



ALASKA ENERGY AUTHORITY

2018 REPORT TO ALASKANS



LETTER FROM THE BOARD CHAIR

March 1, 2019

To the Alaska State Legislature:

The Alaska State Legislature created the Alaska Energy Authority in 1976 to build, finance, and assist with ongoing operations of energy projects throughout Alaska. Since then, the work of AEA's dedicated team has resulted in a reduced cost of energy for Alaskans in communities both large and small. AEA's mission to reduce the cost of energy and their work to build safe, reliable and affordable energy systems is of critical importance. Safe, reliable and affordable energy is the cornerstone of local community self-sufficiency and sustainability. It would be hard to find another State entity with such a high caliber of technical expertise and practical experience for managing the energy projects and programs that collectively build the foundation for strong local economies and communities. AEA is relevant, serves a critical mission, and will continue to play a valuable role in Alaska's future.

AEA's work brings benefit to nearly every community in the state. For instance, the Power Cost Equalization program reduces the cost of energy for ratepayers in 195 rural communities. AEA owns the Bradley Lake Hydroelectric project, which produces some of the lowest cost energy in the region and is currently going through a \$47 million upgrade. The West Fork Upper Battle Creek Diversion project, which broke ground in FY2018 and will be completed in summer 2020, will add ten percent more of this low-cost, stably priced and long-term energy from the state's Bradley Hydro investment. The 170-mile AEA-owned Alaska Intertie – stretching between Willow and Healy – connects interior Alaska with this low cost energy, and improves reliability within the whole system. Finally, Rural Power System Upgrade (RPSU) projects, Bulk Fuel Tank Farm Upgrade (BFU) projects, and Renewable Energy Fund (REF) projects have collectively leveraged hundreds of millions of federal and private funding for the construction of statewide energy infrastructure and long-term protection of these investments. Not only do these projects improve community energy sustainability, every project built and maintained through AEA's technical and financial assistance supports crucial economic activity around the state.

I am honored to serve as Chairman of the AEA Board. The organization's mission is of critical importance as Alaska enters into a new era. The availability of and consumer confidence in safe, reliable and affordable energy in communities across the state will provide the sturdy foundation on which Alaska's future can grow, and through which Alaska can truly be open for business.

Sincerely,



Dana Pruhs
Board Chair

LETTER FROM THE EXECUTIVE DIRECTOR

March 1, 2019

To the Alaska State Legislature:

For more than 40 years, the Alaska Energy Authority (AEA) has reduced the cost of energy in Alaska through a diverse portfolio of projects and initiatives that improve energy safety, reliability, and affordability.

In the Railbelt, AEA oversees State-owned energy generation and transmission investments. Bradley Lake Hydro and the Alaska Intertie are assets that have reduced the cost of energy to ratepayers from Fairbanks to Homer for decades. AEA works alongside all six Railbelt utilities to ensure these assets are managed for the greatest possible benefit to utility members throughout the whole system and with a long-term view in mind. In 2018, we broke ground on the West Fork Upper Battle Creek Diversion Project, which will ultimately increase Bradley Lake Hydro energy by 10%. That translates to enough electricity to power about 5,000 homes at one of the lowest rates in the region. The AEA-owned Alaska Intertie – 170 miles of transmission line from Willow to Healy – allows ratepayers in the interior to also benefit from the low cost of Bradley Hydroelectric power, and customers region-wide benefit from the added reliability of a fully connected system.

AEA's primary energy cost reduction program in rural Alaska is Power Cost Equalization (PCE). Serving 195 communities, PCE has helped bring stability and reliability to energy costs in communities where there have historically been limited alternatives for otherwise reducing energy costs. Over the last five years, rural Alaskans have saved \$160.2 million because of the State's investment in PCE. Complementing PCE, AEA has programs to maximize efficiencies in rural power systems, which has the dual benefits of reducing PCE program costs and boosting the longevity and robustness of energy infrastructure. AEA provides critical utility support to nearly two hundred rural communities. In 2018 alone, AEA assisted 78 communities through the circuit rider and rural utility worker programs; assisted six rural communities with electrical emergencies, trained representatives from 40 communities, and worked on Rural Power System Upgrade projects in 12 communities as well as Bulk Fuel Tank Farm Upgrade projects in seven communities.

