ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
February 10, 2014
3:30 p.m.

MEMBERS PRESENT

Senator Cathy Giessel, Chair
Senator Fred Dyson, Vice Chair
Senator Peter Micciche
Senator Click Bishop
Senator Anna Fairclough
Senator Hollis French

MEMBERS ABSENT

Senator Lesil McGuire

COMMITTEE CALENDAR

SENATE BILL NO. 138
"An Act relating to the purposes of the Alaska Gasline Development Corporation to commissioner of natural resources on the custody and disposition of gas delivered to the advance to develop a large-diameter natural gas pipeline project, including treatment state in kind; relating to the authority of the commissioner of natural resources to and liquefaction facilities; establishing the large-diameter natural gas pipeline project propose modifications to existing state oil and gas leases; making certain information fund; creating a subsidiary related to a large-diameter natural gas pipeline project, provided to the Department of Natural Resources and the Department of Revenue including treatment and liquefaction facilities; relating to the authority of the exempt from inspection as a public record; making certain tax information related to an commissioner of natural resources to negotiate contracts related to North Slope natural election to pay the oil and gas production tax in kind exempt from tax confidentiality gas projects, to enter into confidentiality agreements in support of contract negotiations provisions; relating to establishing under the oil and gas production tax a gross tax rate and implementation, and to take custody of gas delivered to the state under an election for gas after 2021; making the alternate minimum tax on oil and gas produced north of to pay the oil and gas production tax in kind; relating to the sale, exchange, or disposal 68 degrees North latitude after 2021 apply only to oil; relating to apportionment factors of gas delivered

to the state under an election to pay the oil and gas production tax in of the Alaska Net Income Tax Act; authorizing a producer's election to pay the oil and kind; relating to the duties of the commissioner of revenue to direct the disposition of gas production tax in kind for certain gas and relating to the authorization; relating to revenues received from gas delivered to the state in kind and to consult with the monthly installment payments of the oil and gas production tax; relating to interest payments on monthly installment payments of the oil and gas production tax; relating to settlements between producers and royalty owners for oil and gas production tax; relating to annual statements by producers and explorers; relating to annual production tax values; relating to lease expenditures; amending the definition of gross value at the 'point of production' for gas for purposes of the oil and gas production tax; adding definitions related to natural gas terms; clarifying that credit may not be taken against the in-kind levy of the oil and gas production tax for gas for purposes of the exploration incentive credit, the oil or gas producer education credit, and the film production tax credit; making conforming amendments; and providing for an effective date."

- HEARD & HELD

PREVIOUS COMMITTEE ACTION

BILL: SB 138
SHORT TITLE: GAS PIPELINE; AGDC; OIL & GAS PROD. TAX
SPONSOR(s): RULES BY REQUEST OF THE GOVERNOR

01/24/14	(S)	READ THE FIRST TIME - REFERRALS
01/24/14	(S)	RES, FIN
02/07/14	(S)	RES AT 3:30 PM BUTROVICH 205
02/07/14	(S)	Heard & Held
02/07/14	(S)	MINUTE(RES)
02/10/14	(S)	RES AT 3:30 PM BUTROVICH 205

WITNESS REGISTER

DEEPA PODUVAL, Principal
Black & Veatch, Management Consulting Division
POSITION STATEMENT: Presented the Alaska North Slope Royalty Study.

PETER ABT, Managing Director

Oil and Gas Strategy
Black & Veatch, Management Consulting Division
POSITION STATEMENT: Presented the Alaska North Slope Royalty Study.

JASON DE STIGTER, Senior Consultant
Black & Veatch, Management Consulting Division
POSITION STATEMENT: Provided modeling for the Alaska North Slope Royalty Study.

MIKE PAWLOWSKI, Deputy Commissioner
Department of Revenue (DOR)
Juneau, Alaska
POSITION STATEMENT: Commented on the Alaska North Slope Royalty Study.

ACTION NARRATIVE

3:30:05 PM
CHAIR CATHY GIESSEL called the Senate Resources Standing Committee meeting to order at 3:30 p.m. Present at the call to order were Senators French, Bishop, Dyson, and Chair Giessel.

SB 138-GAS PIPELINE; AGDC; OIL & GAS PROD. TAX

3:30:29 PM
CHAIR GIESSEL announced continued consideration of SB 138 and that today they would hear from Black and Veatch on the work it did that advised the administration and the departments on how to proceed on the gas pipeline issue.

3:30:54 PM
SENATOR MICCICHE joined the committee.

Alaska North Slope Royalty Study

DEEPA PODUVAL, Principal, Black & Veatch, Management Consulting Division, said she had been working in the energy industry with a focus on natural gas for the last 13 years. Black and Veatch is a privately held corporation with 10,000 employees in 100 offices around the world; they specializing in critical human infrastructure: energy, water, and telecommunications. A fairly large division also supports the federal government. She and her partners have a long history of working with the State of Alaska; she has led the team supporting the state for the last eight years focused on economic analysis, markets, and

commercial support; she would lead the presentation with the help of her colleagues.

