

ALASKA ENERGY AUTHORITY

ADVANCING ALASKA'S ENERGY FUTURE

Curtis W. Thayer
Executive Director

Resource Development Council
April 17, 2025



About AEA

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



Railbelt Energy (Owned Assets)

- Bradley Lake Hydroelectric Project
- Alaska Intertie
- Sterling to Quartz Creek Transmission Line
- High-Voltage Direct Current Transmission Line

Power Cost Equalization

- \$48 Million Program
- 188 Rural Communities
- 82 Electric Utilities
- 82,000+ Alaskans

Rural Energy

- Bulk Fuel Upgrades
- Rural Power System Upgrades
- Circuit Rider Program
- Electrical Emergency Assistance

Renewable Energy and Energy Efficiency

- Renewable projects: biomass, electric vehicles, hydroelectric, solar, and wind
- Federal programs: NEVI, Solar for All, and Home Energy and High Efficiency Rebate Allocations

Grants and Loans

- Renewable Energy Fund
- Power Project Fund

Energy Planning

- Alaska Energy Security Task Force
- State Energy Security Profile
- Electronic Library
- Energy Data Resources
- 40101(d) Grid Resilience Program

Railbelt Transmission Organization

AEA Board of Directors



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Chair
Utility – Not Interconnected



Duff Mitchell

Vice Chair
Financial Expertise in Large Power
Generation



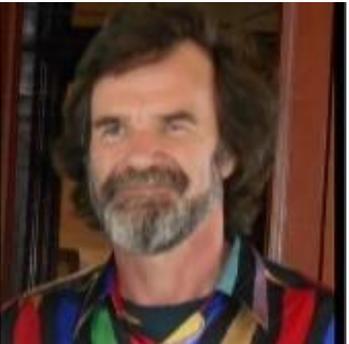
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Expertise in Engineering



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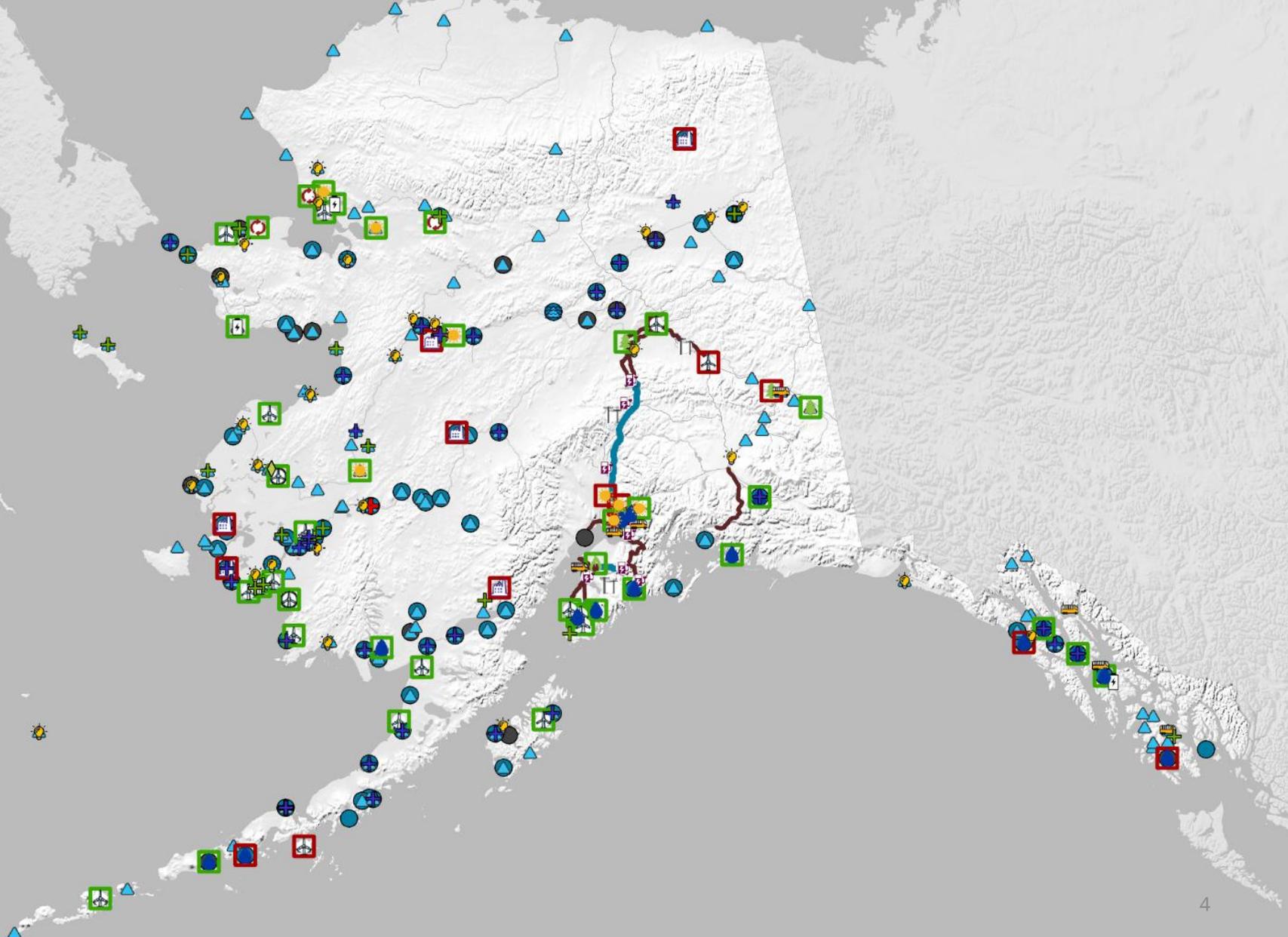


