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2023 ANNUAL REPORT

The subsea cable in the above photo is similar to the high-voltage direct current cable that will be installed between the Kenai Peninsula and Beluga, as part of the Railbelt Innovation Resiliency project.

AEA's mission is to reduce the cost of energy in Alaska. To achieve this mission, AEA strives to diversify Alaska's energy portfolio — increasing resiliency, reliability, and redundancy.

ALASKA ENERGY AUTHORITY

AEA PROVIDES ENERGY SOLUTIONS TO MEET THE UNIQUE NEEDS OF ALASKA'S RURAL AND URBAN COMMUNITIES.

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This publication on the activities and financial condition of AEA is submitted in accordance with Alaska Statute 44.83.940. Design and production by AEA. A total of 500 copies of the report were printed at Service Business Printing located in Anchorage, Alaska at a cost of $7.95 per copy.

LETTER FROM THE GOVERNOR

Thanks to a historic grant from the Department of Energy secured by AEA in October 2023, Alaska has a tremendous opportunity to expand on transmission upgrades already underway and modernize the Railbelt transmission system for the benefit of all the communities it serves.

Dear Fellow Alaskans,

AEA was created in 1976 to promote, finance, and construct power projects that reduce energy costs in Alaska. Access to reliable and affordable energy is the foundation of economic growth and making Alaska the best place in the country to live, raise a family, and do business. As the statewide energy office, AEA plays a key role in harnessing our abundant energy resources of all kinds to achieve this objective.

Thanks to a historic grant from the Department of Energy secured by AEA in October 2023, Alaska has a tremendous opportunity to expand on transmission upgrades already underway and modernize the Railbelt transmission system for the benefit of all the communities it serves. These upgrades will lead to reduced rates for Railbelt communities as we ensure that the lowest-cost power can move without constraint from Homer to Delta. The upgrades will also benefit our rural communities; when energy costs decrease on the Railbelt, there is a corresponding reduction in residential rates for Alaskans in communities that receive Power Cost Equalization. AEA also participated in the development of my Energy Security Task Force Report released in December 2023. It was charged with developing a comprehensive statewide energy plan that would evaluate energy generation, distribution, and transmission throughout Alaska and further drive at the cheapest energy for Alaskans.

From oil and gas to renewables and emerging technologies, Alaska is an "all-of-the-above" state when it comes to energy. AEA will continue to lead our efforts to take advantage of every opportunity to reduce energy costs, increase energy independence, and build an Alaska for the next 50 years and beyond.

Sincerely,

Mike Dunleavy
Governor

LETTER FROM THE CHAIR

It's an exciting time for the energy sector, and I am pleased to present AEA's 2023 Annual Report. This report reflects AEA's dedicated efforts and achievements in pursuit of a sustainable and resilient energy future.

In recent years, persistent inflation and the increased cost of living have been primary points of concern for households across the nation. Nowhere is the burden more evident than in rural Alaska where electricity costs can be up to five times higher than in urban areas. Through its Power Cost Equalization (PCE) program, AEA helps align rural electricity costs with costs in Anchorage, Fairbanks, and Juneau. In fiscal year 2023, AEA issued $42 million in PCE payments to rural electric utilities for the benefit of over 80,000 Alaskans in 188 communities.

Over the last four decades, AEA has invested millions in rural Alaska. AEA administers the Bulk Fuel Upgrade program, which repairs or upgrades fuel storage facilities that lower fuel costs by allowing the community to buy fuel in large quantities. Additionally, through its Rural Power Systems Upgrade program, AEA builds and retrofits power system facilities that improve power generation efficiency. While significant investment has been made, more is needed, and AEA remains committed to the continued safe and reliable operation of rural energy infrastructure.

AEA's Renewable Energy Fund (REF) competitive grant program plays a crucial role in reducing carbon emissions by advancing clean energy projects across the state, with 80 percent of the projects funded located in rural Alaska. Last year, AEA commissioned a third-party research consultant to conduct an independent impact analysis of the program. The report affirms the efficacy of the program finding REF-funded projects have offset approximately 85 million gallons of diesel fuel, 2.2 million cubic feet of natural gas, and 1,063,500 net metric tons of carbon dioxide since 2008. To date, REF has made 289 grants to support renewable energy projects statewide. There are now over 100 operating projects built with REF contributions.

With all of the work occurring in Alaska's energy sector, AEA launched a new online digital library platform in December, aimed at improving the public's ease of access to, and navigation of AEA's current and historical resources. There are over 10,000 publicly available publications, technical reports, research and feasibility studies, and other documents. This number will continue to grow over the library's life.

I am proud of the progress we have made in reducing Alaska's energy costs. However, we still have a long road ahead to ensure a brighter future for successive generations of Alaskans. Leveraging Alaska's strategic location and its vast array of natural resources, we can lead the way in energy diversification while also bolstering Alaska's economy and enhancing energy security.

For the past decade, I have had the privilege of working closely with AEA's dedicated team. On behalf of an appreciative board of directors, I want to thank everyone at AEA for their efforts in making Alaska a better place for all.

J. Dana Pruhs
Chair

LETTER FROM THE EXECUTIVE DIRECTOR

AEA had an exceptional year in 2023, thanks to our talented team's dedication and ingenuity. AEA continued to advance several initiatives to support Alaska's energy goals and policies, which aim to ensure that Alaskans have access to safe, reliable, and affordable energy.

With once-in-a-lifetime federal funds and state support, AEA's budget has increased by over 1000 percent in the last four years. In the wake of this historical period, we have the opportunity for transformational change in the development of energy infrastructure to secure affordable and sustainable supplies for Alaska.

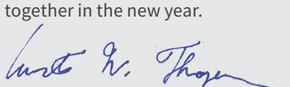
Acting to capitalize on such opportunities, the Governor created the Alaska Energy Security Task Force (Task Force) to develop a comprehensive statewide energy plan that evaluates Alaska's energy generation, distribution, and transmission. As a result of the Task Force's work in which AEA participated, 60 recommendations across six energy priority areas were identified which aim to provide a more affordable and sustainable energy future for Alaska's Coastal, Railbelt, and Rural regions.

One of the most significant developments in AEA's fiscal year 2023 was its selection by the United States Department of Energy's (DOE) Grid Deployment Office for a $206.5 million Grid Resilience and Innovation Partnership grant to advance the Railbelt Innovation Resiliency project, which seeks to modernize and upgrade Alaska's energy infrastructure. This was a highly competitive grant. Among the 700 applications and concept papers submitted, only 58 were selected, and Alaska received the fifth-highest dollar award. To utilize the funds, there must be a commitment to match 100 percent, or $206.5 million, bringing the project's total cost to $413 million. These federal funds were the result of a successful collaboration between AEA and Railbelt utilities Chugach Electric Association, Golden Valley Electric Association, Homer Electric Association, Matanuska Electric Association, and Seward Electric. Using this DOE grant funding, Alaska can leverage dollar-for-dollar matching federal investment to improve resilience and energy security, diversify its energy portfolio, and accelerate the effective future integration of renewable and clean power.