Additionally, AEA's investments in renewable energy across the state reduces communities' fuel costs and helps to create more resilient energy systems. The Renewable Energy Fund has led to 73 operational projects around the state with 56 more projects expected to come online in the near future. That equates to more than \$74 million annually in savings from offset fuels.

Over recent years, AEA has put concerted effort into developing new models for providing critical projects and core services in ways that support long-term community sustainability and self-sufficiency while also decreasing the state's cost burden. This approach involves the integration of training, utility assistance, strategic planning and project funding activities, aims to ensure a full economic life from energy infrastructure, and puts great emphasis on leveraging federal and non-State dollars. AEA serves the people of Alaska, bringing energy safety, reliability and affordability to Alaska's communities.

Sincerely,



Curtis W. Thayer
Executive Director

UNAUDITED FINANCIAL HIGHLIGHTS (in thousands)

BALANCE SHEETS	June 30, 2018	June 30, 2017
Assets:		
Restricted Investment securities and cash	1,212,214	1,157,603
Loans, net	17,968	11,283
Capital assets, net	369,188	374,937
Receivables and other assets	5,766	7,244
Total Assets	1,605,136	1,551,067
Liabilities and net position:		
Liabilities		
Bonds payable	85,179	53,495
Other bond liabilities	1,256	1,533
Payables and other liabilities	29,774	34,829
Total liabilities	116,209	89,857
Net position	1,488,927	1,461,210
Total liabilities and net position	1,605,136	1,551,067

For AEA's complete
FY2018 Audited
Financial Statements,
go to
akenergyauthority.org
or call 907.771.3000

REVENUES, EXPENSES AND CHANGES IN NET POSITION		
Operating revenues:		
Federal grants	3,505	5,992
Revenue from operating plants	21,482	18,698
State operating and capital revenues	16,063	25,419
Interest on loans	296	292
Other operating revenues	144	22
Total operating revenues	41,490	50,423
Operating Expenses:		
Grants and projects	30,496	36,776
Power cost equalization grants	26,196	25,853
Interest expense	2,371	2,652
Plant operating	6,772	4,330
General and administrative	4,454	4,703
Provision for loan losses	15	154
Loss on disposal of asset	(51)	-
Depreciation	15,594	10,809
Other project expenses	-	-
Total operating expenses	85,847	85,277
Operating loss	(44,357)	(34,854)
Investment Income, net	79,345	114,443
State of Alaska reappropriations and transfers	(10,067)	(13,556)
Capital contributions	2,796	-
	-	-
Increase (decrease) in net position	27,717	66,033

ALASKA ENERGY AUTHORITY



AEA's **mission** is to reduce the cost of energy in Alaska. AEA's **work** is the delivery of core services and critical projects for improving energy safety, reliability and affordability.



AEA has positive **impact** in nearly every community and for ratepayers across Alaska.

serving
more than
40
years

AEA was established in 1976 as an independent and public corporation of the State of Alaska with the explicit purpose of assisting with the development, operations and financing of **energy projects** around the state.

2018 IMPACT SUMMARY

Number of Railbelt homes powered by Bradley Lake Hydroelectric Project	56,000
Number of rural Alaska communities assisted with utility operations and where no electrical emergency occurred	72
Number of communities in which energy infrastructure work was ongoing or completed	56
Millions of diesel equivalent gallons displaced by the 73 Operational Renewable Energy Fund projects	30.4
Millions of dollars saved by Golden Valley Electric Association members because of the cheaper power transmitted from Southcentral generation facilities by the Alaska Intertie	27.4
Millions of dollars saved in reduced energy bills in total by about 83,000 rural Alaskans due to Power Cost Equalization	24.1
Millions of dollars saved over the debt payment period for the Battle Creek project due to low cost interest subsidies accessed by AEA that are available only to a government entity	18
Millions of federal dollars leveraged	9.7
Number of communities that experienced and which AEA responded to an electrical emergency	6

BRADLEY LAKE HYDRO

The Bradley Lake Hydroelectric Project is located 27 air miles northeast of Homer on the Kenai Peninsula and has 120 MW of installed capacity. The project consists of a 125-foot high, concrete-faced, rock-filled dam structure; three diversion structures; a 3.5-mile long power tunnel and vertical shaft; generating plant; interior substation; 20 miles of transmission line; and a substation. The power generation potential of Bradley Lake was first studied by the U.S. Corps of Engineers in 1955. AEA, then the Alaska Power Authority, assumed responsibility for the project in 1982. The project was declared in commercial operation on Sept. 1, 1991 and has been producing power since. Total project costs, including major capital improvements as of June 30, 2015, are \$328 million.

