ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
January 28, 2009
3:36 P.M.

MEMBERS PRESENT

Senator Lesil McGuire, Co-Chair
Senator Bill Wielechowski, Co-Chair
Senator Charlie Huggins, Vice Chair
Senator Hollis French
Senator Bert Stedman

MEMBERS ABSENT

Senator Gary Stevens
Senator Thomas Wagoner

OTHER LEGISLATORS PRESENT

Senator Joe Thomas

COMMITTEE CALENDAR

Overview: State Energy Plan by Steve Haagenson, Executive Director, Alaska Energy Authority (AEA)

Overview: Fire Island Wind Farm Update by Barbara Donatelli, Ethan Schutt, Steve Gilbert, Cook Inlet Regional Corporation (CIRI)

PREVIOUS COMMITTEE ACTION

No previous action to consider

WITNESS REGISTER

BARBARA DONATELLI, Sr. Vice President
Administration and Government Relations
Cook Inlet Regional, Inc. (CIRI)
POSITION STATEMENT: Introduced CIRI presenters.

ETHAN SCHUTT, Vice President
Land and Legal Affairs
Cook Inlet Regional, Inc.
POSITION STATEMENT: Gave CIRI's perspective as a landowner.

STEVE GILBERT, Manager
Alaskan Projects
enXco Development
POSITION STATEMENT: Commented on Fire Island Project.

STEVE HAAGENSON, Executive Director
Alaska Energy Authority
Anchorage, AK
POSITION STATEMENT: Presented "Alaska Energy First Step for Energy Independence."

ACTION NARRATIVE

3:36:09 PM

CO-CHAIR LESIL MCGUIRE called the Senate Resources Standing Committee meeting to order at 3:36 p.m. Present at the call to order were Senators Huggins, Stedman, Wielechowski, French and McGuire. Senator Wagoner and Senator Stevens were excused.

3:36:42 PM
Overview: Fire Island Wind Farm Update

CHAIR MCGUIRE announced that the overview of the Fire Island Wind Farm project would be the first order of business.

BARBARA DONATELLI, Sr. Vice President, Administration and Government Relations, Cook Inlet Regional, Inc. (CIRI), introduced Ethan Schutt, Sr. Vice President, Land and Legal Affairs, CIRI, and Steve Gilbert, Manager, Alaskan Projects, enXco Development. She explained that enXco is the developer who is partners with CIRI in the wind farm project.

3:38:17 PM
ETHAN SCHUTT, Sr. Vice President, Land and Legal Affairs, CIRI, said he would give the committee some perspective of CIRI as a landowner. They intend to begin construction on the Island this summer on a two-year construction cycle - absent some regulatory or permitting snag.

3:39:35 PM
STEVE GILBERT, Manager, Alaskan Projects, enXco Development, said he has been an Alaskan for 25 years and that he had "cut my teeth" in the electric power business as a start up engineer bringing large coal and nuclear facilities on line. He worked at Chugach Electric for 17 years and served as plant manager for

three of the four power plants and of the advanced energy technologies. They did a one-megawatt fuel cell project, the first of its kind in the world and a micro turbine project that was put on the grid next to customers as part of a national program with 80 other electric utilities to test out the technology. He also became involved in renewables. Today they would talk about nearly a decade of work.

3:41:20 PM
MR. GILBERT explained that he is responsible for the CIRI side of things for the Fire Island Wind Farm. CIRI and enXco, a renewable energy project developer in the US, are partners. In 2008 enXco did $1 billion in wind projects alone. Their focus is wind projects in Alaska and for the most part, they are concentrating on the Railbelt.

He reviewed that six electric utilities exist from Fairbanks down through to the Kenai Peninsula; three generate and three don't and are currently purchasing their power from Chugach Electric. If they can get a large scale wind energy project in the Railbelt, it would serve as a catalyst for more wind and other types of renewables opportunity within the state. The whole idea is diversification of energy resources, because the Railbelt, like rural Alaska, is heavily dependant on fossil energies.