Robert Siedman

Board Member
Municipal Utility – Off Road System

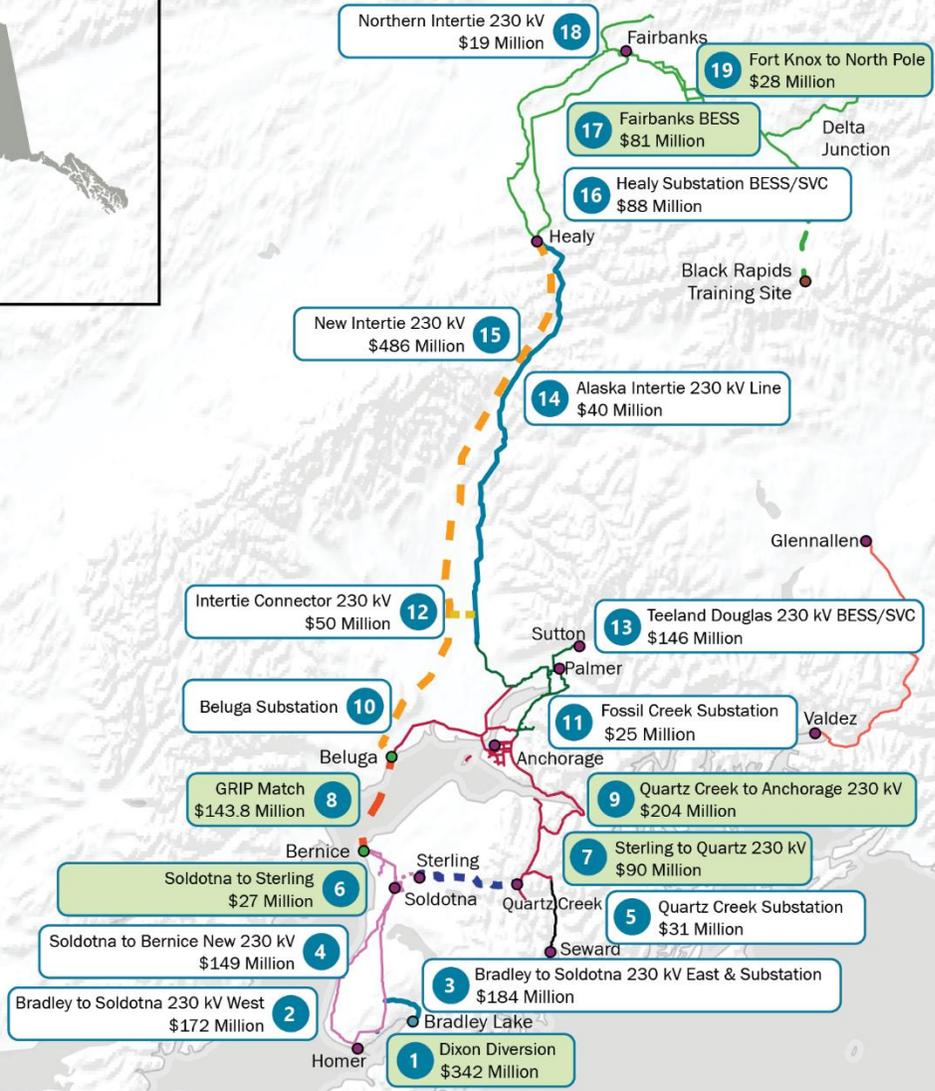
AEA Active Projects and Services

- 🌱 Biogas (1)
- 🌳 Biomass (4)
- ⊕ Bulk Fuel Upgrades (25)
- 🏠 Diesel (6)
- 🚗 Electric Vehicles (9)
- 💡 Emerging Energy Technology Fund (1)
- 🔥 Heat Recovery (3)
- 💧 Hydroelectric (18)
- 🌊 Hydrokinetic (1)
- ⊕ Rural Power System Upgrades (33)
- ☀️ Solar (8)
- 🔋 Storage (3)
- 🏗️ Transmission (3)
- 💡 Village Energy Efficiency Program (27)
- 🚗 Volkswagen Diesel Settlement Grants (7)
- ✈️ Wind (21)
- 🔵 Circuit Rider Assistance (93)
- ⊕ Emergency Assistance (3)
- 🔵 PCE Communities (193)
- 🏠 Power Project Fund
- 🌱 Renewable Energy Fund
- Transmission Line owned by AEA
- Other Transmission Line
- Utility Training (81)





OWNED ASSETS



Railbelt Projects

1. Dixon Diversion: AEA-unfunded (**studies underway**)*
2. Bradley-Soldotna West: HEA-unfunded**
3. Bradley-Soldotna East & Substation: AEA-HEA-unfunded**
4. Soldotna-Bernice: AEA-unfunded**
5. Quartz Creek Substation XMFR: CEA-unfunded*
6. Soldotna-Sterling: AEA-**partially funded***
7. Sterling-Quartz Creek: AEA-**funded, target 2028***
8. GRIP Match: AEA-**partially funded, target 2032****
9. Quartz Creek-Anchorage: CEA-**ongoing, target 2032****
10. Beluga Substation XMFR (2nd line): AEA-unfunded**
11. Fossil Creek Substation XMFR: CEA-MEA-unfunded*
12. Intertie Connector: AEA-unfunded**
13. Teeland-Douglas: MEA-unfunded*
14. Alaska Intertie: AEA-unfunded*
15. New Intertie Beluga-Healy: AEA-unfunded**
16. Healy Substation: AEA-unfunded*
17. Fairbanks BESS: GVEA-**partially funded, target 2027****
18. Northern Intertie: GVEA-unfunded*
19. Fort Knox-North Pole Loop: GVEA-**funded, target 2031***

*Expansion or upgrade
**New project

Acronyms

BESS: Battery Energy Storage System
SVC: Static Var Compensator
XMFR: Transformer

Legend

- Alaska Energy Authority
- Chugach Electric Association
- Copper Valley Electric Association
