Modernizing the Railbelt Grid

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House Energy Subcommittee
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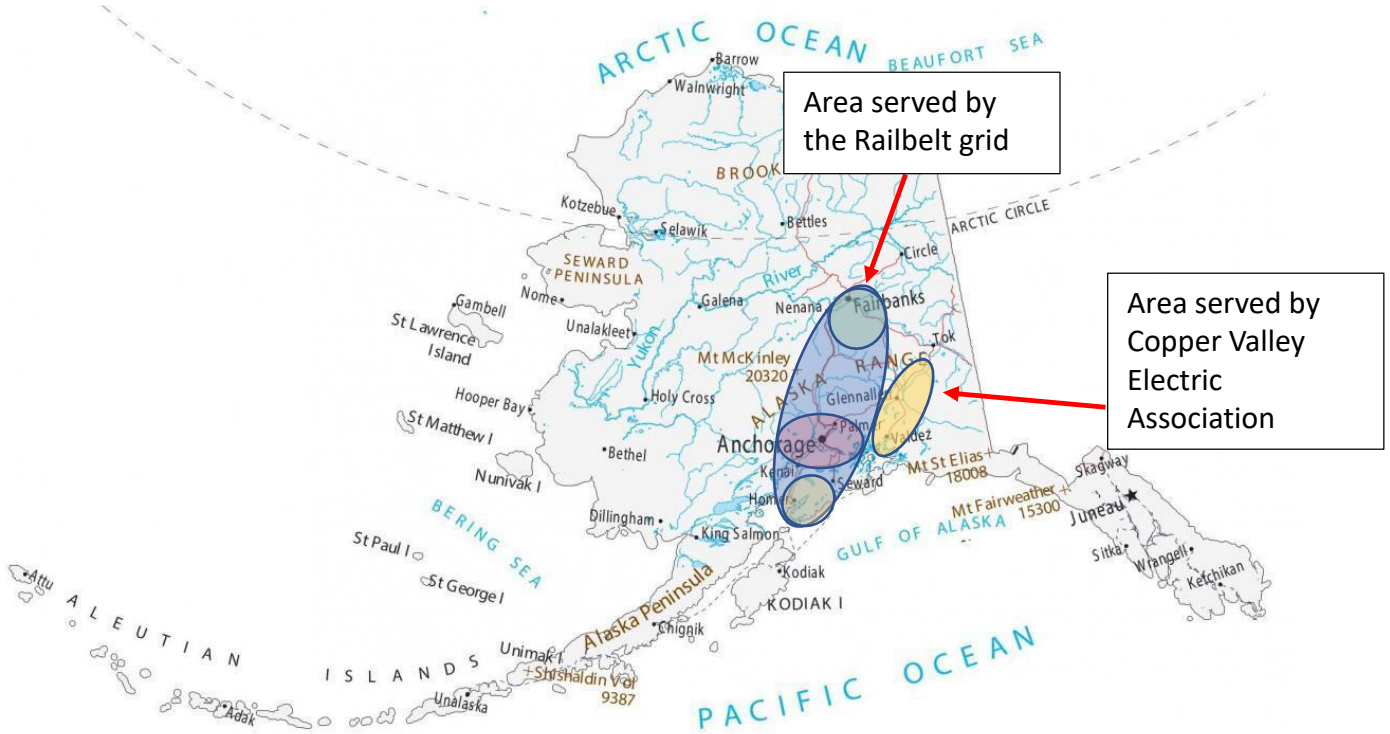
Alaska Railbelt and the Copper Valley



- The area originally served by the Alaska Railroad
- 75% of Alaska's population
- 80% of the electricity generated in Alaska
- Three regions, 700 miles end-to-end, roughly the distance from Washington DC to Atlanta, Georgia
- Virtually no federal investment in transmission to date
- Single transmission lines between the three Railbelt regions (Southern Central and Northern)
- Interregional power transfer capability is less than 10% of combined peak load
- Currently not electrically interconnected with the Copper Valley region

Historic Railbelt Alignment

The State and Federal governments have long encouraged teaming arrangements, and the Railbelt alignment on this transformational infrastructure project is historic.

There is unprecedented alignment among this diverse team consisting of all Railbelt electric utilities, transmission owners, and operators and their regulator:

- *The Alaska Energy Authority*
- *The Regulatory Commission Of Alaska*
- *Chugach Electric Association Inc.*
- *Golden Valley Electric Association Inc.*
- *Homer Electric Association Inc.*
- *Matanuska Electric Association Inc.*
- *Seward Electric Systems (City of Seward)*
- *We are seeking State legislative leadership and support for this transmission infrastructure upgrade*

The Railbelt Electric Utilities Collective Vision –

Five united utilities and the State of Alaska aligned and poised to transform the Railbelt into a sustainable fuel-diverse clean energy economy

The Railbelt Utilities and AEA share a vision:

“a collaborative future in the Railbelt in which our communities come together and share resources to strengthen and build a smart, clean electrical grid that ensures our residents, our national defense infrastructure, and communities adjacent to the Railbelt access to clean, low-cost energy from any source.“