3:43:10 PM
MR. GILBERT explained that renewable energies are a family of technologies: biomass (fuels that are grown and in the process absorbs the CO2 that is emitted during the combustion process), solar (photovoltaic and direct heat), wave and tidal, geothermal, hydro and wind. Wave and tidal are two very different fledgling technologies and are about where wind was 20 years ago. It's not quite ready for prime time, but technologists want to keep an eye on it because the energy available in the flow of water is substantial. Water is 842 times denser than air.

Geothermal energy takes advantage of heat under the surface of the earth – like the potential at Mt. Spur. Hydro is a great renewable resource and Wind Energy Alaska formed a partnership with Homer Electric called Kenai-Hydro, LLC. and obtained FERC preliminary permits giving them the opportunity to study particular resources in a defined geographic area.

The lowest cost renewable energy available today is wind energy. Often the capital costs of these technologies are measured on

the kW basis and a hydro project is $5000 per kW; by comparison Fire Island is expected to be about $3000 per kW. Hydros, especially those with a dam, include storage. Wind doesn't necessarily include storage, but wind and hydro can be combined where as the wind picks up, the hydros would be throttled back and as the wind trails off, they would be throttled up again. This is not a new concept and is being proven out in the northwestern states.

MR. GILBERT explained that windmills have flat blades where a wind turbine has blades shaped like a wing. A windmill will capture and convert about 5 percent of the energy in the wind because the wind is pushing the blade out of the way; whereas the new wind mill (turbine), taking advantages of lift and drag, captures and converts about 40 percent of the energy in the wind.

3:47:29 PM
Turbines in the Railbelt, relative to turbines in rural Alaska, operate on the same principals and do the same thing; they help diversify generation resources. Kotzebue turbines would be a quarter of the height of the turbines that would be needed for Fire Island and the Railbelt applications, because of economies of scale. The modern turbines turn about 20 revolutions per minute (rpms); so slow that you can watch them move.

3:48:12 PM
Fire Island is just offshore Anchorage, Mr. Gilbert explained. In 2000, Chugach started collecting wind data on the Island; wind towers were added and CIRI became involved. It looked good so they began studies in 2004 to get a transmission line to the Island. This is when they filed their paper work with the FAA.

3:49:19 PM
Initially the FAA didn't have a concern, but 14 months later it found problems with the radar and VOR, a navigation aide on the Island. That put things on hold while they addressed the FAA's concerns by removing nine of the 33 turbines and now they have 24 approved sites. Typically you want 80 meters from hub to ground, but 65 meters was approved for most of the sites and four were actually too low to use. So that brought them down to a total of 20 sites.

The transmission line would come from the southern part to the northern tip of the Island where submarine cable will run to the mainland and connect to the Chugach grid. Working with Chugach he developed all the different interconnect scenarios looking at

a high voltage interconnect of 138 kilovolts (kV) and a lower range voltage of 34,500 kV. In a June meeting all the utilities expressed interest in the 34,500 kV interconnect and so that's what they are currently working on permitting.

3:52:26 PM
He explained that the turbines need to be accessed and a technician can climb down inside and conduct inspections as necessary. Maintaining the wings will provide permanent jobs since they require gears, coolants and lubricants just like any other power plant.

3:54:25 PM
Recent activities include staking the road and power line alignments and identifying any potential problem areas so they could steer around them. They applied for a Corps of Engineers 404 permit, a large umbrella permit, and have been conducting interagency meetings working towards that. The Corps has begun the public notice period and CIRI has been meeting with prospective contractors. All have assured them of their intent is to use virtually 100 percent Alaskan labor for construction; and Chugach, ML&P, Golden Valley Electric and Homer Electric all signed an MOU seeking to purchase power from Fire Island if it works.

MR. GILBERT said he regularly lectures UAA and UAF engineers regarding the inclusion of non-fuel generation to encourage young engineers to look for opportunities to use non-fuel generation and then fill that in with a fossil fuel. Reduced emissions clearly are a benefit and diversification of resources is another benefit.

He explained that non-fuel generation is a relatively level-priced source because the price of wind, rain and geothermal are zero and that never changes. While any new power plant might cost more upfront, especially renewable, over time it gets less expensive.

3:57:35 PM
The Railbelt is fueled by natural gas over 90 percent. While natural gas is good because you don't have to have a fuel pile or have to deal with ash, 90 percent is a risky place to be. So the message is one of diversification. A chart from Chugach clearly showed how the jump in fuel costs rippled through the economy.

