## Cover Page

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| Recipient Organization: | Kawerak, Inc. |
| Project Title: | Bering Strait Energy Planning Network |
| Date of Report: | December 23, 2021 |
| Award Number: | DE-IE0000054 |
| Total Project Costs: | $1,124,255.00 |
| Technical Contact: | Anahma Shannon, ashannon@kawerak.org |
| Partners: | BSDC, ACEP, CCHRC, DeerStone Consulting |

**ACKNOWLEDGMENT**
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# 1. Table of Contents

## 2. Executive Summary


*Figure 1: Bering Straits Region*

Through funding from this Department of Energy – Office of Indian Energy grant, Kawerak has been able to provide technical assistance to 20 tribes in the region. The goal of the Bering Strait Energy Planning Network project was to provide technical support for developing energy projects, and to build capacity in the communities of the Bering Strait Region. The Bering Strait Regional Energy Network consists of individuals, organizations, and groups in the Bering Strait Region interested in renewable energy, reducing energy costs in communities and protecting our environment. At Kawerak, our Energy Program has worked to connect this network with resources for funding and developing energy projects throughout the region.

Tribes in the region have established Kawerak, Inc. as an umbrella organization in order to pool resources and funding. Kawerak is often called the "Regional Native Non-Profit" consortium for the Bering Strait region. Kawerak is not a federally recognized tribal government. Kawerak is a non-profit corporation that provides numerous social, educational, construction, economic and other services to Native people of the region on behalf of the tribal governments in the region. Kawerak receives funding by compacting with the Bureau of Indian Affairs, and through numerous other state and federal funding sources. Kawerak is governed by its Board of Directors. The Kawerak Board of Directors consists of a representative from each of the tribal governments in the region, two Elder representatives, and one Norton Sound Health Corporation representative.

The Kawerak Energy Program has focused on energy education in schools and communities, outreach to communities, and identifying potential energy projects in the region with technical assistance from our contractors. Our outreach efforts focused on providing valuable information to communities, participation in the community and regional energy planning. And with help from our contractors, we have worked with our communities to provide many instances of direct technical assistance for developing energy projects, including energy planning assistance, seeking funding, conducting feasibility studies, and helping with project management.

The goal of the Bering Strait Energy Planning Network project was to improve local capacity for effective energy planning and project development for the benefit of the region. **The Bering Strait Energy Planning Network Objectives Included:**

1. Provide technical support for rural energy planning and energy project development.
2. Increasing access to energy information and training.
3. Regularly update our regional energy plan.

4. Increase collaboration with other agencies and regions to improve energy solutions in rural Alaska.

**The tasks accomplished to meet the project objectives included:**

- Establishing a Regional Energy Planning Network
- Establishing energy communication with Tribal members, community leaders, and industry professionals through a regular Newsletter
- Assisting tribes with specific energy project development activities
- Establishing energy plans for our Tribes
- Creating a clearinghouse of energy data and information for Tribes to access
- Helping Tribes apply for energy project funding
- Hosting Regional Energy Summits
- Providing energy training and education opportunities for residents of our Tribal communities

## 3. Project Objectives

The goal of the Bering Strait Energy Planning Network project was to improve local capacity for effective energy planning and project development for the benefit of the region.

**The Bering Strait Energy Planning Network Objectives Included:**

1. Provide technical support for rural energy planning and energy project development.
2. Increasing access to energy information and training.
3. Regularly update our regional energy plan.
4. Increase collaboration with other agencies and regions to improve energy solutions in rural Alaska.

**The tasks accomplished to meet the project objectives included:**

**Establishing a Regional Energy Planning Network –** Kawerak developed the Bering Strait Energy Planning Network, hired an Energy Development Specialist, provided energy specific trainings for staff, and created a network of energy champions in the Tribal communities in our region. The relationships and bonds that were formed around energy have strengthened the ability for our communities to coordinate, plan, and execute energy projects. They have built a regional energy support system that aids in their energy security and Tribal self-determination.

**Kawerak increased access to energy information and training** through trainings, summits, and K-12 curriculum delivery. Regional Energy Summits were concentrated efforts to deliver education and training opportunities to Tribal members of our communities. Additionally, Kawerak became a clearinghouse for community energy data, feasibility studies, reports and community energy history. This data and library of pertinent studies were catalogued and organized by community into a website to allow for ease of access to energy information.

**Hosting Regional Energy Summits –** Kawerak coordinated with project partners and communities to host three Regional Energy Summits. These gatherings were well attended by rural Tribal members from the region where they had an opportunity to receive energy information, training, and the networking and knowledge sharing opportunities led to updating

community energy plans and identifying project priorities. The meetings also created an opportunity for community energy champions to gain traction around specific projects, elevating the projects to receive technical assistance for project development.

**Providing technical assistance to tribes on energy planning and project development -** The Bering Strait Energy Planning Network provided planning support and technical assistance to tribes on local energy planning and energy priority project development, and updated the regional energy plans and community profiles, sharing results with state energy planners. Kawerak energy program became a clearinghouse for energy information, coordinating technical assistance with tribes and energy partners, and assisting tribal grant writers and project planners in the development of energy projects. Many of these efforts were supported through the project partnerships with organizations such as the Alaska Center for Energy and Power (ACEP), Bering Straits Development Corporation (BSDC), The Cold Climate Housing Research Center (CCHRC), the Alaska Native Tribal Health Consortium (ANTHC), Village Safe Water (VSW), and DeerStone Consulting. Developing these partnerships and subsequent contracts allowed Kawerak to funnel specific technical projects to these organizations and add technical capacity to meet community energy needs. Kawerak also established an energy team, a three-member team made up of village representatives to report to the regional planning organization (ARDOR).

## 4. Description of Activities Performed

### *Developing Local Staff*

- Hired Leroy Seppilu, Energy Specialist, to work solely on the Bering Strait Region's Energy Planning Network. Leroy was in the position from early 2017 to late 2018 (18 months).
- Hired Amanda Toerdal, Energy Specialist, to work solely on the Bering Strait Region's Energy Planning Network. Amanda was in the position from December 2018 to August 2020 (20 months).
- Hired Tatiana Askoak, Energy Specialist, to work solely on the Bering Strait Region's Energy Planning Network. Tatiana was in the position from August 2020 to October 2021 (14 months).

**The following workshops, trainings, and development activities helped to orient Kawerak's energy staff, improve their technical understanding, and improve their ability to respond to the energy needs of our Tribal communities:**

- **DOE Training – NREL** (March – April 2017) – Anahma Shannon and Leroy Seppilu were able to attend the March 7-9 and March 28-30 sessions respectively. Leroy Seppilu was able to attend the DOE Training held at the Alaska Native Tribal Health Consortium in April.
- **Grant Writing Workshop** (January 2019) – Amanda Toerdal attended this workshop, hosted by ANTHC with Meredith Noble of SenecaWorks.
- **ITEP VW Settlement Technical Assistance Webinar** (January 2019) – Amanda Toerdal attended this webinar online, to prepare for assisting tribes in applying for VW Settlement funds.

- **Alaska Forum on the Environment** (February 2019) – Amanda Toerdal attended one-day for specific energy workshops including Clean Energy Financing and Emerging Energy Technologies in the Arctic.
- **Micro-reactors meeting in Anchorage** (Summer 2019) – Anahma Shannon and Amanda Toerdal attended this meeting to learn about potential future developments in micronuclear technologies for rural Alaska.
- **Unalakleet, AK - Power plant, wind farm, solar photovoltaic array tour** (Summer 2019) – Anahma Shannon and Amanda Toerdal traveled to Unalakleet to meet with the Tribe, City, and Utility Cooperative to learn more about renewable energy efforts that benefit the Native Village of Unalakleet and Unalakleet residents.
- **AEA Energy efficiency partnership teleconference (**2019-Present) – Amanda Toerdal attended the AEA EE partnership meetings to learn more about EE efforts in the state and remains involved in this network in her new role as the Pilgrim Hot Springs General Manager for Kawerak.
- **DOE Webinars, Tribal Energy Series** (2019-Present) – Amanda Toerdal and Tatiana Askoak attended DOE-OIE Tribal Energy Series webinars to learn more about Tribal Energy efforts throughout the country. Amanda remains active in this community and continues to listen in to new webinars related to Tribal Energy Development projects.
- **Strategic Energy Management Workshop** (May 2019) – In partnership with Renewable Energy Alaska Project (REAP) and Alaska Network for Energy Education and Employment (ANEEE), this workshop took place after the 2019 Bering Strait Regional Energy Summit, at UAF Northwest Campus. 20+ Tribal Members and regional partners attended.
- **National Tribal Energy Summit, Washington, DC,** (May 2019) – Amanda Toerdal from Kawerak and Deilah Johnson from Village of Solomon attended the National Tribal Energy Summit to learn more about Tribal Energy Projects and Tribal Self-Determination happening throughout Indian Country.
- **Occupational Endorsement in Sustainable Energy** (2019-2020) – Amanda Toerdal completed the following University of Alaska Courses and graduated with her OE in Sustainable Energy in December of 2020.
    - Introduction to Sustainable Energy
    - Home Energy Basics
    - Alaska energy Utility Lecture Series
    - Basics of Solar Energy Systems
    - Wind Energy Systems
    - Utility Lecture Series
- **IPCC Climate Change meeting with NOAA in Nome –** Amanda Toerdal and Anahma Shannon, along with other representatives from the Natural Resources Division at Kawerak, attended the International Panel on Climate Change meeting that took place in Nome in 2019. NOAA presented details from the IPCC report and asked for feedback from the audience regarding a response to climate change.
- **Alaska Remote Networks Energy Academy (ARENA) Program** – Anahma Shannon was part of the 2017 ARENA cohort, during which she traveled to Canada, Iceland, and other Alaskan communities to learn more about renewable energy projects in the Arctic. Amanda Toerdal applied in 2019 and was accepted into the 2020 ARENA cohort. The