All of this can be achieved by upgrading the Railbelt's grid resilience and reliability, enabling greater access to current and future clean energy resources. AEA continues to assess the Dixon Diversion project, which would fortify Alaska's energy security by increasing overall renewable generation and mitigating exposure to fuel price volatility and supply-side disruptions. It could be operational by the end of the decade and increase the energy production capacity of the Bradley Lake Hydroelectric Project by 50 percent. In doing so the project will offset the equivalent of approximately 1.5 to 1.6 bcf/year of natural gas consumed for electricity production. An offset of this magnitude is equal to about 7.5 percent of Alaska's unmet natural gas demand projected for 2030.

Together with our partner, the Alaska Department of Transportation & Public Facilities, AEA received approval from the U.S. Federal Highway Administration for the second annual State of Alaska Electric Vehicle Implementation Infrastructure Plan. This approval unlocked an additional $11 million for electric vehicle charging stations throughout the state, complementing the $19 million already allocated for fiscal years 2022 and 2023. Utilizing these funds, AEA became the sixth state to award its first round of National Electric Vehicle Infrastructure (NEVI) Formula Program funding in support of nine projects across Alaska, allocating $8 million in NEVI funds.

AEA remains committed to ensuring access to safe, affordable, and reliable energy for Alaskans. I would like to thank Governor Dunleavy, the Alaska Congressional Delegation, and the Alaska State Legislature for their support in these endeavors. I also wish to express my appreciation to the entire AEA team, who delivered successful outcomes across Alaska. We have much to accomplish together in the new year.



Curtis W. Thayer
Executive Director

Find funding opportunities at https://www.akenergyauthority.org

In the fall of 2023, AEA was selected for a Grid Innovation and Partnership (GRIP) award of $206.5 million by the Department of Energy which will require a $206.5 million match for a total project cost of $413 million. The awarded Railbelt Innovation Resiliency project would install a new submarine high voltage direct current transmission line from the Kenai Peninsula across Cook Inlet to the existing Beluga Power Plant. This line will serve as an alternate energy pathway between the Kenai and Anchorage/ Matanuska Valley. The resilience of the electrical system will be greatly improved, increased transmission capacity will allow new renewable energy projects to be constructed and shared, and a decrease in line losses will allow more energy generated to reach consumers.

Kenai Peninsula, Alaska

OWNED ASSETS

Throughout the 1980s, AEA developed the state's energy resources to help diversify Alaska's economy and provide affordable energy to Alaskans. AEA built and owns several key pieces of Railbelt electric infrastructure — the Alaska Intertie, the Bradley Lake Hydroelectric Project, and the Sterling to Quartz Creek transmission line. These assets benefit Railbelt consumers by reducing the cost of power.

Alaska Intertie

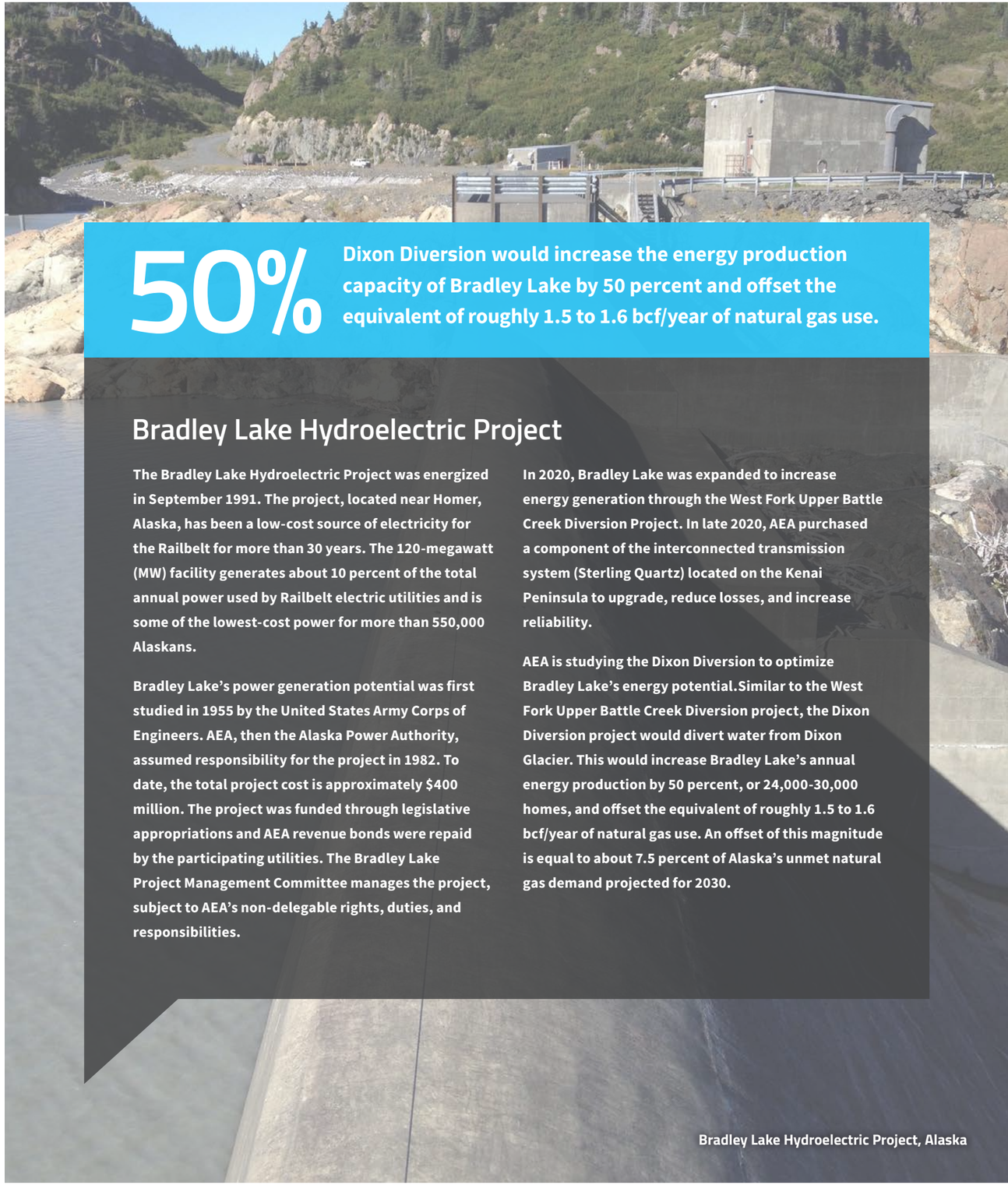
Completed in 1986, the Alaska Intertie is a 170-mile long, 345-kilovolt (kV) transmission line that stretches between Willow and Healy and operates at 138 kV. The Intertie connects Golden Valley Electric Association (GVEA), the utility that serves areas north of the Alaska Range, with Southcentral Alaska utilities. It was funded with State of Alaska appropriations totaling $124 million and has no debt service. The Intertie provides significant cost savings through the transmission of economic energy to GVEA. It delivers to GVEA its share of Bradley Lake power and enables the sharing of reserve generation capacity between the Anchorage and Fairbanks load centers.

Operation of the Intertie is governed by the Alaska Intertie Agreement signed in 1985 and amended thereafter. The parties to the agreement are AEA, Chugach Electric Association, GVEA, and Matanuska Electric Association. Each of these entities has a seat on the Intertie Management Committee (IMC), which has responsibility for managing the Intertie. Through AEA's leadership as an IMC member and with its step-in rights on financial decisions regarding the Intertie, AEA is uniquely positioned to ensure that ratepayers across the electrically interconnected Railbelt region benefit as intended under the current Alaska Intertie Agreement.

