

**ALASKA STATE LEGISLATURE  
HOUSE SPECIAL COMMITTEE ON ENERGY**

February 13, 2013  
8:02 a.m.

**MEMBERS PRESENT**

Representative Doug Isaacson, Co-Chair  
Representative Charisse Millett, Co-Chair  
Representative Neal Foster  
Representative Pete Higgins  
Representative Shelley Hughes  
Representative Andy Josephson

**MEMBERS ABSENT**

Representative Benjamin Nageak

**COMMITTEE CALENDAR**

PRESENTATION: "EMERGING ENERGY OPPORTUNITIES FOR ALASKA"

- HEARD

**PREVIOUS COMMITTEE ACTION**

No previous action to record

**WITNESS REGISTER**

GWEN HOLDMANN, Director  
Alaska Center for Energy and Power (ACEP)  
University of Alaska Fairbanks (UAF)  
Fairbanks, Alaska

**POSITION STATEMENT:** Provided a presentation on the Alaska Center for Energy and Power, University of Alaska Fairbanks.

**ACTION NARRATIVE**

[8:02:26 AM](#)

**CO-CHAIR DOUG ISAACSON** called the House Special Committee on Energy meeting to order at 8:02 a.m. Representatives Hughes, Millett, and Isaacson were present at the call to order. Representatives Josephson, Foster, and Higgins arrived as the meeting was in progress.

**PRESENTATION: "EMERGING ENERGY OPPORTUNITIES FOR ALASKA"**

8:03:27 AM

CO-CHAIR ISAACSON announced that the only order of business would be a presentation by the Alaska Center for Energy and Power (ACEP), University of Alaska Fairbanks (UAF).

8:03:48 AM

GWEN HOLDMANN, Director of ACEP, prefaced her presentation by commending the work completed by the House Special Committee on Energy during previous legislative sessions. Ms. Holdmann urged for a holistic approach to energy issues that connects the use of the state's domestic energy resources with economic opportunities for its residents. If no action is taken to mitigate the cost of energy, she estimated that about \$5 billion will be spent on diesel fuel in rural Alaska, and about \$60 billion will be spent on fossil fuels for Railbelt electric power generation. This does not include the costs of generation, operation and maintenance, and replacing infrastructure. Furthermore, legislative energy-related appropriations have totaled \$2.3 billion since 2008. She pointed out if Alaska's long-term goal is addressing the price of energy it should also be tied to economic opportunities so there are jobs; that is the focus of ACEP's program at UAF. The state's energy challenges are: high energy costs; fragmented electric grid; harsh climate; location at the end of supply lines; stranded resources; and a dispersed population. Ms. Holdmann informed the committee ACEP is an applied energy research program currently working on a range of energy technologies and options. She offered ACEP as a resource to assist in the decisions the legislature must make, and said it can also help communities and homeowners make good decisions about energy use. The center also connects students with industry to work on real energy challenges. Another part of ACEP's task is to commercialize the production of energy by working with industry to break down barriers to production. Regarding partnerships, she said ACEP has 30 affiliated faculty members on all UA campuses who work on specific problems, or on just one. The center also has many partners in industry, thus almost every project involves private industry, utilities, communities, and the state. As an example, she spoke about mapping geothermal finds by forward looking infrared (FLIR) radiometry at Pilgrim Hot Springs near Nome, the practical application of which is to keep geothermal exploration costs down. The funding for this research was by the U.S. Department of Energy (USDOE).

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MS. HOLDMANN continued, noting that FLIR radiometry can also apply to new energy challenges in the state; in fact, the device can be flown over a community and assess the heat loss of an entire community at one time, which would benefit the weatherization programs funded by the state. In response to Representative Higgins, she noted the photo provided was an image from Canada as ACEP operates on external grants and contracts and does not have funding to pursue this technique in Alaska.

CO-CHAIR ISAACSON further explained that the FLIR images are taken from unmanned aerial vehicles (UAVs) which are less expensive to operate and a survey in partnership with the military may be possible.

[8:16:15 AM](#)

MS. HOLDMANN recalled that the legislature funded research conducted by UAVs at UAF and ACEP will fly a UAV survey over Pilgrim Hot Springs next summer. She further explained that ACEP is organized around three areas: community energy solutions; powering the economy; and the energy field of the future. Although communities need lower cost energy, ACEP must focus on powering the economy through long-range economic development. In addition, besides extracting and exporting resources today, future resources - such as onshore methane hydrates - are critical and Alaska can be a pioneer in this field. She returned attention to ACEP's funding sources, and pointed out that the center received about \$18 million in 20 active projects; in fact, ACEP is a revenue source for UAF, bringing in a significant amount of funding beyond what is received from the state. She provided a chart that illustrated the economic benefits of the energy research at UAF, benefits that come from a wide range of sources. For example, ACEP and the Institute for Social and Economic Research (ISER), UA Anchorage (UAA), have jointly submitted a proposal to USDOE. Ms. Holdmann said ACEP has sixteen staff members housed in Anchorage and Fairbanks, and the program is five years old, with projects throughout the state ranging from small modular nuclear reactors to fossil and renewable resources. Although ACEP cannot do everything, Ms. Holdmann said it has a focus on advanced battery storage technology; in fact, Fairbanks has the largest battery storage system in the world. Although the new

technology will not be built here, Alaska has the opportunity to test the technology.

CO-CHAIR ISAACSON asked why Alaska would not build new technology in the future if its energy programs are successful.

[8:23:01 AM](#)

MS. HOLDMANN stated that other entities are spending millions of dollars to develop new source technologies in the U.S. and elsewhere; however, Alaska can focus first on areas where it does have an advantage.

