ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
March 17, 2017
3:30 p.m.

MEMBERS PRESENT

Senator Cathy Giessel, Chair
Senator John Coghill, Vice Chair
Senator Shelley Hughes
Senator Kevin Meyer
Senator Bill Wielechowski

MEMBERS ABSENT

Senator Natasha von Imhof
Senator Bert Stedman

OTHER LEGISLATORS PRESENT

Senator Mike Dunleavy

COMMITTEE CALENDAR

PRESENTATION: POTENTIAL LNG OPPORTUNITIES IN HOUSTON, ALASKA

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

ROGER PURCELL, Senior Consultant
East-West Pacific Consulting, LLC
Knikatnu, Inc.
Wasilla, Alaska
POSITION STATEMENT: Testified on the cost and environmental benefits of cogenerating gas systems.

EDWARD WOODS, Territory Sales Manager
Dresser-Rand of Siemens AG Power and Gas
Germany

POSITION STATEMENT: Proposed building a natural gas facility in Houston, Alaska, and distributing gas to multiple Alaska communities and industries.

ANDRE' GONTHIER, Director of Special Projects
Northstar Industries, LLC
Liberty Energy Trust
Conshohocken, PA
POSITION STATEMENT: Proposed building a natural gas facility in Houston, Alaska, and distributing gas to multiple Alaska communities and industries.

ACTION NARRATIVE

3:30:03 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 Hughes, Meyer, Wielechowski, Coghill, and Chair Giessel. The committee was also joined by Senator Dunleavy.

Presentation: Potential LNG Opportunities in Houston, Alaska

3:31:20 PM
CHAIR GIESSEL said the only order of business today was the presentation on a proposal to bring liquified natural gas (LNG) to the Interior and other parts of the state, at the request of Senator Dunleavy. She noted that Dave Nufer and former mayors Roger Purcell and Verne Rupright were also present. She recalled that SB 23, passed in 2013, proposed moving LNG by truck from the North Slope to Fairbanks, and SB 50, passed in 2015, expanded the scope of AIDEA [Alaska Industrial Development and Export Authority] to look at other basins for sources of gas, such as Cook Inlet. Since the passage of the bill, the committee has been awaiting an update from the administration, which will come later this session. In the meantime, there are several proposals of different methods to convey natural gas to the Interior, and today the committee will hear one of them.

3:31:40 PM
ROGER PURCELL, Senior Consultant, East-West Pacific Consulting, LLC, Knikatnu, Inc., Wasilla, said this he is a former mayor. He stated that this a very important issue for the City of Houston and the entire state.

EDWARD WOODS, Territory Sales Manager, Dresser-Rand, Siemens AG Power and Gas, Germany, said he is proposing LNG for Alaska and is supporting the statewide transition from imported diesel to domestic energy for the state.

3:33:53 PM
MR. WOODS said natural gas is domestic, and diesel is imported. Gas is also more cost effective and has lower emissions. He referred to his slide and said natural gas has virtually zero particulate emissions when compared to coal and diesel. He explained that LNG is liquified natural gas. A "beach ball" volume of natural gas chilled to minus 260 degrees would reduce the volume to the dimensions of a ping pong ball. In its liquid state, it can be easily transported; it can then be re-vaporized to its natural gas state for use in natural gas engines and for cooking and heating appliances.

3:34:07 PM
MR. WOODS said that natural gas is safe and non-flammable in its liquid state. One could put a lit cigarette into it without creating a fire, he explained. It requires an intense spark to ignite. It is non-toxic, and a cookie could be dropped into a glass of LNG and then eaten. "It vaporizes," he said. It can be put on water, and when it vaporizes, the water can be drunk.

MR. WOODS said he is here to talk about the technology developed by Siemens, originally Dresser-Rand. Siemens has a modular gas liquefaction facility that uses the modular format for gas clean-up, power generation, and liquefaction, and then "that liquid gets taken into storage and dispensing, and we're proposing into ISO-storage tanks," which he will explain later.

3:35:13 PM
MR. WOODS said the bottom line is that it's a scalable platform. Each "LNGo system" consumes a 100-foot by 100-foot footprint and can start making liquids within one year of papers being signed. The system will produce 30,000 gallons per day, he said. When the need for LNG rises, modules can be added. For engineering, development, and operation, Dresser-Rand has a relationship with Northstar Industries of Boston, which is a leader in natural gas and LNG; "natural gas in the form of metering and manifolding natural gas compressor stations and so forth." On the LNG side, they are experts in looking at proposed operations and dispersion models and safeties for the site development, as well as the cryo-equipment needed for the hoses to load the ISO-containers. Northstar Industries is 51 percent owned by Liberty

Energy Trust, an energy equity firm that is looking at projects such as this for private investment.