3:35:35 PM
PETER ABT, Managing Director, Oil and Gas Strategy, Black & Veatch, Management Consulting Division, said he had been with this company for eight months or so. Prior to that, he spent 10 years working for Gazprom helping them develop their global LNG strategy focusing on commercial structures, negotiating commercial and terminal use agreements, sales and purchase agreements of LNG. He had also spent time working in the oil and gas development, exploration and production drilling and completing wells. He spent time in pipeline line development and had run trading organizations and had a deep knowledge of U.S. natural gas business, the global LNG business, and the issues the AKLNG project faces.

3:37:02 PM
JASON DE STIGTER, Senior Consultant, Black & Veatch, Management Consulting Division, said he had been working on this project with Ms. Poduval since 2008 and was deeply involved in the modeling effort. Most of his client engagements focus around economic, financial, and risk analysis.

CHAIR GIESSEL acknowledged that Commissioner Balash was on line.

MS. PODUVAL noted these facts:

The Alaska North Slope Royalty Study was undertaken between June 2013 and November 2013 and, hence, preceded finalization of the Heads of Agreement ("HOA") between ExxonMobil, ConocoPhillips, BP, TC Alaska, AGDC, and the State Administration as well as the Memorandum of Understanding ("MOU") between the State Administration and TransCanada.

While the study informed the State Administration as it negotiated the HOA and the MOU, the study, and this presentation summarizing it, do not analyze the specific terms within these agreements or their impacts on the competitiveness of the AKLNG project.

The study pointed out several factors that were taken into consideration by the administration and addressed where possible within those agreements, like the risks associated with royalty in kind (RIK) and procuring access and control in a potentially integrated LNG project.

3:39:59 PM
After the royalty study summary, supplemental analysis was included that summarizes some ongoing work that looked at specific terms in the MOU and HOA and their impacts on the state, and she looked forward to presenting some of it to the committee and to work with legislative consultants to pull together an analysis related to the specific decisions at hand.

In the interests of time Ms. Poduval said they had summarized the royalty study at a high level; she said a lot of work had been done that was not included, including various detailed analysis. They ran more than 100 separate scenarios and continue to analyze various issues. The Administration has looked at a significant body of work to get to this point.

Executive summary:

The Alaska Liquefied Natural Gas (AKLNG) project is a proposed project to liquefy Alaska North Slope (ANS) gas and export it as LNG, primarily to Asian markets. The project is comprised of three main components:
—Gas treatment plant (GTP)
—Pipeline
—Liquefied natural gas (LNG) plant

The total estimated capital cost of the three components of this project is $45 billion falling within a range of $39-$54 billion. She clarified that the $45-$65 billion estimate they hear about includes the investments in the upstream, especially at Pt. Thomson. Natural gas to supply the project is anticipated to come from the proven reserves at the Prudhoe Bay and Point Thomson units on the Alaska North Slope. The key project sponsors are Exxon Mobil, ConocoPhillips and BP (referred to in this study as Producers) with potential participation by TransCanada and the State of Alaska. The Final Investment Decision (FID) for the project is assumed to be 2017-2018, with the project achieving commercial operation around 2023-2024.

3:44:01 PM
MS. PODUVAL said the study had two main objectives; the first was to provide information that can help the state protect its royalty interest and maximize its value from this project. The second was to understand what the state can do to incentivize and impact the success of the AKLNG project in its role as land owner of the oil and gas resources on the Slope.

3:44:55 PM

The team included Black and Veatch as well as the international expertise of Daniel Johnston, and the study was conducted under the leadership of the Department of Natural Resources (DNR) with support and consultant from Department of Revenue (DOR) DOR. Inputs and assumptions provided by the Producers were considered, as well. A lot of uncertainty surrounds this project at this point, because it is significantly large with many complex variables that cannot be perfectly foreseen.

3:45:58 PM
SENATOR FAIRCLOUGH joined the committee.

3:46:09 PM
Given that they have tried to make the best assumptions possible while being conservative and recognizing that many reasonable scenarios can be created to look at this project, Ms. Poduval said they were presenting their view of the market and it will not necessarily be the official view of the administration.

3:47:17 PM
She skipped the key findings and went on to conclusions on slide 15, saying bottom line, it's their assessment that the AKLNG project can be feasible and competitive with changes to the project's cost structure and the state's fiscal framework. From an incentive perspective fiscal and non-fiscal incentives can improve the commercial attractiveness of the project. These include:
-a reduction in government take, either royalty or taxes
-ways to share the cost of the project, which are expected to be significant
-non-fiscal terms such as stabilization provisions and modifications to existing lease terms, such as the state's right to switch between royalty in kind (RIK) and royalty in value (RIV).

