

Cover Sheet

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Applicant/Implementer: Association of Village Council Presidents

Project Title: Facilitation of Community Energy Plans

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Executive Summary

The purpose of the Cooperative Agreement was based on the mission the two agencies have in common. The Association of Village Council Presidents (AVCP) has been a critical player in accomplishing what Alaskan Native communities need since 1964 with various programs including energy assistance.

The AVCP/DOE Partnership enabled AVCP to assist 10 of 56 remote Alaska Native villages in the development of a community-led Community Energy Plan. These plans have empowered the 10 Tribes to address their own energy development needs.

The community energy plans that AVCP assisted the communities with identified the community's energy vision, goals, and a high level project timeline of each goal. The plans also include the technical potential, resource assessment, grant and technical assistance resources.

The AVCP/DOE Partnership also enabled AVCP to provide tribal leaders and staff from the 56 Federally-Recognized Tribes with information about the policies and programs of the Department, support regional workshops and forums, and provide directed technical assistance for initial energy project support.

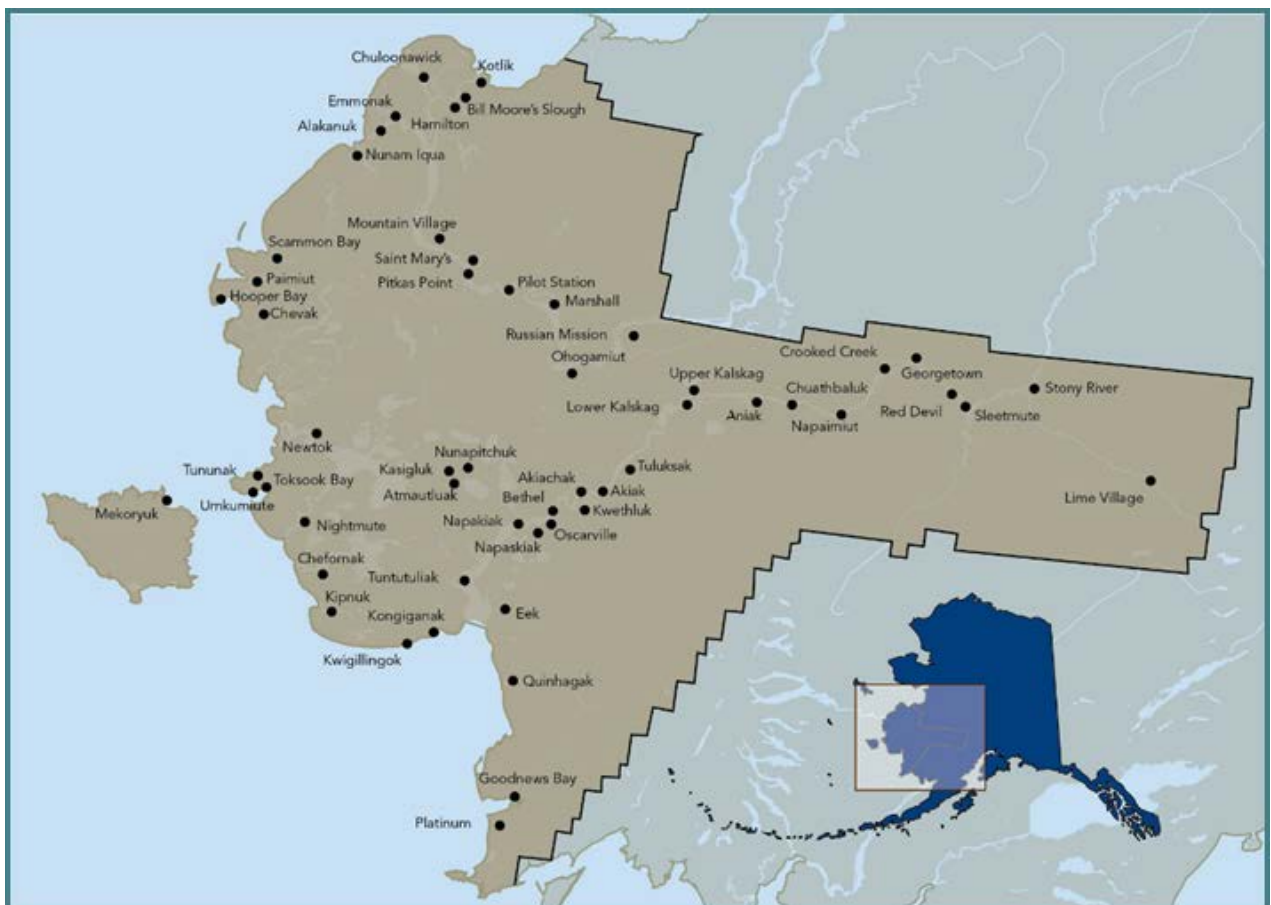


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Project Overview

The Association of Village Council Presidents (AVCP) is one the 13 regional Alaska Native Claims Settlement Act (ANCSA) Native Associations, a regional non-profit Alaska Native corporation that provides a broad stream of social services programs, technical assistance, training, and advocacy to the 56 Alaska Federally-Recognized Tribes residing in the 48 villages scattered over a 59,000 square mile region, similar in size of New York, in remote western Alaska along the Yukon River, Kuskokwim River, and Bering Sea Coast.

Average home energy costs in the AVCP region is more than 275% of the national average under the high energy cost benchmark using average per unit cost for home energy. The primary residential energy sources used in every community is electricity and fuel oil (Diesel). The average cost per kilowatt hour (kWh) for residential customers are between \$0.51 and \$1.27 per kWh. Because of the remote location, fuel oil is more expensive in the AVCP region and averages \$5.00-\$6.00 per gallon. Because of the harsh climate, the average household uses over 1,000 gallons of fuel oil per year. That is \$5,000-\$6,000 dollars just to heat an average 1000sqft home **not** including electricity.

The AVCP region consists of the Bethel and Kusilvak Census Areas. Out of 3,142 counties and census areas nation-wide, the Kusilvak Census Area ranks top 1% in Poverty and the Bethel Census Area ranks top 7%. The high cost of energy is detrimental to the already cash-poor economy. However, this region has a strong subsistence economy. Subsistence hunting and gathering have enabled the region to grow in population which has increased by 8% since 2010. This shows our federal and state governments that small Alaskan villages will always be here and it is time to take an aggressive approach towards community and regional infrastructure development that will allow for affordable energy, transportation, communications and healthy workforce.

This cooperative agreement has allowed AVCP to assist tribes to begin thinking and chipping away at energy solutions. We emphasized that a successful energy plan or project needed to be led by the community. AVCP's purpose was to light the flame, give the tribes tools for success, and help them along the way.

We shared DOE information with the 56 Tribes during regional and village specific meetings, DOE regional workshop, and sent outreach materials such as briefing papers, web briefs, webinars and newsletters. AVCP provided five project evaluation analysis, 10 on-request community based energy planning and prioritization for the development of community energy plans.