MR. WOODS said Houston is the ideal location. It has 1,000 acres that are zoned heavy industrial, which is appropriate for their system. He said the LNGo system is quiet; at 72 decibels at 3 feet, his speaking voice is likely louder. It has low emissions, as it is a half-gram engine driving and powering the site. Also, the gas that comes in is cleaned up and that clean gas goes into the liquefaction, so it's high-purity methane, and it is great for engines and allows stable engine operation over time. The tail gases are consumed in the power generation, he said, and they are burned in the half-gram engines. There is no venting or flaring, he explained.

MR. WOODS said his project would use a portion of the heavy industrial zone in Houston, and there is rail for transporting the gas, which will come from multiple sources. "We're looking at a couple of firms that are operating in the Cook Inlet area as well as some local coalbed methane resources on the property and adjacent to it." The presence of the rail doesn't take away from the availability of the road access where LNG can be put on trailers and distributed out.

3:38:13 PM
MR. WOODS sees Houston as a hub and the Alaska Railroad as being the primary spoke for getting the gas to market. He sees Fairbanks as storage, he said, to support phase 1 and 2 expansions. Phase 1 expansion is targeted be 1 billion cubic feet per year, he stated, and that is approximately 30,000 gallons a day, which is appropriate to onea LNGo system.

MR. WOODS said worked on power generation with Caterpillar. He understands that lives depend on those diesel engines for creating power and keeping people warm. With that in mind, Dresser-Rand is looking at installing a second LNGo unit into this project for when components need to be brought down for service and maintenance. The project would include taking the LNG to Fairbanks, using that rail as the primary spoke, and supporting Fairbanks with their phase 1 and 2 expansions to allow additional customers on that gas network but also use it as a hub to take LNG out via the road spokes to remote mines and communities. The LNG could also go south on the rail to the ports of Whittier and Seward and be put on marine vessels to go to other mines and communities.

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MR. WOODS said that Hitachi has been very instrumental in supporting the development of ISO-format containers for LNG tanks. Hitachi has been supporting the distribution of LNG by rail in Japan for over 30 years and is bringing that experience to Alaska, he explained. Mr. Woods said he covers the entire US for Dresser-Rand on the LNGo, and he is very excited to help support Alaska in being the leader in getting LNG distributed by rail. He welcomed the opportunity for this to be the model for the rest of the US.

3:41:16 PM
MR. WOODS said Fairbanks is one potential consumer and may use [LNG] to generate power. The diesel engines are a trusted source for the community, he noted. Earlier in the week he talked with energy managers from over 80 Alaska villages and communities, and he proposed using Dresser-Rand micro-grid services from Germany to help better integrate the natural gas power generation systems as a side-by-side with the diesel generator sets, leaving the diesel set until it is demonstrated that LNG can be a source of energy for those communities. To better use natural gas, he said, they are also proposing that hot water from the engines be used in a combined heat and power format to heat community buildings and to support clean water and sewage treatment plants in the communities.

3:42:52 PM
MR. WOODS said that once LNG is in the communities, a gas line can be installed for residential use. Industries like mining, fisheries, and forestry can also use natural gas, he stated. Diesel prices are volatile and are very high compared to natural gas. "Coming from a welding shop in Montana, supporting the mining industry," he surmised that a mine may be looking at shuttering because diesel prices are too high. Stable natural gas prices could extend the life of that mine, or it could allow a new one to open in Alaska.

3:44:19 PM
MR. WOODS said he is proposing the use of a Yanmar natural gas generator set, 35-kilowatt output, for the smaller communities and a Dresser-Rand Wascore generator set for larger ones.

3:44:33 PM
MR. WOODS summarized that the technology is available, and there is this wonderful hub-and-spoke system with a prime location in Houston, which has cost effective rail to transport that LNG throughout the state, leading to demand and efficient use for domestic energy within the state. The benefits are economic, as

well as improved health by reducing the soot and particulate pollution from diesel engines. From an environmental standpoint, natural gas has less impacts than diesel. "The pieces are in place, and we ask for your support in the statewide transition from imported diesel to the domestic fuel of natural gas."

3:45:37 PM
SENATOR DUNLEAVY asked if he needs funding or tax credits from the state.