3:59:18 PM

MR. GILBERT explained when Bradley Lake hydro came on line it was more expensive at first, which caused a lot of anxiety. It was supposed to take about 11 years before its cost to produce power was on par with what it cost for a fueled source, but it ended up taking only about six years. Hydros last for 100 years, so that's 94 years of benefit for their people.

MR. GILBERT said if Fire Island had been developed in 2005 when there was interest in it, the cost of fuel would be competitive with natural gas today. So, he said, incremental goals are needed that will allow them to graft non-fuel generation into their portfolio of resources over time.

4:00:59 PM
CHAIR MCGUIRE asked where the state appropriation sits today and what the threshold is for using those funds.

MR. SCHUTT reviewed that the state legislature appropriated $25 million to the AEA to construct the power transmission line for this project last year. Significant protections were built in to that appropriation, namely that it couldn't be accessed until a binding power sales agreement was put in place, which means the legislature isn't funding a boondoggle or building a transmission line to an island that doesn't have a power project. That sales agreement is in place now, and they will want to seek reimbursement after the transmission lines have been built with private funds.

SENATOR HUGGINS asked him to comment on integration challenges.

4:03:08 PM
MR. GILBERT replied that Chugach is kicking off an integration study next week that has to do with how energy is absorbed from an intermittent resource like wind. The question is how to optimize the energy the wind creates for the benefit of the whole system. Last year a little over 8300 megawatts (MW) of wind, alone, was added to the US grid, and various operating scenarios have been employed to make that happen.

4:03:52 PM
SENATOR HUGGINS asked if batteries were one of the variables involved with wind integration.

MR. GILBERT replied that typically batteries aren't used in integration and they have no intention of using them. Hydros use batteries, but the idea is that as the wind picks up, the hydros

are throttled back and as the wind trails off, they get throttled up again.

4:04:38 PM
SENATOR FRENCH asked if they get all 20 towers up and running and get a nice 20 knot breeze down the Turnagain Arm, what kind of output could be expected.

MR. GILBERT answered that the FAA has authorized the equivalent of 30 MW annually or about what 9,000 average Anchorage homes would use. There is enough space, so more turbines could be built. Perhaps a new technology would replace the VOR and then they could put up more turbines. On a 20 mph day you would produce two-thirds of rated output, so probably about 20 MW.

SENATOR FRENCH asked if that would be enough to take 9,000 houses off the grid that day.

MR. GILBERT replied yes, in effect, but you don't tell the utilities you're taking them off the grid. He usually tries to express fuel savings on an annual basis.

4:06:59 PM
SENATOR FRENCH asked the estimated break-over date for producing electricity with wind for less money than with fossil fuel.

MR. GILBERT replied if they had done Fire Island in 2005, it would be less now. It depends on the price of fuel.

4:08:02 PM
SENATOR FRENCH asked if natural gas stays around $5 when could rate-payers expect to see a return on their investment.

MR. GILBERT replied that in 2005 two different scenarios showed that Fire Island would be on par with gas generation in 11 and 19 years for just fuel, but in reality he guessed it would be closer to three years.

4:09:41 PM
SENATOR WIELECHOWSKI said this is a win-win for everyone; Alaskans were involved at all levels. He asked if he had analyzed how much gas this project would save.

MR. GILBERT said he couldn't do that calculation in his head. Chugach is working toward deployment of a new gas turbine fuel plant, which will be substantially more efficient than what is

currently running. Chugach hasn't had any new generation since 1978.

4:11:38 PM
CHAIR MCGUIRE asked Mr. Schutt to comment on the ability to store wind and to explain to what extent it's factored into this modeling.

MR. SCHUTT replied that this project doesn't have a storage component designed into it. But exciting new technologies for wind storage are being explored because its intermittent nature creates integration issues for the engineers and economic issues for the utility that's purchasing the power. Some companies are looking at innovative storage technologies so that the equivalent of base load power could be generated from a wind project. One technology uses the turbine to compress air into high pressure storage tanks and that is bled off at a constant rate to match the output in the wind profile. Another technology that has been brewing for 10-12 years is the use of fly wheel batteries, but storage efficiency isn't up to where it would make economic sense yet.

