MR. BARROWMAN turned to slide 14, "Agenda," and slide 15, "Approach," and said Wood Mackenzie looked at non-capital expenditure ("non-capex") and non-operating expenditure ("non-opex") options to reduce the cost of Alaska LNG supply. He clarified it is not really cost issues being looked at here, but rather to drive home that costs will be fundamental to the success of this project, which is highlighted by the showing of a range between the cases of \$45 billion and \$65 billion. He said three options were looked at that could reduce the cost of supply: 1) a conventional non-recourse debt structure in a tolling plant; 2) a restructure of the project to increase the State of Alaska's share; and 3) relief from federal or state taxes on a stand-alone basis.

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MR. BARROWMAN discussed the first non-capex/opex option to reduce the cost of supply, a third-party-owned tolling utility. Moving to slide 17, "The introduction of a debt funded third-party tolling structure will reduce the cost of supply," he noted the left vertical bar on the graph represents the current project, so is the same bar seen on slide 11. Wood Mackenzie

did two things in its analysis, the first being to add in the element of debt. The debt structure assumed is a debt:equity ratio of 70:30 - 70 percent debt and 30 percent equity, with equity meaning that the companies involved will need to fund 30 percent of the project themselves. The 70:30 ratio is common within the industry. Also assumed is a repayment term of 15 years, so that is the life of the period over which repayment of the loan plus interest will take place. The assumed interest rate is the London Interbank Offered Rate (LIBOR) plus 3.5 percent. The LIBOR rate for long-term U.S. dollars is about 1.5 percent, giving an interest rate of about 5 percent for the debt. The way to think about this is like a mortgage on one's house - borrowing up front, putting some equity into the house, and then repaying the loan over a number of years at a fixed amount each year. In the early years it will be a lot of debt and over the years that debt portion will be reduced. This reduces the cost of supply, he explained, because it takes out a large chunk of the upfront capex. For example, if the debt is roughly \$30 billion and \$15 billion is equity, the owners will not incur the \$30 billion in cost until production starts and at which point the loan will then be repaid plus interest. In Wood Mackenzie's breakeven calculation using the IRR hurdle, only \$15 billion is put in upfront by the owners, rather than \$45 billion; the effect is that that will reduce the cost of supply.

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MR. BARROWMAN continued on slide 17, explaining that the second element added into the analysis is a third-party tolling company. Tolling means that someone else comes in and owns all the facilities that are downstream of the fields. This would be the gas treatment plant, the pipeline, and the liquefaction facility. The companies would put the gas down the pipeline and through the plant and be charged a toll in the same way that a toll road works. This could reduce the cost of supply because someone who owns these facilities and pipeline is likely to accept a utility rate of return, which is a lower return than the 12 percent that is required on the upstream. A third-party-owned tolling utility usually will accept a lower rate of return because the cash flows are typically much more stable - it is known what the toll rate is going to be, although it might fluctuate slightly. There should be fairly stable production and the toller is not at the mercy of, say, the oil price going up or a lot of the other risks that face the upstream. So, in the analysis, Wood Mackenzie ran the breakeven cost of supply at 8 percent rather than 12 percent. Some context for comparison is Gassled in Norway. On one hand it is not a good comparison

because it is an already built pipeline system, but on the other it is a good comparison because it has a managed return. Gassled is really all the offshore gas pipelines that exist in Norway. Originally the pipelines were all owned by different companies, but about 15 years ago they were all merged into this Gassled entity. Originally the ownership was in line with the upstream company. The upstream companies would own shares in gaslines. The returns they make are only a real return of 7 percent pre-tax, and pre-tax and post-tax in Norway are quite different. The marginal rate of tax is 78 percent, so the returns post-tax of Gassled are not that high, they are significantly below 8 percent. Over time the upstream companies have sold out their interest and the owners of the Gassled system tend to be investment funds or pension funds, including a couple of Canadian pension funds which have indirect interest in the Gassled system. What is being seen is likely to happen here - Wood Mackenzie is assuming a situation where a known upstream player comes along that may be a pipeline owner or may be a utility or other investor like a pension fund, someone who is willing to accept a lower return.

[2:03:24 PM](#)

MR. BARROWMAN continued addressing the graph on slide 17, noting the right vertical bar represents a third-party-owned tolling utility, a scenario where there is a significant reduction in the breakeven cost of supply. He said all of the projects that Wood Mackenzie looked at will do debt financing, so that is not going to be unique. Most, he advised, will not go through a third-party tolling; some do have third-party tolling and for some the ownership of the plant is the same as the ownership in the upstream. That may be an area where the Alaska LNG Project could be made more competitive. When talking about third party, the state also may have a role in here. He pointed out that even when comparing Alaska LNG with a project that does third-party tolling elsewhere, the absolute benefit to Alaska LNG is probably going to be greater. This is due to the project's huge amount of [liquefaction and other infrastructure], represented in dark blue on slide 11. Basically, this area is cut in about half, so although proportionately these other projects will reduce, the Alaska LNG Project is really able to reduce this quite significantly. Because the Alaska LNG Project has quite a low gas cost compared to the other jurisdictions, moving to a tolling system could be proportionately beneficial towards the project. In absolute terms, even at the \$65 billion case, what has happened is getting below the \$70 long-term price case. It may be possible to have a profitable project if the price rises,

he advised, but it is still going to struggle at today's price of \$45 a barrel, although in the low-cost case it is starting to look a lot better than it was on the existing-project case that Wood Mackenzie originally showed committee members.

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MR. BARROWMAN displayed slide 19, "The introduction of State ownership," and addressed the second non-capex/opex option, a state-owned tolling utility, that could reduce the cost of Alaska LNG supply. He explained that the left and center vertical bars on the graph are the same as in slide 17, while the right vertical bar represents the adding in of a State of Alaska-owned tolling utility. In this assumption, he said, the State of Alaska owns 100 percent of the pipe and the plants. Also assumed is that the State of Alaska may be able to reduce tax, a unique additional point over a third-party. In this scenario Wood Mackenzie has assumed a no-tax case, meaning no tax in the pipe and plant. There would still be the royalties and profit taxes in the upstream. It is just in the downstream that federal and state taxes are removed, including state corporate income tax and state ad valorem property taxes. Clearly, the decision of what happens is up to the legislature, he continued, but what Wood Mackenzie has done is to show a situation where that happens and what the economics would look like. In this situation there would be a reduction of a little under \$1 an MMBtu and the \$45 million case would start to break even at today's prices. It is certainly something that is worthy of consideration, he advised.

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MR. BARROWMAN moved to slide 21, "Changes to the Fiscal Regime," and addressed the third non-capex/opex option that could reduce the cost of Alaska LNG supply. He pointed out the concept that if governments want projects to move ahead and the tax or royalty system is preventing it from happening, then the government would be willing to change the fiscal regime because it is better to have a bit of something than a lot of nothing. Typically, relief is granted for assets that are high cost found in inhospitable locations or for projects that have low profitability under existing terms. For example, the Snohvit LNG Project in Norway received accelerated capital allowance relief as well as relief against the upstream taxes. The Yamal LNG Project in Russia received exemption to certain taxes to allow the project to move ahead. He noted that more detail and

more examples of relief are provided in the presentation's appendix for those members wishing to look at it.