2020 sessions were delayed due the COVID-19 Pandemic; however, Amanda plans to attend the ARENA cohort sessions when they are rescheduled to 2022.

## *Partnerships & Contracted Support*

In an effort to increase collaboration with other agencies and regions, Kawerak tapped into agency and organization talent in Alaska that delivers energy solutions to Tribal communities around the State. The partners we chose each had a unique set of skills related to energy. This team allowed us to pair community needs and challenges with solution driven experts that have experience delivering services to rural and Tribal communities in Alaska.

**Alaska Center for Energy and Power** – Kawerak's partnership with ACEP resulted in the ability to utilize technical expertise to develop projects, develop meaningful energy plans for our communities, and to collect and utilize community utility generation and load data. ACEP also provided technical assistance around PCE reporting.

**Alaska Native Tribal Health Consortium** – Kawerak energy staff met often with staff at ANTHC to identify project opportunities, advance project through assistance on grant writing efforts, partnered on funded projects to successfully design or construct projects in the region.

**Bering Straits Development Company** – Kawerak contracted with BSDC to assist with the Building Monitoring Installation in coordination with Alaska Housing Finance Corporation in March of 2018. Their Green Energy Store was also utilized to provide supplies for the energy summit.

**DeerStone Consulting, LLC** – Kawerak contracted with DeerStone to provide direct technical assistance to our Tribes. DeerStone analyzed renewable opportunities for tribes, assisted in developing technology specific planning documents, and energy plans for communities in our region. DeerStone also assisted communities on Power Cost Equalization related priorities including PCE reporting and signing up community facilities to ensure communities were maximizing available electricity subsidies from the State of Alaska.

**Cold Climate Housing Research Center** – Kawerak partnered with CCHRC so that they could provide our Tribes with direct technical assistance related to energy efficiency, building energy retrofit recommendations, mechanical and ventilation design and analysis, renewable integration recommendations, and economic analysis of proposed energy projects.

**Renewable Energy Alaska Project** – REAP was a huge contributor in the education opportunities developed and offered to K-12 students in our region during this project. Kawerak developed a close relationship with their staff, getting to understand the educational opportunities and synergies between REAP and the goals of the Bering Strait Regional Energy Network. We also worked with the Alaska Network for Energy Education and Employment (ANEEE), a part of REAP, on energy management workshops. Kawerak was able to participate in multiple planning meetings and continues to be active in REAP Board Meetings.

## *Training & Education*

Kawerak delivered or facilitated the delivery of numerous training opportunities for residents of the Tribal communities in our region. These ranged from technical, hands-on workshops for professionals to easily digestible K-12 curriculum for youth. Our approach was to provide varied trainings and energy education opportunities that could benefit every person and every

household in the region. Kawerak developed partnerships with various agencies to implement training and education initiatives including Kawerak Education and Employment, Alaska Department of Labor, Renewable Energy Alaska Project (REAP), Alaska Network for Energy Education and Employment (ANEEE), Alaska Housing Finance Corporation (AHFC), Nome Public Schools, Bering Strait School District, and NACTEC.

**Below is a list of trainings and education offerings that were offered as a result of the Bering Strait Energy Planning Network project:**

**Wood Boiler Maintenance Training** (October 2018) in Elim Alaska – Kawerak organized a training in coordination with the Alaska Energy Authority that focused on biomass heating technologies and how to get the most out of wood-fired heating. The Training included wood harvest best practices, handling and storing wood, and the maintenance of wood-fired boilers. Kawerak offered 2 scholarships for participants to attend.

*Figure 2: Wood Boiler Maintenance Training*

**Building Monitoring (BMON) Installation and Management Training** (May 2019) in Nome & Teller, AK. This was done in coordination with AHFC.

**Twenty-Five workshops were offered at the Bering Strait Regional Energy Summit** (May 2019).

**Strategic Energy Management Workshop (May 2019) in Nome, AK**. Alaska Housing Finance Corporation and Alaska Network on Energy Education and Employment hosted this full-day workshop on May 9, in conjunction with the regional energy summit.


*Figure 3. Strategic Energy Management Workshop Speakers and Participants*

**Grant Writing Workshop (May 2019) in Nome, AK**. Meredith Noble of "Learn Grant Writing" hosted a one-day intensive workshop for grant writing after the 2019 Bering Strait Regional Energy Summit.

**Youth Environmental Educational Summit (August 2019) in Nome, AK.** Kawerak Energy Program hosted an “energy education” booth at the 2019 Youth Environmental Education Summit and participated in interactive learning sessions for K-12 youth.

**Draft & Craft your Community Energy Action Plan Workshop (August 12 & 13, 2019) in Solomon, AK and Nome, AK.** Kawerak Energy Program and Village of Solomon hosted a two-day workshop to discuss the various components for a community energy plan or strategic energy plan. Ten participants from regional communities joined the workshop and began draft energy plans for their communities.

**Power Pledge Challenge (2019-2020)** Worked with REAP, Nome Public Schools, Bering Strait School District, and NACTEC regarding implementing energy curriculum for K-12 students in the region. REAP staff members traveled to Nome to as present Power Pledge Challenge workshops to students. In 2019, Nome Public Schools Anvil City Science Academy was the winner of the Power Pledge Challenge. Kawerak Energy Program staff assisted REAP with travel coordination, challenge prizes, NJUS power plant tours, and outreach activities.

**Bering Straits School District AK Energy Smart Curriculum** – was delivered to students in the district by Renewable Energy Alaska Project (REAP), in coordination with Kawerak. This was part of an overall effort to improve energy education offered in the K-12 environment within the region. The larger effort was a partnership with Nome Public Schools, BSSD, NACTEC, and REAP.

## *Village Technical Assistance*

The energy challenges within the twenty tribes living in 16 communities we serve are vast and complex. Baseline data gathering to understand these challenges was a first step in getting acclimated to the energy needs of our communities. Our program became a clearinghouse for energy data, previous studies, energy audits, and energy reports. These contributed to our conversations with Tribal community leaders as we worked towards updating regional and community energy plans. Armed with data, feasibility studies, and an understanding of community energy priorities, Kawerak’s energy program was well equipped to tap into internal resources as well as our external partners and contractors to deliver technical assistance to develop energy projects in our communities.

To organize community data, we created a website for easing access to energy information for communities and technical assistance service providers. The website is titled the “Bering Strait Regional Energy Network” and includes community specific data such as population, electricity and fuel rates, the community’s energy plan, and information about renewable energy in the community. The website also includes information from energy newsletters, resources, and links to relevant sites. Kawerak also developed and formalized the way in which we processed technical assistance requests for our communities, creating a database that houses requests both completed and cancelled. For the first time, our tribes had a central source of energy information relevant to their needs.

Utilizing this wealth of energy information, we were able to successfully pair energy projects with funding. One of these funding mechanisms was the Norton Sound Economic Development Corporation Community Energy Fund, where 15 of the communities in our region were allocated $1,000,000 each to build energy infrastructure. Many of these dollars were left under-utilized

and Kawerak's energy program was able to assist communities in advancing the most worthwhile projects utilizing their NSEDC Energy Funds.

**Below is a list of many of the technical assistance requests that Kawerak was able to support through the DOE funded project, organized by community.**

## Brevig Mission

Brevig Mission's utility is operated and maintained by Alaska Village Electric Cooperative (AVEC). Brevig Mission has a diesel powered microgrid that generates an average of 1,274,822 kWh annually for 121 customers (86 residential, 8 facilities, and 27 non-community facilities), according to the FY2020 Power Cost Equalization Report from the Alaska Energy Authority (PCE Report from AEA). Previous community efforts to integrate solar, wind, and heat recovery in the community have failed.