4:13:23 PM
CHAIR MCGUIRE asked if storage would be a future consideration.

MR. SCHUTT replied not for this project. This is the first wind project they have participated in and CIRI is collecting data now. Their long-term vision is to use a renewable resource so that the non-renewable resources can be exported to the world. They hope Fire Island will be an anchor project.

4:15:45 PM
CHAIR MCGUIRE announced an at ease at 4:15.

4:19:02 PM
CHAIR MCGUIRE called the meeting back to order at 4:19 and announced the overview of the State Energy Plan.

Overview: State Energy Plan

4:19:54 PM
STEVE HAAGENSON, Executive Director, Alaska Energy Authority, presented "Alaska Energy First Step for Energy Independence."

He went to page 6 and started with how much energy Alaska uses. He found one rule of thumb said 1000 gallons per Alaskan per year; another rule said three to four times the amount of power

cost equalization (PCE) fuel used in a village or the whole community. Looking at electricity, space heating and transportation got them to 39-53 million gallons of fuel. Since that was a wide spread, they asked the Institute of Social and Economic Research (ISER) to put a model together for the space heating component. Electric usage was already documented well with the utility sales in the PCE database that AEA tracks; and they decided to try to "get close" to a good estimate.

So they went out to 28 communities and asked three questions: what resources are in their backyard that they could make energy out of, what didn't they want to use, and why not. A lot of people didn't want to use coal because of CO2 and they didn't want to use nuclear because of nuclear waste.

The reason they asked "why not" is because there may be ways to solve those issues – if a way could be found to sequester CO2, maybe coal could be used as a source and then it could be sequestered and everyone could get where they want to go. They learned a lot about things that weren't really in books.

4:22:06 PM
MR. HAAGENSON used Bethel as an example of local creativity where people cut down willows and instead of turning them into pellets that would require new stoves to burn, they compressed willow "broomsticks" into logs that could be burned in their existing stoves.

Next AEA put together a resource matrix for the whole state; every city was listed. Then they added every possible resource that was in the area. They took that list and augmented it with information from the community meetings. Then AEA created technology teams so that the public could have someone to talk to about using their energy resources. The last step was actually doing cost estimates.

4:25:31 PM
Page 14 indicated how different fuels compare in usage in each area and page 15 showed the PCE data. Using local fuels will help sustain the local economy, he stated, and it would add jobs to the communities and retain some of the money there that would otherwise go to some foreign oil company.

Pages 16-18 looked at possible solutions for all the different areas in the state. They talked about power plant efficiency increases, heat recovery, using renewable energy and economies of scale.

MR. HAAGENSON said this study was meant to be a tool to understand the value of resources in a particular neighborhood. It could help Southeast make a planning grid, for instance.

4:32:01 PM
Page 23 talked about the total annual energy consumption per state; Alaska is at the highest at 1 billion Btus per person per year. Another graph on page 24 showed all the energy produced and consumed in Alaska by sector. The bottom showed import energy and the top showed export energy. It showed that most of the petroleum that is produced is exported.

Page 49 showed what sectors are creating CO2, where it's coming from and how much is coming from each source of energy in Alaska.

4:33:53 PM
MR. HAAGENSON went to page 33 that talks about the history of energy policy in Alaska. On page 36 it talked about specific factors that impeded success of alternative energy initiatives as stated by an analyst in 1985 in a review of a prior energy study. It said the state agencies don't pick winners and losers very well and they don't develop strong management capabilities and lack methods for assessing the technical and financial feasibility of projects. Coordination amongst state agencies is often lacking. Features of alternative technology were poorly mapped with useful rural application. Unrealistic expectations existed about what an agency or technology could accomplish. Too much responsibility was delegated to contractors while the state often assumed the risk in performance of the project.

As he read this he thought on one hand there is this energy document and on the other hand AEA is responsible for evaluation of the Renewable Energy Fund. So, if the state doesn't pick losers and winners very well, what are they doing? As a new state employee, he said they need to make sure that doesn't happen and he took a very aggressive review posture on all the projects under the Renewable Energy Fund to make sure they missed the "landmines" they should have learned from the past. In his opinion in the past they didn't engage anybody real; they didn't make anything happen.