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MR. BARROWMAN displayed slide 22, "Impact of Federal and State fiscal change on integrated structure," and continued his discussion of the third option. The graph illustrates [the cost of supply impact of changes to the fiscal regime on the integrated 100 percent equity project] for three different cases, he explained. The left vertical bar represents the current project and excludes the tolling and any state equity; it is a comparison to look at the current project, equity funded, and see what happens if federal and state tax are taken out. The analysis did not made any changes to the upstream, but the analysis includes the 25 percent royalty in-kind (RIK) and tax as gas (TAG). Addressing the case of no federal take represented by the middle vertical bar, he noted that the breakeven point is reduced by about \$1 an MMBtu. Referring to the case of pre-take represented by the right vertical bar, Mr. Barrowman explained that pre-take excludes federal and state tax. The incremental element between no federal take and the pre-take, he said, is the removal of the state corporate income tax and the state ad valorem tax, which reduces the breakeven by the order of about \$1 an MMBtu. In the \$45 billion case it is tending towards being in the market for the \$70 long-term oil price assumption, he reported, but still nowhere near the current price of today. He said the takeaway from this is: changes to the fiscal regime certainly can make a difference; changes to the fiscal regime on their own will not be sufficient and need to be part of a package of other changes.

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MR. BARROWMAN closed his presentation with slide 24, "Conclusions." In terms of global competitiveness, he said, Alaska LNG is currently quite challenged. However, there are levers that can be used, he said, such as state support for a tolling utility-like return, a debt financed project, or an increase of the state share with potential for resultant reduction in tax. He noted that a number of elements were outside the scope of this analysis; for example, Wood Mackenzie did not attempt to quantify monetization of the state's gas share. The state has a 25 percent interest and is able to market that share of gas and potentially make a profit from that gas. Wood Mackenzie also did not quantify the in-state gas supply, which is about 300 million cubic feet a day and another

area of potential benefit. Other things not quantified were job creation, enabling new exploration, and third-party access. If companies see that there is an export route for gas, then it may make exploration for gas more attractive. If more gas was to be discovered, it could be exported. If it is the short-term, there may need to be additional cost on plant and pipeline, but it certainly gives companies more options and it makes it more attractive in terms of exploration.

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SENATOR WIELECHOWSKI thanked Mr. Barrowman for the presentation, saying he was expecting doom and gloom, but is now feeling a little optimistic. He asked what sort of pushback could be expected from the producers, and what downsides could be expected to the state and to producers, by going to a third-party-owned tolling utility.

MR. BARROWMAN replied it is difficult for him to comment on what the producers themselves may say. But, he said, if he were a producer and if it was a reliable owner he was confident in, then he may well feel confident that it would be giving him the opportunity to monetize his gas; so he would see more upside than downside. Clearly, there is a challenge in finding someone to take on the role of third-party ownership, he allowed, and he is not suggesting that it is going to be an easy task because a lot of cash will need to be found. [His] presentation did not address who is actually going to build it, he noted. Is it necessarily going to be the same as the owners? There are a lot of questions that this study raises, he said.

SENATOR WIELECHOWSKI surmised from slide 17 that the breakeven point is roughly at [an oil price] of \$45 per barrel for the scenario of a third-party-owned tolling utility and 12 percent rate of return.

MR. BARROWMAN clarified that there are a number of elements to it. He explained that for the upstream portion [depicted in light blue], the breakeven is still at 12 percent because the assumption is that these upstream producers will require a return that is normal for upstream producers, which is on the order of 12 percent. However, the pipe and plant portion, depicted in dark blue, assumes a return of 8 percent, which is the third-party toller coming in and accepting a lower return and therefore the producers do not need to pay as much in a toll for the third party to make an 8 percent return.

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SENATOR DUNLEAVY surmised that if the state reduced its exposure or risk by putting less into the project, then the state would get less out of the project.

MR. BARROWMAN understood Senator Dunleavy to mean the state would have less in because there would be an independent third-party toller.

SENATOR DUNLEAVY replied yes, the state would have less in.

MR. BARROWMAN answered that someone else coming in would be making a profit - an 8 percent return on the pipe and plant. However, what it would do is enable the project to move ahead. Potentially these may be revenues that were not otherwise available, because on the current project basis the economics do not stand up.

SENATOR DUNLEAVY asked whether contracting is changing along with the perceived supply of gas in that for years it has been heard that contract [lengths] are for 20-25 years. He further asked whether contract durations are now becoming shorter because the folks who are buying the gas are playing suppliers off of each other, something that has always been done.

MR. BARROWMAN confirmed there is much more flexibility now in the LNG market than there was 10-15 years ago. Historically, he said, Senator Dunleavy is correct, but beware of the long-term contracts. More short-term contracts and more spot supplies are starting to be seen. Some major players are buying supplies for their own portfolio, so purchases will be made that will not immediately be allocated specifically to an end user.

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REPRESENTATIVE SADDLER inquired why, if third-party tolling or state ownership provides the potential for such significant cost savings, other competing projects elsewhere in the globe would not be using the same thing. He further inquired whether there are special circumstances in Alaska that make it possible or advantageous for the Alaska LNG Project but not for the others.

MR. BARROWMAN turned to slide 11 and replied that the issue is Alaska has this huge cost for liquefaction and plant and many other projects around the world are able to move ahead at 12 percent, so therefore the companies will be involved in both the

upstream and the LNG plant. For some of the other projects it may be attractive to get in third-party tollers who may be willing to accept a lower rate of return. It may be appropriate for some, but it is not going to be appropriate for everyone. So, yes, it may well happen elsewhere. Certainly the debt part is not unique. In absolute terms there is going to be a bigger benefit for Alaska than elsewhere, because Alaska is starting off with a bigger number.

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REPRESENTATIVE TARR addressed the gas treatment plant (GTP) and liquefaction facility [represented in dark blue within the bars] on slide 11. She said she would like to better understand how Wood Mackenzie is using that cost over time, because the first molecule of gas is going to be the most expensive. For example, when looking at the infrastructure costs relative to the 30 or 40 year life of the project, the early part is where those costs are the most significant. In regard to showing that cost as being oversized relative to other projects, she asked whether Wood Mackenzie is averaging that over the life of the project or is saying on day one because those costs are so significant that is what disadvantages Alaska LNG to other projects.

MR. BARROWMAN explained that Wood Mackenzie builds into its models the upstream gas costs, and the downstream liquefaction and pipe costs, and then runs those models. The data built into the model for Alaska downstream is the pipeline costs and plant costs, and these costs are year by year from the early to mid-2020s, with production starting about 2026. There are the upfront capital costs to build the plant and pipeline infrastructure. Then there are the operating costs throughout the lifetime that are required each year to operate the facilities and have these running through the productive life of the downstream facilities. Then the throughput is plugged into the model. The throughput starts off at 3 Bcf per day and then there are losses before getting on to the LNG tankers. The model does an iterative calculation to work out what the revenues need to be in dollars per unit, a unit being an MMBtu, for the project to break even at a 12 percent discount rate, so giving the project a 12 percent return. The model will calculate a net present value calculation, meaning that each year the cash flow for each year is discounted by 12 percent more than the cash flow for the prior year. The model calculates a cash flow, which is the revenues less the costs, and the breakeven point is when it gets to a net present value of zero at a 12 percent discount rate. So, the model calculates

the breakeven and looks at the life of the project. Things that happen earlier in the project have more effect on the breakeven cost of supply than things later, because five years down the line those things have been discounted by five lots of 12 percent, and 30 years down the line they have been discounted by 30 years of 12 percent.