They anticipated that the AKLNG project would be an integrated project like several large LNG projects are worldwide. Integrated project ownership of AKLNG by the Producers presents the risk of misalignment wherein project revenues could be moved between the upstream and the midstream components to maximize value to the Producers. These decisions could potentially be to the detriment of the state.

3:49:39 PM
MS. PODUVAL said one of the study's findings was that fiscal structure changes beyond stand-alone royalty share or tax rate modification can help in improving project economics and

creating alignment. One way to achieve that would be direct participation by the State in the project in conjunction with establishing a gross share of the gas that would allow for an alignment of the share of the gas as well as potential equity participation in the project.

3:51:23 PM
Direct state equity participation in the project can provide key benefits to the state and include:
—creating alignment of interests
—creating transparency through the midstream portion of the supply chain for the state entity that participates in the project
—having the ability to facilitate third-party access to the mid-stream
—potentially increasing the state's cash flows and improving producer economics.

She said that establishing a gross share of gas in lieu of production tax and marrying that with equity investment in the project may provide the needed alignment for a competitive project as well as allowing the state to maximize the value of its resources.

3:53:17 PM
MS. PODUVAL noted that this is not a strategy without risks, and the state has the ability to lessen those as well as achieve objectives of transparency and open access for third parties, but will need to weigh those opportunities circumspectly and with carefully defined state’s rights and obligations.

3:54:14 PM
MIKE PAWLOWSKI, Deputy Commissioner, Department of Revenue (DOR), said it was important to remember that these conclusions, one being the commercial agreements and another being the access for third parties, are a review of the royalty study completed prior to the finalization of the Memorandum of Understanding (MOU) with TransCanada and the Heads Of Agreement (HOA). The administration looked at these as key concerns and managed some of those risks in the HOA or articulated them as areas of concern they will continue to work on. This study is the foundation on which the state built its response in the discussions with the Producers.

3:55:26 PM
MR. ABT took over the Black & Veatch presentation and began with the LNG market on slide 18. He focused on three primary tasks:

-providing an overview of how LNG is traded in value in the various markets that are available to the AKLNG project
-undertaking an analysis of historical and future global LNG pricing trends
-providing some discussion around the supply and demand projections in the LNG market and the potential implications that will have on the AKLNG project

Current LNG market realities on the demand side:
-the LNG market is highly concentrated
-7 countries account for 70 percent of demand
-Asia Pacific accounts for 70 percent of global trade
-demand is growing rapidly, about 8 percent per year

Current LNG market realities on the supply side:
-LNG supply is also highly concentrated among 8 exporting countries that provided 85 percent of global LNG exports in 2012
-liquefaction capacity, or trains, are very expensive and financed on long term sales and purchase agreements (SPA) with LNG buyers.
-gas quality varies by project and between buyers with Asian buyers preferring higher btu gas
-long term contracts of 20 years or more dominate the market and are expected to continue doing so in the future
-no liquid market to provide price markers for LNG (unlike natural gas or crude oil)

3:58:25 PM
MR. ABT said the price structures of the SPAs need to provide certainty over the long term to support the cost of the projects and the underlying reserve developments that are necessary to provide the feed gas to the LNG terminals. In the past, he said, LNG contracts have typically been structured with an oil price linkage.

SENATOR FAIRCLOUGH asked if that price linkage had been standard since 1970 and if it was true in an Asian market also.

MR. ABT answered yes; that is clearly the price preference in the Asian market. They have been the predominant buyers of LNG since the 70s; there is no natural gas market per se in Asia, so everything has been linked to crude since that time. With the recent development of U.S. Gulf Coast export projects they are trying to delink some LNG prices away from crude oil, but a majority of LNG prices are still linked to oil contracts. The period of 2002 - 2006 saw some lower-price oil-linked contracts signed by Chinese/Japanese buyers, but that was mostly due to

prevailing economic conditions at the time and some pressures that project developers were under to get project financing, and in 2008 there was a severe world recession.

MR. ABT said the recent emergence of Henry Hub linked tolling agreements in the U.S. Gulf Coast has created an alternative price structure that the Asian buyers are very interested in. These structures in current market conditions are lower than the oil-linked prices for delivery into the Asian markets. But buyers in Japan and Korea are aggressively seeking Henry Hub linked contracts now and are entering into traditional oil contracts. He anticipated that condition will not last for much longer and a limited amount of U.S. volume will be exported from the Gulf Coast. Once those projects have been identified and final investment decisions have been taken, the Japanese and Korean buyers will likely be back in the market pursuing oil linked contracts once again.

4:01:56 PM
SENATOR FRENCH said this seems like an area of potential risk for the state, because if it turns out that the Henry Hub model becomes dominant over the next few years it could lose out because those contracts pay less than the oil linked contracts.