*Figure 4. Brevig Mission City Council Members Meeting about Energy Projects*

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Brevig Mission, NSEDC CEF Projects** (2018–2019) – Kawerak assisted the City of Brevig Mission to develop the details of their Norton Sound Economic Development (NSEDC) Community Energy Fund (CEF) wind and solar versus a heat recovery project. The two projects had been separately funded under CEF but were not compatible projects to be implemented in the community. The technical assistance provided included bringing in a renewable energy consultant (Brian Hirsch, DeerStone Consulting), leadership from the community utility (Bill Stamm, Alaska Village Electric Cooperative), and a project manager that had been developing the heat recovery project (Jonathan Pierson, Alaska Native Tribal Health Consortium) to present options to the community leadership to decide on which project to move forward with.

DeerStone produced a report of options for Brevig Mission to consider. The team presented information to educate the new City council members about the pros and cons of both the wind/solar and the heat recovery projects. The council had many questions about each project; they were able to talk directly to the two different projects' managers, and they showed interest in making a move that would finalize the issue. We ultimately received word that the City Council decided to use the CEF to fund the wind and solar project rather than the heat recovery project. However, there were stipulations set by the wind/solar equipment company that still need to be sorted. Brian Hirsch and Anahma Shannon emailed and teleconferenced extensively with NSEDC's Paul Ivanoff and Amanda Patrick about how to advise the City of Brevig and what next steps should be.

- **Brevig Mission, PCE** (2018) – Kawerak and DeerStone consulting worked with Brevig Mission to ensure they were maximizing Power Cost Equalization subsidies from the State of Alaska. An audit of their PCE reporting and community facilities that were signed up to received subsidies revealed opportunities for additional savings. By implementing the resulting recommendations made by Kawerak and DeerStone, Brevig Mission was able to save over $10,000 annually in electricity bills.

- **Brevig Mission, VW Settlement** (2019) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe. The project was approved and funded in the amount of $168,622 which provided a new fuel-efficient dump truck for the community.

- **Brevig Mission, LED Lighting Retrofit** (2019) – Kawerak worked with the Tribe to develop an application for funding that would retrofit outdoor community lighting with LED lighting. This project was funded by the Alaska Energy Authority and Wells Fargo in the amount of $29,490.

## Council

There is no centralized power distribution system located in Council. Residents use either generators or alternative energy resources, such as small wind and solar applications, to generate power for their seasonal needs. Remnants of an old electrical system exist but would need investment and updating before it could supply power to the community.

Kawerak provided energy information to the Native Village of Council including quarterly newsletters, energy month education materials, and information regarding the VW Settlement Tribal Trust. During our DOE grant period, the tribe did not choose to pursue any technical assistance through Kawerak.

## Diomede

Little Diomede's utility is operated and maintained independently by Diomede Joint Utilities, part of the City of Diomede. The small power plant runs two diesel generators, one as the main source of power and the second as a backup. The powerhouse generates an average of 344,319 kWh annually for 53 customers (35 residential, 3 community facilities, and 15 non-community facilities), according to the FY2020 PCE Report from AEA.

Power outages due to high winds and sea storms occur frequently and are increasing exponentially due to a lack of sea ice. Diomede is currently running solely on diesel power.

However, the community has hopes to explore alternative energy solutions and renewable energy resources soon.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Diomede PCE** (2018) – Kawerak connected the electric utility to Connie Fredenberg of Utility Management Assistance to provide technical assistance related to PCE reporting and utility management.

- **Diomede Community Energy Planning** (2019) – Kawerak planned to travel to the community to hold a community meeting in an energy planning session in November 2019. The meeting was cancelled due to severe weather, however Kawerak continued to work with the tribe to update their community energy priorities.

  **Diomede Native Store** (2019) – Kawerak directed their subcontractor CCHRC to work with the Native Village of Diomede in their planning efforts to construct a local store for their community that would be an energy efficient new building in the village.

- **Diomede Emergency Power Plant Operator** (2019) – Kawerak assisted with travel expenses to send an emergency power plant operator to the community.

- **Diomede DOE-OIE Funding Application** (2019) – CCHRC and DeerStone Consulting worked with the Tribe to develop a workplan, narrative, budget and other items so the Tribe could apply for a DOE-OIE grant to build an energy efficient building envelope to house a community store. Diomede was awarded this grant in 2021 in the amount of $222,848.

- **Diomede VW/EPA/SOA DERA Funding (2021)** – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe. Kawerak and DeerStone Consulting assisted the City of Diomede and the Native Village of Diomede in applying for and managing a project of combined funding from the Volkswagen Settlement, the EPA, and the State of Alaska to replace a diesel genset. The project was funded in the amount of $148,304 from VW and $135,000 from EPA Tribal DERA.

## Elim

The community of Elim's utility is operated and maintained by Alaska Village Electric Cooperative (AVEC) in partnership with the City of Elim. The powerhouse in Elim operates diesel generator sets that produce an average of 1,310,465 kilowatt hours annually for 135 customers (91 residential, 10 community facilities and 33 non-community facilities), according to the FY2020 PCE Report from AEA.

While the community does not have community scale renewables integrated into their electric grid, they are utilizing biomass heat for their Water Treatment Plant which creates a local economy (wood harvesters and biomass plant operator) while reducing dependence on imported fossil fuels.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Wood Boiler Maintenance Training** (October 2018)– Kawerak organized a training in coordination with the Alaska Energy Authority in Elim that focused on biomass heating technologies and how to get the most out of wood-fired heating. The training included wood harvest best practices, handling and storing wood, and the maintenance of wood-fired boilers. Kawerak offered 2 scholarships for participants to attend.

- **Elim, NSEDC CEF Funding for Water Treatment Plant Energy Upgrades** (2019) – The water treatment plant in Elim had been identified by ANTHC as having many energy savings opportunities. Kawerak worked in coordination with ANTHC to get community support to apply for NSEDC CEF funds to match against a state grant to complete energy related improvements in the water plant and circulating water system. In 2019, the Native Village of Elim was awarded $55,000 in CEF funds for “Elim Water Utility Upgrades & Improvements.”

- **Elim VW Settlement** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe. The Native Village of Elim successfully completed the VW settlement process and received funding in the amount of $134,162 for a new fuel-efficient dump truck, which arrived to the community in September 2021.

## Gambell

The community of Gambell’s utility is operated and maintained by Alaska Village Electric Cooperative (AVEC). The powerhouse operates mainly off a diesel generator system that produces an average of 1,920,617 kWh annually for 214 customers (165 residential, 15 community facilities and 34 non-community facilities). In 2009, AVEC installed three 100kW (NorthWind 100) wind turbines which generate approximately 285,498 kWh of power on an annual basis, according to the FY2020 PCE Report from AEA.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Gambell VW Settlement Funding** (2018) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe. The tribe was allocated $143,347 in fund and plans to participate in the final VW Tribal Trust funding cycle for 2021-2022.

## Golovin

Golovin’s electric utility is owned and operated by Golovin Power Utilities, under the City of Golovin. The powerhouse operates four diesel generator sets that produce approximately 1,044,080 kilowatt hours annually for 101 customers (48 residential, 8 community facilities and 45 non-community facilities), according to the FY2020 PCE Report from AEA. The community is currently in the beginning stages of relocating their power plant. The current location is in the flood zone, and during recent winter storms the water level has risen dangerously close to the power plant, which would cut out electrical services to the entire community.

Golovin received a $500,000 grant from the NSEDC Community Energy Fund in 2019 to begin site preparation for a new power plant located on higher ground, above the flood zone, and near the new water treatment plant facility. They are exploring options with the State of Alaska as well as federal funding to finance the remainder of the project. Golovin is currently running solely on diesel power. However, the community has interest in installing renewable energy

systems to displace diesel fuel and to lower the cost of energy, such as using solar energy to heat their water storage tank.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Golovin, PCE Reporting** (2018) – ACEP and Kawerak worked with the Golovin electric utility to improve PCE reporting and sign-up community facilities that were not signed up to receive PCE subsidies.
- **Golovin VW Settlement Funding** (2018) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe.
- **Golovin, Pre-Feasibility Study** (2018) – ACEP and ANTHC worked with Golovin as coordinated by Kawerak to develop a wind pre-feasibility study report.
- **Golovin, Tri-Organization Coordination** (2019) – Our energy program was requested to attend the Tri-Organization meeting on June 22, 2019 in Golovin, AK as a guest speaker. Anahma Shannon and Amanda Toerdal attended the meeting, and spoke about energy planning, energy projects, pre-feasibility studies, and the energy development guide that was developed by Bailey Gamble with ANTHC.
- **Golovin Power Plant Relocation** (2019) – Kawerak's energy team provided outreach to the community and assistance in their planning efforts to relocate their new power plant. The existing power plant has aged and is in a flood zone.