In the fiscal year 2021, the IMC created an Asset Management Plan for the Alaska Intertie. The plan includes a preventive maintenance program, multi-year projections of maintenance and repair funding, climate change considerations, and analysis of factors affecting future use. The plan incorporates and facilitates some of the major changes anticipated on the Railbelt, such as increasing renewable power generation, reducing greenhouse gas production, and participation by Independent Power Producers.

$37M

In the period 2008-2021, the Alaska Intertie saved GVEA customers an average of $37 million per year.



50%

Dixon Diversion would increase the energy production capacity of Bradley Lake by 50 percent and offset the equivalent of roughly 1.5 to 1.6 bcf/year of natural gas use.

Bradley Lake Hydroelectric Project

The Bradley Lake Hydroelectric Project was energized in September 1991. The project, located near Homer, Alaska, has been a low-cost source of electricity for the Railbelt for more than 30 years. The 120-megawatt (MW) facility generates about 10 percent of the total annual power used by Railbelt electric utilities and is some of the lowest-cost power for more than 550,000 Alaskans.

Bradley Lake's power generation potential was first studied in 1955 by the United States Army Corps of Engineers. AEA, then the Alaska Power Authority, assumed responsibility for the project in 1982. To date, the total project cost is approximately $400 million. The project was funded through legislative appropriations and AEA revenue bonds were repaid by the participating utilities. The Bradley Lake Project Management Committee manages the project, subject to AEA's non-delegable rights, duties, and responsibilities.

In 2020, Bradley Lake was expanded to increase energy generation through the West Fork Upper Battle Creek Diversion Project. In late 2020, AEA purchased a component of the interconnected transmission system (Sterling Quartz) located on the Kenai Peninsula to upgrade, reduce losses, and increase reliability.

AEA is studying the Dixon Diversion to optimize Bradley Lake's energy potential.Similar to the West Fork Upper Battle Creek Diversion project, the Dixon Diversion project would divert water from Dixon Glacier. This would increase Bradley Lake's annual energy production by 50 percent, or 24,000-30,000 homes, and offset the equivalent of roughly 1.5 to 1.6 bcf/year of natural gas use. An offset of this magnitude is equal to about 7.5 percent of Alaska's unmet natural gas demand projected for 2030.

Bradley Lake Hydroelectric Project, Alaska

RAILBELT TRANSMISSION UPGRADES

Railbelt Innovation Resiliency Project

AEA has secured $206.5 million for the Grid Resilience and Innovation Partnership through the U.S. Department of Energy's Grid Deployment Office. A cost share of 100 percent, or $206.5 million, is required for a total project amount of $413 million.

The awarded Railbelt Innovation Resiliency (RIR) project aims to enhance resiliency and transfer capability along Alaska's Railbelt, which experiences disturbances that can create problems with the connected loads or even cause the system to fail. Electrical power systems are characterized by voltage and frequency. An imbalance between generation and load causes frequency variations in a power system. To maintain optimal conditions, these two parameters must be controlled. The current Railbelt system configuration is fragile with little resilience, which restricts clean energy adoption, fuel diversification, and Alaska's preparation for a sustainable carbon-free future.

The key to achieving this objective is to reinforce interconnections between the primary regions of the Railbelt by adding parallel lines to increase resilience and implementing battery energy storage systems (BESS) to resolve long-standing frequency control and instability issues. Along with the high-voltage direct current (HVDC) submarine cable, these additions will alleviate transmission congestion and optimize interregional transfer capability. Coordinated interregional control and operations of the BESS and HVDC line will tie all the individual systems together to maximize stability and limit congestion.

The project holds the promise of also benefiting Alaska's rural communities. When energy costs decrease on the Railbelt, there is a corresponding reduction in residential rates for Alaskans who reside in remote communities that receive Power Cost Equalization funding to help pay for energy costs.

75%

The "Railbelt" refers to the interconnected electric grid that stretches approximately 700 miles from Fairbanks through Anchorage to the Kenai Peninsula. About 75 percent of Alaska's population is served by the Railbelt. As the largest electrical grid in the state, it is vital for statewide economic and community development.

REQUIRED PROJECT WORK

1. **Upgrade transmission line between Bradley Lake and Soldotna Substation**
2. **Upgrade transmission line between Soldotna Substation and Sterling Substation**
3. **Upgrade transmission line between Sterling Substation and Quartz Creek Substation**
4. **Battery Energy Storage Systems for Grid Stabilization**

Alaska Intertie, Photo by GVEA

Railbelt Transmission Line and BESS Upgrades

AEA and the Railbelt utilities in 2022 bonded $166 million for Bradley Lake Hydroelectric Project Required Project Work. Transmission line work will use 65 percent of the funds and BESS will utilize the remaining 35 percent. These enhancements will reduce line losses, increase capacity, and improve the delivery of power from Bradley Lake to Railbelt consumers. These projects will be the initial phase of some of the most significant improvements to the Railbelt electrical grid in in 30 years. Funding for the projects comes from payments by the five Railbelt utilities — Chugach Electric Association, Golden Valley Electric Association, Homer Electric Association, Matanuska Electric Association, and Seward Electric System.

Bond proceeds will be used solely to pay for transmission line upgrades and battery energy storage systems that will reduce the constraints on the Railbelt grid by improving the Kenai Peninsula's transmission capacity to export power from Bradley Lake.

Upgrades to transmission lines are more important now than ever before. A resilient Railbelt transmission system is achievable and needed to allow for better use of Bradley Lake's potential and enable increased access to current and future renewable resources.

Electricity costs for Alaska's rural residents are notably higher than for urban residents. PCE lowers rural residents' electric service costs, ensuring rural utilities' viability and the availability of reliable, centralized power.

$42M

During the fiscal year 2023, appropriations allowed for PCE payments at 100 percent resulting in approximately $42 million in program disbursements.

Nome, Alaska

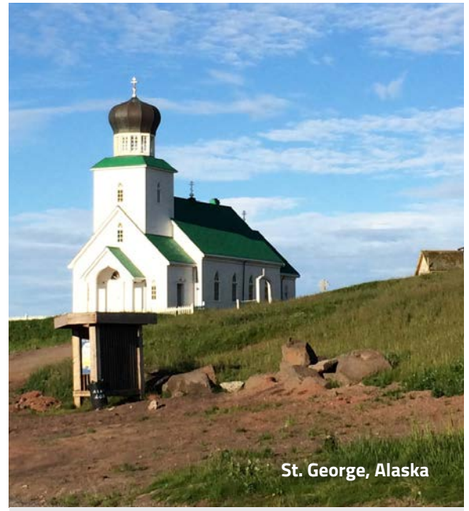
POWER COST EQUALIZATION

The Power Cost Equalization Program (PCE) was established in 1984 to lower the cost of electrical power borne by rural residents and community facilities to a level comparable to that paid by residents of Alaska's larger cities. AEA and the Regulatory Commission of Alaska (RCA) administer this program that serves over 80,000 Alaskans in 188 communities that rely primarily on diesel fuel.

The PCE program makes payments to eligible rural electric utility companies and those companies credit their residential and community facility customers with payments made through the program up to a level of consumption. Those payments result in a reduction in the unit cost of power for residential and community customers.