MR. ABT responded that the Henry Hub-linked price contracts are targeted to entering the market place in about the 2017-2020 timeframe, but there will be a time when demand goes beyond what the Gulf Coast can provide. The underlying assumption is that the Gulf Coast will have a limited amount of export volumes.

There are twenty-odd projects that have applied for approval to sell LNG sourced in the U.S. to non-free trade agreement countries, but he didn't anticipate all of those projects receiving approval nor did he anticipate that if they receive approval that they will ultimately get constructed.

4:03:36 PM
MS. PODUVAL added another factor that will come into play is the desire of the Asian buyers to have diversification within their LNG supply portfolio. There are concerns about being too heavily dependent on shale gas from the U.S. as well as passage through the Panama Canal to get Gulf Coast LNG over to Asian markets. So, they anticipate projects like AKLNG that have a well-established resource base, a stable political environment, and proximity will be attractive to Asian buyers even outside of price considerations.

SENATOR FRENCH said he asked whether or not the Henry Hub pricing scheme would pay us less than a crude-linked contract would and neither presenter answered it.

MR. ABT apologized and said it is possible that the AKLNG project could be priced through a Henry Hub-type pricing mechanism, but the fixed price element of the contract would need to be determined in order to make the project economic and that has not been a part of this analysis.

SENATOR FRENCH said it's in the analysis before him and he didn't know why neither analyst would say on the record that LNG prices Henry Hub-linked tolling agreements are less that oil linked contract prices.

CHAIR GIESSEL said Ms. Poduval had noted that transport costs through the expanded Panama Canal were not known and that the distance is much greater than between Alaska and Asia, and that they had not, therefore, analyzed that scenario. But they could certainly think about it and respond later.

4:06:44 PM
MR. PAWLOWSKI said he would be happy to work back through the committee to Senator French's question. He thought Mr. Abt was trying to say that the Henry Hub linked contracts have a variable component, which is the Henry Hub price, and then there is a fixed component, which is for recovery of the cost of the infrastructure, and without knowing what that fixed component looks like it's difficult to compare them.

SENATOR DYSON said the most recent contracts have a 14-15 percent effective slope and asked if it was a btu equivalent.

MR. ABT answered that the slope is what was used to convert the LNG price from a crude oil price to an LNG price. In Asia it's typically 14-15 percent. In simple terms, if a barrel of crude oil is $100, the equivalent LNG price is $14-15/mmbtu.

4:09:50 PM
SENATOR MICCICHE said he thought the slide20 was incorrect and that "mcf" should be "mmbtu."

MR. ABT said that was correct. With respect to the Henry Hub pricing versus oil-linked pricing, in today's market the Henry Hub price is at a level that is lower than the crude oil-linked price. So, Gulf Coast projects, if they were in service today, at Henry Hub prices would be lower than the oil-linked price.

4:10:38 PM
SENATOR MICCICHE asked if was safe to say that if those two relationships were plotted over the last 20 years and likely the next 30 years that they would be all over the place on value.

MR. ABT said yes, that was a fair statement. Tremendous volatility has been seen in natural gas prices in North America that would have suggested the Henry Hub-based price versus crude oil would be very similar, in some instances even higher than what the prevailing crude oil-linked price would have been over the past 30 years.

4:11:25 PM
MR. PAWLOWSKI inserted that the full study is available on the DNR commissioner's website under "Priorities," and the consultants are in a video link describing some of the issues the committee is wrestling with.

4:12:29 PM
MR. ABT went to the bottom of slide 20 and said non price features are typically negotiated into the long term SPAs; they include duration of contracts, the nature of commitment (take or pay provisions), delivery terms (ability to pull the cargo and take it to a higher value market or not take the cargo and allow the seller to take it to an alternative location), and the LNG specifications that he mentioned earlier.

SENATOR DYSON asked if the buyer can say he does not want to take this cargo and the ship can go to another market with a better price.

MR. ABT responded that a lot of the provisions are negotiated depending upon the actual demand that a buyer may have at some point in time or the flexibility that the seller would include in its ability to divert a cargo. Typically, if the buyer has purchased the LNG at the terminal - freight on board (FOB) purchase - the buyer would control the flexibility of the tanker on the open water. If they did not have sufficient demand to justify delivery into the target market, they then would have the ability to divert that cargo to an alternative market.

4:14:52 PM
MR. ABT said the demand forecast used by Black & Veatch for this study and all their economic analyses was labeled the "Reference Case." Slide 21 summarized several forecasts of projected LNG demand growth over the next 20 years; in 2020 the range will be

40 million tons per annum, just over 5 bcf/day. The forecast is a little more aggressive through 2015 and then is more conservative from 2015-2030. The difference between the Reference Case and the other forecasts was due to factors that differ based on view of the markets, for instance, Asia has more aggressive demand growth and they also believe Europe will have more demand for LNG than what they see. They also expect that other agencies are forecasting a much higher penetration in transportation fuels for trucking and marine facilities than what they used for the Reference Case.

