ALASKA ENERGY AUTHORITY

TRANSMISSION UPGRADES

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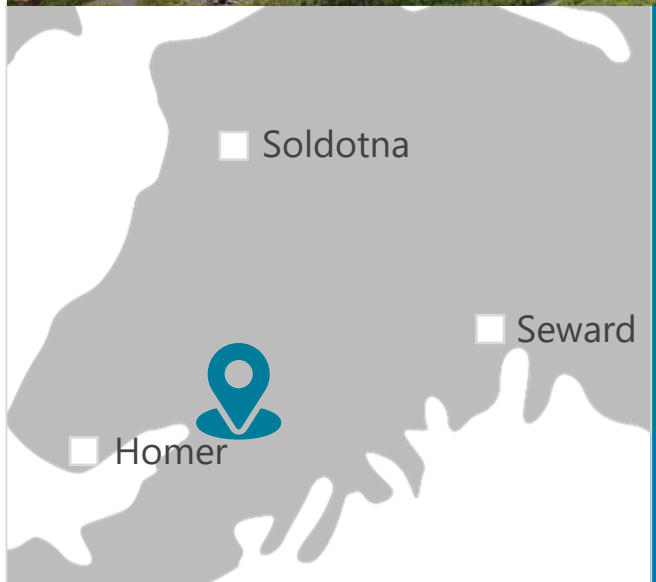
ALASKA ENERGY AUTHORITY

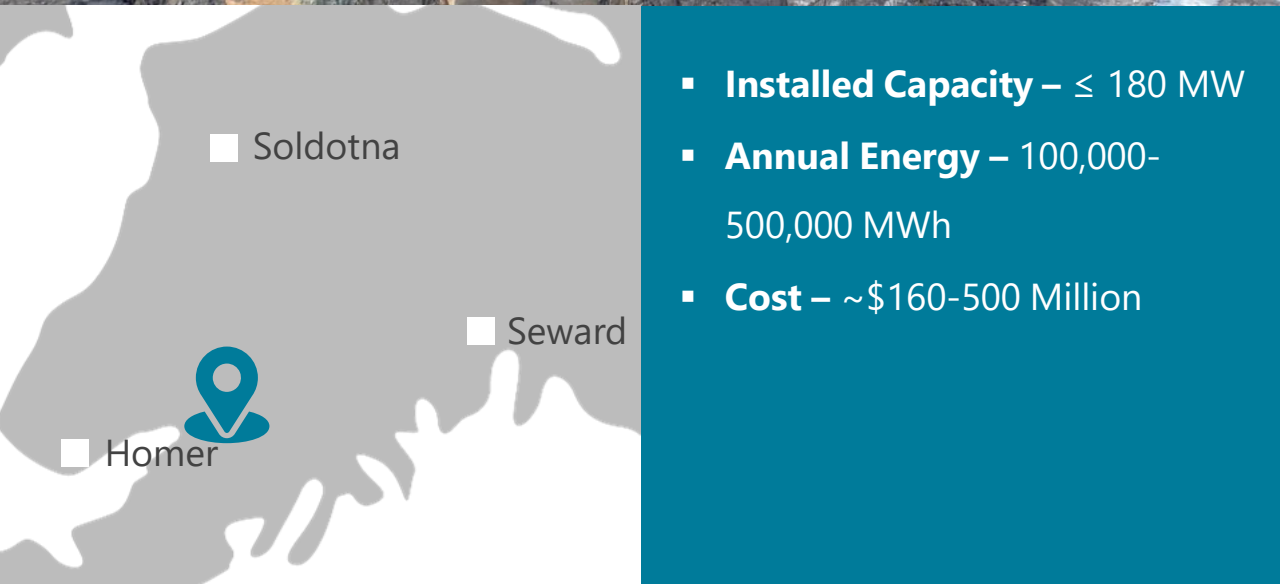
Bradley Lake Hydroelectric Project

Hydroelectric power is Alaska's largest source of renewable energy — and Bradley Lake is Alaska's largest hydro facility.