*Figure 5. Golovin Community Visit - Tour of Community Facilities*

## Koyuk

Koyuk obtains its electricity through diesel powered generation at a power plant within the village owned and operated by AVEC. The powerhouse produces an average of 1,271,415

kilowatt hours annually for 127 customers (86 residential, 10 community facilities and 31 non-community facilities), according to the FY2020 PCE Report from AEA. Koyuk is currently running solely on diesel power at the powerhouse. However, the community has interest in installing renewable energy systems to displace diesel fuel and to lower the cost of energy and has explored its wind resources as well as potential hydropower resources in the past. There are no active plans to implement renewables into the community.

A community wide energy efficiency project was approved by the tri-councils of Koyuk in 2019 and a grant application for NSEDC's Community Energy Fund (CEF) was submitted in 2020 with the assistance of Kawerak. The Native Village of Koyuk hoped to use their CEF money to replace residential appliances throughout the community to help people save on their electricity bills, to reduce diesel fuel use, and to decrease emissions for the community. This energy efficiency project proposal also included a plan to upgrade all streetlight bulbs and add new streetlights throughout the community, in partnership with AVEC, to lower costs, save energy, and make the nighttime streets safer for residents.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Koyuk, Biomass Operator Capacity Building** (October 2019) – The City of Koyuk was interested in utilizing wood for heating in their community. Kawerak utilized grant funds to send their local utility technician to a biomass wood boiler training in Elim and connected community leadership to the Alaska Energy Authority to get technical assistance in developing a wood-fired boiler project in the community.
- **Koyuk VW Settlement** (2019) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe. The Native Village of Koyuk successfully completed their application and received funding in the amount of $167,237 for a new fuel-efficient dump truck.
- **Koyuk Energy Planning** (2018-2019) – Kawerak worked with Koyuk on a community energy plan and assisted with prioritizing projects to be funded under their NSEDC Community Energy Funding.
- **Koyuk NSEDC Funding** (2019) – After working closely with the community on energy planning and project priorities, Kawerak assisted Koyuk in applying to access their NSEDC Community Energy Funding to implement priority project activities. The application that was submitted to NSEDC included a funding request for LED lighting and community energy efficiency. The project was partially funded in the amount of $62,487, for the streetlight upgrade portion. The community was encouraged to apply to NSEDC Outside Entity Funding for the remaining portion of the grant activities.
- **Koyuk VW Settlement** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe.

## Mary's Igloo

There is not a centralized power distribution system on Mary's Igloo traditional lands. The community was relocated in the early 1950's after the close of the BIA school, with most of the residents settling in Teller. Many of Mary's Igloo tribal members still return to their lands seasonally for fish camp and subsistence activities. These summer camps operate without a power grid. Some residents use portable generators to produce power for their seasonal needs. Mary's Igloo has a strong interest in renewable energy systems and energy efficiency projects

for their tribal members. Mary's Igloo Traditional Council is particularly interested in how to install and maintain their own small solar array to power their cabin and appliances during the summer months. A workshop to teach community members how to install and maintain solar for their fish camps was scheduled in 2020 but was cancelled due to COVID-19.

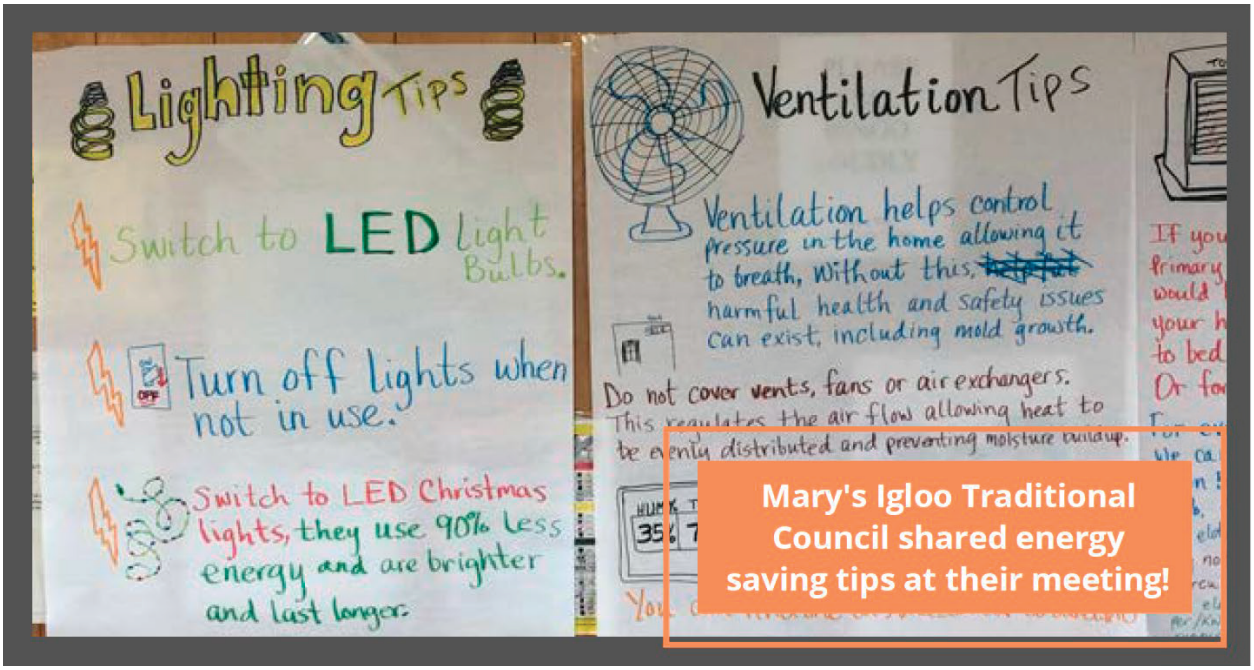


*Figure 6. Mary's Igloo Traditional Council Energy Saving Tips*

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Mary's Igloo Traditional Council** (2019) – Kawerak energy staff traveled to the community in June 2019 to meet with the Tribal council to discuss off-grid solar energy systems and to discuss other community energy priorities.
- **Mary's Igloo Energy Efficiency Cultural Center** (2019) – CCHRC worked with the community on the initial planning for an energy efficient cultural center project and continued to provide technical assistance for this effort as the center's designs were adjusted to best fit the community and to increase energy efficiency. The Tribe applied for and was awarded $800,000 in 2020 from the Indian Community Development Block Grants program.
- **Mary's Igloo Solar Education** (2019) – Kawerak completed a grant application for Honor the Earth and was successfully awarded $3,861 to purchase a small off-grid solar system that can be used for training purposes and educational outreach. Kawerak is working with the Tribe to host an "off-grid power workshop" in Teller for Mary's Igloo in the future. The 2020 and 2021 workshop plans were cancelled due to COVID-19.

## Nome

The community of Nome gets its power from Nome Joint Utility Systems (NJUS), the local power utility, which falls under the City of Nome. NJUS produces an average of 29,374,743

kilowatt hours for a total of 2,200 customers (1,748 residents, 79 community facilities, 373 non-community facilities), according to the FY2020 PCE Report from AEA. NJUS runs two 5.6 MW Wartsila diesel generator sets as well as two large 90kW wind turbines.

NJUS has a total of 20 wind turbines, of which the 2 large EWT 90kW turbines generate the most power. The utility also gets occasional power from 16 older Entegrity 20kW wind turbines, of which a few operate on and off. These older turbines are slowly being phased out from the utility system, as it is difficult to service them, and they no longer make replacement parts for the model. 2,186,915 kilowatt hours of power are produced annually by the operating wind turbines. The elder Entegrity model wind turbines are planned to be phased out in 2022.

Currently, there are no active plans to implement additional renewables into the community, however there are various solar arrays on residential and commercial buildings throughout the town. Many residents outside of city limits also utilize renewable energy to offset their electrical costs. A community wide energy efficiency program would be a great benefit for the community and help to reduce the overall demand on the current system.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Nome-Beltz Junior High School Energy Presentation** (2019) – Kawerak accompanied REAP to the school for the REAP Power Pledge Challenge Presentation.
- **Kawerak Building Monitoring** (2019) – Building monitoring technology was installed in Kawerak's Talialuk Building in Nome to track energy usage in the building. Sensors were installed by Alaska Housing Finance Corporation (AHFC), with help from Kawerak's IT Department and electricians from Bering Straits Development Company. The BMON project is the start of a testing phase of the equipment that will both lower costs for Kawerak and prepare the technology to be used at Head Start locations in the Bering Strait Region with the goal of reducing energy usage and cost.