The pre-PCE cost of electricity in rural communities is almost always significantly more than urban electricity costs. Residential and community facility buildings in 188 communities see the benefits of PCE credits. AEA calculates the amount an eligible electric utility is due based on a filing made by the utility and issues monthly payments. PCE program staff also provide technical assistance to utility clerks who need help preparing and filing PCE reports. PCE disbursements are funded by the PCE Endowment Fund. Alaska Statute 42.45.085 provides that five percent of the PCE Endowment Fund's three-year monthly average market value may be appropriated to PCE.

In recent years, the five percent draw on the endowment fully funded PCE disbursements. Fiscal year 2018 saw the enactment of statutory changes that address how excess PCE Endowment Fund earnings are to be used. These changes allowed the endowment fund earnings to pay for PCE program administration costs fully and the earnings could also contribute $30 million to the Community Assistance Program and up to another $25 million to the Renewable Energy Fund Program, Rural Power System Upgrade projects, and the Bulk Fuel Revolving Loan fund.



St. George, Alaska

750 kWh

RESIDENTIAL

Residential customers are eligible for PCE credit up to 750 kilowatt hours (kWhs) per month.

70 kWh

PUBLIC FACILITIES

Community facilities can receive PCE credit for up to 70 kWhs per month multiplied by the number of residents.

82

ELECTRIC UTILITIES

A total of 82 rural electric utilities participate in the PCE program.

RURAL ENERGY

In rural Alaska, AEA constructs bulk fuel tank farms, diesel powerhouses, and electrical distribution grids. Through circuit rider, emergency response, and training for operators and utility managers, AEA provides the resources necessary to support the operation of these facilities.

Rural Power Systems Upgrade

Venetie, Alaska

AEA's Rural Power Systems Upgrade (RPSU) program improves power generation in small Alaska villages off the electrical grid system. The Denali Commission is AEA's major federal funding partner, which requires a state match of 50 percent for non-distressed communities or 20 percent for distressed communities. RPSU also manages Alaska's allocation through the Environmental Protection Agency's (EPA's) Diesel Emissions Reduction Act (DERA). Pending yearly funding from Congress, states can apply for DERA funds based on population. EPA's tribal DERA program also awards funds competitively nationwide. AEA uses DERA funds to replace prime-power diesel engines. AEA identifies communities for engine replacement through DERA based on current engine condition, redundancy, efficiency, and engine eligibility. In 2023, AEA oversaw the construction of three powerhouse replacement projects in Napaskiak, Rampart, and Venetie. Additional RPSU design work was completed for Manokotak and Nelson Lagoon. Engine replacement with DERA funds was completed in Akiachak (four engines). Engines were purchased and transported to Grayling (two engines). Design has started in Bettles (one engine) and Tenakee Springs (two engines).

In recent years, AEA's focus has shifted from replacing full facilities to improving operations and maintenance to maximize rural power systems' benefits. There are currently 14 active Maintenance and Improvement (M&I) projects, which target high-return investment in eligible community power systems. Projects include replacing old switchgear and control systems, maximizing heat recovery, updating engine controls to improve efficiency, and sometimes replacing diesel gensets. In 2023, 10 M&I (switchgear upgrades) projects were completed in Tenakee Springs, Kwethluk, Karluk, Chignik Bay, Atka, Ouzinkie, Unalakleet, Stevens Village, Hoonah, and Pilot Point.

AEA has started a multi-year distribution inventory and assessment to evaluate the condition of distribution systems. This will provide the same benefits as inventorying and assessing power systems and bulk fuel. The data will be accessible to any entity involved in distribution systems in the village and will be gathered organically over time. AEA employs three-dimensional (3D) imaging collected by drone, LIDAR imaging, and geographic information systems to gather measurements and process data to create, edit, and share 3D renderings of the systems. The project will establish a system that will result in a comprehensive and ongoing ranking of all distribution systems eligible for AEA support. Data will be used to inform funding agencies and select projects.

Bulk Fuel Upgrades

In rural Alaska, diesel fuel is largely used for power generation and heating, while gasoline is used for transportation. Most rural villages are located along rivers or on the coast and get their goods via barge, including heating fuel and fuel for diesel-fired electrical generators. Many bulk fuel facilities were built more than 40 years ago and are not compliant with modern regulations. Yet they remain in service until updated or replaced, posing risks to personal safety and the environment.

AEA's Bulk Fuel Upgrade (BFU) program repairs or upgrades fuel storage facilities that help lower the cost of fuel per unit by allowing the community to buy fuel in bulk quantities. In Calendar Year 2023, Nunapitchuk, Shungnak, and Venetie received commissioned tank farms. There are six full BFU projects in various stages of design and construction. In recent years, AEA has switched its emphasis from bulk fuel facility replacement to Maintenance and Improvement (M&I) projects. Currently, 15 M&I projects are planned or underway, which target high-return investment in eligible community power systems.

In addition to the normal gathering and assessment of technical data, full 3D imagery of the bulk fuel facility was captured. AEA uses 3D imaging and geographic information system software to capture imagery, collect measurements, and process data to create, edit and share 3D renderings of the systems. The project will result in a comprehensive and ongoing ranking of all facilities which will be used to inform funding agencies, and select projects. The data will also be used for construction management, operator training, and remote assistance. The 3D platform enables AEA project managers to track key project milestones and immediately assess project information. The targeted result is accelerated productivity, decision-making, and cost savings.

Rural Training and Assistance

AEA provides comprehensive technical assistance to rural utilities to ensure infrastructure lasts its full economic life, preventing catastrophic electrical emergencies, and building community self-sufficiency. This helps assure the safe, reliable operation of rural Alaska electric generation equipment in which millions of dollars are invested.

Rural Training

AEA's Rural Training program develops operators with the skills necessary to operate their energy infrastructure and keep operators compliant with current industry standards. In 2023, 34 operators from 25 communities were trained in Bulk Fuel, Person in Charge, and Power Plant Operations at the Alaska Vocational Technical Center. AEA is pioneering the use of 3D imaging coupled with data from every rural powerhouse to create new ways for operators to learn about their site's specific needs. AEA has converted some operation and maintenance manuals into electronic form that has been digitized into 3D imagery of the powerhouse. Training videos are also linked to the imagery. This allows an operator to easily find, diagnose, and fix equipment in the powerhouse.

Circuit Rider and Technical Assistance

The Circuit Rider and Technical Assistance programs provide essential assistance to reduce the number of emergency responses needed when there are power outages in rural communities with a population between 20 and 2,000. AEA's team routinely instructs rural utility operators and managers on proper operations and maintenance of their generation and distribution infrastructure. During 2023, Circuit Riders assisted eligible utilities over 250 times in providing remote monitoring, training, and technical consultation. On-site assistance and minor repairs to power systems were performed in 44 communities.

Electrical Emergency Assistance

AEA assists rural communities during extended power outages to reduce the likelihood of death and property damage. In an electrical emergency, AEA assists the utility in responding and restoring electricity transmission and generation. Financial or technical assistance, including emergency repairs, may be provided. AEA responds to a real or potential emergency before it becomes a disaster or major loss. Engines, generators, and transformers may need to be purchased and/or installed as part of an emergency response. Four emergencies were declared in 2023.

