

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

March 27, 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 Benjamin Nageak  
Representative Andy Josephson

**MEMBERS ABSENT**

All members present

**COMMITTEE CALENDAR**

PRESENTATION(S): INTERIOR RURAL ENERGY: OPPORTUNITIES TO MOVE FORWARD

- HEARD

PRESENTATION(S): ALASKA ENERGY: PROBLEMS & SOLUTIONS

- HEARD

**PREVIOUS COMMITTEE ACTION**

No previous action to record

**WITNESS REGISTER**

JULIE ROBERTS-HYSLOP, Vice President  
Tanana Chiefs Conference (TCC)  
Fairbanks, Alaska

**POSITION STATEMENT:** Provided a PowerPoint presentation entitled, "Interior Rural Energy: Opportunities to Move Forward," and dated 3/27/13.

DAVID PELUNIS-MESSIER, Rural Energy Coordinator  
Tanana Chiefs Conference (TCC)  
Fairbanks, Alaska

**POSITION STATEMENT:** Participated in the PowerPoint presentation by Tanana Chiefs Conference.

BERNIE KARL, Owner  
Chena Power; Chena Hot Springs; K and K Recycling  
Fairbanks, Alaska

**POSITION STATEMENT:** Provided a PowerPoint presentation entitled, "Alaska Energy/Economy: Problems and Solutions."

**ACTION NARRATIVE**

[8:02:11 AM](#)

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

**PRESENTATION(S): INTERIOR RURAL ENERGY: OPPORTUNITIES TO MOVE FORWARD**

[8:03:23 AM](#)

**CO-CHAIR ISAACSON** announced that the first order of business would be a presentation by the Tanana Chiefs Conference.

[8:03:43 AM](#)

**JULIE ROBERTS-HYSLOP**, Vice President, Tanana Chiefs Conference (TCC), informed the committee Tanana Chiefs Conference represents 42 Interior villages. She said she was born and raised in the village of Tanana which is located 130 miles from Fairbanks on the confluence of the Yukon and Tanana Rivers. Every summer the village's freight comes by barge on the rivers. Ms. Roberts-Hyslop provided a brief history of her work for her tribe, and said she represents a lot of people. The energy issue continues to be a challenge for people who choose to live in villages; they make this choice because it is their home. The presentation will provide the committee with insight on village life. In Tanana, community members have improved building standards and are looking at renewable energy such as using biomass to heat the washeteria. Over the past few years using wood has led to tremendous savings and brought the cost of living down.

[8:07:15 AM](#)

DAVID PELUNIS-MESSIER, Rural Energy Coordinator, Tanana Chiefs Conference (TCC), said the TCC region consists of 42 member villages representing 37 federally recognized tribes throughout the Interior, who live in some of the coldest regions in the nation. The mission of TCC is to provide a unified voice in advancing sovereign tribal governments through the promotion of physical and mental wellness, education, socioeconomic development, and the culture of the Interior Alaska Native people [slide 2]. His organization believes one way to fulfill this mission is by the use of sustainable energy. The TCC region covers about 235,000 square miles and makes up about 37 percent of the state; the size of the region creates challenges in the transportation of energy, goods, and individuals [slide 3]. In Arctic Village fuel costs \$10 per gallon and electric rates are very high. Mr. Pelunis-Messier displayed a map provided by the Alaska Energy Authority (AEA), Department of Commerce, Community & Economic Development, showing the different resources that are available across the state. In the TCC region, most of the area is still dependent upon diesel fuel for heating and for electrical generation, however, there are efforts to return to biomass for heating schools, city buildings, and tribal buildings. Fuel from biomass provides employment, is sustainable, does not have to be imported into the region, and provides energy security. For example, because there is limited storage for diesel fuel, in winter villages may only have one week's supply of fuel for electrical generation. Energy security is a serious problem, in addition to the fact that the cost is equivalent to six to ten times that of Anchorage. Also, high energy costs are a barrier to economic development [slide 4]. Information provided by the Institute for Social and Economic Research (ISER), University of Alaska Anchorage (UAA), shows that low-income households in remote communities spend up to 47 percent of their income on fuel [slide 5]. The high cost of fuel also has a detrimental effect on subsistence activities and on the cost of travel and goods. For example, a roundtrip flight from Galena costs about \$380, and freight to some communities costs \$0.85 per pound [slide 6].