  The system includes one main wireless gateway sensor that looks like a Wi-Fi router and several small black sensors mounted on walls throughout the building. These small black sensors are measuring temperature and occupancy and how many time the boilers kick on throughout the day. The gateway collects that data and tracks it on a live, online platform. Kawerak's Energy Program, under the Environmental Program, Natural Resources Division, is working with AHFC to monitor the Talialuk Building's energy usage. Some rooms in the building heat up to higher temperatures than others, resulting in the need to open windows and therefore waste energy. Understanding this loss and finding solutions to stop it will help save energy and lower costs for Kawerak. Currently, Kawerak's new Facility Director is leading this project.
- **Banner Wind to Heat Study** (2019) – Kawerak, DeerStone, and Cold Climate Housing Research Center provided technical assistance on a feasibility study for a wind-to-heat project. The request came from Nome Joint Utility Systems in partnership with owners of Banner Wind: Sitnasuak Native Corporation and Bering Straits Native Corporation. The feasibility study evaluated the opportunity to provide excess wind power as heat for a community facility, likely the Nome-Beltz Junior/Senior High campus. If pursued, this project has the potential to save $849,000 over the life of the system for the school.

## Savoonga

The community of Savoonga's utility is operated and maintained by Alaska Village Electric Cooperative (AVEC). The powerhouse was constructed in 2008 and operates diesel generator sets that produce an average of 2,235,694 kilowatt hours annually for 218 customers (162 residential, 9 community facilities and 47 non-community facilities). Savoonga has two 100kw Northwind 100 wind turbines, installed by AVEC in 2009. The turbines produce around 80,989 kWh annually, according to the FY2020 PCE Report from AEA. Strong winds and delayed maintenance have affected wind turbine production on occasion. The turbines work to displace diesel, and when working at full capacity can produce approximately 15 percent of Savoonga's power needs from the wind.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Savoonga VW Settlement Funding** (2018) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe, and the community's project was approved in the amount of $176,607. They replaced one dump truck with this funding.
- **Savoonga VW Settlement Funding** (2019) – Kawerak submitted documents for Volkswagen settlement funding the next round. Savoonga was again awarded the VW Settlement funding and received $164,418 to use for another fuel-efficient replacement dump truck.
- **Savoonga VW Settlement Funding** (2020) – Kawerak submitted documents for Volkswagen settlement funding. The proposed project was to partner VW funds with Tribal DERA funding for new diesel generators in the power plant. The Tribe chose to not pursue this option in the last cycle of VW funding.

## Shaktoolik

Shaktoolik's utility is operated and maintained by Alaska Village Electric Cooperative (AVEC). The powerhouse runs on diesel generator sets that produce an average of 780,308 kilowatt hours annually for 97 customers (62 residential, 4 community facilities and 29 non-community facilities). The utility also has two 100kw Northwind 100 wind turbines, installed by AVEC in 2011, which produce nearly 50% of Shaktoolik's power needs, or 367,268 kWh annually, according to the FY2020 PCE Report from AEA.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Shaktoolik Community Facility** – In 2019, the City of Shaktoolik requested technical assistance from Kawerak related to the energy efficient planning of their new community building. Kawerak connected Shaktoolik with CCHRC for an initial discussion, however the project was not pursued**.**
- **Shaktoolik VW Settlement Funding** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe.

## St. Michael

There is no power plant in St. Michael. St. Michael receives its power from a 10-mile intertie from the nearby village of Stebbins, whose power plant is operated by the Alaska Village Electric Cooperative (AVEC). This is the only intertie in the Bering Strait Region. The AVEC

powerhouse runs diesel generators that produce an average of 3,518,837 kilowatt hours annually for 186 customers in Stebbins (137 residential, 10 community facilities and 39 non-community facilities) and 138 customers in St. Michael (89 residential, 10 community facilities and 39 non-community facilities), according to the FY2020 PCE Report from AEA.

AVEC is in the process of procuring and installing a 100kW Northwind 100 wind turbine, set for commissioning in 2022. The excess power produced by the turbine is planned to be used for a wind-to-heat system that will heat the water treatment plant in the community of St. Michael, which has some of the highest water bills in the region and state.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **St. Michael-Stebbins NSEDC CEF Funding for 900kW wind turbine** (2018) – Alaska Village Electric Cooperative was interested in applying for funding for a 900kW wind turbine for the communities. Kawerak helped to facilitate a meeting with community leaders and AVEC. Ultimately, the community agreed that applying for NSEDC CEF funding for the turbine was in the best interest of the communities and ended up collaborating with AVEC to apply. $1.3 million was awarded to Stebbins and St. Michael for the project from CEF. The $1.3M in CEF funds were used as match to apply for a $1 million DOE-OIE Tribal Energy Deployment grant, which was awarded to AVEC in 2018.The total project cost was $5,950,434. The total savings over the project lifespan is estimated to be $11.4 million.
- **St. Michael, WOTEC** (2018) – St. Michael requested energy technical assistance for various projects, including finding parts and performing maintenance on their waste oil (WOTEC) burner, Kawerak assisted with identifying and ordering parts, and identifying maintenance needs.
- **St. Michael VW Settlement Funds** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe.

## Shishmaref

The power plant in Shishmaref is operated by the Alaska Village Electric Cooperative (AVEC). The AVEC powerhouse runs diesel generators that produce an average of 1,817,697 kilowatt hours annually for 206 customers (151 residential, 11 community facilities and 44 non-community facilities), according to the FY2020 PCE Report from AEA. The Shishmaref AVEC power plant does not use any renewable energy sources at this time.

The community of Shishmaref has been planning for possible relocation of their village for the past two decades. Due to climate change, the coastline is eroding quickly, which puts residential homes and community facilities at risk. The community has chosen a new site for relocating their village, however that has not yet been a formal plan finalized for funding and executing this move. Once a decision is made by the community and funding is found, new power sources such as renewable energy might be considered for the new site.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Shishmaref Wind Turbine Removal Plan** (2018) – Kawerak and DeerStone Consulting met with the electric utility and local leadership to discuss options for removing the

existing wind turbine infrastructure in the community. The wind turbines are attached to the existing water treatment storage tanks and were an original effort of ANTHC to reduce the amount of energy required to heat the water. The turbines have not functioned for over 20 years. This TA request resulted in an estimated cost to remove and a plan for completion, which the community will support moving forward.

- **Shishmaref Strategic Energy Plan** (2018-2019) – Shishmaref received funding in 2018 through DOE and Denali Commission to develop a Strategic Energy Plan. AVEC oversees the energy planning effort. Kawerak and DeerStone Consulting supported Shishmaref in developing priorities to include in the plan. This included a site visit in 2019 to engage in a community energy planning session.
- **Shishmaref LED Lighting Retrofit** (2019) – Kawerak provided technical assistance to community for Village Energy Efficiency Program application to replace outdoor community lighting with LED which was funded by the Alaska Energy Authority and Wells Fargo in the amount of $37,020.
- **Shishmaref Heat Recovery** (2020) – Kawerak worked with ANTHC to facilitate discussions with regional stakeholders around fundraising needs to complete the heat recovery project in the community. The project was funded for design and construction, but after design was complete it was apparent that there were not enough funds to finalize the construction. Thus, construction activities never began. The community and ANTHC are currently looking for other funding to fill the shortfall.

## Solomon

There is no centralized power distribution system located in Solomon. Residents use small personal generators to produce power for their seasonal needs. The old BIA Schoolhouse in Solomon has been converted into a Bed & Breakfast business and community center, which is run by the Village of Solomon, a federally recognized tribe. The schoolhouse runs on a diesel generator during summer operations, as well as a solar + battery system that was recently installed in August 2021 through the Tribal Solar Accelerator Fund and GRID Alternatives. Solomon's energy vision statement is: "Develop and innovate Renewable Energy that is consistent with our cultural identity." The vision statement was created in 2017 partially to support the goal of returning Solomon to a year-round village. The community gathered for the first renewable energy planning session at the village community center (Bed & Breakfast) in August of 2017.


*Figure 7. Solomon MET Tower*

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Solomon – Renewable Energy Planning** (2017-2019) – Overall, the Village of Solomon's energy vision is to “Develop and innovate Renewable Energy that is consistent with our cultural identity.” As described in their energy plan, the vision was created to support the goal of returning Solomon to a year-round village. Since 2010, the community has had "Alternative Energy for Solomon" listed as a Village Priority on their Local Economic Development Plan, and the vision created for their energy plan is focused on doing that priority justice.