Perryville, Alaska

AEA'S CIRCUIT RIDERS SUPPORT RURAL POWERHOUSE OPERATORS

On any given day, AEA Circuit Riders respond to calls from powerhouse operators throughout rural Alaska and use 3D imagery to support, diagnose, and treat problems that arise. In December, a community contacted AEA with a high coolant temperature condition. Phone communication was not ideal. It can be easy to get confused with verbal communication, as imagery can prompt operators about valve alignment or direction on specific equipment. By having access to current imagery, many situations are clarified, preventing problematic situations from worsening. In this specific situation, AEA's Circuit Rider provided a visual of the equipment the powerhouse operator was speaking to as well as instructions regarding the proper alignment of valves, which helped the operator through the troubleshooting process.

RENEWABLE ENERGY AND ENERGY EFFICIENCY

AEA's renewable energy programs are central to Alaska's clean energy economy. The programs work with local governments, non-profits, and tribal organizations to implement new energy solutions. They also provide technical assistance, funding, and training to increase knowledge about cost-saving energy technologies.

Pillar Mountain Wind Farm, Kodiak, Alaska
*2023 Renewable Energy Fund: Impact and Evaluation Report

Biomass

Biomass heat reduces diesel fuel use, keeps the money spent on fuel (wood) within the community, and creates local jobs. AEA's biomass program has funded over 20 biomass woody biomass heating systems for schools and public buildings and provided technical support for more than 50 systems. Along with the United States Forest Service (USFS), the program has funded over 170 preliminary studies to evaluate a community's biomass potential. In 2023, AEA, working with a consultant, conducted feasibility studies in Dillingham and Glennallen, and are working on a couple more to get projects in the pipeline for development. The team applied to the USFS's Wood Innovations Grant program. In partnership with the Department of Natural Resources, AEA requested $500,000 to fund program activities involving forestry inventory updates, biomass feasibility studies, outreach and education, technical assistance, and training resources for rural communities.

Hydroelectric

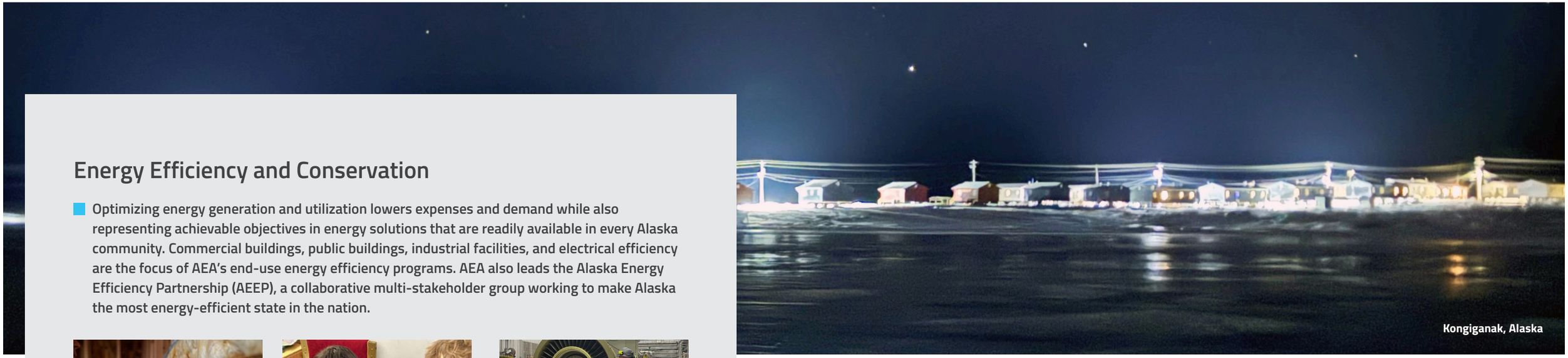
In an average water year, Alaska's principal renewable energy source, hydroelectricity, fuels more than 29 percent of the state's electrical energy. AEA supports 51 utility-scale hydroelectric projects. The majority of Alaska's existing hydro projects are located in the Southeast and Southcentral regions. Projects range from conceptual stages to operational facilities. Through its hydropower program, AEA improves the quality and efficiency of development, reducing construction costs. AEA coordinates with state, federal, municipalities, tribal entities, and private investors in analyzing, planning, and generally assisting hydroelectric project development.

Solar

Solar photovoltaic (PV) systems continue to grow in Alaska. These systems range from on- and off-grid residential to utility-scale PV. Northern latitudes often have impressive solar generation in spring and fall due to clear skies, cool temperatures, dry air, and bright, reflective snow. Solar PV systems can exceed their rated output at these times. AEA's Power Project Fund helped finance an 8.5-megawatt solar farm in Houston on the Railbelt that went online in September 2023, and Round 15 of the Renewable Energy Fund funded the construction of two solar projects in rural Alaska. In addition, AEA is a member of the National Community Solar Partnership, which shares best practices among states. Furthermore, in 2023 AEA applied to EPA's Solar for All program, which would fund a $100 million solar program in Alaska that targets low-income and disadvantaged communities if awarded.

Wind

Wind energy constitutes approximately two percent of Alaska's annual electrical generation, representing a remarkable 400 percent growth since 2012. AEA's active participation in the Alaska Wind Working Group and the 2023 Alaska Wind Workshop reflects a commitment to addressing policy issues and funding needs, as well as fostering dialogue crucial to advancing wind energy initiatives in the state. Our vast existing wind resources, onshore and offshore, underscore the need for continued development. In this year's Round 15 of the Renewable Energy Fund, over $5 million was allocated to wind and wind/solar feasibility studies or conceptual design projects, covering island microgrid applications through utility-scale wind farm exploration in the Railbelt. An additional roughly $1 million was earmarked for storage solutions to enhance existing distributed wind generation.



Kongiganak, Alaska

Energy Efficiency and Conservation

Optimizing energy generation and utilization lowers expenses and demand while also representing achievable objectives in energy solutions that are readily available in every Alaska community. Commercial buildings, public buildings, industrial facilities, and electrical efficiency are the focus of AEA's end-use energy efficiency programs. AEA also leads the Alaska Energy Efficiency Partnership (AEEP), a collaborative multi-stakeholder group working to make Alaska the most energy-efficient state in the nation.

Alaska Energy Efficiency Partnership

Each quarter, more than 50 public, private, and nonprofit organizations meet to discuss energy efficiency and conservation efforts in Alaska through AEA's energy efficiency and conservation outreach group, AEEP. Through information sharing and integrated planning, the group strives to improve Alaska's energy efficiency and conservation behaviors. In 2023, AEEP meetings continued to focus on improving efficiency. Members discussed the Inflation Reduction Act Rebate Program, decarbonization efforts, energy data collection and use, and Commercial Property Assessed Clean Energy and Resilience. Energy efficiency funding and educational opportunities were also shared.

Power Pledge Challenge

AEA partnered with AK EnergySmart for its 11th annual Power Pledge Challenge. The program educates elementary through high school students in rural and urban Alaska on energy basics. It also educates them on energy efficiency and conservation at home and at school. Schools participate in monthly challenges such as developing community energy profiles, creating energy-saving public service announcements, or calculating energy savings by switching to LEDs. More than 2,000 students in 91 classrooms in 29 schools in eight regions throughout the state were educated on energy literacy this year as part of the program. Almost twice as many students participated this year as last.