- Golden Valley Electric Association
- Homer Electric Association
- Matanuska Electric Association
- Seward Electric System
- In Progress

CAPACITY

120MW

Bradley Lake generators are rated to produce up to 120 MW of power.

ENERGY

10%

Bradley Lake generates about 10 percent of the total annual electrical energy used by Railbelt electric utilities.

GENERATION COST PER KWH

\$0.04

From 1995 through 2020, the project averaged 392,000 MWh of energy production annually at \$0.04 per kWh.

Bradley Lake Hydroelectric Project

- Energized in 1991, the Bradley Lake Hydroelectric Project is **Alaska's largest renewable energy source**. It is located 27 air miles northeast of Homer.
- The 120 MW facility provides **low-cost energy to 550,000+** people on the Railbelt.
- Bradley Lake's **annual energy production** is ~10 percent of Railbelt electricity at 4.5 cents/kWh (or ~54,400 homes/year) and over \$20 million in savings per year for Railbelt utilities from Bradley Lake versus natural gas.
- The AEA, in partnership with Railbelt utilities, **is studying the Dixon Diversion Project**, which would increase the annual energy production of Bradley Lake by 50 percent (the equivalent of up to 30,000 homes).

\$342 Million

Dixon Diversion Project

The AEA is studying the Dixon Diversion Project to optimize the Bradley Lake Hydroelectric Project's energy potential. Like the West Fork Upper Battle Creek Diversion Project, the Dixon Diversion Project would divert water from Dixon Glacier to increase Bradley Lake's annual energy production by 50 percent.

- Located five miles from Bradley Lake and would utilize existing powerhouse at Bradley Lake.
- Estimated annual energy 100,000-200,000 MWh (the equivalent of up to 30,000 homes).
- Estimated to offset 1.5 billion cubic feet of natural gas per year in Railbelt power generation (equal to 7.5 percent of Alaska's unmet natural gas demand projected for 2030).
- Estimated completion is 2030.