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REPRESENTATIVE TARR related that when thinking about a potential third-party tolling structure, two questions come to mind. One is access, which was not mentioned. She requested Mr. Barrowman to comment about access for in-state use; for example, for local utilities and how that would work. Second, under the potential for state ownership, she noted that once property or other taxes were removed there would not be a source for the impact aid or the payments in lieu of taxes. Because this project would be pretty impactful on local communities, she inquired whether those costs were factored into overall costs in the modeling.

MR. BARROWMAN replied that access for in-state use would need to be negotiated, but it is something that the state can build into the approval process to allow the required access structure. Regarding the impact aid, he said Wood Mackenzie removed the state corporate income tax and the ad valorem property taxes, but nothing else. He understood there may be concerns about a number of things, such as municipal benefits from taxes. If a project moves ahead, one would hope there would be significant other sources of income for the state itself, which would be on the upstream, such as upstream taxes from gas production. As well, there will be the state's share of gas production. He clarified he is not saying these other sources would make up for sources lost, but making the point that it is not necessarily all downside and there will be other upsides as well.

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SENATOR COSTELLO requested some examples of what third-party tolling entities might be.

MR. BARROWMAN responded it could be a range of different investors, including financial investors such as equity funds or pension funds. It could be pipeline companies or other utility companies, or possibly some Asian investors. For example, a number of Asian companies have been willing to invest, such as the Japanese, and maybe at slightly lower rates than other ones are willing to accept. It is difficult to say exactly what they

are, he continued, but there are examples. It certainly will not be the upstream companies, but there could be other companies involved in energy and other companies that are involved in ownership of pipelines, and companies that are willing to accept returns based on long term, stable income streams. The state also has a role to play here, he advised. It may be that the state takes part of additional equity as well and it may be that the state seeks funding from some of these other entities.

SENATOR COSTELLO asked whether Mr. Barrowman is currently aware of any entities that are interested in investing as third-party tolling entities.

MR. BARROWMAN answered he is not specifically aware of any that are interested in specifically investing in Alaska. There are a number of entities that have invested worldwide, he said, and he is willing to provide the committee chair with details of companies that have done this type of investment elsewhere.

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SENATOR MACKINNON noted she wants to understand the intersection of slides 7 and 11. She asked whether she is correct in her assumption that the East Africa project is delayed, Canada Large Scale and Australia have been placed on hold, and Alaska is the last man standing.

MR. BARROWMAN replied that slide 7 just highlights examples of some of the projects where there have been delays. He clarified that "LNG Canada" is the name of one particular project, it is not all the LNG projects in Canada; for example, there is the Pacific NorthWest LNG Project and Douglas Channel LNG Project. Slide 7 says that the FID for the LNG Canada Project has been postponed beyond the end of 2016. On slide 11, the bar labeled "Canada Large Scale" is a couple of projects that Wood Mackenzie thinks might move ahead. The boundaries in that bar include LNG Canada and Pacific NorthWest LNG Project, so it shows the range between the breakeven costs for supplying the two projects. So, not all the projects highlighted [in slide 7] feature in slide 11.

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SENATOR MACKINNON referred to slide 11 in regard to comparing the local market with East Africa and different portions of the world, which are included on the slide as benchmarks that Alaska

should compare itself to. She inquired whether a majority of these projects are still going forward or have already been paused because of the current energy price and other variables.

MR. BARROWMAN responded that some of these are going forward. The East African ones are very large projects where significant volumes of LNG will be produced, he said, and the expectations are that these will be moving forward to FID. Wood Mackenzie highlighted that there are a number of other projects that have been delayed and some that have been canceled. So, it is a fairly broad spectrum from projects that Wood Mackenzie expects to go ahead to ones that are being canceled and delayed.

[2:37:39 PM](#)

SENATOR MACKINNON asked whether Mr. Barrowman has any working knowledge of the liquidity that is on the market from the side of producers or investors. For example, looking at ExxonMobil's balance sheets and what cash is available to the company for investing in different opportunities around the globe and what those rates of return might look like. She further asked whether there is a lot of cash liquidity sitting on the balance sheets waiting for investment opportunities and whether the companies that typically invest in these kinds of projects are out looking and diversifying their portfolios.

MR. BARROWMAN answered he could not quote what the liquidities of the companies are, but he knows some are quite stressed and others have significant amounts. Many may well debt fund some portion of their investment as well, he continued. The issue is that even if a company has money sitting there, the project will need to achieve a return, and the hurdle of 12 percent will need to be achieved. The reason for that is that companies have a long portfolio of different projects that they are comparing, so that is really going to be the main driver on whether projects proceed or not.

[2:39:25 PM](#)

REPRESENTATIVE HAWKER drew attention to the bar labeled "Current Project" on slide 17 and recalled that elsewhere in the report Wood Mackenzie has called it a 100 percent equity model. On slide 17, he observed, it is being compared to a partial debt:equity structure. He inquired whether "100 percent equity model" means 100 percent equity funding or also includes some element of debt financing.

MR. BARROWMAN replied it is totally equity funded by companies and does not include any debt funding. The debt funding first appears on slide 17.

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REPRESENTATIVE HAWKER posed a scenario in which a project is pursued under what is being called the current equity model. He asked what the likelihood is that the state and all its partners would "totally cash upfront equity fund" the project without debt. He said it has been his understanding over many years that these partners would also likely pursue some level of debt:equity structuring, which would have a correspondent reduction in the breakeven costs in the bar depicting the current project.

MR. BARROWMAN responded that Representative Hawker is correct. The point he made, he explained, was that when looking at the debt funding, all the other projects that Alaska compares with would debt fund as well. It is unrealistic to assume that a project of this nature would be equity funded. The purpose in showing it is a start point for comparison. The challenge that even Wood Mackenzie has is not knowing the exact details of all the debt funding arrangements that may be used. So, to start with a comparable basis, Wood Mackenzie looks at a 100 percent funded basis and then moves through.

2:42:01 PM

REPRESENTATIVE HAWKER asked how much the breakeven costs would be reduced on the current project model by applying a similar 70:30 debt to equity structure.

MR. BARROWMAN answered it would be reasonable to assume that about half of that reduction may be as a result of debt. The problem, he said, is that when starting to layer on these things, it is very much a case of what order the things are put in. If just debt funding and just third-party tolling was looked at, a total reduction would be seen that is more than the combined reduction. As a rule of thumb, it is reasonable to think about 50:50 between the debt to equity and the third-party tolling structure.

REPRESENTATIVE HAWKER surmised Mr. Barrowman is saying "sort of split the difference."

MR. BARROWMAN agreed that that is probably reasonable.

2:43:15 PM

REPRESENTATIVE HAWKER recalled Mr. Barrowman pointing out the second element in the tolling structure presuming a utility rate of return typically about 8 percent. He recalled Mr. Barrowman describing the investors involved as being "long term stable stream" investors. He inquired whether, as indicated on slide 15, a project like Alaska LNG could expect that sort of investor to step in with an 8 percent non-recourse debt at the beginning stages where the maximum construction, market, and project risks are being faced. That would seem to be contrary to those investors' willingness to offer such a low rate in exchange for the security of a very low or no-risk project, he remarked. He therefore questioned whether that 8 percent really would apply at the inception of the project or whether much more expensive mezzanine financing would have to be put up to get the Alaska project going, stabilized, and proved to be a stable investment.

MR. BARROWMAN clarified that the 8 percent being talked about is not an interest rate; it is the rate of return that a third-party toller would need to receive. The issue of debt is a separate point. The non-recourse debt that is being talked about is related to the debt structure. Wood Mackenzie has spoken to a number of people about what they believe lenders would require for a project of this nature. Wood Mackenzie believes somewhere between 3 and 4 percent above LIBOR is probably realistic at this stage. So, two separate things are being talked about: one is the interest rate that would apply for a lender that is lending, say, 70 percent, and Wood Mackenzie is saying that that would be about 5 percent; and then separately is the third-party toller that would require a return of 8 percent on its equity.