  In the summer of 2017, Kawerak supported Solomon’s renewable energy planning activities which included a meeting in the village to discuss project priorities and opportunities. Kawerak also attended Solomon’s Environmental Education Youth Summit in Nome in 2019, hosting an “energy education” booth. In August of 2019, Kawerak collaborated with the Tribe to host the Community Energy Action Plan Workshop. Kawerak tapped into ACEP through our contract with them to provide support completing Solomon’s Renewable Energy Plan. ANTHC and ACEP were key partners in the community energy plan. Bering Straits Development Company assisted with MET tower data collection. ANTHC provided direct technical assistance through their energy program including energy efficiency audits and recommendations that fed into their overall planning report. In addition to the energy plan that was created, Solomon also developed an Energy Leadership Committee.
- **Solomon MET Tower Data Collection** (2018-2021) – Kawerak worked with Bering Straits Development Company (BSDC), ACEP, and ANTHC to install MET towers and collect data. The MET tower was removed in summer 2021 with assistance from BSDC.
- **Solomon Village Relocation and Developing a Small Microgrid System** (2019) – Kawerak directed DeerStone Consulting to respond to a technical assistance request to plan for long-term village relocation that would require a small microgrid primary power system.
- **Solomon Tribal Solar Accelerator Fund + GRID Alternatives** (2019) – Kawerak provided a letter of support for a funding application that plans to install a solar PV project in Solomon. The project was funded in the amount of $88,216 and the solar PV + battery storage system was successfully installed in August 2021, after being delayed by two years due to the COVID-19 Pandemic.

## Stebbins

The power plant in Stebbins is operated by the Alaska Village Electric Cooperative (AVEC) and is connected by a 10-mile intertie to the nearby village of St. Michael. This is the only intertie in the Bering Strait Region. The AVEC powerhouse runs diesel generators that produce an average of 3,518,837 kilowatt hours annually for 186 customers in Stebbins (137 residential, 10 community facilities and 39 non-community facilities) and 138 customers in St. Michael (89 residential, 10 community facilities and 39 non-community facilities), according to the FY2020 PCE Report from AEA. The AVEC is in the process of a wind turbine project – a 100kW Northwind 100 turbine, which will be commissioned in 2022.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **St. Michael-Stebbins NSEDC CEF Funding for 900kW wind turbine** (2018) – Alaska Village Electric Cooperative was interested in applying for funding for a 900kW wind turbine for the communities. Kawerak helped to facilitate a meeting with community leaders and AVEC. Ultimately, the community agreed that applying for NSEDC CEF funding for the turbine was in the best interest of the communities and ended up collaborating with AVEC to apply. $1.3 million was awarded to Stebbins and St. Michael for the project ($680,000 from Stebbins' CEF). The $1.3M in CEF funds were used as match to apply for a DOE-OIE Tribal Energy Deployment grant, which was awarded to AVEC in 2018.
- **Stebbins VW Settlement Funds** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe.

## Teller

Teller's power utility is operated and maintained by Alaska Village Electric Cooperative (AVEC). The powerhouse operates off a diesel generator system that produces an average of 848,081 kilowatt hours annually for 116 customers (74 residential, 7 community facilities and 35 non-community facilities), according to the FY2020 PCE Report from AEA. There are no community scale renewable energy systems in place in Teller. The community has had a wind energy assessment survey completed, but no projects have been pursued to date.

In 2019, the City of Teller in partnership with ANTHC applied for and received the USDA High Energy Cost Grant to install a heat recovery system, capturing the waste heat from their powerhouse generators to heat community facilities and displace the amount of diesel used by the community. The project is currently completed.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Teller Strategic Energy Plan** (2018) – Kawerak and DeerStone Consulting supported Teller in updating an existing strategic energy plan.
- **Teller Bulk Fuel** (2019) – Teller Native Corporation requested technical assistance and a site visit for their bulk fuel tank farm facility. Kawerak staff travelled to Teller to view the site, take photos, and meet with Native Corporation President to discuss their energy progress and goals. Our program assisted them to arrange a study of the estimated cost for bulk fuel improvements as well as planning for potential future replacement of the farm.
- **Teller Head Start BMON** (2019) – Kawerak staff traveled with Alaska Housing Finance Corporation staff to Teller to install Building Monitoring System at the Teller Head Start Building. This was the second BMON system installed in the region.
- **Teller VW Settlement Funds** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe.

## Unalakleet

The community's electric utility is operated and maintained by the Unalakleet Valley Electric Cooperative (UVEC). The powerhouse operates off a diesel-wind system that produces an average of 4,435,679 kilowatt hours annually for 389 customers (273 residential, 27 community facilities and 89 non-community facilities). UVEC has six Northwind 100kw wind turbines located on the hills just north of the community. The turbines generate 790,395 kilowatt hours of power on an annual basis, according to the FY2020 PCE Report from AEA.

UVEC is in the process of upgrading their transmission and distribution system to decrease line loss and maximize their renewable energy. They are also exploring battery storage options to capture excess wind. There are various residential and small-commercial solar arrays in Unalakleet. The community is the only utility in the region that allows net-metering, and the residents are very knowledgeable about their own energy systems.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Unalakleet, Wales Battery System** (2019) – Kawerak and ACEP responded to a technical assistance request from the Native Village of Unalakleet to assess the condition of a battery system in Wales. This request was cancelled in 2020.
- **Unalakleet VW Settlement Funds & DERA Grant Application** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe. The Tribe was allocated $141,241 of VW Settlement Funds.

## Wales

The Alaska Village Electric Cooperative and the City of Wales operate and maintain the electric utility. The electric generation source is diesel. The powerhouse produces an average of 661,291 kilowatt hours annually for 68 customers (40 residential, 5 community facilities and 23 non-community facilities), according to the FY2020 PCE Report from AEA.

There are remnants of high-penetration wind generation system in Wales, installed by the Department of Energy National Renewable Energy Lab (NREL) in partnership with Kotzebue Electric Association, Alaska Village Electric Cooperative and Alaska Energy Authority in 2001. A battery storage system was also tested at the site but had many issues with operation and maintenance. The system is no longer functional.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **Wales VW Settlement Funds** (2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe.
- **Wales Utility Operations and Maintenance** (2020) – Kawerak met with the IGAP coordinator about implementing the use of 60Hertz microgrid software, a platform designed to assist small rural utilities in operating and maintaining their power plant effectively.
- **Wales Heat Recovery** (2020) – Kawerak provided project support to ANTHC who is leading the design and construction of a heat recovery project in Wales. Wales possibly plans to use their NSEDC Community Energy Funds to support this project.

- **Wales Tri-organization Meeting** (2020) – Kawerak participated in the Wales Tri-Org Meeting telephonically to discuss energy planning, goals, and discuss the recently announced DOE-OIE grant opportunity.

## White Mountain

The City of White Mountain operates and maintain the local electric utility. The electric generation source is diesel. The powerhouse produces an average of 902,819 kilowatt hours annually for 101 customers (65 residential, 8 community facilities and 28 non-community facilities), according to the FY2020 PCE Report from AEA. White Mountain has explored some renewable energy options, but none have proven to be viable projects. If there is interest, solar power, wind power, and biomass could all be feasible solutions for the community.

Below are instances of technical assistance that Kawerak provided to the community under the DOE funded project.

- **White Mountain, VW Settlement** (2018) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe. The tribe was successfully allocated $162,758 and purchased a new fuel-efficient dump truck.
- **White Mountain, Energy Priorities, Power Plant and Infrastructure** (2019) – Kawerak traveled to the community for a site visit to evaluate vehicles eligible for VW settlement funding, to tour their power plant, and become familiar with the village energy needs.
- **White Mountain VW Settlement Funds + Tribal DERA Funding** (2019-2020) – Kawerak assisted with the application process for VW settlement funds on behalf of the Tribe in conjunction with a Tribal DERA grant for a new diesel genset in the power plant, a combined grant with the community of Diomede. The grant was partially funded by the EPA and only the Diomede portion of the project moved forward.

### *Bering Strait Regional Energy Leadership Committee*

The Bering Strait Regional Energy Leadership Committee was created to identify areas of focus for the Kawerak Energy Program. The committee was comprised of regional leaders that have jurisdiction in energy in their respective Tribal communities. The committee met quarterly via teleconference starting in October 2019. The goal of the committee was to identify areas to drive coordinated and focused efforts around impactful energy initiatives for the region. The committee focused their meetings on various items of interest, including building standards, energy efficient building codes, and setting region-wide energy goals.

https://kawerak.org/natural-resources/bering-strait-regional-energy-network/

Members of the Bering Strait Regional Energy Leadership Committee, also known as the “ELC,” were selected through a nomination process during the 2019 Regional Energy Summit. Participants at the summit were asked to submit their nominations for “energy champions” from their communities and the region. The top five nominations were selected as the “executive team.” ELC Executive Team members consisted of Amos W. Brown, Sr., Native Village of White Mountain, Deilah Johnson, Village of Solomon, Robert Keith, Native Village of Elim, Lucy Oquilluk, Mary’s Igloo Traditional Council, and Robert Tokeinna, Jr., Native Village of Wales.