Clean Energy Olympics

AEA supported the Renewable Energy Alaska Project's fifth annual Clean Energy Olympics (CEO), a design competition that engages students in the engineering process through the lens of wind energy. In the CEO competition, teachers and coaches help students in 4th-12th grade build the best-designed model wind turbine, either individually or as a team. During competition showcases, models are scored on design performance and process. This year, 35 students on 13 teams competed in the state competition. Five teams qualified and competed at the 2023 National KidWind Challenge, held at the University of Colorado Boulder.

Village Energy Efficiency Program

The Alaska Legislature established the Village Energy Efficiency Program (VEEP) in 2010 to reduce per capita energy consumption. For several years, AEA leveraged federal State Energy Program funds to meet this mission. In 2022, AEA released a VEEP Request for Applications to fund efficiency programs. AEA, in partnership with the Denali Commission and Wells Fargo, awarded 48 communities to facilitate energy efficiency improvements throughout the state. These projects include upgrading lighting from legacy high-voltage bulbs to LED, window and garage weatherization, and upgrading HVAC systems. Despite COVID-19 setbacks and supply-chain shortages, the program is ongoing and successful, with all projects scheduled to be completed in the summer of 2024. To date, this program has collectively saved 1,189,463 kW, providing an estimated $611,498.95 in annual cost savings for the awarded communities.

Renewable Energy – Village Energy Efficiency Program

AEA's newly created Renewable Energy-Village Energy Efficiency Program (RE-VEEP) expands on VEEP. In 2023, AEA released a RE-VEEP Request for Applications to award a total of $2.6 million in sub-grants to eligible local governments within Alaska to finance building-scale renewable energy, energy efficiency, and conservation projects in public buildings and facilities located in rural Alaska. Through these types of projects, communities can reduce their energy consumption and costs.

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Sign up for AEEP news and updates at https://www.akenergyauthority.org/aeep

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Port Electrification

Alaska is taking steps to reduce its carbon footprint at its cruise ship docks through infrastructure improvements. The State of Alaska, through AEA, is undertaking a project to electrify the Whittier Deep Water Dock, in collaboration with Holland America Princess. The state cruise ship head tax will support this effort.

Port electrification projects support Alaska's clean energy economy and drive the transition towards sustainable and eco-friendly practices within the cruise ship industry, while also yielding numerous economic, environmental, and social benefits for Alaska and its communities.

Port electrification allows ships to turn off their engines, resulting in major advantages such as reducing polluting emissions that affect ports and cities and noise levels. The system can also become more cost-effective. In addition, port electrification projects aim to allow cruise ships to receive shoreside power from local Alaskan utilities and to replace traditional onboard diesel-powered generation with sustainable Alaska renewable energy resources such as hydro and clean-burning natural gas at Alaska's cruise ship docks.

By providing shoreside power to cruise ships during their time at port, these projects will significantly reduce ships' carbon footprint and greenhouse gas emissions while visiting Alaska communities.

Port of Whittier Deep Water Dock, Photo by CLIA

Benefits of Port Electrification:

1. **Environmental Impact:** Port electrification will substantially reduce greenhouse gas emissions and air pollutants, improving air quality and mitigating cruise ship operations' impact on local ecosystems. It is estimated that a cruise vessel emits more nitrogen oxides (NOx) than 10,000 vehicles in an eight-hour period.
2. **Economic Growth:** The implementation of port electrification projects will attract environmentally conscious travelers and cruise lines, enhancing Alaska's reputation as a world leader in sustainability and a sustainable tourism destination. This, in turn, will boost local tourism revenue and create job opportunities in the clean energy sector.
3. **Health and Well-being:** By reducing harmful emissions from docked ships, port electrification will contribute to local communities' health and well-being, reducing respiratory illnesses and enhancing the overall quality of life.
4. **Sustainable Cruise Industry:** Port electrification aligns with global sustainable travel trends. Alaska's shipping industry will be better positioned to attract environmentally responsible travelers and maintain a competitive edge in the changing shipping landscape.

CO_2 CO2: 3,200-3,300 Metric Tons Per Year Reduced

N_2O Criteria Emissions (NOx, SOx, CO, Particulate Matter): 93-96 Metric Tons Reduced Per Year

Visible Emissions: Eliminated Except for Engine Startup on Departure

State Energy Program: State Energy Security Profile

As part of the State Energy Program, AEA developed a State Energy Security Profile (SESP) in collaboration with a contractor and members of an advisory committee comprised of representatives from the public and private energy sectors, in compliance with the Bipartisan Infrastructure Law. The energy sector is uniquely critical as all other infrastructure sectors depend on power and/or fuel to operate. Threats to energy infrastructure can directly affect security and resilience within and across other critical infrastructure sectors — threatening public safety, the economy, and national security. Individual SESPs are essential for energy security planning.

Alaska's SESP describes the state's energy landscape, people, processes, risks, and strategies for energy resilience. As part of the SESP, Alaska will work with energy partners to secure its energy infrastructure against physical and cybersecurity threats; minimize disruptions to energy supply; enhance response to and recovery from energy disruptions; and ensure a secure, reliable, and resilient energy infrastructure for the State. After reviewing Alaska's SESP, the Department of Energy determined that it met all six elements mandated by Congress. As a result, Alaska will remain eligible for federal assistance.

Electric Vehicles

AEA is the lead agency for electric vehicle (EV) infrastructure deployment in Alaska. Following the passage of the Bipartisan Infrastructure Law (BIL), also known as the Infrastructure Investment and Jobs Act, AEA has been conducting public outreach with local agencies, utilities, and other interested parties to inform Alaska's strategic plan for deploying EV infrastructure.

Alaska Electric Vehicle Working Group

AEA leads the Alaska Electric Vehicle Working Group (AKEVWG), which is comprised of members from across the state including the Alaska Department of Transportation and Public Facilities (DOT&PF), the Alaska Electric Vehicle Association, electric utilities, EV owners, EV vendors, municipalities, prospective charging sites, site hosts, universities, and other stakeholders. The AKEVWG meets quarterly on topics such as siting charging stations, climate considerations, and power requirements for publicly accessible charging locations. In addition to quarterly meetings, the AKEVWG facilitates technical sessions and distributes monthly newsletters through its EV listserv.

Volkswagen Settlement Fund EV Project Updates

With Volkswagen Settlement Trust funds and State Energy Program funds, AEA funded the construction of an EV fast-charging corridor connecting Healy to Homer and Seward. This year, the corridor was completed. Sites, owned and operated by private hosts, were commissioned in Anchorage, Cantwell, Chugiak, Cooper Landing, Healy, Homer, Seward, Soldotna, and Trapper Creek. The network of 15 direct current fast charging and eight Level 2 chargers is fully operational and available to EV drivers, tourists, and travelers.