4:36:20 PM
He urged them to engage Alaskans to take the first step together. The state put $25 million into the capital budget for this fund and that is leveraged about 7 to 1. The more the state

can have private people move these projects forward, and help them succeed, they will all be better off. Page 38 talked more about the Renewable Energy Fund and page 39 talked about steps to success.

4:37:14 PM
Page 44 talked about policy energy implications and fuel stabilization, a hedging-type application, power cost equalization, carbon tax, cap and trade programs, net metering, land use, transportation, low cost housing, low income home energy assistance, weatherization programs, home energy rebates, and the 2.5 particulate matter issues, renewable energy funds and energy research funds. All of these need to be addressed in policy, Mr. Haagenson said.

4:38:03 PM
Page 55 had a section on permitting. DNR has some concerns about permitting and some applications have happened that were done maybe a little naively. This is a statement that says you need to talk to people who understand this and make sure you get the right permits before proceeding on those jobs.

4:38:43 PM
Page 56 was the beginning of a technology section on diesel efficiency and use, wind, biomass, geothermal, heat pumps, solar, coal, natural gas, delivery systems and storage systems. There are case studies, contact information, a primer on how the technology is being applied and what is happening in Alaska today. The study tried to get Alaskans engaged in the solution.

4:40:15 PM
Page 244 contained acknowledgements; most are from AEA, Alaska Center for Energy and Power, ISER and DNR people. These people have done a lot of work in pulling this document together. This is about building our future with our kids and making sure we making wise decisions. This document was intended to focus so legislators can see what is available. He said an accompanying CD contained the results for every community in Alaska that they had data for.

4:41:57 PM
MR. HAAGENSON said AEA's next step is to go out and talk to Alaskans to get them engaged and to develop financing options as opposed to going to a bond market.

4:42:53 PM

He went to a snap shot of four hydro projects in the Bethel area. It showed how the excess resources out there could be put together with the needs of the community. As the communities are tied together, wind can be in one and hydro in another depending on what looks best for the region. You could switch to hydro batteries, for instance, when the wind isn't blowing. This study, since it is looking at local resources, does not look at transmission lines since those are under the section on delivering power from one place to the other.

He said there are five reasons for building a transmission line. If you have unused capacity and it can be delivered to some place that can use it is one reason – much like the Tyee line to Ketchikan. If you can make it cheaper in one place and deliver it cheaper than you can make it in another location is another reason. The third reason is if you want to increase reliability you could have a second line, but you would have to have a first line already. If you want to reduce losses, you could have a second line, but would also need a first line already; and the last reason is strategic. If you're going along and there is a resource you want to hook into, you could swing out and pick it up on the way by.

MR. HAAGENSON said he wanted to look local first primarily because he getting their own fuel would add jobs to the communities; they could keep their money local, as well.

4:45:21 PM
MR. HAAGENSON went on to talk about the Renewable Energy Fund (passed last year). AEA was instructed to put together a program for evaluation of those projects and an application form. They ended up with 234 projects for a total of $755 million. An advisory committee worked with him, AEA staff and DNR to complete the evaluation of the first round of projects. They ended up with a list of 77 projects which totaled to be $100 million. They had applications from a wide range of technologies – hydroelectric, biomass, bio-fuels, geothermal, wind, solar, transmission lines, tidal and heat recovery systems.

The legislation also instructed them to give the most importance to high cost of energy areas first and then significant importance to spreading of funds and matching funds. In the very first stage, a three-man team actually looked at each application to make sure it was complete. AEA staff, independent outside economists and other consultants helped them evaluate the proposals. They used two types of evaluations: technical and economic feasibility.

The final stage was a numeric guideline with preexisting weighting factors. The project manager and the two program leaders did this evaluation. Cost of energy had a 30 percent weighting factor, matching funds had 25 percent, economic and technical feasibility was rated at 20 percent, project readiness was 5 percent, economic and other Alaskan benefits was 10 percent, sustainability was 5 percent and local support was 5 percent. The data was broken out by region.

MR. HAAGENSON said the advisory committee did the regional spreading from the final list. A cap of $4 million per project was put on the non-Railbelt component, which was below what six projects requested. The Railbelt and Southeast Alaska projects were capped at $2 million per project, but then they realized that was not fair for Southeast that was still on diesel fuel; so they were capped at $4 million.

