ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
January 26, 2011
3:32 p.m.

MEMBERS PRESENT

Senator Joe Paskvan, Co-Chair
Senator Thomas Wagoner, Co-Chair
Senator Bill Wielechowski, Vice Chair
Senator Bert Stedman
Senator Lesil McGuire
Senator Hollis French
Senator Gary Stevens

MEMBERS ABSENT

All members present

OTHER LEGISLATORS PRESENT

Senator Joe Thomas
Senator Cathy Giessel

COMMITTEE CALENDAR

ALASKA ENERGY REPORT

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

MIKE HARPER, Acting Executive Director
Alaska Energy Authority (AEA)
Anchorage, AK
POSITION STATEMENT: Introduced his team.

BRYAN CAREY, Project Manager
Alaska Energy Authority (AEA)
POSITION STATEMENT: Presented the Alaska Energy Report.

SARAH FISHER-GOAD, Deputy Director
Operations
Alaska Energy Authority (AEA)
POSITION STATEMENT: Commented on Alaska Energy Report issues.

ACTION NARRATIVE

3:32:36 PM
CO-CHAIR WAGONER called the Senate Resources Standing Committee meeting to order at 3:32 p.m. Present at the call to order were Senators Stevens, French, Wielechowski, Co-Chair Paskvan, and Co-Chair Wagoner.

Alaska Energy Report

3:33:53 PM
CO-CHAIR WAGONER invited Mr. Harper to give his presentation.

MIKE HARPER, Acting Executive Director, Alaska Energy Authority (AEA), introduced his team. He said that he thinks the best way to get to the goal of 50 percent renewable energy by 2025 is with a big hydro project in South-central near the Railbelt region, and he believes the Susitna hydro project does it.

3:35:01 PM
SENATORS STEDMAN and MCGUIRE joined the committee.

3:35:17 PM
BRYAN CAREY, Project Manager, Alaska Energy Authority (AEA), said last year the AEA completed a Regional Integrated Resource Plan (RIRP) that documented the need for a large amount of new generation for the Railbelt as the current generation is aging out and the gas supplies in Cook Inlet are decreasing.

Last year, he said, the Alaska Legislature passed a state energy policy in HB 306 that directs the state to set the goal of getting 50 percent of electrical generation from renewable and alternative energy by 2025. The only way you can meet that is to have a large hydro facility, and most probably on the Susitna River.

MR. CAREY said they have looked mostly at the Watana location, a name he would use interchangeably with Susitna. The other large hydro project identified in the RIRP was a lake tap coming out of Chakachamna Lake west of Anchorage. Watana is 90 miles up-river of Talkeetna; the nearest road is the Denali Highway about 40 miles to the north. He explained in the 1980s the Susitna project also included Devil's Canyon which would have been a dam flooding back to Watana. Currently they are looking at Watana only.

3:37:56 PM
MR. CAREY switched to a map of Chakachamna Lake and noted the Lake Clark National Park and Preserve above its head and the Trading Bay State Game Refuge below it on the river. In the Susitna case all the water would go through the dam and come out on the river; in the case of Chakachamna, since the water is being diverted from one drainage basin over to another, any water that is to go across the drainage basin is not going to be available to go down the river into the Game Refuge. Conversely, neither is any water required to go down the river to the Game Refuge available for generation.

He explained that the Susitna reservoir would be approximately 39 miles long and about 2 miles wide; it's 30 miles above significant salmon. He explained during the 1980s, studies found that some Chinooks went through Devil's Canyon, but they don't know where they went, and no salmon were ever found above that point. More recently in 2003, ADF&G found some salmon above the Watana location, but how many is still uncertain. It could be a low number just because very few Chinook can make it through the Devil's Canyon area.

3:39:23 PM
SENATOR WIELECHOWSKI asked if a dam would make the water temperature change and if that would impact the salmon.