DIXON DIVERSION PROJECT

AT THE BRADLEY LAKE HYDROELECTRIC PROJECT

\$413 Million (\$62.7 Million Secured; \$143.8 Million Still Needed)

Grid Resilience and Innovation Partnerships (GRIP): HVDC Line

The AEA secured \$206.5 million for GRIP Topic Area 3: Grid Innovation 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 project includes constructing high-voltage direct current (HVDC) submarine cables as a parallel transmission route from the Kenai Peninsula to Anchorage.



HIGH-VOLTAGE DIRECT CURRENT (HVDC)
SUBMARINE CABLE TRANSMISSION LINE PROJECT

The project addresses several challenges facing Alaska's Railbelt regions:

- Provides a **redundant pathway** between the Southern (Kenai Peninsula) and Central (Anchorage and Mat-Su) Regions
- Eliminates the **single-point-of-failure** inherent in the previous system (the system will still be subject to single point of failure between Willow and Healy)
- Allows for **more renewable power** to be added to the grid and distributed across the Railbelt
- **Increases the ability to share power** between the Southern, Central, and Northern Regions of the Railbelt, allowing the most economical power to be used at all times

\$90 Million (Under Construction; AEA Bonds Existing)

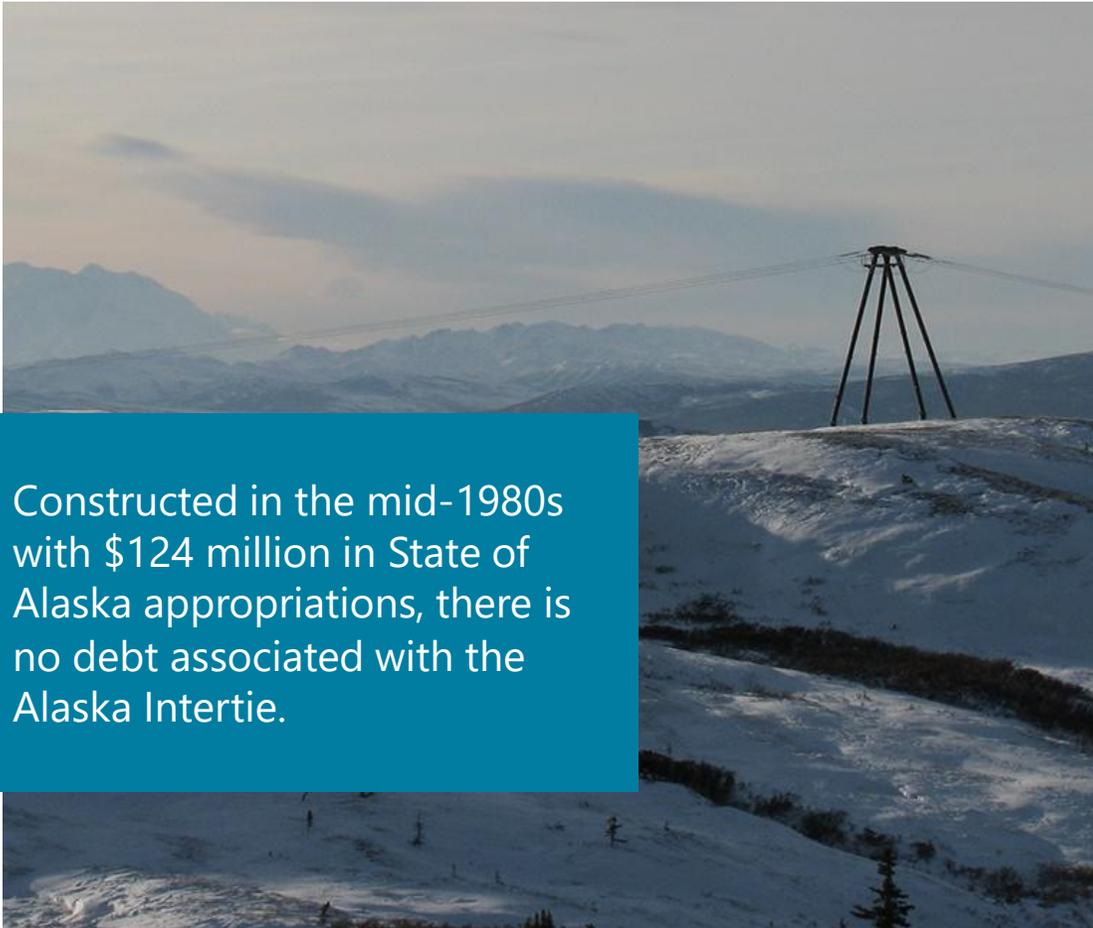
Sterling to Quartz Creek (SQ) Transmission Lines

In 2020, AEA acquired the SQ Transmission Lines, as part of the Bradley Lake Hydroelectric Project.