- **Location** – The Bradley Lake Hydroelectric Project is located 27-air miles northeast of Homer on the Kenai Peninsula
- **Benefits –** Provide low cost energy to 550,000+ members of Chugach Electric Association, Golden Valley Electric Association, Homer Electric Association, Matanuska Electric Association, and Seward Electric System.
- **Annual Energy Production –** ~10% of Railbelt electricity at 4.5 cents/kWh (or ~54,400 homes/year) and over $20 million in savings per year to Railbelt utilities from Bradley Lake versus natural gas
- **Status** – Energized in 1991



- **Dam Height –** 125 feet
- **Dam Elevation –** 1,190 Feet
- **Reservoir Length –** 4 miles
- **Reservoir Width** – 1.3 miles
- **Installed Capacity –** 120 MW
- **Annual Energy –** 400,000 MWh
- **Cost –** ~$400 Million



- **Installed Capacity –** ≤ 180 MW
- **Annual Energy –** 100,000-500,000 MWh
- **Cost –** ~$160-500 Million

Dixon Diversion Project

The proposed Dixon Diversion Project would expand the size of the largest hydro project in Alaska — the Bradley Lake Hydroelectric Project.

- **Location –** The Dixon Diversion Project is located five miles southwest of Bradley Lake
- **Studying Two Options –**
  - Alternative 1 – Tunnel to Bradley Lake
  - Alternative 2 – Run-of-River Powerhouse on Martin River
- **Benefits –** Could provide annual electric energy for 17,000-40,000 homes on the Railbelt. (Bradley Lake Hydroelectric Project: 54,000 homes)
- **Status –** Alternative analysis underway

BPMC

The Bradley Lake Hydroelectric Project is owned by AEA and managed by the Bradley Lake Project Management Committee (BPMC), which is comprised of a member from each of the five participating Railbelt utilities:
Chugach Electric Association,
Golden Valley Electric Association,
Homer Electric Association,
Matanuska Electric Association, and
Seward Electric System.

Required Project Work Summary

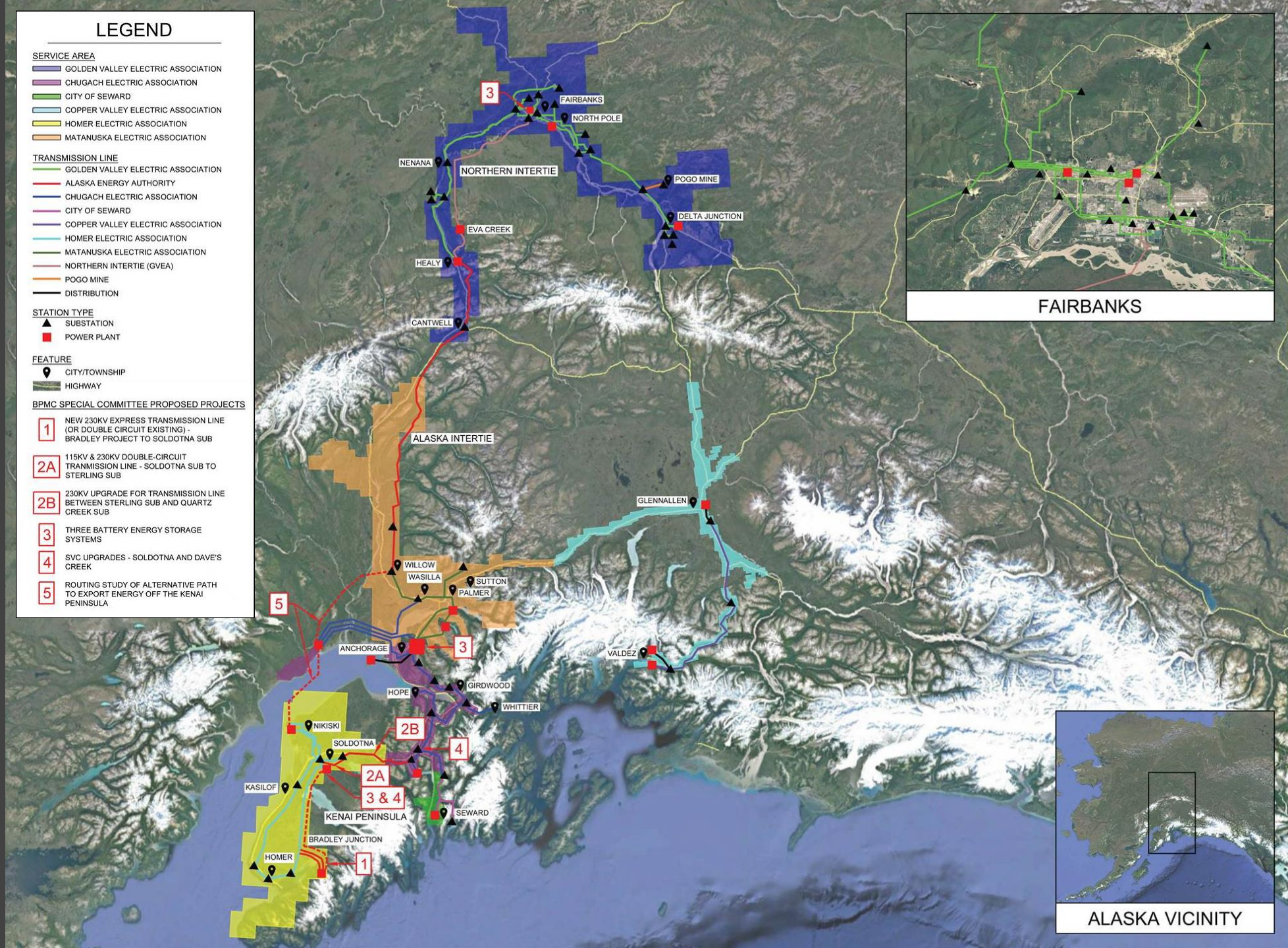
Project Name	Scope	Schedule	Budget
Upgrade Transmission Line from Bradley to Soldotna	Construction of a second 115 kV transmission line from Bradley to the Soldotna Substation	January 2022-January 2029	
Upgrade Transmission Line from Soldotna to Sterling	Upgrade of the transmission line from 115 kV to 230 kV from the Soldotna Substation to the Sterling Substation in accordance with the results of engineering studies	November 2021-January 2029	
Upgrade Transmission Line from Sterling to Quartz Creek	Upgrade of the transmission line between the Sterling Substation and Quartz Creek Substation (SSQ Line) from 115 kV to 230 kV	January 2022-January 2029	
Battery Energy Storage Systems (BESS) for Grid Stabilization	Upgrade to existing BESS system in Fairbanks, and also new BESS systems in the Kenai, and Central regions of the grid	June 2019-September 2025	