CO-CHAIR ISAACSON pointed out that Ucore Rare Metals Inc., is developing heavy strategic metals [near Ketchikan] for batteries and other applications. He opined that Alaska has the resources and knowledge to do everything here that can be done anywhere else in the world.

MS. HOLDMANN agreed that Alaska has a huge opportunity to provide raw materials such as rare earth minerals (REE). She turned attention to one of Alaska's comparative advantages: high contribution renewables and solving the technical challenges thereof, such as integrating diesel engines with wind systems. As an aside, she described the lab in Fairbanks which is a unique recreation of a village complete with a power system and all of its inherent problems, enabling researchers to test new ideas and find new strategies and solutions. Returning to comparative advantages, she said industry is interested in working in Alaska because of its niche technical challenges, value-added processing, and difficult to extract and transport fossil fuels. Alaska is a pioneer in high contribution renewables and "island" energy systems. As the world is becoming more electrified, power generation will be more like electrical generation in Alaska than that of the Lower 48 due to the lack of electrical grids. Returning to the lab in Fairbanks, she said the lab is a friendly test facility and works with industry to fix programming and other problems and test products before installation in the field. Another niche technology of interest is hydrokinetics, of the emerging energy technology grant fund applications, 20 percent for were for hydrokinetic ocean and river technologies. She stressed that ACEP does not build turbines, but devises devices that will make it possible for the turbines to work in Alaska; at this time, ACEP has installed a hydrokinetic turbine in Nenana for testing the effects of debris and ice.

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CO-CHAIR ISAACSON asked how much electricity the test turbine has generated, and during what time of the year.

MS. HOLDMANN advised that in the winter there is not enough flow to generate electricity, thus generators must be removed. There is also the need to address the issue of the outmigration of smolt to protect the fish populations. The test unit in Eagle was a 25 kilowatt (kW) unit which produced one-half of the town's energy needs when it was operating. The equipment was turned over to ACEP because the issues of debris and fish protection made the project uneconomic. She opined this industry is very excited about the work ACEP has done. On the other hand, low temperature geothermal is an example of a missed opportunity; the first system in the world was installed in Manly and geothermal is now a giant industry worldwide. Ormat Technologies Inc., tested its technology in Alaska at Manly Hot Springs, and the system at Chena Hot Springs is the lowest temperature commercial geothermal system in the world. Alaska has not taken advantage of this to drive opportunities in the state. At UAF the same technology is used.

[8:35:54 AM](#)

CO-CHAIR ISAACSON asked how the legislature could advance these economic advantages.

MS. HOLDMANN said a challenge for geothermal in this state is that the sites are not located near population centers and there are just a handful of potential sites, unlike the situation in Iceland. An aspect of Iceland's policy is that they offer free education for those who will live there, go to school, and then market Iceland's geothermal expertise back at home. She urged the state to do something similar to establish contacts around the world.

[8:39:04 AM](#)

MS. HOLDMANN restated the first priority is to address the energy needs in Alaska and then export the solutions. She returned attention to the comparable advantages of difficult to extract fossil fuel resources: heavy oil, methane hydrates, and underground coal gasification. None of the preceding is a commercial technology today, but may be in the future, providing new opportunities for Alaska exports. Taking a broader look for the state, Ms. Holdmann displayed a map of the Northern Sea

Route and said that in 2012, 46 ships followed this route. Alaska should capitalize on this increase because many of the mineral discoveries will be made in the Arctic and in the Aleutians. Alaska is also a leader in coil drilling techniques that are used for exploration worldwide, and in thermosiphons for extracting heat that were developed at UAF. She encouraged the committee to use ACEP as a resource to help answer questions by assessing technology options - as it did regarding small modular reactors; for data collection and analysis - asking how investments are performing; for energy analysis - to support policy energy analyses; and for projecting possible options - using a decision-making tool developed by UAF. She advised there is a funding request in the UA capital budget to support these projects.

[8:44:34 AM](#)

REPRESENTATIVE FOSTER posed a scenario of rural community residents who are paying 40 cents per kW hour before Power Cost Equalization (PCE) and 20 cents per kW hour after PCE. In this situation, residents may not be enthusiastic about a renewable energy project that reduces the cost of energy to 21 cents, even though savings to the state will be much more. He asked how to create an incentive for renewable energy projects under these circumstances.

MS. HOLDMANN observed PCE takes the average cost of energy in Fairbanks, Juneau, and Anchorage, and computes a formula to subsidize communities that have higher costs. In addition, there is a fuel and non-fuel component, thus if the amount of fuel is reduced the subsidy is also reduced. She acknowledged disagreement over whether this is a disincentive to the development of renewable energy projects, but there is no disagreement that often the benefit of PCE does not reach the residents. Ms. Holdmann cautioned that a new wind farm may reduce the PCE subsidy and benefit the state, but may not mean that ratepayers have a lower cost on their utility bills. She encouraged the committee to pursue changes to the PCE program.

[8:48:34 AM](#)

CO-CHAIR MILLETT recalled that the Emerging Energy Technology Fund resulted from work with Ms. Holdmann in Fairbanks.

CO-CHAIR ISAACSON previewed some of the additional information that will be presented to the committee and urged new members to review existing reports and a history of the committee's

actions. He opined the presentation showed some ways to have energy attract private investment and how to connect communities to each other, to economic opportunities, and to the resources around them. Co-Chair Isaacson invited Ms. Holdmann to submit additional information.

MS. HOLDMANN advised she would forward to the committee copies of last year's ISER report on restructuring PCE.

[8:52:36 AM](#)

**ADJOURNMENT**

There being no further business before the committee, the House Special Committee on Energy meeting was adjourned at 8:52 a.m.