- **Location** – 39.4 miles of 115 kilovolt (kV) transmission and out of use 69 kV transmission from Sterling to Quartz substation (Kenai Lake).
- **Benefits** – The AEA ownership ensures better cost alignment, reduce line losses, increased reliability, and more timely repairs and upgrades.
- **Status** – 69 kV line decommissioned and removed; engineers are designing and are procuring equipment for the upgrade of the existing 115 kV line to 230 kV. Construction has started on the first section.
- **Cost** – Estimated cost to upgrade line is \$90 million for the SQ transmission line and Sterling to Soldotna transmission line.

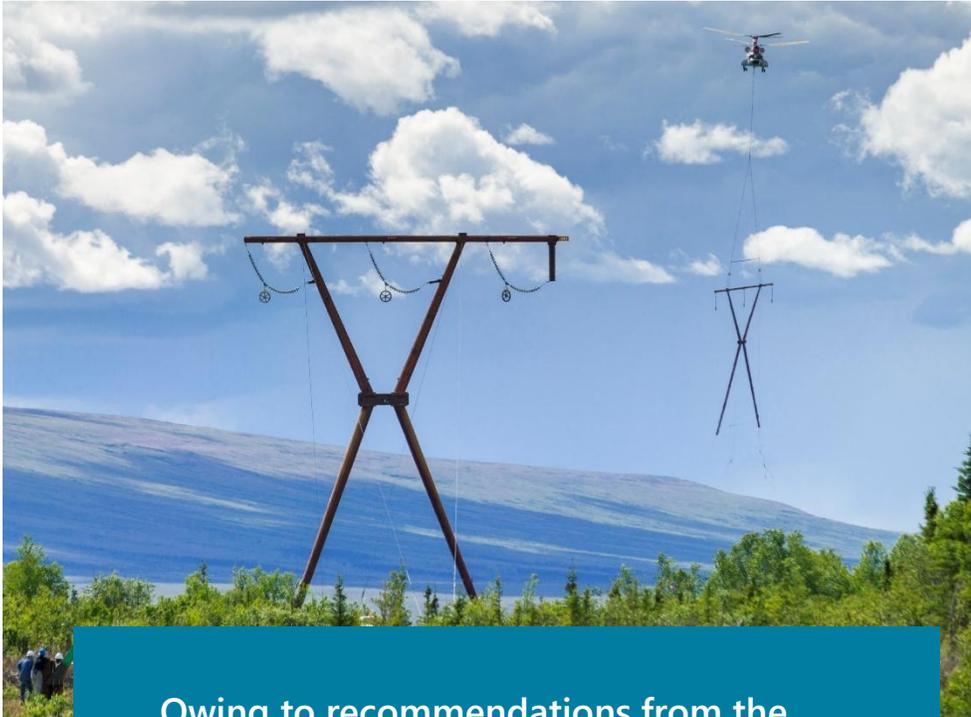


Alaska Intertie



Constructed in the mid-1980s with \$124 million in State of Alaska appropriations, there is no debt associated with the Alaska Intertie.

- AEA owns the **170-mile Alaska Intertie transmission line that runs between Willow and Healy**. The line operates at 138 kV (it was designed to operate at 345 kV) and includes 850 structures.
- A **vital section of the Railbelt transmission system**, the Intertie is the only link for transferring power between northern and southern utilities.
- The Intertie transmits power north into the Golden Valley Electric Association (GVEA) system and provides Interior customers with low-cost, reliable power — between 2008 and 2021, the Intertie **saved GVEA customers an average of \$30 million annually**.
- The Intertie provides benefits to Southcentral customers as well through **cost savings and resilience to unexpected events**.



Owing to recommendations from the governor's Alaska Energy Security Task Force concerning the elimination of transmission wheeling charges and the establishment of a RTO, the Legislature passed House Bill 307, which was signed into law on July 31, 2024. Under the new law, the RTO will be a division of AEA.

Railbelt Transmission Organization (RTO)

- Form the RTO on or before January 1, 2025, modeled after the Bradley Lake Project Management Committee. Governance structure must be comprised of a representatives from AEA, the Railbelt utilities, and the Railbelt Reliability Council (non-voting member).
- Apply to the Regulatory Commission of Alaska (RCA) for a certificate under AS 42.05.221 on or before December 31, 2024.
- By July 1, 2025, file with the RCA a nondiscriminatory open access tariff that provides for the recovery of Railbelt backbone transmission costs and related ancillary services, and replaces wheeling charges with a new mechanism that fairly recovers and equitably allocates the costs of operating the backbone transmission system.
- Hold and administer the certificate and tariff for the RTO. The tariff will require updates to the revenue mechanism to reflect changes in costs from year to year.