Objectives

1. Information Sharing, Education and Capacity Building

a. Regional Workshop/Forum

AVCP will plan, organize and staff one regional meeting, subject to funding under this agreement. Regional meeting will provide DOE an opportunity to present Project Development and Finance Workshop/Forum that gives tribal and corporate leaders, staff, utility managers, and other entities involved in village energy development efforts training and updated information about renewable energy and energy efficiency programs.

Meeting will general be held in Bethel, or jointly with other planned events, including other regional meetings.

b. Tribal Leader Outreach and Education Materials

AVCP staff will assist the DOE with research, writing and publishing concise educational and information briefing materials for distribution to Alaska Native village tribal leaders and staff. Topics will be mutually determined by AVCP and DOE staff, based upon expressed interest from Alaska Native village tribal and corporate leaders, utilities, and staff.

Education and outreach materials produced under this agreement may include the following:

- i. Online web announcements. Posting information about energy development, DOE program information, other relevant information about energy events.
- ii. Webinars (2-3). Webinars for Alaska Native village and corporate leaders, staff, utility managers could include presentations by DOE, federal and other state energy program officials about issues related to the clean energy and energy efficiency project development. The webinars will be promoted through e-mail blasts, webpage highlights and correspondence with AVCP membership. Webinars are archived for continuing access by interested parties.
- iii. AVCP will also promptly respond to information requests from Alaska Native village and corporate leaders, staff, utility managers on issues relating to the clean energy and energy efficiency project development.

2. On-Request Technical Assistance

- a. Directed Technical Assistance: AVCP will provide directed technical assistance to requesting Alaska Native village tribal governments or Alaska Native corporations for community-based energy planning, project evaluation, and prioritization. Specifically, experienced AVCP staff members will provide assistance Alaska Native village tribal governments and corporations who have requested direct technical assistance from the DOE for the following types of assistance.

- b. Community based Energy Planning: AVCP will prepare, organize, and conduct two-day energy planning workshop in Alaska Native village; support energy project evaluation and prioritization; assist with drafting community energy plan. (Estimate 4-5 village requests)
- c. Project Evaluation Analysis: Using National Renewable Energy Laboratory (NREL) models, Alaska Energy Authority (AEA) resource information, and community energy data, AVCP will assist Alaska Native villages, corporations, and/or utilities with high level project evaluation and analysis, including installed costs, generation, energy savings, and economic and financial performance estimations. (Estimate 4-5 village requests)
- d. START Program Support: AVCP will provide support to the DOE Alaska START program for community energy planning and project evaluation analysis

3. AVCP Capacity Building

Increase the capabilities and capacity of AVCP staff to support clean energy and energy efficiency development in the Calista region, through DOE workshop and training opportunities. Training opportunities will include: energy planning facilitator training, NREL training on renewable energy models, and project development workshop train the trainer.

Description of Activities Performed

1) Information Sharing, Education and Capacity Building

a. Regional Workshop/Forum

AVCP assisted the DOE in coordinating a regional energy workshop in Bethel, Alaska from March 23 – 25, 2015. AVCP emailed, faxed, and called all 56 Tribes, 48 cities, and 48 village corporations of the regional energy workshop multiple times before the workshop. As a result, we helped the DOE obtain 98 participants from our region. The workshop in Bethel had the most participants from DOE's 2015 Alaska Indian Energy Workshops held in Dillingham, Bethel, and Juneau. Although Sherry's quote below says 91, the roster count from NREL says 98.



Givey Kochanowski giving the opening and welcome at the Bethel workshop

The workshop in Bethel was held at the Yupiit Piciryarait Cultural Center and attended by 91 people—an all-time workshop high! Much of the technology interest centered around solar and wind applications and how to integrate those systems onto isolated grids. The attendees also expressed interest in energy efficiency measures. To facilitate better understanding of these measures, NREL partnered with local groups to provide a tour of homes designed by the [Cold Climate Housing Research Center](#) and a hands-on demonstration of a building

energy audit (Sherry Stout, NREL).

<https://www.energy.gov/indianenergy/articles/alaska-energy-workshop-tour-creates-rich-opportunities-knowledge-sharing>

The workshop was facilitated by Givvy Kochanowski with the Alaska based DOE OIE and technical experts from NREL Sherry Stout, Paul Schwabe, Amy Hollander, and Brian Hirsh.

Learning Objectives of the workshop were the following:

- Understand the process for and potential pitfalls of developing and financing community and facility scale renewable energy projects
- Determine how the development of a renewable energy project could further a Tribe's goals
- Learn from the experience of other tribal efforts in renewable energy development

What we learned from the participants on how to improve the workshop per the evaluations

- Work more with local, regional, state, and federal more
- One-on-one technical assistance, more workshops
- One-on-one sessions with each community that signs up for it
- Keep to the schedule; don't jump around
- Explanations of certain topics so that older attendants could understand the language
- More chances for questions
- More technology information
- Data seemed tailored to lower 48, include AK stats; agenda – not clear on where we were in the binder; great presentations
- Stop jumping around and changing the agenda

The workshop was an overall success. There was direct communication between DOE/NREL, AEA, NUVISTA, AVEC, AVCP, our 98 Alaska Native leaders and other energy stakeholders in the AVCP region.

b. Tribal Leader Outreach and Education Materials

- i. Online web announcements
From 2015 – 2017, AVCP staff posted information about energy development, DOE program information, and relevant information about energy and community development funding opportunities
- ii. Webinars: AVCP membership to promote DOE webinars
From 2015 – 2017 AVCP staff promoted DOE webinars through forwarding the webinar announcements to our 56 tribal administrators.
- iii. Promptly responding to information requests from Alaska Native village and corporate entities
We responded to the Alaska Native villages of Akiachak, Alakanuk, Kalskag, and Oscarville

2) On-Request Technical Assistance

a. Direct Technical Assistance

AVCP Staff assisted four Tribes in the application development of energy projects in Akiachak, Alakanuk, Kalskag, Napakiak and Oscarville.

Oscarville

AVCP staff, in partnership with the Holistic Approach to Sustainable Northern Communities group, assisted the Tribal Administrator of the Oscarville Traditional Council in applying for an ICDBG Imminent Threat Grant in 2015. The Tribe was awarded \$450K to obtain a community watering point and the original intent was to re-scope the award to address a portion of the community's high electrical costs. That is why we assigned staff to help write the imminent threat grant.

However, during that time, the Oscarville Village Corporation donated \$50K to install electrical meters on the homes in Oscarville. Electrical meters were the first step in allowing residents to pay the Alaska subsidized, Power Cost Equalization (PCE), which drastically reduced electrical rates for the residents. Currently, the community is connected by a 4 mile electrical transmission line to Bethel. The Bethel based electric cooperative had one customer in Oscarville and that was the Oscarville Village Corporation which was not eligible for the State of Alaska's PCE subsidy. What was happening was the village corporation was getting the electric bill and dividing the bill amongst the households.

AVCP staff assisted the Holistic Approach Team, who identified a contractor, in taking photos for the contractor so he could conduct an assessment and cost analysis. Soon after, the contractor was able to install electrical meters and the village became eligible to join AVEC, an electrical cooperative serving 56 villages statewide. After joining the cooperative, the small village now enjoys the Alaska subsidized Power Cost Equalization subsidy.