[8:12:28 AM](#)

MR. PELUNIS-MESSIER continued, saying that space heating is the biggest challenge in rural communities; in fact, about \$0.75 of every "energy dollar" per household goes to pay for space heating. Schools and community buildings suffer from this cost, as do businesses [slide 7]. He noted that TCC passed a resolution to increase efficiency standards in Tanana, which

will be discussed later in the presentation. In terms of opportunities, he praised the AEA Village Energy Efficiency Program (VEEP), which provides funds for the assessment of village electrical loads, and remediation. The work funded by this program provides significant long-term reductions in energy use. Also, the AEA Rural Power Systems Upgrade Program (RPSU) has funded power systems upgrades in several communities. In addition, renewables such as solar, biomass, and wind are adding energy security and lowering cost. Mr. Pelunis-Messier said TCC strongly supports the liquefied natural gas (LNG) trucking plan because it has the potential to lower the cost of propane in rural Alaska.

[8:16:06 AM](#)

MS. ROBERTS-HYSLOP said that in the summer 100-pound bottles of propane come by barge to Tanana at a cost of \$150 each. During winter, the cost can be \$190 each.

MR. PELUNIS-MESSIER described a project at the Nenana Teen Rec Center where solar panels were installed for lights and hot water. During an evaluation of power use, he discovered that if one 75-watt exterior light was replaced with one 20-watt light, the energy saved was equivalent to that generated by one solar panel.

CO-CHAIR ISAACSON questioned whether lower wattage is sufficient for an outdoor security light.

MR. PELUNIS-MESSIER advised that replacing 250-watt bulbs with 60-watt light-emitting diode (LED) streetlights is efficient and effective. The light may not spread equally, but the quality of light is good. For security light applications, adding a motion sensor is especially efficient [slide 8]. Mr. Pelunis-Messier returned attention to the TCC resolution on energy standards in Tanana. He observed that new homes are built in rural Alaska and on the road system in the Interior that are not designed for "14,000 heating degree days." However, TCC passed Resolution 2013-111 that states, "Buildings financed with public money shall seek to achieve the following efficiency standards: roof, R-100; walls, R-70; and floor/slab, R-50." He cautioned that even projects funded with state money are currently built without the use of high efficiency materials [slide 9].

[8:22:49 AM](#)

CO-CHAIR ISAACSON asked for a definition of heating degree days.

MR. PELUNIS-MESSIER explained that it is a standard of measuring how cold an area is for the purpose of comparing the climate of different regions.

REPRESENTATIVE NAGEAK asked for data from the house in Anaktuvuk Pass built by the Cold Climate Housing Research Center, Inc.

MR. PELUNIS-MESSIER answered that he worked on the solar array and wind turbine for that project and said it is a fantastic success. The house was cheaper to construct than standard homes in that area and uses much less fuel. The style of construction incorporated Native knowledge of the area by using traditional sod materials. He returned attention to the presentation, stressing that the reason Fairbanks is having air quality problems is because inefficient homes have been built there for the last 50 years. A graph showed that over the average life cycle of a building, 84 percent of the costs are operating expenses such as heating, maintenance, and electricity, thus spending more upfront to increase efficiency will result in significant reductions in the overall life cycle costs [slide 10]. Mr. Pelunis-Messier said biomass is a name for burning wood more efficiently by using gasification technology. Tanana's biomass project is an example of how heat can be provided locally in most of the Interior. In 2006, the City of Tanana was importing about 30,000 gallons of diesel fuel at a cost of \$150,000 to heat the washeteria, sewer loop, shop, and fire hall. The city manager instigated biomass projects and in 2013, Tanana only needed to import 12,000 gallons of heating fuel. The savings stayed in the community and paid residents to harvest wood, creating job opportunities [slide 11]. A "rain barrel model" is a way to visualize money that goes in and out of a community; for example, energy dollars come into a community from government sources, and if those funds are used to pay for fuel oil or gasoline, the funds leave the community immediately, which is a dynamic that needs to change. To facilitate change, residents are working with AEA and in partnership with regional housing authorities to install biomass projects.