The project was funded through legislative appropriations and AEA revenue bonds that are being repaid by the participating utilities. Bonds are expected to be retired in July 2020, after which the participating utilities will be obligated to pay AEA up to \$12.5 million annually for deposit into the Railbelt Energy Fund. The Bradley Lake Project Management Committee (BPMC) generally manages the project, subject to AEA's non-delegable rights, duties and responsibilities.

In FY2018, financing was secured for and construction began on the West Fork Upper Battle Creek (WFUBC) diversion project, which will increase the amount of clean, low cost energy from Bradley Lake by about 10%, or 37,000MWh – enough to keep the lights on in a Homer sized community for a year. AEA performed an Invitation To Bid for the project and received six bids in November 2017. The lowest response bid was \$36.5m by Orion Marine Construction. Financing was secured in December 2017 with low cost interest subsidies available only to a government entity, which is anticipated to save approximately \$18m over the debt payment period. The Contractor mobilized to Bradley Lake Hydroelectric Project in April 2018 and started construction activities for the Diversion Project. The project will be completed in 2020.



601,000 Alaskans benefit from the stable, low price power from Bradley Lake: 518,000 directly through use of this power, and 83,000 indirectly through PCE payments that are in part determined by the cost of power in the Railbelt

ALASKA INTERTIE

The Alaska Intertie transmission line is a 170-mile long, 345 kV transmission line between Willow and Healy that is owned by AEA and operates at 138 kV. The Intertie interconnects Golden Valley Electric Association (GVEA), the utility that serves areas north of the Alaska Range, with Southcentral Alaska utilities. Although the Alaska Intertie allows resources north and south of the range to be shared to improve reliability, the GVEA storage battery and generation resources have been used to send emergency power south to minimize catastrophic network-wide outages.

Constructed in the mid-1980s with \$124 million in State of Alaska appropriations, this AEA-owned asset is associated with no debt. There are significant cost savings resulting from the exchange of economy energy and sharing of reserve generation capacity between the Anchorage and Fairbanks load centers. GVEA ratepayers achieved savings in excess of \$27 million in 2018.

The operation of the Intertie is governed by the Alaska Intertie Agreement entered into in 1985, amended in 1991 and again in 2011. The parties to this agreement are AEA, GVEA, Municipal Light & Power, Chugach Electric and Matanuska Electric Association. Each of these entities also has a seat on the Intertie Management Committee (IMC), the entity with the responsibility for operating and managing the Alaska Intertie.

Through AEA's leadership role as an IMC member and the only participating member with step-in rights on financial decisions regarding the intertie, AEA is uniquely positioned to ensure that ratepayers for the entire electrically interconnected Railbelt region are treated similarly, without regard to a specific utility's individual service territory.



POWER COST EQUALIZATION

The Power Cost Equalization (PCE) payments reduce the unit cost of power to residential and community customers of eligible utilities. The pre-PCE the cost of electricity in rural communities can be three to five times higher than for customers in more urban areas of the state. The program's purpose is to equalize power costs to near the average cost of power in Anchorage, Fairbanks and Juneau. The Alaska Energy Authority calculates and issues the annual payments, and provides technical assistance to utility clerks who need help preparing PCE reports. Residential and community facility buildings in nearly 200 communities are eligible for the reduced rate.

The PCE program is funded by earnings of the PCE Endowment Fund. AS 42.45.085 provides that five percent of the PCE Endowment Fund's three-year monthly average market value may be appropriated to the PCE program. It has only been in recent years that the five-percent draw on the endowment has been sufficient to fully fund PCE payments. Additionally, because of recent statutory changes made regarding how excess PCE earnings are used, in FY2018 the PCE Endowment fully funded program administrative costs, contributed \$30 million to local governments through the state's community assistance program, and also provided \$25 million total for a combination of Renewable Energy Fund and Rural Power System Upgrade projects.