AVCP also facilitated another energy related grant opportunity for Oscarville. The Alaska Housing Finance Corporation (AHFC) conducted energy audits on 13 homes and 4 commercial facilities in September. We used the data to apply for funds to implement the recommendations in the audits. The majority of the homes in Oscarville are 2+ and 3+ Energy-Rated homes. With the recommended improvements completed, each home would have become a 5+ Energy Rated Home saving each household and approximate \$2,000 - \$3,000 per year. Unfortunately, this grant was not awarded.

Alakanuk

AVCP worked with the Alakanuk Traditional Council in an application to rehabilitate their proposed tribal and community gathering facility. The Tribe inherited an old school which was in very good shape. Our staff assisted the Tribal Administrator in applying for the USDA-RD and DOE grants. The goal of the project was to provide an adequate tribal and community center facility that is sustainable and will be used for its intention without being closed due to energy costs. Unfortunately, this grant was not funded either.

Kalskag

AVCP worked with the Tribal Administrator of the Native Village of Kalskag in the pursuit to rehabilitate their Multi-use Facility. The building houses the Tribal operations, US Post Office, Washeteria, Community Center, and the proposed village public safety officer apartment. Currently the facility expends \$68,797 per year on electricity. The tribe was looking at the possibility of installing solar panels and a new heating system to address the unsustainability. The grant opportunities that were presented had match requirements in which the tribe couldn't afford. That stopped the next step of grant application assistance.

Akiachak

The Tribal Administrator of the Akiachak Native Community requested technical assistance in applying for a DOE grant for the weatherization of their Youth and Elder Center. The building is unused due to the energy costs of opening the building. One of our staff was assigned to assist the tribal administrator in finding solutions and help submit a DOE grant. However, after requesting assistance, the tribe was non-responsive to AVCP staff.

Tuluksak (coordinating energy related meetings)

AVCP facilitated a meeting on September 30, 2015 regarding a struggling Tribally Owned Power Plant in Tuluksak. Participants included the DOE Office of Indian Energy, Alaska Energy Authority, AVCP, NUVISTA Light and Electric, Alaska Electric Cooperative, and the Native Village of Tuluksak. As a result of the meeting the action plan was for the Tribe to:

1. Create a Plan; plan that entails action steps towards a sustainable and reliable power plant in Tuluksak
 - a. Use AVEC's assessment and current letter to the AEA –was assigned to the Tribe's consultant
2. See if the DOE has additional technical assistance resources for Tuluksak –DOE
3. Build capacity within TNC – Assigned to AVCP, DOE, AEA, & TNC
 - a. Need to meet with TNC leadership
 - b. Bring TNC to nearby utilities that are successfully operated by the tribe and village corporations
 - c. Bring capacity builders to TNC
4. Establish a check-in call for TNC and AEA
5. Find funds for a new 300KW or 400KW generator
6. Secure funds for a new Tank Farm

AVCP facilitated additional discussions at the request of the Tribe. However, the leadership within the Tribe changed and progress on the action plan wasn't followed.

b. Community Based Energy Planning

The Statement of Project Objectives required AVCP to conduct 4-5 community energy plans. AVCP has exceeded that expectation and assisted 10 tribes in the development of their Community Energy Plans. This empowered the tribes to pursue energy within their community. We made it clear that this was their plan and not AVCPs. Within this report we are just including the community energy plan overview.

Alakanuk Community Energy Plan Overview

Vision Statement “Coming together to educate our community to conserve energy and to identify other cost saving alternative energy resources for the future generations”



Photos of boats along the eroding shoreline in Alakanuk, AK

Background

Alakanuk is a Yup'ik word meaning “wrong way,” aptly applied to a village on this maze of watercourses. The village was first reported by G.R. Putnam of the U.S. Coast & Geodetic Survey in 1899. It was originally settled by a Yup'ik shaman named Anguksuar and his family. A Catholic mission school was built near the village. A post office was established in 1946. In 1948, the school was relocated to St. Mary's, and many families moved from the old school site to Alakanuk. It incorporated as a second-class city in 1969. A tie-line was built between Alakanuk and Emmonak and four wind turbines were installed in Emmonak that will eventually provide renewable energy to both communities after the power plant and bulk fuel tank farms are upgraded.

The current population is 704 with the incorporation type of Alakanuk as a 2nd Class City. The Alakanuk Traditional Council is a federally recognized tribe. The total generating capacity is 1,199 (kw) with an electric intertie build between Alakanuk and Emmonak.

The community facilities include water and piped sewer system and a central watering point. Approximately 90% of the home are connected. Water is processed from the Alakanuk Slough and is treated, stored in a tank, and piped to most of the community.

The new facilities include a water treatment plant, a heated 300,000 gallon water storage tank, vacuum sewage plant, sewage lagoon, arctic piping, and household plumbing. There is one school (Lower Yukon School District) and an airstrip.

Alakanuk experiences a seasonal economy with 76 residents who hold commercial fishing permits. Many have gill net permits, and set net fishermen sell their salmon to who sell their salmon to a commercial buyer.

Alakanuk Traditional Council is a federally-recognized tribe and is located in the Village of Alakanuk. The population of the community is comprised of 97.7% Alaska Native or part native. Alakanuk is Yup'ik Eskimo village active in commercial fishing and a subsistence lifestyle. The sale, importation and possession of alcohol is banned in the village.

The climate in Alakanuk is subarctic. The snowfall average is 60 inches a year, and the precipitation averages 19 inches a year. The temperatures range from between -25 to 79 degrees Fahrenheit. Heavy winds are frequent during the fall and winter. The Yukon River is used as an ice road during freeze-up, from November through May.

There are a number of utilities throughout the Calista Region servicing Native Villages. The Alakanuk Traditional Council's utility provider is Alaska Village Electric Cooperative (AVEC). Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Alakanuk as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas.

Goal 1: Education and Awareness for Alakanuk residents on cost saving methods to reduce energy usage by 5% by 2020.

The Village of Alakanuk identified the reduction of energy use by 5% by 2020 as their primary goal. This will be accomplished through the following projects:

- Using energy saving lighting, vs using incandescent light bulbs.
 - LED & CFL light bulbs
- Upgrading or using energy efficient appliances
- Unplugging appliances when not in use
- Turning the thermostat down with the goal of reducing heating costs
- Conserving fuel consumption
- Using wood source for heating to help off-set heating fuel consumption
- Composting

Goal 2: Research Alternative energy resources for cost saving methods.

The Village of Alakanuk also identified the need to research alternative energy with the goal of reducing the costs of energy. This will be accomplished through the following projects:

- Utilizing waste heat

- Using used oil as fuel
- Looking into the possibility for Solar panels
- Looking into and using wind turbines
- Looking into hydropower as a possible alternative energy

Goal 3: Collaborate with housing entities to provide energy efficient homes.