Total $270 Million

How to Pay for Upgrades

- **Bond Obligations –** Bradley Lake bond obligations retired June 30, 2021
- **Power Sales Agreement** – Existing agreement obligates utilities to make annual excess payments of $12.4 million until July 1, 2050
- **Financing Opportunity –** Excess payments to maturity totaling approximately $300 million supports a debt service of $225-$250 million
- **Cost –** No additional cost burden to ratepayers or to the State's budget
- **Benefit-Cost Ratio –** Aggregate project savings are estimated to yield a positive benefit-cost ratio range of 1.08 to 2.27, which equates to a potential savings of $1.6-$3.3 billion over the first 50 years
- **Overall Project Benefits –** One of the most significant improvements to the electrical transmission system in Alaska's history, which includes:
  - eliminating the constraints on exiting transmission systems,
  - stabilizing rates for consumers throughout the Railbelt by increasing the deliverability of energy from the Project, while
  - providing jobs and economic development opportunities

BPMC Required Project Work



Next Steps

Fiscal Year 2022

- Establish river gauge
- Initiate Bradley Lake FERC License Amendment
- Alternatives Analysis Report (Conceptual Design

Fiscal Year 2023

- Detailed mapping/topography
- License Amendment Consultations
- Environmental Studies
- Hydrology Studies
- Initial Geotechnical Investigations
- Preliminary Design

Fiscal Year 2024

- Feasibility Design and Hydrology
- Environmental Studies
- Draft License Amendment
- Detailed Geotechnical Investigations
- Operations/Power Modeling
- Environmental Assessment

AEA provides energy solutions to meet the unique needs and opportunities of Alaska's rural and urban communities.

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APPENDIX

Bradley Lake Required Project Work Definition

- Required Project Work is defined in the Power Sales Agreement (PSA) to mean "…repairs, maintenance, renewals, replacements, improvements or betterments required by federal or state law, a licensing or regulatory agency with jurisdiction over the [Bradley] Project, or this Agreement, or otherwise necessary to keep the [Bradley] Project in good and efficient operating condition, consistent with (1) sound economics for the [Bradley] Project and the Purchasers and (2) national standards for the industry."

- In other words, for the proposed projects to be considered "Required Work" under the PSA, the work must be intended to keep the project in good and efficient operating condition. The measures of this work must: (1) be based on sound economics for the Project and the Purchasers, and (2) be consistent with national standards for the industry.