## *Newsletters and Website*

**Bering Strait Regional Energy Network Newsletter –** Kawerak developed a regional energy network newsletter to be sent quarterly to our Tribes, city governments and other regional and local stakeholders. This allowed our team to highlight community energy project successes, highlight technical assistance opportunities to the Tribes, and post about upcoming events or funding opportunities. This was also a way to communicate grassroots energy savings opportunities that could be easily implemented at the community level, such as LED lighting retrofits.

- Issue 1 – March 15, 2019
- Issue 2 – June 15, 2019
- Issue 3 – September 15, 2019
- Issue 4 – December 30, 2019
- Issue 5 – March 30, 2020

**Bering Strait Regional Energy Network Website –** The website was developed to serve as a regional database of energy information for all 20 tribal communities in the region that are served by Kawerak. The site contains past newsletters, maps, energy information, rates, current renewable energy systems, links to studies and reports for specific communities, and more.

## *Region-Wide Energy Events & Presentations*

**Kawerak Regional Conference – November 2018**
During the Kawerak Regional Conference, the Kawerak Energy Program hosted a 3-day energy track and brought in representatives from the communities to learn the basics of energy. The workshops were well attended, and participants asked insightful questions. Participants engaged in many conversations that related to energy in their communities. Presentations at the Energy Track were given by Kawerak, AVEC, AHFC, REAP, DeerStone, Rural Alaska Fuel Services, and the Alaska Department of Environmental Conservation. Presentations focused on benchmarking, Healthy Homes Program, weatherization, energy pricing, tank farm challenges, bulk fuel, village-scale project development, how power is generated, understanding your electric bill, a hands-on energy education workshop, and finally, an update about our Kawerak DOE-OIE Energy Program.

*Figure 8. 2019 Bering Strait Regional Energy Summit*

**Bering Strait Regional Energy Summit – May 2019**

The three-day energy summit was an opportunity to gather industry professionals alongside Tribal community participants. The summit allowed for networking, learning, discussions, and collaboration among participants. The presentations focused on technologies for the region, funding strategies, energy efficiency, and included hands on workshops and roundtable discussions with agency participants. The summit was followed up by an Energy Fair (open to the public), a grant writing course, and an energy management workshop. We offered paid airfare, lodging and per diem for one energy representative per village located outside of Nome. Kawerak also provided travel scholarships for 15 extra participants on a first-come, first-serve basis, with a max of three sponsored representative per community.

*Figure 9. 2019 Bering Strait Regional Energy Summit*

**Bering Strait Regional Energy Summit – 2020**

The second regional energy summit was planned for May 2020 to take place in the Village of Unalakleet. Unfortunately, due to COVID-19 and travel restrictions this in-person summit was cancelled.

**Bering Strait Virtual Energy Summit – 2021**
The regional energy summit was rescheduled to 2021 and given in a virtual format to allow for participants to attend in a safe way during the COVID-19 Pandemic.

**Presentations and Conferences Attended:**

- November 2016 – Presented Project Outline at DOE Annual Review, Denver, CO
- March 2017 - DOE-IE Program Review in Golden, Colorado
- May 2017 – Tribal Energy Summit in Washington, DC
- October 2018 – Northwest Arctic Borough Energy Steering Committee, Kotzebue, AK
- November 2018 – Kawerak Regional Conference
    - Kawerak – Energy Program Presentation
    - DeerStone Consulting – Energy Presentation
- November 2018 – BIA Providers Energy Track, Anchorage, AK
- December 2018 – DOE-IE Program Review in Lakewood, Colorado
- May 2019 – DOE-IE Program Review in Washington, DC
- May 2019 – Bering Strait Regional Energy Summit in Nome, AK
- August 2019 – Presented at Nome Joint Utilities Board Meeting on the Energy Program
- August 2019 – Presented at regional ARDOR Board meeting on the Energy Program
- October 2019 – Northwest Arctic Borough Energy Steering Committee, Presentation on the Energy Program, Kotzebue, AK
- October 2019 – Kawerak ARDOR Board Energy Presentation, Nome, AK
- November 2019 – DOE-IE Program Review, Program Presentation, Lakewood, CO
- November 2019 – ATCEM – PCE Presentation, Anchorage, AK
- February 2020 – Alaska Forum on the Environment
- March 2020 – Kawerak Board Meetings, Meetings with Tribal Leaders, Nome, AK
- March 2020 – Regional IGAP Teleconference, Energy Presentations and Discussions
- March 2020 – September 2021 – Unfortunately, during this time Kawerak was not able to present in-person due to COVID-19 travel restrictions.

## *Program Sustainability*

Kawerak's Energy Program will not be capable of sustaining itself after the conclusion of this DOE funding. Due to a lack of capacity-building and programmatic funding in the energy space, Kawerak does not have the resources available to continue to employ an Energy Development Specialist. While there are some programs available through USDA and other federal agencies that could be relevant to energy technical assistance, there are no specific technical assistance or capacity-building programs that Kawerak was able to apply to.

However, the capacity gained internally at Kawerak will be sustained within the Environmental Program, through the work of Environmental Program Director Anahma Shannon and within the Pilgrim Hot Springs program. Amanda Toerdal is the new Pilgrim Hot Springs General Manager, and part of her job duties are to work to implement energy efficiency, renewable energy, and economic development projects utilizing the geothermal resource at Pilgrim Hot Springs. Development for Pilgrim Hot Springs has the potential to benefit the entire region, not only with renewable energy and economic impacts, but also with the impact of new health, wellness, and food security initiatives.

Besides the direct work of the Environmental Program, the capacity gained internally at Kawerak through the DOE-funded project will also allow our organization to support work in the following areas:

- **Village Master Plans** - Kawerak is working on engaging communities in the region in the creation of Village Master Plans for each community, which energy would be a large component of. The Environmental Program now has the capacity and resources needed to provide information, data, and networking opportunities to other Kawerak programs working on this effort, such as the Transportation Program and Community Planning & Development.

- **Sanitation Energy Efficiency** – Kawerak continues to engage with our Regional Health Organization and the Alaska Native Tribal Health Consortium on ensuring any planned water and sanitation projects in the region are energy efficient. This engagement includes participating in the regional Water Sewer Infrastructure Task Force, which Anahma Shannon contributes to regularly in her role as the Environmental Program Director.

- **Transportation Projects –** Through Kawerak's work with the VW Settlement opportunities, which was possible due to our capacity gained during the DOE-funded project, our organization will continue to aid tribes who are utilizing VW Tribal Trust funds to purchase new heavy equipment for their communities, which benefits all current and future transportation and construction projects in the region.

- **Site Development at Pilgrim Hot Springs –** Amanda and Anahma will continue to develop the Pilgrim Hot Springs site. The site, once an orphanage, was purchased by a consortium of Tribal entities. The goal of the site includes developing a tourism destination while also creating a sacred space for cultural functions where visitors can feel connected to the land.

## 5. Conclusions and Recommendations

The goal of the Bering Strait Energy Planning Network project was to improve local capacity for effective energy planning and project development for the benefit of the region. The grant funding provided by the Department of Energy successfully supported this goal and our various objectives, which included providing technical support for rural energy planning and energy project development, increasing access to energy information and training, regularly updating our regional energy plan, and increasing collaboration with other agencies and regions to improve energy solutions in rural Alaska.

A specific example of energy project development and increased capacity within the region is shown by Kawerak's newly developed Pilgrim Hot Springs program. Kawerak is an owner-member of Unaatuq, LLC, the consortium which owns Pilgrim Hot Springs. The internal capacity gained through this technical assistance grant contributed to the success of Kawerak's proposal to become a co-managing member of the property. In 2019, Unaatuq officially approved Kawerak's co-management plan and committed to fund a new position, the Pilgrim Hot Springs General Manager. The PHS General Manger works under the Environmental Program at Kawerak and utilizes the energy knowledge and network gained through the DOE-funded Energy Program.

This program development within Kawerak leaves a legacy of energy capacity within our organization and will continue to keep Kawerak at the forefront of renewable energy development in the region, state, and beyond. For example, the new PHS General Manager is Amanda Toerdal, who brings her energy knowledge gained as the previous Energy Development Specialist into her new role. Anahma Shannon, as Environmental Program Director, continues to be involved in renewable energy and sustainable development projects for Pilgrim Hot Springs, and for the region. Kawerak's work as co-managing owner of Pilgrim Hot Springs also connects us with a multitude of partner networks through the various owners of Unaatuq, project contractors, technical assistance providers, and expands our organizational capacity.