The Village of Alakanuk also identified the need to collaborate with other housing entities with the end result of providing energy efficient homes. This will be accomplished through the following projects:

- Energy Efficient homes through home energy retrofitting, and building new houses energy efficient.
- Collaborating with the Cold Climate Housing Research Center (CCHRC) with the goal of providing energy efficient homes.
- Weatherizing homes
- Using energy Efficient windows
 - Fixing air leaks when possible
- Energy efficient doors
 - And fixing air leaks when possible

Emmonak Community Energy Plan Overview

Vision Statement “We the community of Emmonak will build our own capacity through energy education and training, to continue utilizing and seeking renewable energy, and pursuing community upgrades for our present and future generations”



Photo of Emmonak Community Energy Planning Participants

Background

The village of Emmonak is located at the mouth of the Yukon River, 10 miles from the Bering Sea. It is 120 air miles northwest of Bethel and 490 air miles from Anchorage.

In 2000, there were 767 people living in Emmonak. Residents call themselves “Kuigpagmuit,” which means “people from the Yukon River.” The village was originally called “Kwiguk,” which is Yup’ik for “big stream.”

The original settlement was located 1.4 miles south of its present location, and was first reported to the Western world by the U.S. Coast and Geodetic Survey in 1899. The village was moved due to increased flooding and the resulting erosion in 1964-65. The new location was given the name “Emmonak,” which means “black fish.”

Commercial fishing was the major industry until 1964, when flooding destroyed the Northern Commercial Company cannery. (Calista, 2017)

There are a number of utilities throughout the Calista Region servicing Native Villages. The Native Village of Emmonak utility provider is Alaska Village Electric Cooperative (AVEC).

Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Emmonak as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). Comparing Fiscal Year (FY) 2014 to (FY) 2016 the Residential kWh Sold decreased 7.8%. The Total kWh Sold & (PH) Consumption slightly decreased from (FY) 2014 to (FY) 2016 at 3.6%.

Goal 1: Through information and education training we can reduce energy cost by 15% by 2022

The Village of Emmonak identified the reduction of energy cost by 15% can be done through information and education. This goal will be accomplished through the following projects:

- Starting energy education programs for the community
- Making flyers for energy education and training
- Doing Public Service Announcements (PSA's) for Energy Education to include announcements with newspapers
- Ensuring renewable energy training for locals
- Switch to energy efficient appliances
- Replace lighting to LED
- Ensuring the future generations (youth and teens) have energy education and training
- Researching grant and loan funding to change to LED lighting and ballasts

Goal 2: Obtain 35% of electricity from renewable resources within 10 years (2027)

The Village of Emmonak also identified obtaining 35% of electricity from renewable resources within 10 years. This will be accomplished through the following projects:

- Utilizing biomass for heat
- Collect local wood for burning and heating
- Encouraging community members on wood burning stove use to off-set electricity and stove oil use
- Installing and utilizing solar power for households and business'
- Using less fossil fuel
- Continue utilizing the AVEC wind turbines
- Researching the feasibility of hydroelectricity

Goal 3: Ensure ongoing efficient energy affordability and reliability for Emmonak Residents

The village of Emmonak identified ensuring the ongoing efficient energy affordability and reliability for the residents as the final goal. Activities will include the following:

- Ensuring diesel powered generators to include back-up generators
- Ensuring homes have back-up generators
- Having a facility upgrade to the water and treatment plant
- Utilizing waste heat
- Utilizing glycol boilers for the home heat and water heating
- Ensuring homes are weatherized

- Utilizing upgraded water heaters with an on/off switch
- Adding more LED street lights
- Adding safety reflectors for the dock and beach
-

Kalskag Community Energy Plan Overview

Vision: Developing Sustainable and Affordable Energy Resources for the People of Kalskag



Homes in Kalskag, AK

Background

Kalskag, a Yupik Eskimo village influenced by the Roman Catholic Church, sits on the north bank of the Kuskokwim River where the Potage Mountain Range begins its growth to the Yukon. It lies 30 miles west of Aniak, 99 miles northeast of Bethel and 348 miles west of Anchorage.

The only way in and out of Kalskag is by air for passengers and freight or river barge for equipment and material. The average cost of a round trip ticket between Kalskag and Bethel is over \$300 per person.

With influences from the Bering Sea, Kalskag is an arctic region whose snowfall averages 60 inches and total precipitation of 19 inches per year. The temperatures range from -55 to 87 degrees. The Kuskokwim River is ice-free from mid-June through October. Twice annually, barges deliver bulk fuel, propane and cargo to local businesses and the school. The

Kuskokwim River affords easy access by skiff in the summer and snow machines in the winter.

Lower Kalskag, our neighbor, is connected by a State of Alaska maintained 4.2 miles of gravel road and both communities share a State owned 3,200' long by 75' wide gravel airstrip. Kalskag has potential and have an obligation to the people, the economy, the surrounding villages, and to themselves to be self-sufficient.

The village of Upper Kalskag was originally a fish camp known as "Kessiglik." During the early 1900's, residents of "Kalthagmute" (a smaller neighboring community) began to move to the village. In 1930, with a population of 62, the BIA established a government school, and by 1932, residents of neighboring communities relocated to Kalskag. By 1950, the population had grown to 139 and 147 by 1960. During the early to mid-1970, the State of Alaska was battling a flu epidemic, unfortunately during this time the population dropped significantly to 122. From 1980 to year 2000, there was an average increase of 36 per decade, bringing the then population to 230. In 2010, approximately 20 individuals left the area in search of employment to support their families or entirely away from the community. Today the population stands at 231 which is on average an increase of 18.7 per decade. There are a number of utilities throughout the Calista Region servicing Native Villages.

The Native Village of Upper Kalskag's utility provider is the Alaska Village Electric Cooperative (AVEC). Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Tuluksak as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). From FY14 to FY16 the Residential kWh Sold started at 335,119 in FY14 to 356,782 in FY16, an increase of over 6%. The Total kWh Sold & PH Consumption increased from 803,239 in FY14 to 836,083 in FY16. An increase of a little over 4%.

Goal 1: Develop Alternative Energy Resources

The primary goal for Kalskag is to develop alternative energy. This goal will be accomplished through the following projects as prefeasibility studies and follow through of:

- Biomass
 - Utilizing trees and willows for energy
 - Wood chips and pellets for burning
 - Grass/dirt for composting
 - Developing a pilot project for biomass
- Through the utilization of wind turbines
 - Finding a suitable location
- Waste to heat
 - Beginning a pilot project of using waste oil for heat
 - Installing the waste to heat furnace/heater at the Multi-Purpose Building
- Solar
 - The planning and utilization of solar panels for the schools
 - The planning and utilization of solar panels on the Multi-purpose building
- Hydro

- Researching and the use of data to determine if hydro would work for Kalskag

Goal 2: Educate the Community on Energy Efficiency

The Village of Kalskag identified educating the community on energy efficiency to show potential savings of energy and to save on energy costs. This goal will be accomplished through the following activities and projects:

- Developing and utilizing an energy efficiency education program
- Changing the lights used to LED lighting for savings on energy use.
 - To include changing out lights at residential and commercial buildings
- Installing and using AMPI electric meters so residents know the amount of energy they currently use
- Utilizing heat tape use only when needed
- Circuit Breakers (suggested to turn off circuit breakers when not in use)
- Utilizing surge protectors and turning them off when plugged in equipment is not in use
- Looking into the availability of Power Cost Equalization (PCE) for non-profits
- Propose an energy resolution to AVEC
- Un-plug unused equipment
- Educating the kids and family on electric usage
- Utilizing energy efficient wiring, and changing out non-efficient wiring to energy efficient wiring where needed
- Ensuring houses are Energy Efficient
- Research treated wood for homes

Kipnuk Community Energy Plan Overview

Vision Statement “Working together towards renewable energy and alternative energy methods while educating residents to support economic development by decreasing fossil fuel use through weatherization and energy efficiency programs”



Jason Smith facilitating the Kipnuk Community Energy Planning Workshop

Background

Kipnuk, or “Qipneq” in Yup’ik, is located in the Yukon Kuskokwim Delta, 85 air miles Southwest of Bethel and four miles inland from the Bering Sea coast. Kipnuk sits on west bank of the Kugkaktlik and gets its name from a nearby bend in the river.