4:17:27 PM
SENATOR BISHOP asked if the Reference Case kept with his theme of "our assumptions in this study were made in a conservative manner."

MR. ABT answered yes.

4:18:03 PM
He said slide 22 depicts the breakeven price for the AKLNG project, and added that the breakeven price has no bearing on the price of LNG. It also depicts the buildup of costs that are necessary to construct this project and breaks them down into components as follows:
-upstream costs on the left
-the cost of the LNG plant
-the cost of the GTP and the pipeline
-shipping from the terminus of the LNG plant to the market in Asia
-the state's take (taxes that each agency collects throughout the entire supply chain)
-the federal government's take
-zero MPV for the producer (an assumption)
The breakeven price is $12.30/mmbtu and takes into account the capital and operating costs of the midstream (assuming an 8.5 percent discount rate).

Key factors that can cause the breakeven price to either increase or decrease include a lower ambient temperature at the LNG facility, which would cause the ability to generate LNG to fluctuate; but perhaps the biggest factor is a projected change in the capital costs, which already have a great deal of uncertainty.

A decrease in capital costs or increased efficiencies through the labor markets would result in a decrease in the breakeven price. One other factor that might influence the breakeven price

downward is negotiating with the producers and having them accept lower returns than what they typically look for in their midstream investments (assuming an 8.5-10 percent discount rate, and the producers would look for something higher than that).

4:21:52 PM
SENATOR MICCICHE asked if he was not using a particular ambient temperature range for liquefaction conditions in his analyses.

MR. ABT said that was correct at this stage, but they had not got into any of the detailed engineering that would optimize the plant design.

4:23:05 PM
On slide 23 he compared the breakeven analysis for the AKLNG project to all the other proposed LNG projects that have a projected in-service date after 2014 and developed a global supply curve. The breakeven price of the various projects was plotted on the vertical line; each slice on the horizontal access represented an individual LNG project that is currently under development. The relative capacity of each of these projects was determined by the width of the respective line along the horizontal axis.

The box in purple represented the amount of new capacity necessary to meet their projected demand in 2025. He explained that the curve tells them that the AKLNG project as currently configured in the current fiscal structure is out of the money and that projects with lower breakeven prices than Alaska's can provide about 340 million tons of new supply, which is more than what is required to meet the projected demand of 250-300 million tons in 2025. So, the AKLNG project faces significant competition.

4:25:15 PM
MR. ABT said, however, due to many factors, not all of the projects under development are going to be in service by 2025 or even after, including many that are on the left of the AKLNG project. Many include the U.S. Gulf Coast green field LNG projects that are still seeking export authorization and have yet to file for authorization from the Federal Energy Regulatory Commission (FERC) to construct their facilities. So, it's highly likely that many, if not all, of the green field projects in the U.S. Gulf Coast will not be constructed. In addition, several of the projects located to the left of the AKLNG project are located in relatively unstable areas throughout the world. So,

the likelihood of those projects getting developed for multiple reasons is also questionable.

SENATOR FRENCH asked what units of measurement he used on the Y axis.

MR. ABT replied dollars per mmbtu, similar to the axis on slide 22.

SENATOR FRENCH asked if the $12.30 breakeven figure was the same for both.

MR. ABT answered yes, for the AKLNG project. He added that they had evaluated all of the projects throughout the world and the relative value was depicted on the curve, the point being that there are many projects at a breakeven price less than the Alaska project that have the ability to meet the projected demand in 2025.

4:28:24 PM
SENATOR DYSON said as Asian countries - Taiwan, South Korea and Japan - have talked to them about gas and oil, he always had a sense that one of the things that makes Alaska attractive is political stability and that we are one of the few countries in the world that could protect supply routes that ships use.

MR. ABT agreed that there was a great deal of concern over the Suez Canal and the emergence of the Panama Canal as primary water ways that are necessary to transport LNG from the U.S. Gulf Coast to Japan and the markets in that region. Uncertainty surrounds whether there will be additional costs on ships going through the Panama Canal. So, having supply sources that don't rely on those types of shipping logistics are particularly attractive to the buyers in Asia.

SENATOR MICCICHE asked what causes the gap between where Alaska is and the other projects in of projects being more economic (slide 23). Is it the liquefaction plant costs or the midstream costs?

MR. ABT answered that it is a combination of costs throughout the project; one of the disadvantages that the AKLNG project has are the costs associated with the pipeline and the GTP that are necessary to take the gas from the North Slope down to the LNG terminal. Typically, LNG projects developed around the world don't have a large pipe component in their cost structure, and although some treating is required it's not to the magnitude of

this project. Chevron's Gorgon project in Australia has a high GTP cost, but they don't have a high pipeline cost associated with it.

SENATOR MICCICHE said that the cost of the gas can really be isolated to the extreme cost of the pipeline.

MR. ABT said that's a big component of the gap.