MR. CAREY answered that you can control the water temperature to a certain extent by drawing the water from either the top or the bottom of the reservoir. In the Susitna case, it was thought the river may lag a little bit on its annual temperature change, but it was within the natural variability of the river for the salmon. So, some wildlife habitat would be lost due to flooding. In the case of Chakachamna, significant salmon populations travel through the lake to the national park. It's thought that several species of fish use and spawn in the lake (Lake Trout, Dolly Varden, White, Salmon suspected).

Diversion of water and change of habitat in the State Game Refuge downstream is a big concern of the resource agencies, he said. There is also the concern that when adults return they would first go up the wrong river because they could go up the farthest river to the power house and would not be able to make it back to the lake by the time they figured out that they had to go down-river another 10 miles. Also, for out-migration to the sea the juveniles tend to go where there is the most current. And the most current when you're in the power house is

to go down the power tunnel. So, the amount of juveniles that would actually make it back down the river is questionable.

MR. CAREY said another concern is that FERC would not license the Chakachamna project, because a hydrological connection between Lake Chakachamna and the next lake a mile upriver would affect the national park, and that would take an act of Congress.

3:41:01 PM
SENATOR WIELECHOWSKI asked if the state should completely abandon Chakachamna at this point. Should there be more studies?

MR. CAREY answered that the department is uncertain about the exact kind of energy they would get from the project. Their figures might be on the overly optimistic side from talking to different people at resource agencies. The preliminary decision document recommended doing further engineering work to better define what the costs could be or to see if there is a way to lower the project cost.

3:42:40 PM
SENATOR WIELECHOWSKI asked if environmental people think Chakachamna would cause severe environmental impacts such that it couldn't be permitted.

MR. CAREY replied that the environmental impacts would be substantial as designed in regards to both the fish population upstream and downstream. Chakachamna might seem to have some value as a hydroelectric project, but the amount of energy from a project like that would mostly come during the summer time. And that would be closer to a run-of-river type of project, because drawn-down on the lake would be limited.

CO-CHAIR PASKVAN asked if another way of saying it is that Susitna would be the focus if they want year-round power.

MR. CAREY answered yes. He said installed capacity at Susitna would be approximately 600 MW, and average annual energy would be around 2600 GWh/yr, which is approximately 50 percent of the current annual Railbelt energy consumption. Chakachamna would be more in the area of 300 MW; the annual estimate of energy of 860-1100 GWh might still be optimistic. That amount is 20 percent of the annual Railbelt energy; so you're still not going to get up to 50 percent even with other existing projects.

3:45:31 PM

He showed a slide of Railbelt demand that goes up in winter and down in the summer and Susitna/Watana that together produce more energy during the summer. A lot of the energy timing has to do with environmental restraints dictating producing more energy during the summer to make sure the salmon downriver can get into other streams. But it still produces a substantial amount of energy in the winter time. Chakachamna would do less than Bradley Lake does right now.

His next slide showed 50 energy years if a large hydro like Susitna came in. It would take a big chunk out of what the gas usage would be in the Anchorage area, but there would still be substantial need for heating and generation.

3:47:27 PM
Slide 9 calculated wholesale generating cost of power (not the cost to the consumer). The last estimate for Susitna/Watana embankment (not expandable) was $4.5 billion. If there was a capital contribution of half of that, with the remainder financed at 6 percent 30-year bonds, debt financing would end up being a little bit over 6 cents KWh. O&M would add a tenth of a percent more. He said building Susitna/Watana using the roller compacted concrete (RCC) method might provide a substantial cost savings.

CO-CHAIR WAGONER asked him to explain the concept of roller compacted concrete dams.

MR. CAREY described that RCC dams just started getting built about 30 years ago; they can be built very quickly and arches are not needed (although they can be used to save concrete). For the most part, the concrete is almost like a slurry where you could just dump a load of it in with a dump truck. It goes in very quick, and saves time which saves a lot of money.