Sustainability initiatives for Pilgrim Hot Springs expand beyond renewable energy development to include food security, agriculture, eco-tourism, economic development, and the preservation of history and cultural knowledge. As Pilgrim Hot Springs continues to develop and increase its programs and services, our regional capacity will continue to expand in these areas.

This funding also helped provide the resources needed for Kawerak to establish a Regional Energy Planning Network. Throughout our grant period, we were able to communicate regularly with Tribal members, community leaders, and industry professionals through a regular Newsletter. We also formed the Energy Leadership Committee, which met regularly to discuss important energy topics and connect with energy agencies. Our Regional Energy Summit activities provided invaluable learning opportunities for residents of the region, and the numerous energy training and education opportunities for residents of our Tribal communities Kawerak provided or offered in partnership with other organizations proved to be popular with regional energy champions and other residents.

A very successful result of this funding was the ability for Kawerak to create a clearinghouse of energy data and information for Tribes to access. Specifically, our energy program staff were able to design and publish the Bering Strait Regional Energy Network Database, which provides general energy information for each community in an easy-to-use format.

Our plans to help Tribes with energy project development and apply for energy project funding was accomplished. Specifically, our Energy Program allowed us to help Tribes and communities apply for additional funding opportunities from various agencies. **This effort brought in over $8.6 million in funding to the region for energy saving projects.**

| | Community | Grant | Project | Grants ($) |
|---|---|---|---|---|
| | Brevig Mission | VW Settlement Funds | Fuel Efficient Dump Truck | $168,622 |
| | Brevig Mission | AEA Grant Writing | Funding for LED lighting | $29,490 |
| | Diomede | DOE Grant Writing | Funding for energy efficient store | $222,848 |
| | Diomede | DERA Grant Writing | Diesel Genset Replacement | $135,000 |
| | Diomede | VW Settlement Funds | Diesel Genset Replacement | $148,304 |
| | Elim | NSEDC Grant Writing | Water/Sewer Energy Improvements | $55,000 |
| | Elim | VW Settlement Funds | Fuel Efficient Dump Truck | $134,162 |
| | Gambell | VW Settlement Funds | Project Funding | $143,347 |
| | Koyuk | VW Settlement Funds | Fuel Efficient Dump Truck | $167,237 |
| | Koyuk | NSEDC Grant Writing | Streetlight Upgrades | $62,487 |
| | Mary's Igloo | Supported ICDBG Grant Writing | Energy Efficient Cultural Center | $800,000 |
| | Savoonga | VW Settlement Funds | Fuel Efficient Dump Truck | $176,607 |
| | Savoonga | VW Settlement Funds | Fuel Efficient Dump Truck | $164,418 |
| ** | St. Michael & Stebbins | Supported DOE & NSEDC Grant Writing | 900 kW Wind Turbine ** | $5,950,434 |
| | Shishmaref | AEA Grant Writing | LED Lighting Retrofit | $37,020 |
| | Solomon | Grid Alternatives Grant Writing | Solar PV & Battery System | $88,216 |
| | Unalakleet | VW Settlement Funds | Allocation of funds | $141,241 |
| | | | | |
| **Kawerak helped to secure $2.3 M | | | | |

*Figure 10. Grants Leveraged Through DOE TA Support*

The Kawerak Energy Program was able to create meaningful plans and a list of priority projects for the regions, turn those ideas into some well vetted and analyzed projects and then develop those projects furthermore with grant applications. This was the most meaningful outcome of this project. Leveraging these DOE TA funds allowed us to become a force multiplier, gave us the flexibility to develop meaningful, cost saving projects for areas of high energy costs, high rates of poverty, and improve the wellbeing and lives of the Tribal members in those communities. These projects are a legacy of the DOE TA funding, and we hope that the Department of Energy continues to fund similar efforts that allow Tribes to do energy planning, feasibility studies, and to apply for grants.

**Recommendations**

**We recommend that the Department of Energy continue to support Tribal entity collaboration and specifically support the collaboration of energy players in the different Tribal regions across the State**. These DOE TA grants across Alaska supported statewide collaboration. Knowledge was shared openly as the different regions forged relationships that became a strong network of energy champions. Tribes across the state benefitted from this cornucopia of knowledge that provided camaraderie and a platform for information exchange that allowed us to learn from one another.

**We recommend that the Department of Energy support project development through technical assistance not only delivered by DOE and their contractors but allow for the local experts that were nurtured during these five years of DOE TA to continue to play a role.** Not only does Kawerak now have specialized expertise in energy projects for the region, but we also have a whole list of partners and contractors that we've worked. The people and organizations on this list are uniquely positioned, holding vast amounts of knowledge of the region through close working relationships with our communities. Please use this knowledgeable network that we've created to respond to technical assistance requests. Please ask Kawerak as our region's Tribal energy experts how to best approach technical assistance.

**We recommend that the Department of Energy continue to offer grants along the same scale and flexibility as this past opportunity did.** The funds were flexible and allowed us to use creative problem solving to meet the needs of our unique region and our unique Tribes. This not only built capacity for our region, but it also allowed us to adapt as the world around us changed, as community needs changed, and as our understanding of energy opportunities changed.

**We recommend that the Department of Energy encourage renewable energy development in Tribal communities.** Often small, rural, islanded microgrids in our Tribal communities face many challenges in developing renewable energy projects. Please continue to encourage development through early stages of planning, to in depth feasibility assessment, through design and construction, and particularly through start-up and long-term operations and management of those systems post-construction. The project development work that can lead to getting projects funded is a need that cannot be stressed enough. **Please help Tribes get the planning work done so they can get projects funded.** This means not only vetting projects for feasibility but also helping to develop workplans, scopes, schedules, and budgets that can be used for funding applications.

## 6. Lessons Learned

Even with a well thought out plan for our project, we underestimated the time it would take to learn, build capacity, hire the right people, and to most efficiently operate an energy program. Our lesson learned is that there is no replacement for time in the seat. We appreciate the longer duration of this grant. This allowed us to grow and nurture people through capacity building in the process.

While we were learning, we were also trying to figure out how to best utilize contractors. We felt like we had to hit the ground running. However, building our own team's internal capacity while also trying to formalize contractor relationships and manage their work, was a unique challenge.

The flip side of this conundrum was that our contractors ended up playing a role in developing our skills in energy planning, project development, and project management. We had the unique opportunity to learn from experts in real-time. Our experience here was not what we had expected, which perhaps was to peel off work and delegate to contractors. Instead, we worked as a team and the good working relationships we had with our contractors and partners helped tremendously in the growth of our own team, to build technical acuity, and to better understand the energy project landscape in our communities.

We experienced high turnover both internally and within the energy champions in the Tribal communities we were working with. This constant turnover made it challenging to keep up with progress; it often felt like we had to take a step back to take a step forward. The lesson learned here was to document community priorities, keep more than one person in the community engaged, and help communities to be thinking of succession planning for energy projects.

We learned how important networking is for all aspects of energy projects. Coordination and sharing experiences and project successes among Tribal communities in rural Alaska is extremely valuable. This also extends to funders and consultants that work to support energy projects in the State. We created a strong, valuable network that was responsive and supportive without fail. When we didn't know how to get something done or how to solve a particular problem, we had a network of energy professionals to reach out to. Networking with communities, energy organizations, energy consultants, and funders allowed us to develop the relationships we needed to seek expert help and complete energy projects.

Implementing this project during the COVID-19 Pandemic was particularly challenging. It was hard to get communities and professionals to focus on energy related work when the whole world was adapting to new unique challenges. Our options were particularly limited with the lack of internet connectivity in the Tribal communities we serve. While Tribal and City offices were mostly closed, many lacked at home internet altogether or were utilizing limited bandwidth to homeschool their children. It felt like the work came to a screeching halt and we had to adapt the workplan to continue to do meaningful work.

On the other hand, having to adapt work styles to fit the post-pandemic reality allowed us to develop virtual and telephonic options that eased participation for many people. While we really appreciate in-person meetings, conferences, and interactions, having to adapt to Zoom meetings and conference calls eased the burden of participation for invitees, who were still able to work from home and be available to their families or other responsibilities.

Building capacity was a worthwhile effort that will continue to benefit the region through the projects and people that continue to serve our communities. Anahma Shannon was able to build on her energy knowledge through the Arctic Remote Energy Networks Academy (ARENA) program. She continues to serve the Tribes in the region through her position at Kawerak. Community Energy Champions that were trained and developed as a part of this project continue to serve their Tribal communities. Amanda Toerdal's knowledge around energy as it relates to the Tribes in the region grew tremendously as a result of this project. She continues to serve the region through her position at Kawerak. She now focuses primarily on developing the Pilgrim Hot Springs site, a culturally relevant site that will become a tourism hub and cultural learning destination for the region.

In closing, we want to say thank you for supporting our project, the development of capacity in our region, and for the legacies that will live on after this project has concluded.