SENATOR FAIRCLOUGH asked if Alaska being in the red indicated the volume of LNG that will be available to markets compared to the size of the other projects (slide 23).

MR. ABT replied that the AKLNG project is one of the wider rectangles on that graph and depicts that it is a large project that will produce large volumes of LNG relative to other projects they evaluated.

SENATOR FAIRCLOUGH asked when other markets are looking at Alaska, if they might think of it as a prize, because it can provide gas for longer term.

MR. ABT replied that typically an LNG project will have about 20-25 years of producible reserves, because that is what is necessary to make the economics work. The AKLNG reserves position clearly helps the project, but he wasn't sure that gives it a significant competitive advantage over other projects that are also competing to serve the markets in Asia.

4:36:35 PM
He moved on to slide 24 that addressed project factors that can influence the price the AKLNG project might be able to obtain for the production. Factors that would drive a higher price environment, for example, would include the North American projects, particularly the Gulf Coast projects being permitted at a very slow pace, perhaps like now or even slower. If that were to occur, then the non-North American conventional supplies (Australia, Africa and Russia) would then compete to serve the remaining demand, Alaska being one of those projects. Another factor that could drive favorable pricing for Alaska obviously would be for Asian demand to grow much more rapidly than what they had depicted in their Reference Case.

Were all of this to occur, Mr. Abt said, the very high cost projects in Australia and Russian would become the marginal supplies, and Alaska is positioned very favorably relative to those projects. And if there isn't an abundance of U.S. Gulf

Coast supply, sellers would be in a strong position to continue demanding the high-sloped, oil-linked contract terms as opposed to having to sell under Henry Hub pricing. In that case, he would anticipate LNG selling for somewhere between $14-18/mmbtu.

Under the low price scenario, North America LNG supply would be unconstrained, all of the proposed projects would get developed and would all compete for markets in Asia. The low cost non-North American conventional supplies would have to compete directly with those projects, and in many cases would be unfavorable and uneconomic. Under this situation, Henry Hub-linked prices become the price setter for all Asian LNG into the future. That would be an obvious down side scenario with a price in the $10-14/mmbtu range.

MR. ABT said in both scenarios there is an opportunity for Alaska to compete, but obviously in the higher price/higher demand scenario there is a much better opportunity.

4:40:01 PM
SENATOR DYSON asked the decline rate for nonconventional gas fields in North America.

MR. ABT answered the decline rate is very significant in the early years of production and then it stabilizes over time. The underlying assumption for the unconventional production is that those wells will continue to be drilled, as there is a tremendous inventory of prospects that will get drilled over time if the price signals are sufficient to justify it. Rig efficiency has improved, so more wells can be drilled with fewer rigs and in fewer days. So, in spite of declining rig count, current levels of production can be maintained. The expectation is that U.S. gas supply in the Lower 48 will be able to meet all of the projected demand going forward and, in fact, if the price signal is strong enough, additional sources of supply, even unconventional, can be brought on stream to meet it.

4:41:43 PM
He said the LNG market segment summary on slide 25 is characterized by capital intensive projects and long term contracts. All LNG projects are extremely expensive. The LNG market is illiquid with very few players, which is in sharp contrast to the oil market, which is very transparent and highly liquid. LNG demand is expected to grow quickly over the short and long term, but supply sources are also developing. Currently, the AKLNG project appears to be out of the money within the global LNG supply curve under the status quo

situation, although cost and fiscal modifications could enhance its overall competitiveness.

4:42:49 PM
Slide 26 depicted supply chain elements, he said, and the study provided an overview of the current capital cost estimates for the AKLNG project as well as a quick review of the capital structures that are likely to apply to and provided some comparative projects to consider. Then they assessed the commercial structures that might be applicable to the project.

Under slide 27 they were asked to look at the expected cost for the project and to compare it to the initial 2008 estimate developed during the Alaska Gas Inducement Act (AGIA) process. Working with the state's technical consultants, he came up with an estimate of $45 billion. The Producers' range for the GTP, pipeline, and LNG project was in the $37-54 billion range (not including upstream costs around Pt. Thomson.)

MR. ABT said what has driven the cost escalations in the past five years have been modifications to the project's original scope and cost escalation in labor and materials. In 2008, the AGIA project was focused on building a pipeline to Canada; an LNG project wasn't the primary focus. From the GTP perspective, costs have escalated from $5 billion to $10 billion, primarily because the scope got much bigger. The labor costs associated with plant construction and owner costs have increased significantly over time and going forward, they expect continued uncertainty around the scope, the complexity of the project, and the cost of the skilled labor that will be necessary to build it.

The estimated pipeline costs have increased by about 50 percent to $12 billion. Like the GTP, the pipeline has had a scope change; initially it was scoped as a lower pressure 48-inch line and now it's a much higher pressure 42-inch pipeline with a significant amount of additional compression than originally estimated. The costs in addition to the scope change have been due to an increase in material (globally) and labor costs and those could still increase more.