Another advantage to an RCC dam is you could have a flood half-way through the construction project going over the top of the dam and all you have to do at that point is to wait a week or two for the water to stop and continue working. In the case of an embankment dam, you have to spend considerably more money to build a diversion dam because having water going over the top during construction would set the project back a substantial amount of time and, therefore, money.

3:50:31 PM
SENATOR WIELECHOWSKI said he had seen widely varying numbers, as low as 2 cents and as high as 20 cents, on the cost per KWh, and

asked how he came up with this number. Was he counting on the state giving them a capital appropriation of half the amount?

MR. CAREY answered the amount the state contributes will be determined at a future date. They could either figure out a percent of the project cost or set a price target of what the cost of energy will be that comes out of the project and then determine its investment. Or the Bradley model could be used. His estimated costs show anywhere from 5-6 cents if there is to be a 50-percent capital contribution. If there was to be no capital contribution, it would be 10-12 cents. But someone wouldn't be able to go to the financing markets to acquire bonds without a substantial amount of equity in the project in the first place, and developing Susitna would require at least 25 percent equity or more.

3:52:31 PM
SENATOR FRENCH asked if his numbers assume no state investment.

MR. CAREY replied they assume 50-percent state participation.

SENATOR WIELECHOWSKI asked if the cost per KWh is the wholesale cost to utilities.

MR. CAREY replied that it is the cost for debt financing, which tends to be 90 percent of the cost; and it's a generating cost, so it's a wholesale cost to the utility.

SENATOR WIELECHOWSKI asked what cost the Fairbanks or Anchorage consumer would end up paying.

MR. CAREY replied that 6 cents is the current cost for generation with gas in many cases, and so it would be about 12 cents in Anchorage.

He showed two pictures, one of Bradley Lake, an embankment dam and the largest hydropower project in the state that is owned by the state. He said if Watana used the embankment method it would look similar but taller. Bradley doesn't have a fish ladder because it doesn't have any fish at the lake. It's still questionable whether Watana would need a fish ladder or not. The other picture was of the Wehdah Jordan RCC dam. He explained that not only can this type of dam be built faster but its height could be raised while the dam is still in operation.

3:55:33 PM

CO-CHAIR PASKVAN asked if the low Watana dam could be constructed using the RCC method so that it could be expanded at a later time with future power demand.

MR. CAREY answered that it could be expanded and if the geotechnical investigations about an RCC dam continue to be favorable, that would be the way to go. But he didn't want to say that would be how Watana would be built for sure at this time, because the embankment method was investigated much more fully.

3:58:03 PM
He presented an 11-year timeline of the Susitna project from the start of licensing by filing the preliminary application document with FERC to start up on a low Watana expandable, a fairly aggressive schedule but doable. The detailed schedule of events was made up by AEA and some contractors, but it will get refined more in the next couple of weeks.

The next steps for Susitna are to have a series of public meetings: Fairbanks on February 24, Talkeetna on February 28, Palmer on March 1, and Anchorage on March 2. During this spring they will do aquatics and wildlife gap analyses where the contractors go back and look at all the information from the 1980s and determine what information is missing, what has changed along the river and where science has gone since then. When that is done in the spring, he will be able to work with the resource agencies to direct their study plans on the Susitna River and then next year a very large study plan would occur.

4:00:41 PM
From an engineering standpoint, Mr. Carey said, they would need to identify all the current land owners, form various working groups, do additional geotechnical work (especially if they consider using an RCC), and do lidar mapping along the Susitna River to see where the sloughs have changed since then and where the bars have gone to better know how much storage is in the reservoir area and how to site the different facilities. Access would need more study, too. In the 1980s the access for Watana was to be a 44-mile road off the Denali Hwy. An RCC dam uses more material than an embankment dam; and thus, it may make more sense to do a rail spur from Gold Creek directly to Watana and not build a road to it at all.