Kipnuk was established around 1922 according to early Bureau of Indian Affairs records, but Yup’ik people have inhabited the area for thousands of years. The community is a traditional village, and maintains a subsistence lifestyle in addition to commercial fishing, government projects and Corporation jobs.

The village does not allow alcohol to be sold or imported into the community. This has played an important role in helping the village maintain its Yup’ik traditions according to Mr. Paul Kiunya Sr., a Kipnuk Elder. He says that young people are coming to the community because of its emphasis on subsistence lifestyles and rules against drinking. The village promotes quiet, traditional living and this is important to many youth who want to embrace their culture.

There are many things that make Kipnuk a special place. An interesting historical fact is the discovery of Mastodon ivory near the village. Mastodon finds are relatively rare since most

archeological sites in Alaska contain the remains of Woolly Mammoths. Both animals roamed the tundra between eight and 10 thousand years ago.

Mr. Kiunya says that the people of Kipnuk are the backbone of their strong community. Residents come together for community activities and high school sporting events. He says that the fact that people are making their living, maintaining their customs and practicing their Christian faith keeps the village strong and the people connected to both one another and their culture. (Calista, 2017)

There are a number of utilities throughout the Calista Region servicing Native Villages. Kipnuk's utility provider is the Kipnuk Light Plant. Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Tuluksak as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). From FY14 to FY16 the Residential kWh Sold started at has seen a slight decrease of 4%. While the Community Facility kWh sold had an increase of 7%. The other kWh Sold (non-PCE) has increased 24% from 596,773 to 762,284.

Goal 1: Reduce Electricity use by 35% by 2027

Reducing Electricity use by 35% will be accomplished through the following projects and programs:

- Changing lighting to LED at commercial and residential buildings
- The installation of AMPI meters (Smart Meters) so the residents are able to track their electricity use
- Efficiency Study, Lasers vs Boilers to have solid numbers which will use less energy to produce heat
- Develop and make use of and Energy Education Program
- Research different insulation types available for efficiency, also to consider any health side effects

Goal 2: Reduce energy costs by 30% within 5 years

- Encouraging the use of longer beam foundations to reduce the amount a house shifts and reduce house cracking and also to avoid heat loss.
- Having Home Weatherization test during the winter
- Adding additional street lighting and ensuring they are LED
- The use of wood burning stoves to offset the use of stove oil
- Capturing and the use of waste heat
- Waste heat recovery repair for the electric plant
- Utilizing Energy Efficient Appliances
- Researching Natural Gas as a possible alternative option
- Ensure use of proper molding and sweating during weatherization

Goal 3: Obtain 50% of electricity from Renewable Resources within 10 years

- Utilization of Wind Turbines

- Wind Turbine heaters to offset stove oil for heat
- Affordable Solar Panels
- Solar Panels for homes
- Solar Powered Street lights
- A grant writer, to write proposals for renewable energy funding opportunity announcements

Other Energy Related Priorities:

The planning team identified the following as other energy related priorities for Kipnuk:

- Building codes for non-toxic roofing, as residents utilize rain water as an additional drinking source
- Ensuring Emergency Generators are installed and available
- Upgrading the Polls and Wiring
- Local Radio Station for Emergencies and Announcements
- Funding for a radio antenna
- Organize a Regional Emergency Response Marine Team
- Fire Code Ready Equipment to include storage area for the equipment
- FEMA Disaster Fund
- Code Ready Volunteers, i.e. fire/search & rescue

Kotlik Community Energy Plan Overview

Vision Statement “We the people of Kotlik being placed here by our creator pledge to work together to find the best possible solutions to educate and reduce the need of fossil fuels. Also, to help protect our environment by adding the lowest cost of alternative energy and focus to weatherize residential and commercial buildings to become 5 star energy efficient”



Break-out session during the Kotlik Community Energy Planning Workshop

Background

Kotlik Alaska is home to almost 600 people and is located on the east bank of the Kotlik Slough in the Yukon Kuskokwim Delta. The village is 35 miles northeast of Emmonak, 165 air miles northwest of Bethel and 460 miles from Anchorage.

The village was settled in the 1960s when residents of nearby communities Channiliut, Hamilton, Bill Moore's Slough and Pastolaik relocated to the area after a Bureau of Indian Affairs (BIA) school was built there. Many residents are the descendants of Russian traders who settled in the late 1800s, and most practice a subsistence lifestyle.

The Village of Kotlik is a federally recognized tribe, and over 95 percent of residents are Calista Shareholders. The community's excellent location on the Kotlik Slough allows access by large barges and riverboats, which has positioned the area as one of the main ports and commercial centers in the area.

Numerous residents hold commercial fishing licenses due to the primarily seasonal economy, and most families have fishcamps on the Yukon. Salmon, seal, beluga whale and moose are harvested regularly and are a vital part of local subsistence activities. The village derives its Yup'ik name – Qerrulliik (a pair of pants) – from its location, where the Yukon River splits apart nearby like the legs on a pair of trousers. (Calistacorp.com, 2017)

There are a number of utilities throughout the Calista Region servicing Native Villages. The Village of Kotlik utility provider is the Alaska Village Electric COOP (AVEC). Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Kotlik as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). In Fiscal Year (FY) 2014 the Community Facility kWh Sold was at 205,995 to increase in FY 2015 to 210,990 and to increase again in FY 2016 to 245,595. The Residential kWh Sold in FY 14 was at 706,956 to slightly decrease to 666,153.

Goal 1: Provide the lowest cost of alternative energy solutions for community residents: 1st hydro, 2nd individual house turbines, 3rd solar panels.

The Village of Kotlik identified the following projects to help them reach their goal # 1 to help provide the lowest cost of alternative energy solutions.

- Research and feasibility of Hydro technology
- Research and feasibility of Wind Turbines
 - Research individual wind turbines
- Research and feasibility of Solar technology
- Wood shed back-up for elders
- Alternative Heat Resources
- Use of wood pellets for heat
- Underground Storage/Freezer
- Waste Oil Burner
- Alternative Heat Resources
 - Toyo stoves
- Waste Heater inter-tie ARUC research
- Heat Recovery Inter-tie
- LED lights to supplement lowest cost energy solutions

Goal 2: Weatherize all residential homes

The Village of Kotlik identified the following projects to weatherize all residential homes for energy saving.