[8:30:43 AM](#)

REPRESENTATIVE HUGHES asked whether Tanana is using biomass for its city buildings, and whether the supply of fuel is sustainable.

MR. PELUNIS-MESSIER indicated yes.

MS. ROBERTS-HYSLOP added that the first biomass projects in Tanana were the washeteria and the teacher housing units. The next project was to install wood-burning heat for the fire station that also includes a housing unit. Recently, three units have been installed at the school. The source of wood is driftwood brought by the river which is dry wood, and many tons of it can be harvested by residents. Standing dead timber is also a source of wood.

MR. PELUNIS-MESSIER noted that the local village corporation has designated an island as a wood cutting lot and TCC's forestry department is ensuring that the harvest is sustainable by conducting biomass assessments.

REPRESENTATIVE FOSTER expressed his support of harvesting biomass for savings, jobs, and fire safety. He asked whether there are impediments to any community that wishes to harvest biomass on state land.

MS. ROBERTS-HYSLOP said TCC is working on partnerships with village corporations and federal and state entities for the purpose of harvesting timber. Harvesters stay close to their communities because of the cost of transportation, and try to harvest during the summer when the wood is readily accessible.

[8:37:10 AM](#)

CO-CHAIR ISAACSON observed that driftwood passes through different communities, and asked whether the resource is sufficient to supply areas where there is not much biomass material available.

MS. ROBERTS-HYSLOP advised high-level water in the spring brings more driftwood than can be used by Tanana and the excess floats down to the next community.

REPRESENTATIVE NAGEAK asked whether residents in Tanana are also modernizing their wood stoves as is happening in Fairbanks.

MS. ROBERTS-HYSLOP acknowledged modern woodstoves are very efficient. Her personal experience is that a two-story house can be kept warm with wood heat.

MR. PELUNIS-MESSIER advised that the Interior Regional Housing Authority is installing many efficient Blaze King stoves and conducts a training program on the use of a catalytic converter.

8:40:50 AM

REPRESENTATIVE NAGEAK asked whether large outside furnaces are used to heat community buildings.

MR. PELUNIS-MESSIER indicated no. Certain outdoor wood burning appliances lose a lot of heat and efficiency. The best use is a simple unit with a burn box, blower, and thermal storage located in a mechanical room. Normally, the homeowner sets a thermostat once.

REPRESENTATIVE HIGGINS relayed that peat moss is also a source of biomass.

REPRESENTATIVE HUGHES recalled her previous experience heating with a wood stove was negative.

MS. ROBERTS-HYSLOP assured the committee the stoves are regulated and burn all day without tending.

REPRESENTATIVE JOSEPHSON asked how much the stoves cost.

8:44:20 AM

MR. PELUNIS-MESSIER answered a small Blaze King stove costs \$2,500 and larger wood gasification systems can cost from \$12,000 to \$20,000. A heating system for a building must include the associated wood delivery set-up. In response to Representative Hughes, he said the most efficient wood gasification systems have a water thermal storage component. He returned to the presentation and compared the cost of fuel sources, pointing out that a cord of white spruce is equivalent to about 130 gallons of fuel oil [slide 12]. The harvesting and storage of wood is best kept simple [slide 13]. Regarding propane, TCC passed Resolution 2013-12 which supports the LNG trucking plan as a future source of propane for villages at one-half of the present cost [slide 14]. He stressed that all projects - even those on the cutting edge of technology - must be simple; for example, the In-Stream Hydrokinetic Turbine project in Ruby was high maintenance, challenging, and not properly scaled for the community [slide 15]. He returned attention to the Nenana Rec Center project, and discussed the installation of a programmable thermostat [slide 16]. An example of an energy model that should be followed is: 1. Collect Data & Plan; 2. Efficiency First; and 3. Renewable Energy (Biomass! Solar!) [slide 17].