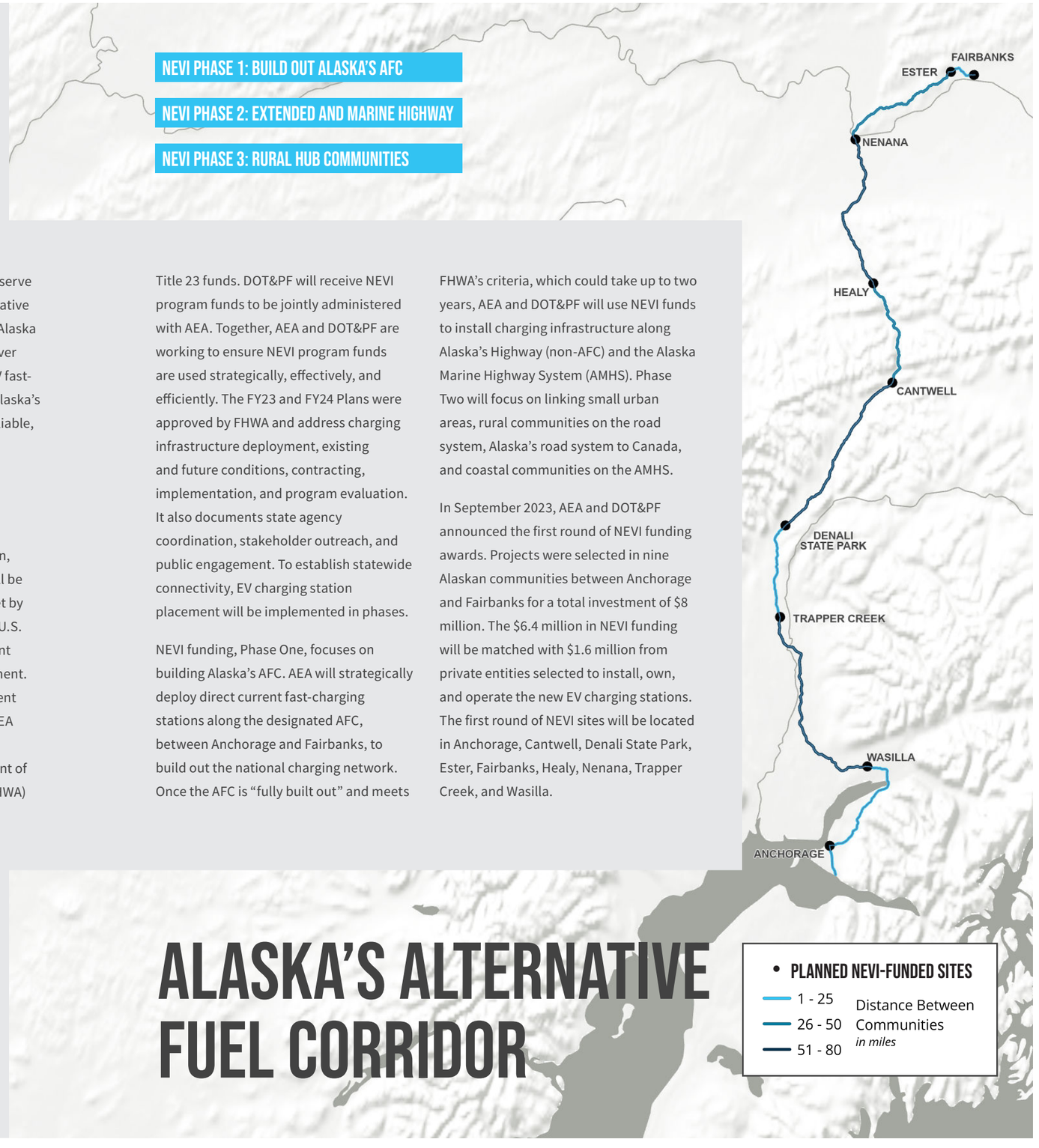
National Electric Vehicle Infrastructure Program

As part of the BIL, the NEVI Formula Program distributes $5 billion over the next five years (fiscal years 2022-2027) to state departments of transportation to build EV chargers along highway corridors to create a convenient, reliable, and affordable EV charging network nationwide. This infrastructure will serve long-distance EV travel along alternative fuel corridors (AFC). Through NEVI, Alaska will receive more than $52 million over five years to advance a statewide EV fast-charging network. NEVI will adapt Alaska's infrastructure system to support reliable, equitable, and sustainable electric transportation.

As a condition of receiving NEVI funds, Alaska is required to submit an annual NEVI implementation plan, demonstrating how the network will be completed to meet requirements set by the U.S. Department of Energy and U.S. Department of Transportation's Joint Office for EV Infrastructure Deployment. Alaska's EV Infrastructure Deployment Plan (The Plan) was developed by AEA and DOT&PF in collaboration with stakeholders. DOT&PF is the recipient of Federal Highway Administration (FHWA) Title 23 funds. DOT&PF will receive NEVI program funds to be jointly administered with AEA. Together, AEA and DOT&PF are working to ensure NEVI program funds are used strategically, effectively, and efficiently. The FY23 and FY24 Plans were approved by FHWA and address charging infrastructure deployment, existing and future conditions, contracting, implementation, and program evaluation. It also documents state agency coordination, stakeholder outreach, and public engagement. To establish statewide connectivity, EV charging station placement will be implemented in phases.

NEVI funding, Phase One, focuses on building Alaska's AFC. AEA will strategically deploy direct current fast-charging stations along the designated AFC, between Anchorage and Fairbanks, to build out the national charging network. Once the AFC is "fully built out" and meets FHWA's criteria, which could take up to two years, AEA and DOT&PF will use NEVI funds to install charging infrastructure along Alaska's Highway (non-AFC) and the Alaska Marine Highway System (AMHS). Phase Two will focus on linking small urban areas, rural communities on the road system, Alaska's road system to Canada, and coastal communities on the AMHS.

In September 2023, AEA and DOT&PF announced the first round of NEVI funding awards. Projects were selected in nine Alaskan communities between Anchorage and Fairbanks for a total investment of $8 million. The $6.4 million in NEVI funding will be matched with $1.6 million from private entities selected to install, own, and operate the new EV charging stations. The first round of NEVI sites will be located in Anchorage, Cantwell, Denali State Park, Ester, Fairbanks, Healy, Nenana, Trapper Creek, and Wasilla.



Scan to the QR Code to view the second annual State of Alaska EV Infrastructure Implementation Plan FY24

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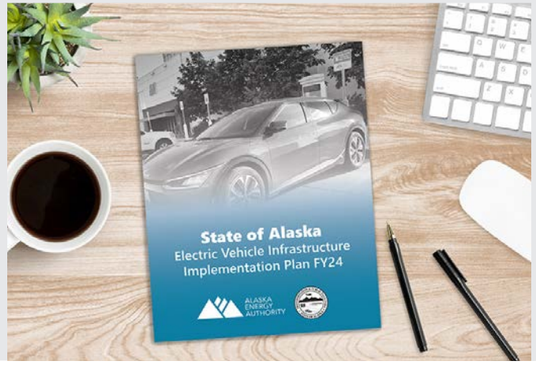

Houston Solar Farm, Houston, Alaska, Photo by CleanCapital

GRANTS AND LOANS

AEA contributes to the energy sector by administering several funding programs. In addition, AEA monitors funding opportunities through Tribal and Indian Energy loan programs and the United States Department of Energy (USDOE). AEA's strong relationship with the USDOE, awareness of funding, and technical assistance available from National Laboratories is of benefit to all Alaskans.

PPF loans debt capital at favorable rates for energy projects.

PPF financing is tailored to meet the specific needs of the borrower.

AEA engages with projects at all stages of development.