MR. CAREY said other things would have to be evaluated like the type of power house. With the RCC method, the power house is on

the exterior and costs less as well as reduces the chance of cost increases due to unexpected conditions underground.

He said some of the resource agencies do not want to spend a substantial amount of time studying wildlife or working on the project until they know there is an official FERC process moving forward, because they have done too much work on it already. Assuming AEA has the funds and the authorization they would be filing a notice of intent with FERC and the preliminary application document to start the official FERC process.

SENATOR STEVENS remarked that this is a fairly simple dam that doesn't require any diversions or tunneling.

MR. CAREY responded that all the tunnels in an RCC dam would be going through it, so the amount of tunneling would be minimal. On the flip side power tunnels are needed with an embankment dam.

4:03:19 PM
SENATOR WIELECHOWSKI asked how many land owners there are, and if either type dam could be put in an earthquake zone.

MR. CAREY replied the major land owners up there are the BLM, CIRI, Tyonek Native Corporation, and probably a couple of smaller owners. He didn't think any houses or cabins would be flooded out.

In regards to seismic considerations, currently there are large dams of this size in California which are above 80,000-100,000 people and in other parts of the world as well. Concrete dams don't fall apart that easily. There are tens of thousands of dams around the world right now and he could think of only one failure due to an earthquake - in Taiwan, and that was because the actual fault went under the dam. No faults have been identified under this site.

4:05:24 PM
SENATOR GIESSEL joined the committee.

4:05:32 PM
SENATOR MCGUIRE said she is involved with a group in the Pacific NW Economic Region that just did a study on national security and long-term viability with dams. Some integrity issues were identified and suggestions were made on doing things differently; and she said she would make the study available to him.

4:06:13 PM
CO-CHAIR PASKVAN asked if there is a difference in expected useful life in the Susitna project if it was built under the embankment method as compared to the RCC method.

MR. CAREY replied that the expected life of Susitna/Watana is greater than 100 years no matter what type of dam is used. The U.S. has hydropower projects now that are beyond 100 years and there is no reason to believe Watana couldn't operate for several hundred years either way.

CO-CHAIR PASKVAN asked for the differences in cost of operation.

MR. CAREY replied there are some differences between the two because more than 90 percent of the cost would be the financing cost; the operation and maintenance (O&M) cost would be less than 2 percent. It's likely that the cost of operations would be one-tenth of a percent.

CO-CHAIR PASKVAN asked if the RCC method, because it is cheaper to build, would ultimately make more sense for the Susitna/Watana project.

MR. CAREY answered yes.

4:08:11 PM
SENATOR WIELECHOWSKI asked if an analysis or coordination had been done with the bullet line or with the big gas line group. Is it more economical to build a big line and then generate electricity off the gas that would provide power for Fairbanks or South-central?

MR. CAREY answered that they hadn't coordinated with the gas line, and it's possible that both projects could still be built. The only difference would be continuing gas generation would make them give up the goal of 50-percent renewable energy by 2025.

4:09:11 PM
He added that another benefit to Susitna would be that once hydropower was on line the cost of power wouldn't be affected by events around the world.

4:10:37 PM
CO-CHAIR WAGONER asked him to hold a meeting on the Kenai for commercial fishermen and other interested parties.

SENATOR WIELECHOWSKI asked if current electrical infrastructure would be able to sustain additional power.

MR. CAREY replied that existing infrastructure would need upgrades in stations north and south and those costs would be substantial.

SENATOR WIELECHOWSKI asked how financing is proposed. What kind of discussion was had with the utilities?

MR. CAREY answered that the utilities support this project.

4:12:48 PM
SARAH FISHER-GOAD, Deputy Director, Operations, Alaska Energy Authority (AEA), responded that it was premature to say how the project would be financed, but as an example the debt service that the AEA has on the Bradley Lake hydroelectric project is paid for by the utilities through a power sales agreement. When that debt is paid off, the utilities actually still have an obligation to pay approximately the same amount for an additional 20 years to the State of Alaska.