8:51:34 AM

REPRESENTATIVE MILLETT asked whether the aforementioned model was provided in the AEA Alaska Energy Pathway document.

MR. PELUNIS-MESSIER opined a plan for efficiency first may be in the book but is often ignored. For example, the Manley Hot Springs Tribal Council built a tribal complex beyond the terminus of the power line, and so ran a 35 kilowatt generator at a cost of \$70,000 in diesel fuel per year [slide 18]. After an efficiency assessment, the council reduced its use of electricity by replacing electric heat, dryers, and a hot water heater with propane, and replacing lights with LEDs. These changes decreased the electrical maximum load from 35 kilowatts to 16 kilowatts. The final goal is to supplement electrical generation with solar [slides 19-21].

8:55:48 AM

REPRESENTATIVE MILLETT relayed AEA believes interest in energy efficiency is waning and asked whether Mr. Pelunis-Messier agreed.

MR. PELUNIS-MESSIER advised "People like being able to come before the legislature and come before their constituents with energy projects, with wind turbines, with solar panels ... they don't see the energy savings." A necessary part of any efficiency project is keeping track of the reduction in electrical use, which can be complicated. He said he strives to showcase efficiency projects just as often as renewables, because efficiency projects have a better payback and less maintenance than new renewable projects. In rural communities, payback on efficiency projects can be as short as five months.

REPRESENTATIVE HIGGINS recalled Rural Alaska Community Action Program, Inc. (RurAL CAP) seeks to expand its Energy Wise Program to other areas of the state. He asked whether TCC works with other organizations on energy efficiency issues.

MS. ROBERTS-HYSLOP assured the committee TCC has good relationships with other nonprofits although they may have different circumstances. Her village works with the City of Tanana, Native corporations, and tribes.

9:00:13 AM

REPRESENTATIVE MILLETT inquired as to whether willow can be used for biomass fuel.

MS. ROBERTS-HYSLOP said that hasn't been explored yet.

REPRESENTATIVE JOSEPHSON was impressed by Mr. Pelunis-Messier's work.

MR. PELUNIS-MESSIER closed, saying funds appropriated to weatherization, energy efficiency, and the AEA Renewable Energy Fund Grant program are appreciated and are put to the best use possible.

[9:02:37 AM](#)

The committee took an at-ease from 9:02 a.m. to 9:04 a.m.

**PRESENTATION(S): ALASKA ENERGY: PROBLEMS & SOLUTIONS**

[9:05:04 AM](#)

CO-CHAIR ISAACSON announced that the final order of business would be a presentation by Bernie Karl of Chena Power.

[9:05:27 AM](#)

BERNIE KARL, Owner, Chena Power, Chena Hot Springs, and K and K Recycling, informed the committee he and his wife own three businesses and employ 140 workers in the state. He gave a short history of his life growing up in a large family where he was taught that hard work makes good luck. He said Alaska and the nation have an addiction to oil and greed but there are opportunities for Alaska. His vision is for Alaska to become a self-sustaining state by following a plan for cheap energy and a vibrant economy without using federal or state money [slide 1]. Three problems - or opportunities - for Alaska are fuel source, energy delivery, and food security [slide 2]. The bigger problem is that except for savings, the state is out of money, and having less money requires innovation and the practical application of intelligence [slides 3 and 4]. Alaska has enough innovation, intelligence, and money to solve its problems [slide 5].

[9:11:59 AM](#)

MR. KARL said one example of innovation is the use of a Rife Ram water pump to water gardens and plants without electricity.

Other examples are to use geothermal heat to generate electricity - a unit that will do this cost \$400,000 and will generate electricity for \$0.06 per kilowatt hour (kWh) - or to grow food, which is just as important. At this time residents in Alaska buy all of their food and grow very little. Mr. Karl said his greenhouses at Chena Hot Springs grow food at -60 degrees [slide 6]. In addition, Fairbanks is currently recycling cardboard, paper, and glass to generate heat and electricity [slide 7]. From this technology has come the Chena Power Energy System which is the largest screw expander in the world. The unit runs with a synchronous generator and produces 300 net kWh without a grid. Mr. Karl advised this new technology will change the way Alaskans look at energy and - when sized down to 2.5 kWh - will make every home grid-independent [slide 8].