ANDRE' GONTHIER, Director of Special Projects, Liberty Permit Energy Infrastructure Fund, Northstar Industries, said they are not asking for financial support now. He said that with the right contracts, the project can use private investments. As the business plan is firmed up, the project may consider available tax benefits, but they are not asking for any special treatment now. If the use of diesel decreases, subsidies are reduced, and lower-cost natural gas can enhance the lives of many Alaskans, he stated.

SENATOR COGHILL said it looks like some of this is contingent on road and rail access, which are things that the state gets involved in. He asked if the presenters have talked to the department of transportation and the railroad. "It looks like you would have to have some completion on that."

MR. WOODS answered that there is a railroad siting adjacent to the property, and there is a letter in the committee packet from the Alaska Railroad that expresses interest in supporting this project. He said the primary distribution of the LNG is through railroad, and roads to the site will be used to bring in equipment. In supporting the Fairbanks natural gas expansions, there would be zero additional trucks transporting LNG from the south to Fairbanks with this proposal.

3:49:11 PM
SENATOR COGHILL noted that the railroad is already working on this, "but there would be a completion factor." He asked about the sources of gas. Gas supply has been one of the question marks in Fairbanks.

MR. GONTHIER replied that they have ongoing discussions with Hilcorp Pipeline Transmission Company, but the negotiations are still progressing. He has spoken with other land holders who hold rights to coal bed methane.

SENATOR COGHILL said the Interior Energy Project always says that gas supply and contracts are imminent, but that talk has been going on for several months. "That's going to be one of the tougher points," he added. He said he likes private investments. He asked about the ISO containers and the current market. What is available now and what is the lead time to get something that a railroad could carry? He said he will have to compare the cost of storing diesel versus gas.

3:50:47 PM
MR. WOODS answered that they are looking at a one-year lead time from signing of the project to first liquids. They see phase 1 expansion of Fairbanks plus mining and village demand to support two 30,000-gallon LNGo systems. He said that upon signing of the project and while preparing the ground; getting the iron in place, including storage tanks; working with the railroad to get that completed, which is all very achievable within the stated timeframe, they would be working with Hitachi to ensure sufficient ISO containers are available.

3:52:09 PM
SENATOR COGHILL said that was great. They need to be ported in, he said, and he asked if it would be through Port MacKenzie.

MR. WOODS answered that equipment and ISO tanks would be brought in by barge, most likely from Seattle to Whittier or Seward, and trucks or railroad would take them to the job site. The ISO containers would come from Japan where Hitachi has manufacturing operations. He added that it would be appropriate to have enough storage to support the seasonal demand swings, and no storage volume has been identified yet, but that would be determined by Northstar Industries.

MR. GONTHIER added that earlier this week, Dresser-Rand discussed a plan with FNG [Fairbanks Natural Gas] to have an energy center in Houston with LNG storage, and that it may make sense to help FNG with their five-day storage requirement. It would be wise to have one field-directed tank at the hub and a smaller one up north. The volumes that FNG talked about are much larger than the ISO container, so it wouldn't make sense for them to have five-day storage just stacking up those containers. It would be more economic to have it in a larger vessel.

SENATOR COGHILL said it is nice that the state wouldn’t have to figure out the nuts and bolts; a private investor would. "If you're willing to take the risk," he said, "I'm game." He liked

the idea of generator sets. He asked about servicing a whole new storage set and generator set.

3:55:18 PM
MR. WOODS said service, maintenance, and support is in place. The Yanmar generator set impresses him. It has a one-year service interval, so it can run one year before it is taken down for an oil and spark plug change. A larger generator set requires maintenance every 1,000 hours. For the smaller remote communities, that one-year service interval is ideal, he stated. It can be at a time of convenience, at a point of low use, with minimal or no impact to the community.

MR. WOODS said the larger generator sets have configurations of "N plus 1," meaning the number of generator sets that are needed plus one that can be brought down for service. Dresser-Rand has field service personnel based throughout the state and has rapid dispatch for support. There is a service team now that takes care of combustion turbines on the North Slope and have been known to respond within one day, he said.

3:57:21 PM
SENATOR COGHILL said having natural gas in Alaska is great, but it is painful for the Interior, because Fairbanks is between two gas fields. Trying to get a secure supply that is not the last-in and first-out will always be a problem. He said that FNG has a contract now, and he asked if Dresser-Rand is in direct competition with them or in synergy. He said he is fine with competition to bring down prices, but he is curious.