For the LNG plant, the costs have also risen significantly from 2008. Liquefaction costs have risen globally over that period and now range from $1200/ton of LNG to $2500/ton. Here their estimate is $1350/ton. Given the challenges of developing a project in Alaska, specifically with respect to labor shortages,

material requirements and the logistics, he expected these costs will be under continued pressure going forward.

4:47:42 PM
Slide 28 provided a brief summary of some of the capital structures to show how they vary from project to project, and depend on the risk profiles and the partner preferences. It depicted capital structures of a few projects and each one includes a partner in the AKLNG project.

He said that most LNG projects have some level of project finance, although there are exceptions, and for projects of this magnitude, long term sales and purchase agreements with credit-worthy counterparties are essential to secure the financing. For this study, they assumed a debt/equity ratio of 70/30.

The projects are:
-The PNGLNG project in Papua New Guinea is currently under construction and scheduled to commence operations later this year. It is led by ExxonMobil and has a 70/30 debt/equity capital structure; it has some Japanese partners as equity participants, which has enabled this project to secure low cost financing. The PNGLNG consortium is responsible for marketing the LNG from the project, and long term SPAs have been entered into with Sinopec, Osaka Gas, Tokyo Electric Power and SPC in Taiwan.

-The Australia Pacific APLNG is a fully integrated project in which ConocoPhillips plays a lead role in the development of the LNG plant. The project is also under construction and first LNG is expected in 2015. It has a 70/30 debt/equity capital structure. Sinopec is a minor partner, but they are also the major off taker of the LNG accounting for some 85 percent of the LNG produced. They have also entered into a contract with Kansai Electric Power Company in Japan that has provided the assurances necessary to the banks, so they were able to secure financing.

-Gorgon LNG is 100 percent equity-financed from the balance sheets of the partners (Chevron, Shell. and ExxonMobil). It is currently the world's largest integrated LNG project and is expected to cost over $53 billion. It is currently under construction with first LNG expected in 2015. Each partner has retained its own equity lifting rights, so each will be responsible for selling LNG from their respective portfolios. Several SPAs have been entered into already.

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This project is the most similar to the AKLNG project. The Producers preference is equity lifting rights and in an ideal world they would like to finance it with 100 percent equity as well.

4:51:29 PM
Slide 29 depicts the various commercial structures that are available to State of Alaska and most LNG projects.

Three typical projects are looked at:
-Integrated: aligned interest, cost and risk sharing, concentrated control amongst the partners
-Merchant: less capital requirement for the individual sponsors and separation of control between upstream and LNG project
-Tolling: contractually assured fees and returns, accommodates supply from multiple upstream sources, no market upside for LNG project in and of itself

MR. ABT said each structure affects the operations and financing costs of the GTP, pipeline, and the LNG plant, and it impacts key criteria important to State; those being open access, expandability, and transparency across the supply chain.

Slide 30 details the advantages/disadvantages of each structure:

-Integrated Structure Advantages:
• Equity owners may or may not act together to sell the LNG product from an integrated structure
• Control over production
• Aligned interests between owners
• Cost sharing and potential tax benefits

Disadvantages:
• Capital requirements are high and span the supply chain
• Concentrated control makes expansions and entry of new participants difficult

Merchant Structure Advantages:
• Lower capital requirement if sponsors of upstream and LNG Project Co are different
• Meets tax requirements for separate P&L center
• Comply with local laws for government ownership of upstream project
• Less control by upstream participants over liquefaction facilities

Disadvantages:

• Less flexibility for equity participants in production of gas and selling LNG – sold uniformly by LNG Project Co
• Commodity price risk exposure for LNG Project Co
• Can be mitigated with variations of the merchant model, for example, by selling LNG back to project owners' marketing affiliate to insulate the project from risk
• Exposure to negotiating power of upstream owners

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Tolling Structure Advantages:
• Contractually assured fees and returns to service contractor — Low market risk to LNG Plant Co
— Mitigates upstream supply risk for LNG Plant Co
• Potential tax benefits if title transfers are taxed
• Accommodates supply from multiple sources, entities
• Ability to attract other investors/owners to project – lower capital requirements
• Facilitates project financing since liquefaction project revenues are not directly exposed to market risks

Disadvantage:
• No upside to commodity price escalation for the service provider as the party paying for the toll does not realize this benefit.

4:55:56 PM
MS. PODUVAL took up the presentation working off of slide 31: how the risk of misalignment could play out and result in lower revenues for the state. For instance, the Producers controlling the upstream and the midstream could create a "closed black box" that could place risk on the state's expected revenues from this project. Producers could shift revenues between the upstream and midstream segments as a way of increasing their take, thus impacting the state's take. For example, a scenario where the LNG plant service rates are established using an equity-rich financing structure and assuming a relatively high return on equity as well.