In response to concerns raised by rural utilities about the need for faster payment processing and more simplified reporting, in FY2018 AEA developed an on-line PCE reporting portal. The new portal will be beta tested in early FY2019 and a three-phased launch is expected later in FY2019. This new tool will be an option for utilities – it will not be mandatory. The PCE Web Portal will allow utilities to submit monthly reports directly to a form on the web. Benefits of the portal include easier submission of the PCE reports, savings on postage, a faster turnaround for payment, and convenient access to historic Utility Monthly Reports (UMR's) in digital form.

195
COMMUNITIES



91 ELECTRIC
UTILITIES



83,000
ALASKANS



RURAL UTILITY ASSISTANCE

AEA provides soup to nuts technical assistance to rural utilities with the primary objectives of ensuring infrastructure lasts its full economic life, preventing catastrophic electrical emergencies, and building community self-sufficiency. In FY2018, with grant funding from USDA, AEA initiated utility business management assistance. This addition to AEA's utility technical assistance portfolio is the final piece in a comprehensive package intended to improve efficacy within the rural utility assistance program.

AEA's Circuit Rider program assisted 103 eligible utilities in FY2018 by providing remote monitoring, training, technical consultation, on-site assistance, and minor repairs to their power systems. The Circuit Rider and Technical Assistance programs provide essential preventative assistance to reduce the number of emergency responses that are needed due to power outages in communities.

103

Communities
received
assistance

AEA's Rural Training Program trains community operators with the skills to operate their energy infrastructure, helping utilities keep their facilities code-compliant and managed sustainably. In FY2018, 42 operators from 30 communities completed training in Bulk Fuel Operations, Power Plant Operations, and Advanced Power Plant Operations in AEA's training courses at AVTEC. An additional 26 students from eight communities received on-site itinerant training in bulk fuel operations.

38

Communities
received
training

AEA provides power-related emergency assistance services to rural Alaska communities as required by AS 42.45.900 and 3 ACC 108. Electrical emergency assistance, provided when there is risk to life or property due to power failure, was provided to six communities during FY2018: Akhiok, Arctic Village, Chefnak, Hughes, Kwethluk, and Netwok.

6

Communities
assisted with
electrical
emergencies

"There was a lot of concern in the community regarding everyone's freezers being off for extended time – had AEA not been able to respond so quickly there would definitely have been issues with food spoiling. On behalf of Hughes and Tanana Chiefs Conference, we greatly appreciate AEA's support."

-TCC Rural Energy Coordinator, May 2018



Hughes powerhouse operator during May 2018 electrical emergency

RURAL BULK FUEL UPGRADES

Rural Alaska is energized primarily by liquid fuels: diesel for power generation and heating, and gasoline for transportation. Rural villages are located either along rivers or on the coast, so fuel is primarily delivered by barge. Delivery is seasonal and limited by sea or river ice, water levels, or ice road availability. Villages of a few hundred people must store hundreds of thousands of gallons of fuel to meet their annual energy needs.

Many of rural Alaska's bulk fuel facilities were built in the 1950-60s. They were not built to national standards or in compliance with current regulations, and some of them are at the end of their useful lives. Yet they continue in service until upgraded or replaced, in some cases posing risks to personal safety and the surrounding environment.

AEA's Bulk Fuel Upgrade (BFU) program builds and repairs code-compliant fuel storage facilities in Alaska communities under 2,000 people. These facilities help decrease the per-unit cost of fuel by allowing the community to purchase in bulk quantities. Moreover, the facilities protect local public health and the environment by preventing spills and contamination. In the two decades, AEA has performed 118 bulk fuel upgrades, and another 5 are currently in design or construction.

In FY2018, AEA completed four Bulk Fuel Upgrade (BFU) projects, in Kake, Shishmaref, Edna Bay, and Port Alsworth. Additional BFU design and construction work was done in the following communities: Kasaan, Kipnuk, Holy Cross, Mertarvik, Tatitlek, and Tuluksak.