- Through Cold Climate Housing Research Center (CCHRC)
- Associational of Village Council Presidents Rural Housing Authority (AVCP RHA) Weatherization Program
- Home Weatherization Programs
- 5 star Energy Savings to Complement the weatherization savings

Goal 3: Educate and train community residents to maintain alternative energy to include building maintenance and repair.

The Village of Kotlik identified the following 2 projects to accompany and help reach their goal #2.

- Research foundation leveling
- Educate & train residents on Energy Saving Methods

Napakiak Community Energy Plan Overview

Vision Statement “The residents of Napakiak envision our community to pursue and develop feasible, energy-efficient, sustainable and reliable alternative resources”



Background

Napakiak is located on an island between the Kuskokwim River and Johnson's Slough. Also the Community falls under the Kusilvak Census area (formerly Wade Hampton). Napakiak is located at [60°41'36"N 161°58'25"W](#) and is approximately 10 miles southwest of Bethel, AK and approximately 407 miles west of Anchorage, AK.

The village of Napakiak was first reported in 1878 by E.W. Nelson. By 1910, the village had a population of 166. During Napakiak's early construction, boardwalks were built in certain areas, a few of which are still being used today.

In 1926, the Moravian church had a local lay worker in the villages that started construction on a chapel. Three years later, the dedication ceremony from the h chapel drew people in from surrounding villages.

In 1939 the Bureau of Indian Affairs school began operating in Napakiak. In 1946 the first store was opened. The National Guard Armory was built in 1960. A year after, the first post office was established.

The City of Napakiak was incorporated as a second-class city in 1970. There are a total of seven city council members, including the City Mayor. The Native Village of Napakiak is a federally recognized Tribe and a governing body. The council deals with creating community enhancement programs.

The Napakiak Native Corporation was incorporated with the passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971. It has a governing Board of Directors. The corporation is responsible for overseeing the village corporation lands, making land available for community purposes and overseeing utilities. Residential rental units that are run by the corporation are located in Bethel.

As of 2000, Napakiak had a population of 353 residents and 96% of the population was Alaska Native/American Indian. In 2010, the population decreased slightly to 344 residents and 97% of the population was Alaska Native or American Indian. Currently there are approximately 605 enrolled Tribal members, which increased from 575 reported in a 2010 Community Plan. (Napakiak Community Plan, 2014)

There are a number of utilities throughout the Calista region servicing native villages. The Native village of Napakiak's utility provider is the Napakiak Ircinraq. Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Napakiak as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). In Fiscal Year (FY) 2015, the effective residential rate (Net PCE Benefit) was \$0.29 per kWh, having increased each year between 2014 and 2016 to \$0.38.

Goal 1: Offset electricity costs for residential and commercial buildings

The Village of Napakiak identified to offset electricity costs for residential and commercial buildings as a primary goal. This goal will be accomplished through the following projects:

- Promote Energy Efficient LED bulbs
- Continue to educate the community on Energy use
- Weatherization
- Promote wood stove use
- Glycol heat recovery for sewer tanks
- Adding additional LED street lights
- Waste heat recovery
- Research wood stoves that are built with ceiling fan blower for heat exchange/heat circulation

- Replacing boilers and furnaces to toyostoves
- Make sure new appliances are energy star rated (energy efficient appliances.
- Ensure new homes are local hire (local lumber) and local contractors.

Goal 2: Obtain 25% of electricity from renewable energy resources

The village of Napakiak also identified utilizing renewable energy resources and obtaining 25% of electricity from renewables. This goal will be achieved through the following projects:

- Study or look into where wind turbines could be stationed
- Research Wind turbines for commercial and residential buildings
- Wind Turbines for commercial buildings
- Main wind turbines for the community
- Research water into energy for the community
- Research Solar panel ready housing (for new homes) petition to AVCP RHA

Goal 3: Renovate the Community Building

The village of Napakiak identified renovating their Community Building as their 3rd goal. This will be done through the following identified projects:

- Foundations of the building (replace as wood rots in time)
- Change roofing/nails there are noticeable leaks in the ceiling
- Renovate porch
- Change windows and doors
- Change lights to LED lights with 4 lighted ceiling fans
- Lower ceiling

Nightmute Community Energy Plan Overview

Vision Statement “Through our cultural traditions and values we will strive to help our current and future generations by reducing the cost of energy through community upgrades, renewables, and energy efficient methods”



Nightmute, AK

Background

Qaluyaarmiut – “The Dip-Net People”

Nightmute, a traditional Yup’ik Eskimo village, is located on Nelson Island in Western Alaska. The village is 18 miles upriver from Toksook Bay and 100 miles west of Bethel, consisting of about 281 people according to 2010 census records. The Qaluyaarmiut people have inhabited Nelson Island for over 2,000 years, and are commonly referred to as the “dip-net people”.

Nelson Island has a rich history, with the Qaluyaarmiut people being first introduced to a Russian naval officer, Lieutenant Lavrenty Zagoskin in 1841. Following his visit, Russian Orthodox priests began visiting the area but failed to have a significant impact on the Qaluyaarmiut people and their strong cultural traditions. Edward Nelson, a Smithsonian naturalist was next to study and explore the land in 1878, he found only six people living on the island. Because of the small number of people inhabiting the land and the limited amount of resources on the island, traders failed to see its value.

Missionaries were the first to take a significant interest in the island, but again an impact on the community proved difficult because of the small amount of people scattered across the land. However, in 1934, a missionary by the name of Father Deshout became part of the community, fostering positive relationships amongst the people of the island. Unlike previous missionaries, Father Deshout encouraged the Qaluyaarmiut people to embrace their culture, influencing the continuation of Yup'ik culture.

Today, the Yup'ik culture remains strong among the people of Nightmute, as they retain traditional Native dance festivals, the Yup'ik language and subsistence living. According to a Nelson Island Eskimo, the subsistence living provided by the rivers and the sea is critical to the community's survival. The people are connected to the changing of the seasons, which affects the birds, fish, whales and other animals in the area.

The Native Village of Nightmute is a federally recognized tribe and remains relatively isolated from outside contact, with many of its people having moved to Toksook Bay in 1964 to obtain more cost-efficient goods. The marine climate of the village results in annual precipitation averages of 22 inches and 43 inches of snowfall. Summer temperatures range from 41 to 57 degrees Fahrenheit, with winter temperatures ranging from 6 to 24 degrees Fahrenheit. (Calista, 2017)

There are a number of utilities throughout the Calista Region servicing Native Villages. The Native Village of Nightmute's utility provider is the Alaska Village Electric CO-OP INC. Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Nightmute as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). In Fiscal Year (FY) 2014 to (FY) 2016, there was a 67% increase in Community Facility kWh Sold from 57,214 to 95,915. The total kWh Sold & PH Consumption increased nearly 4% from (FY) 2014 of 579,832 to (FY) 2016 of 602,926. The Other kWh Sold (non-PCE) decreased 9% in (FY) 2014 of 234,937 to (FY) 2016 of 212,744.