Power Project Fund

AEA administers the Power Project Fund (PPF) program for loan requests from qualified applicants seeking low-interest loans. PPF enables local utilities, local governments, or independent power producers to seek low-cost financing for the development, expansion, or upgrade of electric power facilities, including distribution, transmission, efficiency and conservation, bulk fuel storage, and waste energy. With PPF, affordable loans are available for small-scale energy projects, across all project phases, including reconnaissance and feasibility studies. Loan terms are set according to a project's useful life. Interest rates on PPF loans are formula-driven and related to the 30-year taxable municipal bond yield index, with a prevailing rate of 5.42 percent as of February 12, 2024.

In 2023, AEA closed on a $4.9 million PPF loan to Energy 49 LLC to convert 45 acres in Houston, Alaska into an 8.5-megawatt (MW)-rated photovoltaic (PV) solar array making it the largest utility-scale PV solar installation in the state. The project, developed by Energy 49 LLC, a former subsidiary of Renewable IPP, LLC, the owner and operator of the Willow solar farm, is an 8.5 MW ballasted bi-facial PV solar array capable of powering approximately 1,400 homes. Power generated at the site is sold to the Matanuska Electric Association at a cost competitive rate under a 25-year Power Purchase Agreement approved by the Regulatory Commission of Alaska. The project aims to expand renewable energy production and diversify energy resources in Southcentral Alaska. The clean energy produced by the project will reduce air quality emissions related to power generation while conserving natural gas reserves in Cook Inlet.

Renewable Energy Fund

The Renewable Energy Fund (REF) was established in 2008 to help Alaskans reduce and stabilize their energy costs through the development of viable renewable energy projects. The program seeks to produce cost-effective renewable energy for heat and power, accelerating the diversification of community generation sources, which in turn can increase resiliency and mitigate negative externalities incurred by communities whose heat and power is almost exclusively powered via diesel fuel.

In recognition of REF's past and future impact in promoting the study, development, and integration of renewable energy technologies within Alaska's statewide energy portfolio, when House Bill 62 was passed by the Legislature in May 2023, and Governor Mike Dunleavy signed the bill into law, REF's sunset provision was repealed from statute, ensuring it is extended into perpetuity. REF's extension into perpetuity also demonstrates REF's efficacy in supporting the Governor's energy policy priorities, including the continued diversification of power generation resources through the harnessing of Alaska's vast renewable resources, improving the resilience of electrical infrastructure statewide, reducing the cost of energy, and enhancing energy security.

To date, REF has made 289 grants to develop or construct renewable energy projects statewide. There are now over 100 operating projects built with REF contributions. In the fiscal year 2023, AEA solicited applications for REF Round 15. In consultation with the Renewable Energy Fund Advisory Committee (REFAC), AEA recommended 27 projects for funding, with a total grant request of $25.25 million. In June 2023, with the passage of House Bill 39, the Legislature appropriated and the Governor approved $17 million in support of 18 of the 27 recommended REF projects. In AEA's January 2024 consultation with REFAC for Round 16, 24 projects were forwarded to the Legislature and recommended for funding consideration in the fiscal year 2025.

85M

REF has displaced approximately 85 million gallons of diesel and 2.2 million cubic feet of natural gas since its inception.

2023 REF Impact and Evaluation Report
https://www.akenergyauthority.org/ref

In 2023, AEA commissioned an independent impact evaluation and report on the REF Program.

Analysis was conducted by BW Research Partnership, a third-party research consultancy. The report found that REF has catalyzed renewable energy growth in Alaska and continues to help the state meet its clean energy goals and priorities. Additionally, REF has helped local communities stabilize energy prices by reducing diesel fuel dependence for power generation and heating needs. Since REF's inception, projects funded through the program have displaced approximately 85 million gallons of diesel and 2.2 million cubic feet of natural gas. REF has also successfully mitigated the emission of 1.1 million gross metric tons of carbon dioxide, and yielded more than $29 million dollars in avoided costs of PM2.5 pollutants. The report also finds that the REF program has made a significant contribution to Alaska's overall economy including job creation, $237 million in labor income, and $399 million in value added. Every dollar deployed through the REF program to date has resulted in $2.07 in benefits returned to residents and the economy.

FY2023 FINANCIAL HIGHLIGHTS

STATEMENTS OF NET POSITION	June 30, 2023	June 30, 2022
Assets:		
Restricted Investment securities and cash	1,226,790	1,048,505
Loans, net	26,459	27,058
Capital assets, net	375,794	385,307
Receivables and other assets	8,068	5,634
Total assets	1,637,111	1,466,504
Liabilities and net position:		
Liabilities		
Bonds payable	204,032	45,925
Other bond liabilities	–	56
Payables and other liabilities	51,145	46,646
Total liabilities	255,177	92,627
Net Position	1,381,934	1,373,877
Total liabilities and net position	1,637,111	1,466,504

REVENUES, EXPENSES, AND CHANGES IN NET POSITION	June 30, 2023	June 30, 2022
Operating revenues:		
Federal grants	10,179	8,575
Revenue from operating plants	27,461	22,657
State operating and capital revenues	23,704	3,922
Interest on loans	280	329
Other operating revenues	852	5,008
Total operating revenues	62,476	40,501

REVENUES, EXPENSES, AND CHANGES IN NET POSITION (CONT)	June 30, 2023	June 30, 2022
Operating expenses:		
Grants and projects	26,163	18,238
Power cost equalization grants	42,332	24,222
Plant operating	9,746	7,834
General and administrative	6,707	6,319
Provision for loan recovery	–	–
Depreciation	11,698	12,305
State of Alaska appropriations and transfers	–	–
Other project expense	–	–
Total operating expense	96,646	68,918
Operating loss	(34,170)	(37,765)
Investment income (loss), net	94,280	(144,109)
Interest expense	(6,653)	(1,568)
State of Alaska reappropriations and transfers	(45,000)	(12,395)
Capital contributions	–	–
Loss on disposal of asset	(400)	–
Increase (decrease) in net position	8,057*	(195,837)**

NOTES REGARDING INCREASE (DECREASE) IN NET POSITION

*Net position increased primarily due to unrealized investment gains in the Power Cost Equalization (PCE) Endowment Fund of ($5,900) and from the Bradley Lake Hydroelectric Project bond issuance of ($2,500). Other contributing factors included an overall decrease of ($326) from reduced Trans-Alaska Pipeline Liability Fund revenues.

**Net position decreased primarily due to unrealized investment losses in the PCE Endowment fund of ($143,842) and other funds ($267). Other contributing factors to the overall decrease were net operating losses ($39,299) and ($12,395) of net contributions made to the State of Alaska.

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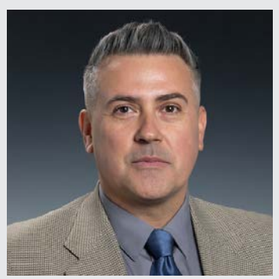

ROBERT HAWKINS
Information Technology Director

TIM SANDSTROM
Chief Operating Officer

KAREN TURNER
Human Resources Director

Alaska Energy Authority
813 W Northern Lights Blvd.
Phone: (907) 771-3000
Fax: (907) 771-3300
E-mail: info@akenergyauthority.org

www.akenergyauthority.org

@alaskaenergyauthority

@alaskaenergyauthority