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REPRESENTATIVE HAWKER clarified that going to that 8 percent required return was the point of his question.

MR. BARROWMAN said he thinks that the 8 percent is realistic. There are potential risks, he continued, but these are taken account of within the 8 percent. He agreed with Representative Hawker that there certainly are execution risks, but said there is not a lot of the other risks that are involved in, say, upstream development, such as oil price risk and exploration risk. Therefore, Wood Mackenzie still feels comfortable with an 8 percent utility rate of return being a reasonable target.

REPRESENTATIVE HAWKER expressed appreciation for Mr. Barrowman's opinion.

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SENATOR GIESSEL, in regard to the 8 percent rate of return talked about by Representative Hawker, noted there are projects that have had significant cost overruns and posited that that has to represent risk for people who are entering into these projects. For example, she continued, today's news has an article about a construction contractor suing Chevron on the Gorgon Project [in Western Australia], a billion dollar lawsuit. And yet a person taking this on would only expect an 8 percent rate of return? She asked whether this is seen commonly and requested an example.

MR. BARROWMAN answered he is slightly struggling to give an example at this stage. But, he advised, any cost overruns would effectively increase the toll charge. The 8 percent rate of return will be based upon the initial investment. If the initial investment rises, then the risk is being placed back on the other project participants if the company needs to make an 8 percent return. Having said that, he continued, in terms of contracts the contracts may well be agreed. Potentially there could be movement around that 8 percent as this is not an exact science. Recalling his earlier example of the built project in Norway, he reiterated that the pre-tax 7 percent return gives post-tax significantly less, but he said that that is something that companies are willing to accept within the North Sea.

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REPRESENTATIVE TARR referenced the concept of take-or-pay contracts, and inquired whether the contracts with utility investors are the same kind such that if the project fails in another way the State of Alaska would be obligated to provide gas to that utility or to pay.

MR. BARROWMAN understood Representative Tarr to be saying that if [the state] signed a sales contract to a Japanese utility and then the pipeline was not built, what are the risks on [the state]?

REPRESENTATIVE TARR noted it could also be an earthquake, given the Alaska landscape.

MR. BARROWMAN replied he is not sure on the details of what would typically go into the contracts on that. He said his gut reaction is that there would need to be clearly some condition that if there was a force majeure event. Other than that, he said he is not sure on the details of what the support would be, but is pretty confident that [the state] would not be forced to supply, that [the state] would have recourse to the owner or builder of the pipeline or tolling structure.

[2:51:16 PM](#)

REPRESENTATIVE JOSEPHSON recalled Mr. Barrowman talking about how a third party playing the role of title owner and operator of the entire kit was atypical and not the norm, but that third-party financing without that ownership was much more what is seen. He posed a scenario under the original model conceived by Senate Bill 138 in which the original parties borrowed money to finance \$15 billion of a \$50 billion project. He asked how that is different than a third-party financing that has been described under this alternative approach.

MR. BARROWMAN responded that if he understands the question correctly, it is similar to the question asked by Representative Hawker about, "If we go from the current project and just debt fund, where do we end up?"

REPRESENTATIVE JOSEPHSON replied yes, except that he thinks it was understood that there would be some component of equity portion to each party's share.

MR. BARROWMAN answered that it will reduce the cost of supply if there is debt funding. Clearly, he continued, one would not be benefitting from, say, a utility rate of return on that and so it would still have about 12 percent rate of return. It would certainly reduce the cost of supply, probably by about halfway down between the current project and the third-party or tolling utility; but, it is not going to take it all the way that a third-party toller would.

REPRESENTATIVE JOSEPHSON understood Mr. Barrowman to be saying that if the original four parties simply accepted a lower utility rate of return for the toll that they charged themselves or others, then suddenly the costs are much more manageable. It is just this difference between this 8 and 12 percent that they would demand be paid that makes it not feasible.

MR. BARROWMAN replied that what is being shown here is that if someone is willing to come in and accept an 8 percent utility rate of return, then it does start to push the project through to being more positive on the economic side.

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CHAIR GIESSEL drew attention to the graphic on slide 13 which shows the supplies that are available now and the opportunity in the gold color. She related it is often heard that there is a very tiny window for [Alaska LNG] to enter into the market and that this window will be missed if [the parties] do not act expeditiously. Observing the pie-shaped portion of yellow under the red line, she interpreted this to be a fairly large area of opportunity for new projects coming online. She asked whether Mr. Barrowman sees a narrow or wider window of opportunity.

MR. BARROWMAN responded that on the chart there certainly is a fairly long period for which supplies need to be provided for. While he would not necessarily say it is very short term, one could envision a situation where deals being signed over the next few years start to fill in that gap. It could be a situation that if things are delayed a number of years then there might not be quite the same levels of opportunity. Having said that, he continued, as one moves through time into 2030 there will be more opportunities arising there. So, while he does not quite agree that it is just a short term problem, he would say that these things will start to get filled up as other projects get signed. Also, as he mentioned earlier, there is a variety - some are long term and some may be short term.

CHAIR GIESSEL thanked Mr. Barrowman for providing his report in person and stated that he provided very helpful and meaningful information.

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CHAIR GIESSEL said Keith Meyer, President of AGDC, will next provide an update on AGDC's efforts to stand up a team to take over the Alaska LNG Project, including timeline, schedule, and milestones. Also included in the update will be information about Front-End Engineering Design (FEED), the scheduling of FEED, the Federal Energy Regulatory Commission (FERC) filings, commercial standpoint in terms of acquiring the Alaska LNG assets, such as land, and the U.S. Department of Energy (DOE) permit, and budget issues. Chair Giessel further stated:

We are, as you might think of us, as the loan officer in a credit union, and so we are entertaining a project that wishes to have some loans put forward and we are evaluating those, doing our due diligence on the economics of those. It is our mandate to maximize the resource for the people of Alaska, so that's what we will be discussing today with ... AGDC.

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KEITH MEYER, President, Alaska Gasline Development Corporation (AGDC), provided a PowerPoint presentation entitled, "JOINT RESOURCES COMMITTEE HEARING," dated 8/24/16. Before beginning his presentation, Mr. Meyer invited Mr. Hugh Short to give an opening remark.

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HUGH SHORT, Vice Chairman, Board of Directors, Alaska Gasline Development Corporation (AGDC), stated that this project has gone through a number of iterations during his year and a half tenure as a board member. It was after the conversation with the producers in late winter and early spring that a decision was faced by the AGDC board. That decision was really focused on to stop the project, or pause depending on how that is characterized and it ends up, or to pursue other avenues to potentially move the project forward under a different structure. At its last meeting [8/18/16], the AGDC board made the statement that the State of Alaska, through the Alaska Stand Alone Pipeline (ASAP) and Alaska LNG, has allocated about \$330 million towards this effort over the last few years. It is the obligation of the AGDC board to be able to look at all the options with the stakeholders and the AGDC president to ensure there is no other path forward on this project and look at the feasibility of other options. That is where the board is at today. The board has directed the AGDC president to put together some alternatives. The alternative that will be seen today, and that the previous speakers have discussed, is something the board has just begun considering and having conversations around. The AGDC board is in the process of learning, understanding, and trying to make decisions based on good public policy and based on ensuring that at the end of the day this project is not putting excess risk on the State of Alaska or the residents of Alaska. Mr. Short said he is encouraged that AGDC is having very good conversations with its producer parties with regard to a potential new structure of moving this project forward. There has been an earnest effort

amongst all of the producer parties in Alaska LNG to discuss and move this project forward because of the significant prize to move 65 trillion cubic feet of gas and get it to market.