118

BFU projects
completed since 2000

\$122 MM

Federal dollars leveraged
since 2001

2

Average number of
times/year rural
communities buy fuel



Kipnuk Bulk Fuel Tanks

RURAL POWER SYSTEM UPGRADES

AEA's Rural Power Systems Upgrade (RPSU) program builds and retrofits code-compliant facilities in communities of less than 2,000 people, providing stable and reliable power. Generally, the efficiency improvement in diesel generation is between 10 and 20 percent, with some improvements as high as or even exceeding 30 percent. Upgrades may include efficiency improvements, power house upgrades or replacements, line assessments, demand-side improvements, heat recovery and repairs to generation and distribution systems. The Denali Commission is AEA's federal funding partner, which requires a state match of 50 percent or 20 percent for nondistressed or distressed communities, respectively.

Working in concert with the RPSU program, AEA also manages the State'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. In addition to the state program, EPA also a tribal DERA program that awards funds competitively nationwide. The State of Alaska, through AEA, uses DERA funds exclusively to replace prime power diesel engines in rural Alaska. AEA selects communities for engine replacement through the DERA program based on current engine condition, redundancy, efficiency and engine eligibility.

In FY2018, AEA completed five RPSU projects, in Kake, Nunam Iqua, Kongiganak, Kwigillingok, and Port Alsworth. Additional RPSU design and construction work, including engine replacement with DERA funds, was done in the following communities: Akhoiak, Beaver, Circle, Chignik Lake, Clarks Point, Kipnuk, Mertarvik, Port Heiden, Stevens, Takotna, Tuluksak, and Twin Hills.



Kipnuk powerhouse

86
RPSU projects
completed since 2000

\$98 M
Federal dollars
leveraged since 2001

15%
Average efficiency
improvement

RENEWABLE ENERGY FUND

The Renewable Energy Fund (REF) has funded 287 grants to assess, develop and/or construct renewable energy projects statewide. There are now 73 operating projects built with contributions from the Renewable Energy Fund, collectively saving more than 30 million diesel equivalent gallons each year. Annual renewable energy generation grows each year as more REF funded projects progress through the construction phase and become operational.

Between 2008 and 2015 the legislature appropriated \$257 million to the REF. In 2018, excess earnings from the Power Cost Equalization (PCE) fund were available to fund the Community Assistance Program (\$30 million), the Rural Power System Upgrade (RPSU) program (\$11 million) and the Renewable Energy Fund (\$11 million). The \$11 million appropriated to REF went to fund eight projects which had been previously recommended for funding: Chitina hydro construction, Wales heat recovery design and construction, Adak hydro feasibility, Koyuk heat recovery design, Shishmaref wind feasibility and design, Seward heat pump design and construction, Kake hydro construction, and a Mt. Village to St. Mary's intertie design and construction.

56

REF projects in the
pipeline

73

Operational
REF projects

\$74 M

Annual savings from
displaced diesel



Unalakleet

POWER PROJECT FUND LOANS

The Power Project Fund (PPF) loan program provides loans to local utilities, local governments or independent power producers for the development, expansion or upgrade of power facilities, including distribution, transmission, efficiency and conservation, bulk fuel storage and heat recovery. The loan term is related to the productive life of the project, but cannot exceed 50 years. Interest rates vary between a tax-exempt rate at the high end and zero on the low end. The tax-exempt rate is equal to the average weekly yield of municipal bonds for the 12 months preceding the date of the loan application. As of December 10, 2018 the rate was 4.04 percent. The interest rate can be adjusted downward in certain circumstances to improve financial feasibility. Loan requests of more than \$5 million require legislative authorization to apply.

In FY2018, AEA closed three PPF loans totaling \$818,000 to complete construction funding for two diesel powerhouse improvement projects (Koliganek and Port Alswarth) and one biomass project (Tanacross). Total committed funds as of 6/30/18 were \$9,787,223 with \$18,136,985 in outstanding loans. Three projects that received PPF loans completed construction in FY2018 are: 1) King Cove's Waterfall Creek hydro project was funded by a combination of an AEA REF grant, PPF loan and Alaska Municipal Bond Bank funds; 2) Venetie completed improvements to their diesel powerhouse; and 3) Newtok completed improvements to their diesel powerhouse. AEA expects demand for the loan program to continue to grow.