She said that Senator Wagoner asked the AEA to give his staff some information on how the State of Alaska has participated in some other large projects, so he can get an idea of what options are out there and what they can do. For instance, the state is participating in conduit revenue bonds, ownership status (AEA owns the Snettisham Hydroelectric project in Southeast Alaska), and AIDEA has provided conduit bonds for Lake Dorothy. The State of Alaska used to own the Four-Dam Pool project which has been split up and is now in local ownership. And she would dig up some of the records on how the state financed that project in the first place.

SENATOR WIELECHOWSKI asked if they think the cost per KWh (5 or 6 cents) will stay level for the life of the dam. One presentation said it would start out at 20 cents, and then it would go down to 2 cents after 50 years.

MR. CAREY replied when that estimate was originally done it was under the constraints of having to put down 100-percent private funding with no state contributions, similar to Bradley Lake. In that case, once you got to the ends of the bonds, the price would drop down to what the yearly costs are. That is why it drops dramatically to 2 cents or even less. In the case of Bradley, you don't have the big drop until at least 50 years

have gone by because once the bonds are paid back, then the state is getting paid back for a certain amount of its contribution. It just gets into how you want to finance the project.

4:15:57 PM
CO-CHAIR PASKVAN asked if the timeline on page 12 starts after deciding on the type of dam.

MR. CAREY replied that investigating RCC construction would not push the timeline out. Work that occurs in the early years, like the EIS, has to be done either way. Some conceptual design using both methods would be done simultaneously. One or the other would be dropped for the final application.

CO-CHAIR PASKVAN asked if starting the licensing now poses a material risk to advancing the project.

MR. CAREY replied no.

SENATOR STEDMAN said it would be interesting especially for the college representing this in Anchorage to have "a little btu analysis" generated if they are going to use 12 cents KW because in the Railbelt a lot of people heat with natural gas. They should also "throw in oil as a comparison." He also wanted to know how quickly they anticipate fully loading the capacity of the dam so it's generating as much revenue as possible.

MR. CAREY responded that the schedule shows 11-12 years for first power. The nice part about RCC dams is that the reservoir can be filling up as construction is going on. Embankment damns aren't ready to generate full power because reservoirs are located at lower elevations and construction has to happen after they are filled. RCCs can generate power quicker.

SENATOR STEDMAN said the issue is paying debt service of 50 percent immediately and a couple billion dollars for the utility line upgrades, and asked for an idea of how quickly they could sell all the power.

4:20:37 PM
MR. CAREY replied that the Railbelt would be able to absorb all of the power from Watana on completion, because it will replace its existing gas generation that is old.

SENATOR WIELECHOWSKI said he would be interested to see how the new power would be integrated into the old. Chugach and ML&P are

building a new gas-fired plant right now, for instance, and he wanted to know where the new energy would be going.

MR. CAREY replied that he would come up with a more specific plan of how it would be absorbed after consulting with the utilities.

SENATOR STEVENS asked him to reflect on wildlife habitat, and said Kodiak went through years of discussion over the impact on the bear refuge, and in the end found that 1.5 bears were displaced by a smaller dam. That was acceptable to the environmental community and to the wildlife refuge, but he asked what kind of wildlife they are talking about.

MR. CAREY replied that environmental issues are very much a concern, because for one thing the resource agencies have mandatory conditioning and if they don't like what the project would do, it won't move forward. Moose, caribou, bear, wolves and other fur bearers pass through the area. In the case of flooding an area, you can't get around the impact. So, there some type of mitigation money would have to be paid, and that would go towards increasing habitat elsewhere, acquiring habitat elsewhere or improving habitat.

4:24:16 PM
CO-CHAIR WAGONER thanked everyone for their comments and adjourned the meeting at 4:24 p.m.