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CHAIR GIESSEL related that she heard the discussion at AGDC's 8/18/16 board meeting about the investment made thus far. As the appropriating body, she continued, the legislature also is doing its due diligence and will take the approach that the major producers take - if a project becomes uneconomic, they stop regardless of what has been invested thus far, rather than continue to pursue an uneconomic project. Thus, the legislature is with AGDC in that process.

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MR. MEYER stated that things are going very well with the joint venture parties. He began his PowerPoint presentation with slide 3, "Key Messages, Where are we with the project?" He explained that these are recent joint key messages that were developed together by AGDC and the producer parties, and, as well, he will also be providing some AGDC corporate statements. He advised that the Alaska LNG Project continues to make good technical progress. The Pre-FEED work is over 90 percent complete and Pre-FEED deliverables are anticipated by mid-September. Planning for the transition to an AGDC-led Alaska LNG Project is underway, with the target for commencement by the end of October and completion by the end of the year.

MR. MEYER moved to slide 4, "Key Messages, What is happening with the transition?" He reported the parties are working together to consider commercial options to improve the project's ability to compete in the global LNG market. Once transitioned, AGDC will be responsible for managing the project going forward, including applying for regulatory approval, securing the commercial commitments from gas sellers, shippers, and buyers necessary to acquire the equity and debt financing that will be required to complete the project and preparing to start FEED. He noted that neither a full FEED, nor a full construction project, is being pushed forward at this point; that will come much later.

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MR. MEYER addressed slide 5, "Key Messages, Are the parties working collaboratively?" As part of the effort to improve the

project's competitiveness, he advised, the parties are working collaboratively to transition the project to state leadership. The parties are also pursuing alternative commercial structure options and concepts that have been successfully used in global LNG projects to reduce the cost of supply of the project. The goal is to have a seamless continuation of the project and maintain project momentum. He said AGDC, BP, ConocoPhillips, and ExxonMobil are currently holding transition meetings with a goal to enable a seamless continuation of the Alaska LNG Project. These discussions have the goal of timely transfer of information, data, and work product, as well as access to assets necessary for a successful FERC filing.

MR. MEYER turned to slide 6, "Additional AGDC Messages," and said AGDC has approved funding through fiscal year (FY) 2017. As part of the state's budgetary process, he continued, AGDC will prepare a budget request to the Alaska State Legislature for FY 2018. He said AGDC will augment its current technical, commercial, and project management expertise as necessary, consistent with project progress and funding. Further, AGDC plans to ensure the Alaska LNG Project builds upon the tremendous expertise and accomplishments already invested into the project. He expressed AGDC's appreciation for the professional and cooperative way the parties have advanced the project to this stage and said he looks forward to continuing to the next stage of the project.

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MR. MEYER displayed slide 7, "Refining the 'Stage Gates,'" and drew attention to the stage gate diagram across the top. He explained that the project is currently wrapping up the Pre-FEED process, and next is the decision [for whether to enter FEED], which is represented by the diamond-shaped box on the diagram. To date in the diagram, all of the documentation has been on the left side of the diamond. There is no governance to deal with under this next phase and so everything right now is focused on this diamond, which is the decision to enter FEED. That decision has two outcomes - either go to FEED or stop. It is very clear now that the project is not ready to go to a full FEED, so there is not the go decision. "But, at the same time," he continued, "we can't stop, just yet." He posited that [AGDC] owes to itself, the state, and all the stakeholders involved to consider what the other alternatives are other than just saying stop, and that is where the project is right now.

MR. MEYER continued on slide 7 and looked at new elements in the decision to enter FEED, explaining that this is the discussion of the modified structure that is more of a third-party tolling structure that brings in infrastructure investors that do accept a lower rate of return. He reviewed the list of five questions on slide 7 that now need to be addressed relative to these new elements. Regarding the first question, "Have we structured the project for tax and other financial efficiencies?" he explained that this is the lowering of the blue bars in the Wood Mackenzie presentation. Regarding the second question, "Have we secured customers sufficient for financing?" he advised that unless the project gets customers it will not get financing. Regarding the third question, "Have we identified and secured parties interested in equity investment in the infrastructure project?" he stressed that equity investors are needed and they need to be attracted to the project, to Alaska, and to the underpinning of the customer contracts. Regarding the fourth question, "Have we identified and secured lenders for non-recourse project debt finance?" he elaborated on the meaning of non-course. It is non-recourse to Alaska, he explained. Non-recourse debt just looks at the sanctity of the contracts underneath that project, the commercial agreements. Regarding the fifth question, "Have we secured large EPC companies competent to manage the construction of the project and shoulder a significant part of the construction related risks?" he noted that this is where the risk is pushed off to those parties best able to handle it. Those parties do have to be paid to handle some risk, he said, but that significant overrun risk is taken away. For AGDC, or potentially the other investors, it is worth paying a little more to get rid of that overrun risk, since [AGDC] does not have the balance sheet to absorb the overrun risk.

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MR. MEYER concluded by reading from slide 8, "Summary." He said AGDC has accepted the challenge to lead the Alaska LNG Project; AGDC recognizes the project will need customers, adequate financing, construction contractors, and legislative approval to move forward; AGDC believes the Alaska LNG Project can be made commercially viable and can compete in the global LNG arena; and the project offers enormous benefits to Alaska and deserves the opportunity to capture Alaska's share of the global LNG market.

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SENATOR MACKINNON inquired as to when AGDC might be coming to the legislature with either a financial request or a request to

change the structure of current Alaska state statute regarding this project.

MR. MEYER replied that right now AGDC is looking at the normal budget process, not a special session. He said AGDC has some existing funding and the next phase is moving from the FERC pre-filing process into the formal FERC filing. The FERC filing itself probably will not happen until January [2017]. He related that he has asked the [engineering and program management] team to prepare a number of different scenarios. One scenario is to live within the existing funds through FY 2017 and another is a more austere program that stretches out through calendar year 2017. Also to be looked at are some increased spending scenarios for more activity, more engineering work, but AGDC is not going to recommend that until it gets better clarity on who else may be funding. It is hoped that the existing producer parties will be funding some of this or maybe the third party would be funding some of this, but that is not known today.

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SENATOR MACKINNON, in regard to transitions, noted that some of the pieces that would be needed for a stand-alone project are in the ownership of other entities. She asked how AGDC is entering negotiations without the authority, or at least the financial backing, to transition those assets to a state-led project.

MR. MEYER responded as follows:

When you talk about the assets that are in third parties, a block of those are in the LLC, if you are talking about that. So, we have access to a lot of the joint venture information. The LLC, which is the landowner and which has some significant status in this project, the state is not a party to. You're correct, it has three parties. We are in discussions with those parties about the use of ... those assets in that LLC. So, we're in discussions, those are confidential, but they're also not complete. From a principal point of view, I'm hoping that it doesn't require a purchase of those. You know the parties have spent some money in that purchase of those right up front is what I'm talking about. At some point in time it will. I think that AGDC is being expected and asked and is willing to take on a lot of the heavy pulling of this project with respect to moving it

through the FERC arena. I don't expect us to be cashing out existing parties at the front end of this. At some point in time we'll want to acquire the assets, or at least certainly the right to use. So, what FERC requires of an LNG applicant is that we have either ownership or control of the land. So we do not need to own, but we do absolutely need to control. The control can be through lease, the control could be through contracts. So, we will need to negotiate a control ... of those LLC assets.