A scenic view of a rural town with a large green mountain in the background. The town features various houses, including a prominent white church with a green dome. In the foreground, there are lush green bushes and a small stream. The sky is blue with scattered clouds. The text 'RURAL ENERGY' is overlaid in large, bold, blue letters.

RURAL ENERGY

An aerial photograph of a rural landscape, featuring a wide valley with a river or stream, surrounded by dense forests and large mountains in the background. The entire image is overlaid with a teal color filter.

RURAL ENERGY INFRASTRUCTURE

Power Cost Equalization (PCE)

The PCE program was established in 1985 as one of the components of a statewide energy plan.

The cost of electricity for Alaska's rural residents is notably higher than for urban residents. PCE lowers the cost of electric service paid by rural residents. Ultimately ensuring the viability of rural utilities and the availability of reliable, centralized power.



188

RURAL COMMUNITIES



82

ELECTRIC UTILITIES



82,000

ALASKANS



750 kWh

RESIDENTIAL

Residential customers are eligible for PCE credit up to 750 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 in a community.

\$48M

FUNDS BUDGETED

In Fiscal Year 2024, AEA disbursed \$48 million to rural electric utilities for the benefit of our rural communities.

Rural Power System Upgrades



Before



After

- AEA's **Rural Power Systems Upgrade program** improves power generation in Alaska villages with less than 2,000 people.
- Approximately **170 communities** are eligible for the program, which replaces outdated, inefficient mechanical systems with new electronically controlled generator sets.
- Due to declining funds, rural **power systems aren't upgraded timely**, and communities are left with aging systems at risk of failure.
- AEA evaluates **several factors** when prioritizing projects for funding – at this time **deferred maintenance is estimated at \$300 million**.

- AEA designs and builds modern, code-compliant bulk fuel facilities through our **Bulk Fuel Upgrade program**.
- In Alaska, there are over **400 bulk fuel facilities** — each sized to support the village.
- Most of the facilities are older than 40 years, **with many exceeding 50 years**, and they average **100,000 gallons** in size.
- However, **aging infrastructure poses several safety risks for rural communities**, e.g. corrosion, erosion, and environmental.
- AEA maintains an inventory and assessment priority need-based list — so far **deferred maintenance is estimated at \$1 billion**.



Bulk Fuel Upgrades



FEDERALLY- FUNDED PROGRAMS



PROCEEDING

Capital Request – \$1.8 Million
Federal Receipt Authority – \$14.9 Million

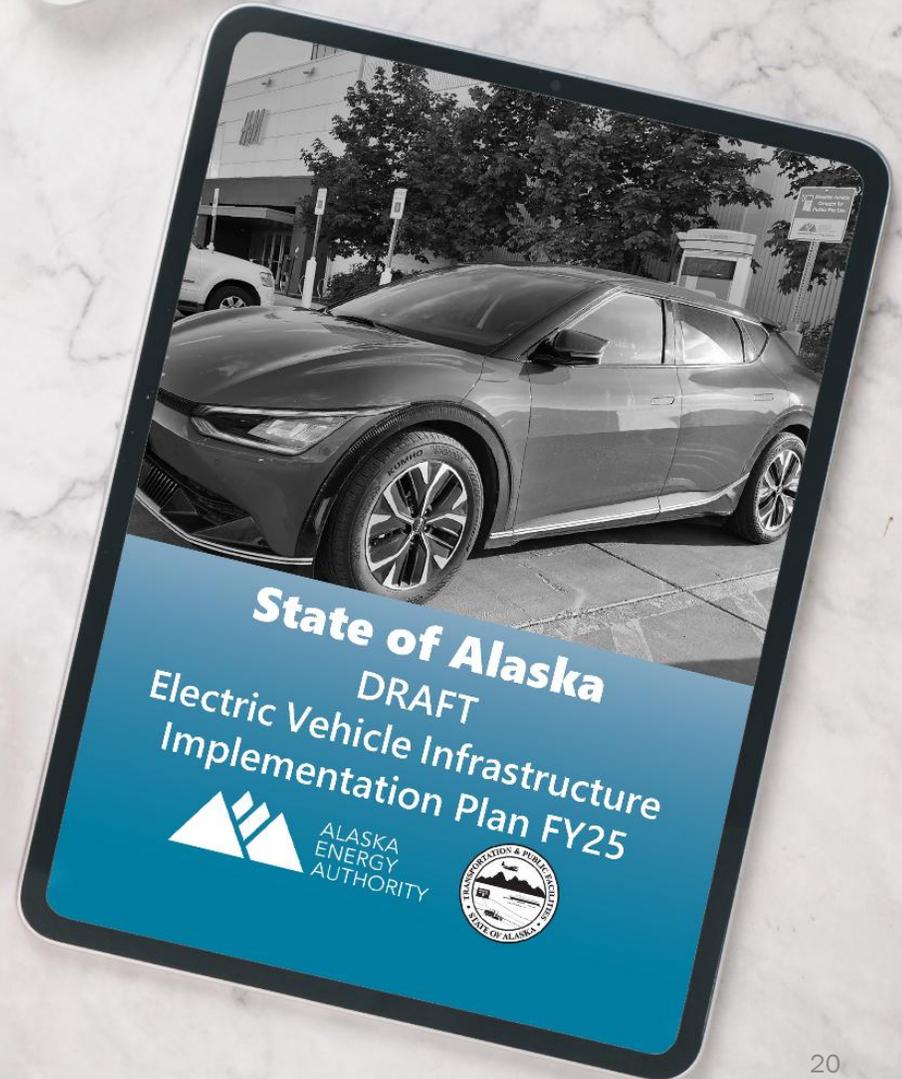
Grid Resilience Formula Grant Program IIJA 40101(d)