Goal 1: Educate and encourage locals about the importance of conserving energy through energy efficiency to reduce energy costs by 15% within 10 years.

The Village of Nightmute identified educating and encouraging locals about conserving energy through energy efficiency as a primary goal. This goal will be accomplished through the following projects:

- Upgrading household appliances to energy star rated
- Encourage Energy Star rated appliance when buying new appliances
- Change T12 to T8 Ballasts
- Upgrade the insulation for homes
- Weatherization for everyone
- Commercial Energy Efficiency upgrades/weatherization
- New efficient homes
- New Energy efficient apartment complex/s for rent
- Energy education for elders for home visits, CD's & DVD's



Jason Smith facilitating the Nightmute Community Energy Planning Workshop

Goal 2: Obtain 37% of electricity from renewable resources within 10 years.

The Village of Nightmute identified obtaining 37% of electricity from renewable resources within 10 years. This will be accomplished through the following projects:

- Researching into installing Solar Panels on Commercial Buildings
- Conduct a wind feasibility study for wind turbine integration
- Hydro study to check the feasibility and possible hydro integration
- Research Hydro for fish-camp use
- Small wind turbines for fish-camps
- Installing wood stoves into residential homes

Goal 3: Ensure Energy reliability and availability for Nightmute residents through community upgrades within 15 years. (With ongoing adjustments)

The village identified energy reliability and availability through upgrades as their final goal.

Activities will include the following:

- Running water & sewer system
- Upgrading the residential fuse panels & research grant & loan funding to switch-out
- Creation of a local talent bank
- Building and use of a laundromat
- Certification training of a local electrician from the community
- Building and utilization of an energy efficient multi-purpose community/teen center
- Switch streetlights to LED
- Additional LED street lights
- Installation and utilization of running water for the community
- Updating the residential/home wiring

- School showers *requested by high school students
- The Availability of vending machines *requested by high school students
- Better/more restroom facilities at the school *requested by high school students

Oscarville Community Energy Plan Overview

Vision Statement “Working together towards energy reliability and affordability to support economic development, community wellness, and generate revenue to strengthen Yupik culture for current and future generations”

Background

Oscarville is a small village located on the north bank of the Kuskokwim River, across from Napaskiak and six miles southwest of Bethel. It is home to 70 people, according to 2010 census records. Its Yup'ik name is Kuiggayagaq.

Since it is such a small village, Oscarville does not have an airport, therefore the river is essential for transportation. In the summer, boating is the most effective way to travel and in the winter, the Kuskokwim River freezes over and people can drive on the ice. Oscarville relies on Napaskiak for passenger, mail and cargo services. Bethel is also a hub for supplies, since it is the largest nearby town. During the initial freezing and breakup of the river, Oscarville can become temporarily isolated.

Nearly all of the people who live in Oscarville are Alaska Native. The residents of the village lead a subsistence way of life, though some commercial fishing occurs. The village of Oscarville is a federally recognized tribe.

There are a number of utilities throughout the Calista Region servicing Native Villages. The Native Village of Oscarville's utility provider is the Alaska Village Electric Cooperative. Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Oscarville as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). In Fiscal Year (FY) 2015, the effective residential rate (Net PCE Benefit) was \$0.16 per kWh.

Goal 1: Reduce electricity use 2% each year for the next 10 years

The Village of Oscarville identified the reduction of electricity use as a primary goal. Oscarville will strive to reduce electricity use in increments of at least 2% each year for the next 10 years to achieve a total reduction of 20% savings. This goal will be accomplished through the following activities and projects:

- Energy education
- Energy efficient lights
- Addressing high energy costs
- Energy efficient appliances
- Smart switches

- Energy efficient homes
- Improving access to firewood

Goal 2: Power 50% of homes with renewable energy within 10 years

The Village of Oscarville also identified the need to educate the community and work with partners to implement increased energy efficiency measures. This will be accomplished through the following activities and projects:

- Investigate research geothermal potential
- Waste heat recovery
- Solar panels on buildings
- Hydroelectricity
- Wind energy
- Waste to heat (wood, animal, human, motor oil, etc.)

Tuluksak Community Energy Plan Overview

Vision Statement “Tuluksak is a sustainable community diversifying its energy resources through a variety of technologies and strategies to promote energy efficiency, reduce energy costs, create jobs, and enhance quality of life”

Background

Located a short distance from the mighty Kuskokwim River, the village of Tuluksak sits along the bank of the Tuluksak River, about 35 miles northeast of Bethel. Its remote location makes it challenging to access for both people and supplies. During the summer, cargo barges deliver goods. There is a stateowned gravel airstrip that allows people and supplies to fly in and out of the community. Residents primarily rely on boats, skiffs and ATVs during the summer months, and snowmachines during the winter months.

The village was first documented in 1861, according to state records. The community was named Tul'yagmyut an Eskimo word meaning “related to loon.” According to an 1880 U.S. census, Tuluksak had a population of 150. The most recent census reported almost 400 people living in the community.

Tuluksak is a traditional Yup'ik Eskimo village. Many residents practice cultural traditions and most rely on a subsistence lifestyle including hunting and fishing. Commercial fishing is also a major source of income. Weather can be variable in the area, with plenty of rain and lots of snow in the winter; the average snowfall is four feet. Summer temperatures typically stay between 60 °F and 40 °F and winter temperatures can fall into the negatives. The community is home to the Tuluksak School, hosting around 15 teachers and approximately 150 students, kindergarten through 12th grade. Students are taught the importance of their heritage. With a strong education foundation, Tuluksak hopes to remain grounded in its cultural values.

There are a number of utilities throughout the Calista Region servicing Native Villages. The Native Village of Tuluksak's utility provider is Tuluksak Traditional Power Utility (TTPU). Due to the remoteness and lack of access to electrical infrastructure, the average cost of

electricity is significantly higher in Tuluksak as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). In Fiscal Year (FY) 2015, the effective residential rate (Net PCE Benefit) was \$0.67 per kWh. Total electricity consumption decreased by nearly 17% between FY 2014 and FY 2015, with all sectors consuming less electricity.