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SENATOR MACKINNON inquired whether the legislature will hear more about the transition of either control or purchase at a later time in greater detail. She further inquired whether the legislature will see some kind of legislation to start a state-owned project in the coming session.

MR. MEYER, in regard to the first question, answered that AGDC would expect to see that in the future in terms of the funding if funding is needed for that kind of an activity. He reiterated his hope that AGDC can initially do that largely through contract. In regard to the second question, he stated, "It's my understanding that we do not need any kind of legislative change under 138 to go into the kind of structure that we're talking about."

SENATOR MACKINNON commented that that will be interesting and said she looks forward to that.

MR. SHORT offered his belief that AGDC is at a stage right now in this project where it would be premature to forecast or understand what legislative changes, if necessary, would be required. He said the AGDC board has not spent enough time to understand what that would look like and so he would withhold any statement that AGDC would not need any legislative changes until AGDC has more information.

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SENATOR MACKINNON stated, "We all want to monetize Alaska's natural gas." Speaking for herself, she said she absolutely wants a project that is economically viable for the state. Regarding Mr. Short's opening comment about an economic analysis on what AGDC is proposing, she asked whether AGDC has anyone under contract to bring an actual study to the table to see what

AGDC is proposing as investment by the state or through a debt acquisition or a third party. She further asked whether legislators are going to see some hard numbers that have actual analysis by an outside contractor.

MR. SHORT replied that the answer is yes. He said that a lot of financial analysis is required to move this project to the next stage. Adequate information is not had at this time to be able to present that, given the early nature of where AGDC is at in this process. The AGDC board will present that to the legislature when it is appropriate; AGDC is working to bring those resources to the table and ensure there is that process.

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MR. MEYER clarified that AGDC has not done a detailed analysis as it is too early in the process. What is being talked about is a structure, he continued. Wood Mackenzie has laid out what the implications and the benefits of that could be. He applauded Wood Mackenzie for its work and said he is glad to see that it is directionally where AGDC is talking about. He noted Wood Mackenzie did that without any input from AGDC. It was good to see that a project-financed, third-party tolling kind of structure is actually in the zone of competitiveness, he said, and that is what AGDC is sort of shooting for. Right now, however, it is still too early to say what will be the exact structure, what parties are going to be involved. He expressed his hope that the producer parties will play a very active role. He further explained that AGDC is looking at the state ownership structure and at how to get a third-party, quasi-equity investor into a state-owned structure and get the tax benefits, and so through a securitization of the cash flows out of this project. But AGDC is not there yet and has some legal work to do. Also, AGDC has some work to do with customers to determine if it is in the hunt. Some of AGDC's producer parties ideally will be [the state's] best customers. Today AGDC and the producer parties are joint venture parties, but regardless he looks at them from a pipeline standpoint as [the state's] customers and they can buy the services through the pipe and through the LNG facility and take their LNG at Nikiski and they can they go serve their customers. Another alternative is AGDC actively finds customers and has them subscribe for services, or a combination of those. He reiterated that AGDC has not done a detailed analysis on "here is the structure we propose, here is the amount of equity that we're looking at from the state, here are the third parties involved." He added that third parties have expressed interest to him and there is enough excitement out there that people are

interested, but at the same time what is being heard universally on this project by all of the project's participants is that something must be done with the cost of supply. The project team has beaten the capital costs down and, while there is apparently still more room to go, the team has done good work. However, it is still a little too high if all of them are required to fund the thing. So, AGDC has to look at this other structure, like Wood Mackenzie has illustrated, which is not so much new, but new to this project; most of the pipelines in the Lower 48 have been built this way and a number of the LNG facilities. Now it is being said that this looks like it works and he is happy that the Wood Mackenzie folks came up unaided with the conclusion that this puts it in the zone. Now it is up to AGDC to do a lot of work - the stage gate has been expanded to say there must be the financial efficiency, the tax efficiency, that equity must be found, customers must be found, debt must be found, and a large EPC contractor must be found that is willing to shoulder some of this risk as well. That is the work that AGDC faces as it looks into 2017 and throughout 2017, in addition to the FERC filing.

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SENATOR MACKINNON said it has been known for a long time that the project partners could change over time and the structure might change, and that [legislators] needed to be fluid and ready for those changes. She said things seem to have been going forward two steps and then a step back, such as the pipe size and other things that create uncertainty around this project. She inquired whether Mr. Meyer can assure her that there is still a termination point in Nikiski or whether that termination point is starting to come into question. She said she is asking because she was purview to a letter [dated 8/1/16 from Mr. Meyer] that was talking about challenges with the Kenai Spur [Highway].

MR. MEYER assured Senator MacKinnon that he is, and AGDC is, and nothing that AGDC is looking at deviates from that. All of the resource reports done today are for that site, he said. He believed the letter being talked about went to a landowner that is on the affected route of road, the highway relocation, and because that activity has slowed down a bit there are questions out in Kenai. The fellow hand delivered a letter to him and to a board member, and when he gets a hand-delivered letter he wants to respond to the party. Also, he reported, [Mr. Fritz Krusen, Vice President Alaska LNG], met with the fellow. It was a person wanting to know what is happening, it was no suggestion

that AGDC is going to deviate from that. As long as all parties are cooperating together on the site there is absolutely no reason to deviate. It would be a significant delay and detriment if a different site had to be picked.

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CHAIR GIESSEL summarized answers provided to Senator MacKinnon. In regard to financial analysis, the answer was that it is too early and that AGDC will be beginning work on this. The answers also talked about legal questions, detailed analysis, and cost of supply work. She drew attention to slide 7 depicting the stage-gated process, and observed that no dates are provided. She noted that [legislators] had a course on the subject of megaprojects and are therefore quite familiar with this. In regard to the list of missing information that AGDC is working on providing, she asked what the timeline is for reaching conclusion of all of that investigation.

MR. MEYER responded that AGDC does have some timelines not shown on the slide. He offered his belief that there is a window that AGDC must be prepared to hit and that is in the mid-2020s timeframe. He said he would like there to be a sense of urgency to try to hit that and try to get in that window. Working backwards from that, he would ideally like to be in a position to reach a "preliminary" final investment decision (FID), which then kicks off the FEED, in a timeframe of third quarter 2018. A lot of the technical folks say that is aggressive, he allowed, and he agrees. If this is done, it would be looking at a 2023 in-service date. While there could be some sliding on that, he would ideally like to get the five elements listed on slide 7 addressed between now and third quarter 2018. That is the timeline he is pushing his personnel and the AGDC team to meet. So, structure, debt, and equity must be looked at, although debt comes later. The equity folks must be identified and there needs to be customers. He reiterated his hope that the producer parties are the best customers, and they may be the only customers, but [AGDC] must be prepared that they are not and therefore [AGDC] must do some marketing to get to the buyers. This project, and to some extent Alaska's efforts in getting an LNG project, have somewhat suffered because of a lack of market awareness of the project itself, the timing, and the cost. So part of AGDC's challenge as a state project is to raise the awareness in the minds of the market that this project is real, is going to happen, and is going to be cost competitive. But, a lot of work must be done to be able to do that.