They then looked at the rest of the projects and asked how fair it was on a regional spread and found that Dillingham had very low numbers. So they computed a pro-rated number based on the cost of energy across the state and they allocated that to each region. The minimum one could get would be half of that number. So, Dillingham got more money for its project. The committee was pretty happy, but Buckland, Deering and Kobuk put in a joint application. So they decided to make it per community, not per project, which allowed that project to move forward. At the end of the day, the advisory committee is fully supportive of the ranking and believes it represents a fair spread across the spectrum.

4:52:13 PM
The list of funding and regional spread is on the AEA website.

4:53:31 PM
SENATOR STEDMAN said Mahoney Lake (by Ketchikan), Ruth Lake (north of Petersburg) and Takatz Lake on the east side of Baranof Island in Southeast need to be worked into the mix. He explained that Southeast has been in the process of building an Intertie grid for a decade and a half. He pointed out that Takatz Lake didn't make the first cut. He asked if the people who didn't make the first cut have time to redo their application and proposal to make the second round.

4:54:55 PM
MR. HAAGENSON answered that the RFP for round one was due in October and round two was due in November and that evaluation is

starting today. They have slipped by 30 days and they are asking for an additional 30 days till March 3. Takatz Lake is on the list for $2 million.

SENATOR STEDMAN said Takatz Lake didn't make the third round, but that could be amended. The point is if you have a viable project and it is a large 28 MW dam, and it's the corner stone of the whole intertie, once it's in place, the rest of pieces fall in place.

MR. HAAGENSON said he was working backwards from the schedule that was given to them under the statute. Round one was "give it to us as fast as you can;" round two had to be to the legislature by 10 days after the start of session on January 30. He shared Senator Stedman's concern, but on they other hand, they were moving rapidly and have another 115 applications for round two.

MR. HAAGENSON said that the Railbelt is looking at an integrated resource plan and it might be wise to do another Southeast plan as well. They may end up building transmission lines first, but at the end of the day it has to hook together in a cohesive plan. But he promised to look into how Takatz evolved.

4:58:28 PM
SENATOR WIELECHOWSKI asked what match is offered under the cost, request and match offered columns.

MR. HAAGENSON replied that the legislation directed them to evaluate the match; it could come from the feds or any state entity.

SENATOR WIELECHOWSKI noted that not very much went to Anchorage or Palmer because they have lower cost energy (page 4), but he was bothered by the Mt. Redoubt/Mt. Spur geothermal construction project, which requested $950,000 and had a $97 million match. It seemed that they would want to consider evaluating that differently in the future.

5:00:16 PM
MR. HAAGENSON agreed with him; it looked like a great option. The problem is the Mt. Spur rights were sold at auction last year for about $3 million to Ormat Technologies, Inc. and the applicant had no right to be there.

SENATOR WIELECHOWSKI said that was just one example; others had multi millions of dollars in matches.

5:00:57 PM
SENATOR HUGGINS asked what happens to the 45-day window clock of the Renewable Energy Fund if a project is not approved.

MR. HAAGENSON replied that HB 152 says on the first round there is a 45 day window in which LB&A can agree or disagree. If they agree on the 46th day, they could start awarding the grant funds. I they say no, the instructions in the statute are for them to go back and review the process.

SENATOR HUGGINS asked him to give a 62-second overview of how the "Alaska Energy First Step for Energy Independence" would fit into the context of getting energy some place.

MR. HAAGENSON replied that all of these projects start in a communities' backyard. If there are resources in their backyard that they can use, if they use that local fuel, it doesn't matter what diesel fuel costs any more. The first step is to get this out to people so they can understand the issues. The next step is for AEA to go out and meet with Alaskans to help them deliver and draw up a regional plan that each community can fit into.

He will look at the areas that don't have a resource, that do have resources and the ones that have surplus resource, and then figure out how to hook them all together to get the lowest cost for all.

SENATOR HUGGINS said he is trying to get to the point of delivering power.

MR. HAAGENSON said he would stop by and chat with him about that.

5:03:29 PM
CHAIR MCGUIRE thanked him and adjourned the meeting at 5:03 p.m.