- Under 40101(d), AEA anticipates receiving **\$60 million in federal formula grants** to catalyze grid resilience projects. In August 2023, the **first two years of allocations, \$22.2 million**, were awarded to AEA.
- The AEA’s competitively solicited applications for the initial federal formula allocation in February 2024. The AEA selected three projects for sub-awards, totaling \$20.9 million. In December 2024, DOE issued final approvals for the sub-award projects. Due to pauses on funding for IIJA programs, the issuance of sub-award agreements have been delayed but are anticipated to be finalized in Q2 2025.
- In August 2024, AEA received \$17,627,018 in federal program formula funds for fiscal year 2025, requiring \$2.6 million in state matching funds. The AEA is working with DOE to determine next steps.
- **Resilience measures include** but are not limited to:
 - Relocating or reconductoring powerlines
 - Improvements to make the grid resistant to extreme weather
 - Increasing fire resistant components
 - Integrating distributed energy resources like microgrids and energy storage
- Formula-based funding requires a **15 percent state match** and a **33 percent small utility match**.

\$52 Million (Over Five Years)

National Electric Vehicle Infrastructure (NEVI) Program

- The AEA and the Alaska Department of Transportation & Public Facilities (DOT&PF) continue to deploy the **State of Alaska NEVI Plan**.
- **On November 25, 2024**, AEA and DOT&PF received approval of the fiscal year 2025 plan. This **unlocked \$11 million in addition to \$30 million** available from previous fiscal years.
- In fall 2023, **the first round of Alaska NEVI awards were announced**. **The** AEA and DOT&PF selected projects in nine communities for a total investment of \$8 million. **Private entities will own and operate the new charging stations**.
- **Phase 2** will develop charging infrastructure in more than 30 communities along **Alaska's Highway System** and the **Marine Highway System**.





\$62.5 Million (Shared with AHFC)

- **In April 2024, AEA and the Alaska Housing Finance Corporation (AHFC) were selected for a \$62.5 million grant from the Environmental Protection Agency's Solar for All program.**
 - The AEA is developing community solar in disadvantaged communities.
 - The AHFC is developing residential rooftop solar for low-income households.
- **Program benefits:**
 - Energy cost savings,
 - Increased resiliency,
 - Distributed solar energy for low-income and disadvantaged households,
 - Workforce development, and
 - Reduction in greenhouse gas emissions.
- **No match required for this competitive grant.**

Home Energy and High Efficiency Rebate Allocations

The AEA is collaborating with AHFC to distribute Alaska's allocation of \$74 Million

Home Efficiency Rebates

- Rebates for energy efficiency retrofits range from \$2,000-\$4,000 for individual households and up to \$400,000 for multi-family buildings.
- Grants to states to provide rebates for home retrofits.
- Up to \$2,000 for retrofits reducing energy use by 20 percent or more, and up to \$4,000 for retrofits saving 35 percent or more.
- Maximum rebates amounts are doubled for retrofits of low-and moderate-income homes.
- **Alaska's allocation: \$37.4 million; no State match required.**
- **Funding is estimated to be available between fall/winter 2025.**