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CHAIR GIESSEL commented that something learned from those megaproject courses is that "urgency often equals higher cost." She then addressed marketing, noting that Senate Bill 138 is very specific that the Department of Natural Resources (DNR) is responsible for the marketing of the gas, DNR is charged to get the highest return for the people of Alaska. She asked what the coordination is between DNR and AGDC in terms of marketing.

MR. MEYER answered that DNR is responsible for the royalty gas and royalty decision of the marketing of that. He said AGDC is doing two things. One is marketing the project so that the pipeline, the liquefaction, the access to the gas. The other is providing a commercialization service to parties like DNR and to parties that might be the producers that want to sell wellhead sales. When he is talking about marketing, AGDC is going to be talking to large buyers about purchasing LNG at Nikiski all the way to purchasing natural gas up at the north and subscribing to pipeline and liquefaction service on the system and they would be tolling customers. So, this project can be looked at as the tolling model described in the earlier presentation. The customers hold capacity, and the customers may be the producers or buyers or a marketing entity created to provide a bundled service. In regard to how AGDC is coordinating with DNR, right now AGDC has made it clear that it is not trying to take the royalty decision. He said the way he has characterized it to DNR is that AGDC will find a customer, will bring the customer back to Alaska, and there will be a netback for a reasonable tolling. Then DNR will be provided with the price of the gas and DNR can either take it or say no this or that must be done, and then between the two the parties eventually come together.

CHAIR GIESSEL remarked that it raises questions in her mind about how AGDC can be marketing gas that AGDC does not have at the moment.

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SENATOR COSTELLO asked how Mr. Meyer thinks that not reaching a FEED decision is going to help [the state] let the world know that this project is real.

MR. MEYER replied that "it's sort of a fact that we're not going to go into a FEED decision." He recalled one of the Wood Mackenzie slides indicating that there are a number of projects facing that. He said he would love to see this project go to

FEED, but AGDC is not going to push and say this project must go to FEED. It is not going to - the parties do not support it now and he would not recommend it now. There is work to do under this other structure. He related that AGDC has said to its producer parties that if everybody votes to go to FEED, then AGDC will be there with them, so he is not saying that AGDC would be negative if everybody wanted to go. But for right now that is not being looked at. Is that a negative to the project? Yes. There is no question that going to FEED is a much stronger vote of confidence. Would it make AGDC's marketing easier if the project were going to FEED? Absolutely. The FEED addresses some risks. However, he pointed out, the amount of work done on this project in Pre-FEED far surpasses most of the other projects. So, even though it is called Pre-FEED, the amount of work lets the project provide a pretty good cost estimate, which then lets the project develop some competitive tariffs and pricing for the customers. But, all of that has to be validated finally in the FEED stage.

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SENATOR COSTELLO asked what happens to Senate Bill 138 as far as the road map now.

MR. MEYER responded that to him Senate Bill 138 is alive and well and that is what AGDC is living under. The charge in the bill was to build a project for the benefit of Alaska, he said, and to maximize the upstream resource base and to do that through the construction of a pipeline and an LNG facility, and also address the gas treating and some lines up north and also put a burden on AGDC, which AGDC welcomes, to address the in-state gas needs. He posited that AGDC is very squarely in the fairway of Senate Bill 138 and he does not see AGDC deviating. He offered his appreciation for the comments of Mr. Short. His own comments, he continued, were prefaced with "I don't see that," as opposed to a statement of fact. Senate Bill 138 does not say "you can't do this unless you get these three parties on board." The bill certainly contemplated a joint venture. While he was not with AGDC when the parties got into Senate Bill 138, he said he thinks the contemplation was, "hey if we get in this joint venture this is going to go all the way to construction." However, none of the documentation said that, none of the documentation said it was even going to go beyond Pre-FEED. The documentation said everything prior to "the diamond" [FID] is all that is being agreed to. The project is now at the diamond, so the parties have to decide whether to go to FEED. The market has changed, he continued, "there is less revenue in the front

door for some of them and there is more opportunities out in the world for others, so this project gets hurt a bit." He posited that talking about this sort of different financial structure is not at all deviating from the major goal of what he considers Senate Bill 138 to have.

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SENATOR COSTELLO inquired whether, if staying within the fairway of Senate Bill 138, Mr. Meyer's intention is to allow DNR to do the marketing.

MR. MEYER answered that DNR is responsible for marketing its gas and so AGDC is not taking that. In terms of doing marketing activities to assist that, AGDC is going to do that. Because AGDC is going to be marketing the project and marketing other people's gas, he said he views AGDC's role as going out there finding customers. When he talks about marketing he is thinking of finding customers that he brings back to the Alaska beach and shares with the village. That marketing activity helps all producers and the project. Some producers do not want AGDC to do their marketing, which is perfectly fine, he said, but he recognizes that as a company and as a state "we've got to get out there and sort of help that marketing activity along ... so that's really what we're talking about doing."

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SENATOR STOLTZE stated that one of the premises of the FEED process, although the out of bounds have been changed on that, is that it does not get customers or investors. He asked how the salaries and expenses of the people at AGDC and the contracting work will be paid, absent the next step. He opined that it is unclear which field is being played on, but it is known that the out of bounds and the goal lines are changing. He said he has sat through hours and years of these things and there was a definite drilling in of the importance of the FEED process, but now he does not know if it is out of bounds. If the FEED process is not important there is not going to be investors and customers will not commit, according to all the hundreds of hours of testimony that has been heard. Noting he voted against AGDC's last appropriation, he asked where AGDC's continued funding will come from.

MR. MEYER replied that AGDC has funding through fiscal year 2017 to carry it through these coming activities. He said he has asked folks for both a more austere budget as well as an

elevated level of expenditure assuming there is outside funding. The outside funding could come from the joint venture parties, but at this point that is unknown. At this current time, AGDC is not expecting to go into a \$2 billion FEED program, more work has to be done.

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REPRESENTATIVE TARR referred to an AGDC PowerPoint presentation provided to members prior to the hearing [entitled, "President's Report, Board of Directors Meeting," dated 8/18/16]. Referring to slide 5 in that presentation, "Major Activity Timeline," she observed that the transition to AGDC as the lead is scheduled for [fourth quarter] 2016. She recalled that the funding approved during last year's special session was for the 2016 work plan and budget. She asked how the funding given at that time, which she thought would have carried through the last calendar year and into this full calendar year, has been extended to cover fiscal year 2017 in its entirety. Continuing, Representative Tarr recounted that Wood Mackenzie's presentation contemplates third-party tolling or state ownership. However, she said, Mr. Meyer's comments make it sound like AGDC has already moved to state ownership. Noting that the gas being talked about is not owned by the state, she posited that the only way AGDC can reasonably seek customers for a pipeline and tolling structure is if it is the actual owner of the pipeline. She asked whether Mr. Meyer thinks AGDC has made that decision and is moving forward in that direction more than was presented in the [Wood Mackenzie] presentation and further asked how those options are being contemplated.