3:58:14 PM
MR. GONTHIER replied that the project can work with them and would love to have them as a customer. There are opportunities to work with them using their existing contracts for supply and do a tolling-type model, where Dresser-Rand could take FNG's supplies and liquefy them and deliver them back. Or they can use the model of being the supplier from start to finish and have a turnkey delivery back to them. "Right now, we don't want to come in and say we want to take these guys off the map; we want to work with them. Our interest is for everyone to benefit here."

MR. WOODS added that Fairbanks is receiving a supply of LNG right now, but Dresser-Rand is looking at supporting and facilitating the phase 1 and 2 expansions of FNG. They currently have a source, but Dresser-Rand is offering additional capacity so FNG can expand their customer base. The pipe is in the ground and they are ready to make connections. "So, we can support the

expansion of that gas network, connections within the Fairbanks gas network, helping bring down the emissions that are plaguing that area, as well as provide a competitive natural gas for that community."

4:00:17 PM
SENATOR DUNLEAVY said Roger Purcell asked to meet, and he has heard a thousand variations of gas projects. He asked Mr. Purcell what it will cost the state and was told, "Nothing." It is hard to believe, but the project won't cost the state anything. He said they talked about the ISO shipping containers that have been used in Japan for 30 years, and the concept became even more intriguing, because gas does not have the 12 percent CO2 like on the Slope—it's almost pure gas. Houston is not that far from the source of the gas, and it is an industrial area. He said he liked the idea of moving propane to villages on barges, but he doesn't know how long the containers would last. Also, if the state has a large-diameter pipeline, there might not need to be certain take-outs, which could lower costs and increase revenue for overseas shipping. They could potentially have two gas concepts going on in the state: one coming from Cook Inlet going north by train and truck and one going south for export. In the end, there is no cost. Going all the way to North Pole with a container instead of building out pipe to Fairbanks is an intriguing concept and kind of hard to believe that there will be no cost.

4:03:03 PM
SENATOR HUGHES said she appreciated their presentation and asked what they envision for the rest of the state. What percentage might be going to Fairbanks and to other communities?

MR. WOODS said the term for moving LNG out to communities is the "virtual pipeline." Relative to propane, LNG has important values. Propane boils at -25F and can be used for cooking and heating above that temperature. But with lower temperatures, the propane tank needs supplemental heating.

NR. WOODS said that the capacity of the LNGo system is 30,000 gallons a day per unit, and the Fairbanks phase 1 expansion is to be one billion cubic feet per year, which translates into approximately 30,000 gallons per day. So, one system would support Fairbanks—the anchor tenant—and a second unit would support other communities in Alaska. There would be seasonal swings, so there may be some up and down. Further on they may say, "We're going to have a base demand in Fairbanks, and we're going to look at that rail corridor, and we're going to go out

200 miles beyond that rail corridor by road. Let's call that zone 1." It will have easy access, it will be relatively easy to develop, he explained, and it will have year-round loads to take care of those communities. There is then getting the LNG down to the ports and distributing it by vessel to remote communities out past Kodiak and 300 miles to the west, supporting coastal communities and industries.

4:06:07 PM
MR. WOODS referred to iced-in communities, like Bethel and Nome, which will require a strategy. That is still being modeled but may include building a storage tank or storing ISO containers, but every effort will be made to get LNG out to those customers.

SENATOR HUGHES asked Mr. Purcell about the monthly savings from the system.

4:07:14 PM
MR. PURCELL said Knikatnu installed a Yanmar 35 cogeneration power plant seven months ago, and electric bills went down from a high of $4,500 per month to $201 last month. It produces not just electricity, which dropped below $.08 per kilowatt hour (kwh) from $.19, but it also creates about 200 gallons per minute of 190-degree water, so now the building is heated with that water. "So, actually our costs of energy for manufacturing it did not go up substantially enough to make a difference; it's the great decrease of the actual electricity." It is running in Wasilla and is proving itself. It has lasted the whole winter, he said, which was 20 percent colder than previous years. There are also two systems in Yakutat using propane, and prices went from $.43 per kwh down to $.10, plus the heat, he noted. That has been running over a year now. So, these cogeneration machines have been tested and are working well. "It is being looked at," he said, in a lot more locations throughout the state. He said to imagine schools, hospitals, and clinics reducing energy consumption in rural areas or even in Mat-Su, where more teachers could be employed with the savings.

SENATOR HUGHES said that is what she was thinking, because that is one of the huge costs of education. "I would love to see natural gas in these communities—and these units," she added.

4:09:23 PM
There being no further business to come before the committee, Chair Giessel adjourned the Senate Resources Committee meeting at 4:10 p.m.