This also looks like it would be an integrated project and one that may not be project financed, and any financing on a company's balance sheet may not be transparent related to this project. So, the actual capital structure as well as the cost of the financing and the equity that is claimed by the company could be an area of misalignment and potential dispute.

Slide 32 demonstrated three scenarios in which the tariffs could potentially be set for the AKLNG through the GTP, pipe, and the

LNG plant, and the chart on the right looked at what the corresponding state revenues would be in each of those scenarios. The Reference Case on the left assumed a capital structure of 70/30 debt/equity. Assuming a 12 percent return on equity (ROE) would result in a tariff on the LNG plant of a little over $6.70. The middle scenario was an extreme and assumed the capital structure is 100 percent equity with a 14 percent ROE. This could impact the tariff that is claimed as a deduction for the purpose of calculating net back on the LNG plant; it's close to $11. The third scenario examines a 30/70 debt/equity assumption and still using the 14 percent ROE.

5:00:17 PM
MS. PODUVAL said the point is that the capital structure and the ROE can have a significant impact on what the net back price would be for the natural gas itself and, therefore, impact the state's revenues, which could drop from $150 billion in the Reference Case down to $110 billion.

5:01:09 PM
She said some potential safeguards can be provided by regulations and guidelines on how the tariff would be set and what acceptable capital structures would be and they could be benchmarked, but that still wouldn't solve the potential for misalignment including the state's need for transparency, having open access, low tariffs, and being able to facilitate other third parties to explore and develop the North Slope and be able to monetize the gas.

5:01:38 PM
Transparency within a producer-owned project and cost allocation will be an ongoing challenge for the state, Ms. Poduval said. So, creating alignment between the state and producers is critical for the state to receive full value for the AKLNG project and to have access to information.

SENATOR FRENCH asked about shifting of revenues between upstream and midstream on slide 31 and how that relates to the charts on slide 32, which seems to depict different financing options and their effect on the LNG tariff, mainly.

MS. PODUVAL explained that one example of value shift from upstream to midstream could be if the project is financed not just for the GTP, pipeline and the LNG plant separately, but including capital costs associated with Pt. Thomson thrown into the mix. In that case, it would be difficult to wade through the web of information to understand what would be associated with

upstream financing versus midstream and downstream financing. Some of the potential risk from the capital structure that the slide 32 shows might be realized including the upstream as well.

5:03:50 PM
SENATOR FRENCH asked for a specific example, because there is discussion about the construction of a pipeline from Pt. Thomson to Prudhoe Bay to get gas into the system. And it sounds like it might make a big difference to whether that capital cost for the pipeline was included in the midstream element or the upstream element as to how it affects the state's returns.

MS. PODUVAL said that was correct and she made a note to create an example demonstrating that.

5:04:32 PM
MR. PAWLOWSKI said just to be clear on the left was the project tariff that Senator French was representing correctly and on the right were the SOA cash flows. Those colors break out into blue as royalty, green as production tax, gray as corporate income tax, and the yellow as property tax. One can see the financing shift correspondingly. For example, in the Reference Case, one can see $38.6 billion in royalty dropping in the 100 percent equity, 14 percent ROE for the LNG plant down to $24 billion. That is actually the quantifiable impact going on between the increase in the cost and the effect on the upstream and coming in at the reduction in the state revenues. He again reminded them that this was not an analysis of the project going forward, but an analysis of what issues and risks the state was looking at going into the HOA and the MOU, and the drafting of SB 138. In upcoming discussions he would show them how those issues were addressed.

MS. PODUVAL said slide 33 summarized the section on supply chain elements and that the capital costs for the AKLNG project are likely to remain uncertain through the development of the project. Total midstream project cost estimates from the AKLNG project sponsors range from $37-$54 billion and they are working with the Reference Case assumption of $45 billion. She said complex LNG projects typically have an integrated commercial structure to give sponsors maximum control. The AKLNG is expected to have an integrated structure and that ensuring alignment of interests between the State and Producers is challenging and critical with a Producer-owned integrated project.

5:07:49 PM

She said the third main scope item the royalty study addressed related to the fiscal framework and its implications for the AKLNG project. Specifically, they looked at what fiscal structures relevant to LNG projects are worldwide and how they compared to the AKLNG project, and what incentives the state could provide to facilitate the project, and then assessed how Alaska could leverage its royalty ownership position, specifically using RIK versus RIV.

CHAIR GIESSEL said it seemed like they were entering into a "pretty hefty section" and asked if it would be a good stopping point.

MR. PAWLOWSKI said it was a good spot to pause as it deserved fresh eyes and ready attention.

5:10:41 PM
CHAIR GIESSEL highlighted that the short videos on this issue were available on the DNR website and included this section and the next. [SB 138 was held in committee.]

5:12:37 PM
CHAIR GIESSEL thanked everyone for their presentations and adjourned the Senate Resources Standing Committee meeting at 5:12 p.m.