MR. MEYER responded that the aforementioned timeline was in the AGDC board presentation that was posted on the legislature's and AGDC's websites. That presentation talked about a transition commencing in October 2016 and continuing to the end of 2016. Regarding funding, he said AGDC has funding approved for FY 2017; AGDC is living under that today and intends for that to carry it through at least fiscal year 2017 and potentially a bit beyond, so a special request is not needed. Regarding state ownership and the tolling, he said no decisions have been made on any of this yet, either on paper, by the board, or in his mind; AGDC is still open. The state ownership option gives [the state] some particular tax advantages and that is where the additional steps come from. A big part of the advantage comes from the third-party tolling with the use of infrastructure investors. What is unknown today is whether those two things can live together. He said he has been consistent all along in

what he has told members - do not equate ownership with investment. Even though [the state] may be 100 percent owner that does not mean it is going to be 100 percent investor. If [the state] had to be 100 percent investor that would kill the deal. So, AGDC is definitely looking at third-party equity and absolutely third-party debt. While it will take some significant work, he continued, AGDC is trying to figure out whether those two things can live together - "Can we have a state ownership but yet not reach ... that ownership so much that it ruins our tax position?" It is what he calls "securitization of the cash flow." The state may be an owner but there may be a cash stream coming out that becomes put into a product like a security that the equity folks can invest into. It is unknown today whether both of those things can be done. It is certainly worth going for. There is a big benefit just by moving to the tolling structure, but an absolute much better benefit would be received if the tax can be avoided. He reiterated that the Wood Mackenzie study was done completely without any input from AGDC and offered his belief that there was no help from the others as well. He added that AGDC is not suggesting this project pay zero local tax; it is his plan that parties on the route need to be compensated, maybe through the payment in lieu of taxes (PILT) mechanism. He clarified he is not suggesting that [AGDC] is going for zero state and federal tax - it is the federal tax that the benefit of that ownership is received.

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REPRESENTATIVE TARR stated it still seems that AGDC would not be able to seek other customers until a decision has been made about who actually owns the pipeline. Until then, it seems that doing so is inappropriate and maybe even illegal, she posited. Someone has to have the responsibility of building the infrastructure that the customers would need, she continued, and until it is figured out who is going to build and own the infrastructure it seems like there is a mismatch. Something stressed throughout this process is the alignment of the current arrangement and made clear to her is that these potential other opportunities are aligned much differently. Therefore, she said, she is trying to match up which decision gets made first so that the next piece can happen, and it seems that the ownership piece would have to happen first because before there is an owner how can customers be secured? Customers have to have somebody they would pay and how would financing be gotten without an owner? The alignment, she continued, is not clear of

how these pieces would work together under one of the other arrangements.

MR. MEYER agreed that at some point in time the ownership must be decided. The ownership, he explained, would most likely be held by a project company that would be a special purpose vehicle and it would probably be more than one - probably one for the pipe, one for the LNG, and one for the gas treatment plant (GTP). That structure is the structure that actually gets the debt and does the contracts. That entity is not [yet] formed, so what can be done right now is the "marketing and business development," the identification of customers. He reiterated his hope that the customers will be the producer parties that have the most to gain just by monetizing their gas, not ownership in a low-return pipe. While his hope is that AGDC does not have to leave the state for customers, he knows it is going to have to. To get the customers there must be a good idea of how the costs are lining up, so there must be some thought about the structure and the kind of debt equity that might be obtained. Then it just becomes a simultaneous process of starting to get a customer, the customer may say it wants a certain quantity. If it is a big quantity the customer might get certain advantages and so the advantages have to be taken into account against other potential customers. Some of the customers may take some construction risk, but most will not because they do not have to today, unlike a couple decades ago. What AGDC is doing now is business development, marketing, finding customers, talking to lenders, talking to structuring entities, talking to potential equity investors, and most certainly talking to the upstream folks that he hopes to be the big customers. Then, that all has to come together, and that is a lot of work to do in the next 18-24 months.

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CHAIR GIESSEL stated she would take questions from two more members and requested that members submit any other questions in writing for her to give to AGDC.

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REPRESENTATIVE HAWKER turned to slide 7 and recalled Mr. Meyer's response to Senator Giessel's question in which he called it a "preliminary" FID decision in third quarter 2018. He inquired whether Mr. Meyer is merging the FID decision and the FEED decision itself into the same concept.

MR. MEYER answered that when he talks about a "preliminary" FID, it is sort of giving the green light to do the FEED work, which can be expensive, but it is short of the real final.

REPRESENTATIVE HAWKER concluded, then, that in Mr. Meyer's words, "pre-FID" is equivalent to the FEED decision, which is something he has never heard before.

MR. MEYER replied that he called it "preliminary" FID. He said that, to him, before making a final investment decision, the FEED work must be done or enough FEED work done to where a large EPC contractor says it will take the risk sufficient enough to give comfort to the lenders and equity investors. The FEED work is a level of expenditure that can be significant and therefore it is short of FID, but it is everybody committing to go ahead and fund the bigger FEED.

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REPRESENTATIVE HAWKER referred to the first element on slide 7, "Have we structured the project for tax and other financial efficiencies?" He recalled that "at the last meeting we had, we talked at length about how you were going to set up a tax exempt non-recourse SP, special purpose, entity." He further recalled that a few moments ago Mr. Meyer said in response to a question that the great reduction in cost of service is really becoming a tax exempt organization. That is a 25-30 percent reduction potentially, Representative Hawker continued. He recounted that at the last meeting there was talk about the need to get a private letter ruling or provide some certainty to members that this tax exempt goal can be accomplished. He asked what the plan and timeframe are for pursuing that surety. He further asked whether all the other things about customers, selling people's gas, securing lenders, and contract managers, all hinge upon finally actually defining a project, which is normally what would be done in FEED.

MR. MEYER clarified he did not say the major benefit was the tax efficiency, it is one of the benefits. As seen in the Wood Mackenzie report, he continued, the third party, lower hurdle rate return equity gives the biggest bang for the buck. The taxes are important. This project needs everything it can, but the extent to which it can be structured for both tax efficiency and the third party is not known. The letter ruling is really to help in addressing that, but counsel has been received to not seek the letter ruling until structure is well defined. A well-defined structure for the third-party-funded entity is not had

today, so a letter ruling would be sought afterwards. The letter ruling really addresses the tax issue more so, though, than the structuring.

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REPRESENTATIVE HAWKER remarked that members and AGDC need to get back together on the record and have a long conversation about what AGDC is truly planning to do, and if AGDC's original concept document is still the operative document, and what AGDC's sequence of events is. He inquired whether Mr. Meyer has read [Industrial Megaprojects: Concepts, Strategies, and Practices for Success], by Edward W. Merrow, a textbook the legislature has studied.

MR. MEYER replied he has the book and has read parts of it, if it is the same book he thinks is being talked about.

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SENATOR MACKINNON, in reference to Representative Hawker's questions, said members are trying to understand whether it is a refining of the stage gates or a redefining of what stage gates mean. She recalled Mr. Meyer stating that DNR is in charge of marketing its gas. She said Mr. Meyer can answer this later, but she would like to know if there is other gas available besides DNR's that could be marketed or if that was just the choice of words that Mr. Meyer used. More pressing, she continued, is that in answer to a question by Senator Stoltz, Mr. Meyer stated that AGDC could accept outside funding. Given the legislative process that AGDC would go through to accept funding or trade off risk for the state giving up something, she asked what Mr. Meyer was referring to.

MR. MEYER offered his understanding that for AGDC to accept outside funding, AGDC must receive legislative approval for that. It is also his understanding that if AGDC wants more funding it must get legislative approval. He said he anticipates seeking that, but things are not at that point yet.

SENATOR MACKINNON said Mr. Meyer can answer the following question later. During the TransCanada buyout process, members became aware of several subsidiaries that were starting to be put together. She inquired as to how many subsidiaries there are under AGDC's management and what the intended use is for each of those.

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CHAIR GIESSEL reiterated her request that members submit further questions in writing to her office so she can provide them to AGDC.

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ADJOURNMENT

There being no further business before the committees, the joint meeting of the House Resources Standing Committee and Senate Resources Standing Committee was adjourned at 4:02 p.m.