[9:15:59 AM](#)

CO-CHAIR ISAACSON asked how this technology will serve residential needs.

MR. KARL said residential units cost \$5,000 each and are made in China; the units will be available August 18, 2013, at the Alaska Renewable Energy Fair. He explained the unit needs no foundation or building because the generator comes in a box. In addition, in Fairbanks the ash is combined with crushed glass and used to make geopolymers cement which is stronger than Portland cement [slide 9]. He provided images of small units sized for a home or community buildings, and for units that burn coal, wood pellets, wood chips, barley, or corn. He said a unit can produce 100 kWh of power from coal, and noted that the average kilowatt usage in villages is 100 kWh. Also soon to be available is a unit that gasifies coal at a cost of \$1.75 per gallon. The units are financed through GE Capital, General Electric Corporation, at 6.5 percent interest. Mr. Karl opined small units can be paid for with energy savings, and there is a demonstration unit at Chena Hot Springs [slide 10]. A combined heat/power component can be added to the system that will provide energy at \$0.10 per kWh [slide 11]. Also available for viewing at Chena Hot Springs are modular year-round controlled environment grow systems. The grow chambers are self-contained and are ideal to grow lettuce and vegetables. These units use no herbicides, pesticides, or fertilizer and can grow barley with nutrients from the sea for animal fodder [slides 12 and 13]. He restated that the state does not need to finance these projects.

[9:24:27 AM](#)

MR. KARL turned attention to landfills, and stated that a solution to unsightly landfills in villages is a firebox unit that is approved for use in Class 11 or Class 111 landfills. The unit costs between \$90,000 and \$500,000 and is equipped with water panels to store heat, and burns very hot with an air curtain. The unit makes sense for every community because it will burn trash and capture heat [slide 14].

REPRESENTATIVE HIGGINS asked whether the unit can burn everything.

MR. KARL said yes, adding that nothing is separated and the 2 percent of metal and glass left can be raked out and recycled. His said his goal is to deliver coal to the villages for a guaranteed price. The villages will have no risk but to sign a 100-year contract. He invited everyone to see the units in operation.

REPRESENTATIVE JOSEPHSON cautioned that some solid waste is noxious if burned.

MR. KARL pointed out that there is very little industry in villages. If present, hazardous waste must be separately handled, but the Department of Environmental Conservation (DEC) has approved this unit for normal household waste burned at 1,800 degrees.

REPRESENTATIVE NAGEAK expressed interest in seeing the unit.

[9:29:27 AM](#)

CO-CHAIR ISAACSON asked how the unit is fueled.

MR. KARL answered that the unit is lit with cardboard, paper, or a gallon of diesel fuel, and then "goes catalytic." Mr. Karl restated his belief in the products he described and offered to provide a tour at Chena Hot Springs Resort, K and K Recycling, or Chena Power [slides 15-17].

CO-CHAIR ISAACSON asked Mr. Karl to explain how to make these products into an integrated system.

MR. KARL suggested beginning with efficiency such as using highly efficient materials in new construction even when energy is available. Also, converting to light-emitting diode (LED)

lights saves the Chena Hot Springs Resort 120 kWh. He encouraged communities to use the resources available, or to use coal which is a cheaper resource than wood. He emphasized that businesses that keep money in the state will grow wealth. There are many possibilities for all of Alaska if residents can follow a model and make the best choices for their situation. He provided more examples of the use of technology to mimic nature.

CO-CHAIR ISAACSON observed the availability of energy will attract other industry, and suggested that the committee attend the energy fair and tour Mr. Karl's facility at North Pole.

[9:40:52 AM](#)

#### **ADJOURNMENT**

There being no further business before the committee, the House Special Committee on Energy meeting was adjourned at 9:40 a.m.