Home Electrification and Appliance Rebates

- Rebates for low- and moderate-income households to save energy and money toward energy upgrades made to their primary residence.
- Includes means testing and will provide 50 percent of the project cost to residents with incomes between 80 to 150 percent. Rebates of 100 percent for incomes below 80 percent of area medium income, with similar tiers for multi-family buildings.
- Includes a \$14,000 cap per household, with an \$8,000 cap for heat pump costs, \$1,750 for a heat pump water heater, and \$4,000 for electrical panel/service upgrade.
- Other eligible rebates include electric stoves, clothes dryers, and insulation/air sealing measures.
- **Alaska's allocation: \$37.1 million; no State match required.**
- **Funding is estimated to be available between fall/winter 2025.**

\$15.7 Million

Black Rapids Training Site (BRTS) Defense Community Infrastructure Pilot Program

The AEA partnered with Golden Valley Electric Cooperative (GVEA) and was awarded this grant from the Office of Local Defense Community Cooperation under the Defense Community Infrastructure Pilot Program. **Federal Receipt authority of \$15.7 million received in fiscal year 2024. No State match is required.**

The GVEA will use the funds to extend a transmission line 34 miles along the Richardson Highway to BRTS. Currently, BRTS is powered by three diesel generators that are nearing the end of their useful lives. This extension will improve long-term sustainability and reliability for BRTS by tying them into GVEA's power grid.



Federal Funding – Awards and Pending Applications



#	Awarded and Conditional Awards	Alaska Grant \$	Match \$
1	Energy Efficiency Revolving Loan Capitalization – Proceeding	\$4,782.0	\$ -
2	State Energy Program Funding – Proceeding	\$3,662.0	\$ -
3	High Energy Cost Grants (Manokatok) – USDA Rural Utilities Service – Proceeding	\$2,000.0	\$ -
4	Vehicle Technology Office Competition Federal Fiscal Year 2022 (ARED) – Proceeding	\$1,670.0	\$418.0
5	Energy Efficiency and Conservation Block Grant – Proceeding	\$1,627.0	\$ -
6	Training for Residential Energy Contractors (TREC) – Proceeding	\$1,294.0	\$ -
7	Energy Future Grant – Unknown	\$497.0	\$ -

Total Awards = \$15,950.0

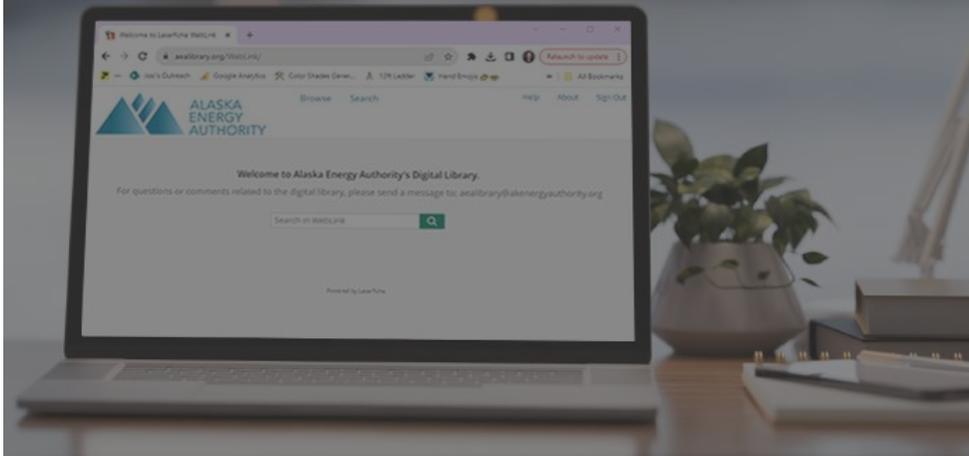
\$15,532.0

\$418.0

\$ in thousands

AEA Electronic Library (E-Library)

Provides the public with open, transparent access to over 50 years of Alaska energy data.



On December 11, 2023, AEA officially launched its digital e-library, which was funded by a \$100,000 grant from the Denali Commission and \$40,000 from AEA.



Since its launch, the e-library has averaged over 650 unique visitors per month. Site visits to the e-library are reported to be trending positively, with an average 10 percent increase in site visits month over month.



The e-library launched with 7,500 documents, including program publications, technical reports, research, and feasibility studies. Currently, over 14,000 documents are searchable.



The e-library is fully accessible to the public via the library tab on AEA's website, or directly at <https://www.akenergyauthority.org/library>



Thank You!

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