Goal 1: Install adequate and reliable generation capacity to meet the needs of all customers

The primary goal for the Village of Tuluksak is to install adequate and reliable generation capacity to meet their needs. Currently the Village is powered by a single generator with no backup installed. The Village requires at least one additional generator to serve as an emergency backup, and ideally would install an additional smaller generator that could operate more efficiently than the current generator, which is operating at an inefficient level of about 50% capacity. Other activities and projects under this goal include:

- Tuluksak Traditional Power Utility (TTPU) waste oil burning
- Installation of a backup generator
- Utility financial liability
- Barge landing
- Bulk fuel storage

Goal 2: Community renewable energy demonstration project within 8 years

The Village of Tuluksak also identified the need to implement a community renewable energy demonstration project within 8 years. This project will act as an example to others in the community, helping to educate residents on renewable energy and demonstrate the benefits. This goal will be accomplished through the following activities and projects:

- New primary care facility pilot project
- Solar PV and battery storage at the airport
- Wind resource assessment
- Waste heat recovery for the new water treatment facility
- Biomass resource assessment
- Hydro assessment
- Run of river hydro demonstration project
- Install solar on the new water treatment facility
- Wind turbine(s)
- Restore NYAC hydroelectric plant

Goal 3: Train Tuluksak residents to perform home energy audits, weatherization retrofits, and energy education

The Village of Tuluksak also wants to build capacity within the community to conduct energy audits and weatherization retrofits for residence. The energy audit and weatherization workforce will also provide door to door energy efficiency educate for residents. This goal will be accomplished through the following activities and projects:

- Workforce training

- Residential and community lighting retrofits (LEDs)
- Residential energy education
- Address the high residential energy users
- Develop an energy efficiency subsidy program

Tuntutuliak Community Energy Plan Overview

Vision Statement “To increase use of renewable energy and alternative heating to ensure a more energy efficiency community for both residential and commercial benefit and to educate the community and future generations to practice more energy efficient methods”



Tuntutuliak, AK - Five installed 95kW wind turbines as part of the Chaninik Wind Group

Background

Tuntutuliak, a Yup'ik Eskimo village with a subsistence based economy, is located about 40 miles from the coast of the Bering Sea. The community was originally located four miles east of its current location and was known as Qinaq when Moravian missionaries visited the settlement in 1908. In 1945, the village moved to higher ground to escape seasonal flooding, and was renamed Tuntutuliak, which means “place of many reindeer” in Yup'ik.

Tuntutuliak is a traditional community, and children at the local school are taught in Yup'ik until the third grade, after which classes are conducted in English. Salmon and seal are important sources of food, and subsistence activities constitute the majority of local diets. Almost half of the village's residents spend their summers at fish camp, and a substantial number hold commercial permits for salmon and herring roe fisheries.

Like many communities in the Region, federal and government jobs and the local school provide most of the year-round employment opportunities. The majority of local incomes are

derived from these sources or from seasonal work such as fishing and fish processing. Traditional handicrafts, including basket weaving, trapping and skin sewing, also provide cash on a limited basis.

At 440 miles west of Anchorage and 40 miles southwest of Bethel, Tuntutuliak relies heavily on air transportation. Seaplanes can access the village seasonally due to its location on the Kinak River, and barges deliver goods approximately six times a year. Local residents also use boats and snowmachines for transportation, and winter trails to Kipnuk and Kongiganak are heavily used when available.

There are a number of utilities throughout the Calista Region servicing Native Villages. The Native Village of Tuntutuliak's utility provider is the Tuntutuliak Community. Due to the remoteness and lack of access to electrical infrastructure, the average cost of electricity is significantly higher in Tuntutuliak as compared to the more urban areas of Alaska. The Alaska Energy Authority (AEA) established the Power Cost Equalization (PCE) program which provides economic support in rural areas where the kWh charge for electricity can be three to five times higher than more urban areas (<http://www.akenergyauthority.org/Programs/PCE>). In Fiscal Year (FY) 2015, the effective residential rate (Net PCE Benefit) was \$0.32 per kWh, having increased each year between 2013 and 2015.

Goal 1: Reduce Fossil Fuel Dependency by Increasing Renewable Energy

The Village of Tuntutuliak identified reduction of fossil fuel dependence as a primary goal. This goal will be accomplished through the following projects:

- Researching solar panel use
- Conducting grid studies to determine the amount of wind that can be integrated into the existing infrastructure
- Eventual upgrading of the grid to integrate additional wind resources and wind-powered heat stoves.

Goal 2: Educate Community on Energy Efficiency

The Village of Tuntutuliak also identified the need to educate the community and work with partners to implement increased energy efficiency measures. This will be accomplished through the following projects:

- Continuing the study and implementation of the waste heat recovery loop
- Establish an energy education program
- Develop new building codes for energy efficient housing
- Work with AVCP RHA to implement the more efficient building codes.
- Weatherization of existing homes and buildings
- Upgrading to energy efficient appliances and only purchasing energy efficiency appliances in the future

Goal 3: Pursue Additional Alternative Heating

The village identified heating cost reduction, through alternative heating methods as the final goal. Activities will include the following:

- Education on the efficient use of wood heating in homes
- Education on the wind-powered electric stoves

- Creation of district heat loops
- Increased use of biomass for home and building heat

c. Project Evaluation Analysis

AVCP staff assisted four Tribes in application development for energy projects. With the application development, the evaluation of projects were analyzed. Please see in Direct Technical Assistance above.

We also conducted specific LED Light Change Project Evaluation for the villages below:

Alakanuk

AVCP assisted the Alakanuk Tribe in project evaluation of LED light changes, energy efficient window upgrades, and furnace replacement. We developed the estimated cost vs. cost savings by 1 month, 1 year, and 5 years.

Napakiak

At the request of the Tribe, AVCP conducted a LED Light Change Project Evaluation. AVCP staff were able to analyze their lighting situation and conduct cost vs. benefit analysis. Just by changing to LED lighting the tribe would break even within 1 year and save an estimate of \$939 every year thereafter depending on maintenance.

Oscarville

AVCP also conducted a LED Light Change Project Evaluation in Oscarville. AVCP staff were able to analyze their lighting situation and conduct cost vs. benefit analysis. Just by changing the tribe's lighting to LED they are saving \$305 per year.

Upper Kalskag

The Kalskag Multi-Purpose building spends \$68,796 dollars per year on electricity. AVCP staff were able to analyze their lighting situation. Just by changing the building's lights to LED we are estimating the Tribe could save \$4,818 per year.

d. START Program Support

Christopher Deschene, Director of the U.S Department of Energy Office of Indian Energy Policy & Programs, and Givey Kochanowski, Alaska Program Manager, traveled to Bethel and Kwethluk, Alaska on May 29, 2015. AVCP leadership met with Chris and Givey in the morning to give an overview of the region. In the afternoon we took a boat trip to Kwethluk to meet with Kwethluk leadership. During this meeting, Chris announced to Kwethluk about their START program award. That has been the extent to our START Program Support.

3) AVCP Capacity Building

The NREL team and training provided was able to teach an AVCP staff member to:

1. Facilitate Community Planning Workshops
2. Project Evaluation

Conclusion

AVCP views the Cooperative Agreement as a success. This opportunity allowed 10 federally recognized Tribes in empowerment of their energy future through their community energy plans. Also, this cooperative agreement had immense support to allow a Tribe to receive a \$450K grant and immense support for the Tribe to begin receiving an Alaska Power Equalization subsidy that decreased the residents' electricity bills.

Lessons Learned

Through this Cooperative Agreement we have realized the need for financial literacy technical assistance for our Alaska Native Villages. As we know, grant dollars have diminished are hard to come by. However, there are immense opportunities through low-interest loans. Tribes in Alaska are very hesitant in applying for debt to create energy efficiencies for their facilities and communities. They do not realize that they may have to spend money to begin saving money after the breakeven point.

We not only need to assist Tribes in identifying and prioritizing their projects, we need to educate them and provide technical assistance on low-interest loan opportunities so that the projects that we do prioritize have a better chance to come into fruition.