Waterfall Creek Hydro, King Cove

17

Active loans
in FY2018

6

Communities financed
projects with PPF in '18

7.3 M

Funds disbursed to
construct projects in '18

ALTERNATIVE ENERGY & ENERGY EFFICIENCY

The alternative energy and energy efficiency programs have increased statewide knowledge and capacity around installation and operation of cost-effective efficiency projects and renewable systems by providing technical workshops, hands-on and online training, and technical assistance. Through strategic program development, stakeholder engagement, and policy analysis AEA is helping to build the renewable energy and energy efficiency markets, driving growth in the private sector.

Energy efficiency is a low-cost energy solution that is both quick to deploy and available in every community in the state. The Energy Efficiency program at AEA leverages federal State Energy Program (SEP) formula funds and has three primary components: (1) The Village Energy Efficiency Program (VEEP) provides grants to improve efficiency in public and community facilities in rural communities with high energy costs; (2) Alaska Energy Efficiency Partnership, a working group of more than 50 public, private, and non-profit organizations; (3) The development of financing markets and mechanisms to use an increasingly larger share of private dollars to complete efficiency statewide (e.g. Commercial Property Assessed Clean Energy, or C-PACE).



Since 2012, Alaska's **wind** energy installed capacity has grown from 15.3 megawatts to 64.1 megawatts. This development has been strongly supported through AEA's wind program and the Renewable Energy Fund. The Wind Program also supports the Alaska Wind Working Group and the formation of the Wind Advisory Group, AEA-led groups that meet regularly to discuss funding and policy changes needed to advance the industry in Alaska. AEA's wind program also provides technical assistance to communities interested in evaluating their wind energy potential.



Alaska Energy Authority's **biomass** program has provided funding for 20 operating woody biomass heating systems for schools and public buildings which reduces diesel fuel use and keeps money for fuel (wood) within the community. Along with the U.S. Forest Service, the program has provided funding for over 150 pre-feasibility studies to evaluate a community's biomass potential and develop sustainable harvest plans. Biomass use in lieu of diesel is reducing diesel fuel consumption and creating local jobs.



AEA's **hydroelectric** program owns or assists approximately 70 projects throughout the state. Projects range from concepts to operational hydroelectric facilities. The hydro program is currently focused on improving efficiency and quality in development, lowering the cost of construction, and coordinating with other State agencies, federal agencies, municipalities, tribal entities, and private investors in analyzing, planning, and generally assisting hydroelectric development.



PROJECT DEVELOPMENT & FINANCE

In light of a reduction in both State and federal grant funding for energy projects, AEA is focused on providing technical assistance and tools to assist communities in the transition from grant funded energy infrastructure to a more debt financed future. Support for community energy project development and finance covers the spectrum from identification and evaluation of cost-effective resource and technology options, assistance connecting with appropriate grant and funding options, to training and support for operations and maintenance to ensure that infrastructure lasts its full economic life.

The project development and finance group at AEA provides direct assistance to communities to help them move to a financially sustainable energy system with reduced or no grant funded assets. AEA works with utilities and project developers to bring good, well-vetted, and cost-effective projects to the point of financing. Acting as a liaison between communities and AEA's technical staff, the project development team identifies the resources needed to provide technical assistance and general technology-specific troubleshooting. To assist communities more readily, this group tracks potential funding opportunities (e.g. federal and private grants and loans) and works to put those funds to work in Alaska.

While the need for community energy funding remains relatively constant, the availability of public funding to help meet that need is decreasing. Integrating all aspects of work within AEA's portfolio, AEA's project development and finance team is working to encourage private sector investment, prepare communities and utilities for using debt financing to implement projects, and facilitate technical assistance through the project lifecycle, from selection through final construction and ongoing operations. AEA is helping Alaska communities transition to a more dynamic project funding paradigm that, by doing so, will continue to build self-reliance and energy system sustainability into the future.



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Front cover: photo of the West Fork Upper Battle Creek Diversion Project construction activities in the foreground, Bradley Lake Hydroelectric Project in the background.
Photo taken summer 2018.