The Railbelt Vision –

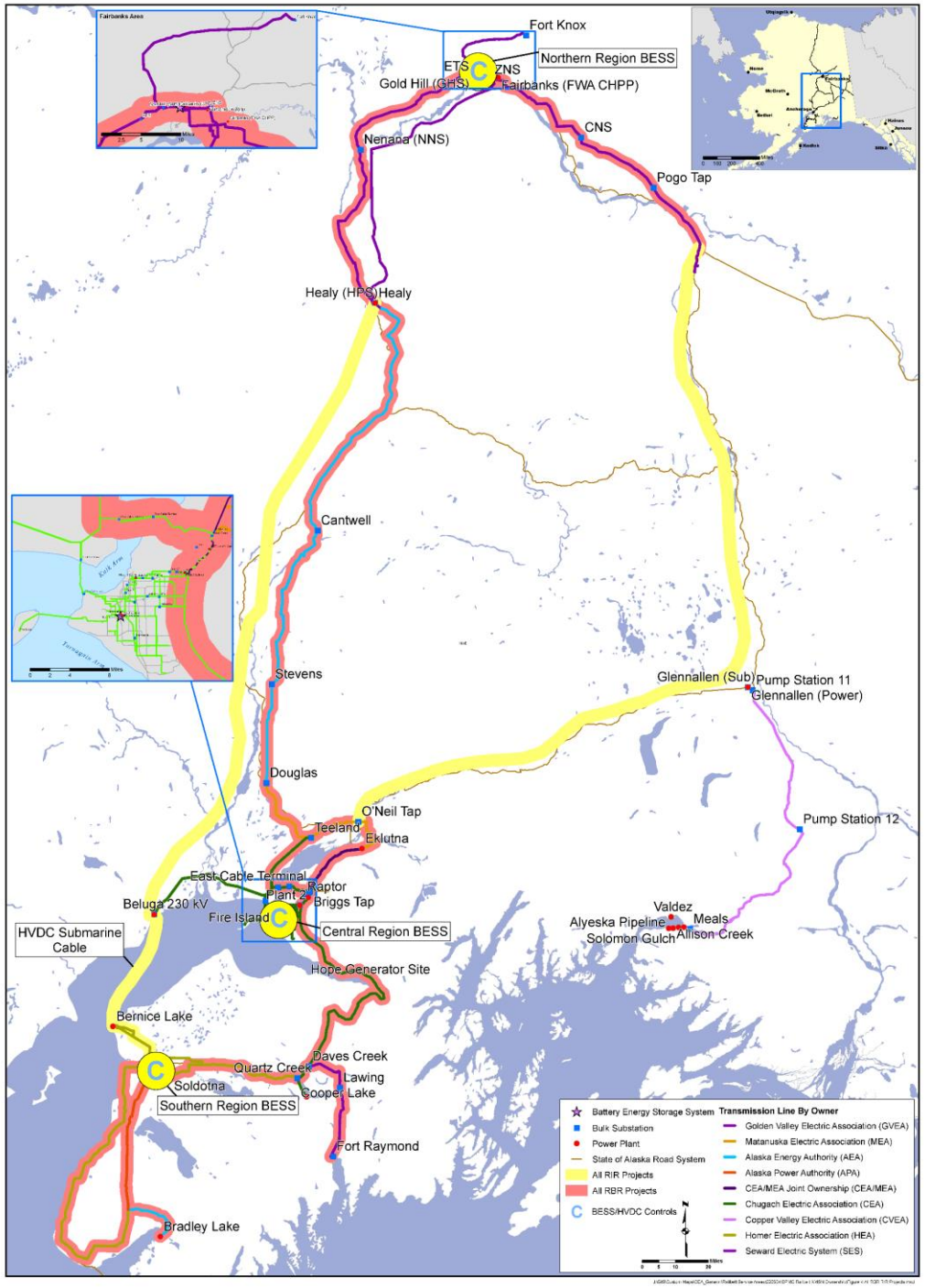
A “once in a generation” opportunity

- A 12-to-15-year plan consisting of a transformational series of transmission infrastructure improvements estimated to cost approximately $2.9B
- Phase One will require $250M per year for five years
- Is essential to the Railbelt grid for a clean and fuel-diverse future
- Can serve as a model for the rest of the United States and the world
- The five Railbelt Electric Utilities, and the Alaska Energy Authority, are pursuing funding from the State of Alaska, supplemented by Infrastructure Investment and Jobs Act (IIJA), other Federal programs, and traditional utility funding sources

Why it matters

- Significant gains in reliability and resiliency for the Railbelt
- Prepares the Railbelt for a fuel diverse, low-carbon future
- Increases effective integration of renewables and low-carbon generation across the Railbelt
- Gains in efficiency will lower the cost of energy, helping to attract industry and drive the economy
- Lower Railbelt energy costs contribute to lower energy costs for all Alaskan rural communities through the Power Cost Equalization (PCE) program

Grid Resiliency and Modernization plan



Legend

RIR Transmission

RBR Transmission

Battery Energy Storage System

C — Battery Energy Storage system /HVDC Interregional Control Scheme

Bradley Lake Hydro - Required Work

$166 million bond was issued by the Alaska Energy Authority (AEA) to fund Railbelt transmission line upgrades.

These enhancements will reduce line losses, increase capacity, and improve the delivery of power from the Bradley Lake Hydroelectric Project (Bradley Lake) to Railbelt consumers. Funding for the projects is coming from payments by the five Railbelt utilities in excess of those required to retire the Bradley Lake project bonds. These projects include:

- Upgrade to Transmission Line between Bradley Junction and Soldotna Substation
- Upgrade to Transmission Line between Soldotna Substation and Sterling Substation
- Upgrade to Transmission Line between Sterling Substation and Quartz Creek Substation
- Battery Energy Storage Systems for Grid Stabilization

Annual bond repayments about $6 million/year. GVEA's share of costs for the 28 years to pay back the bonds is 17%

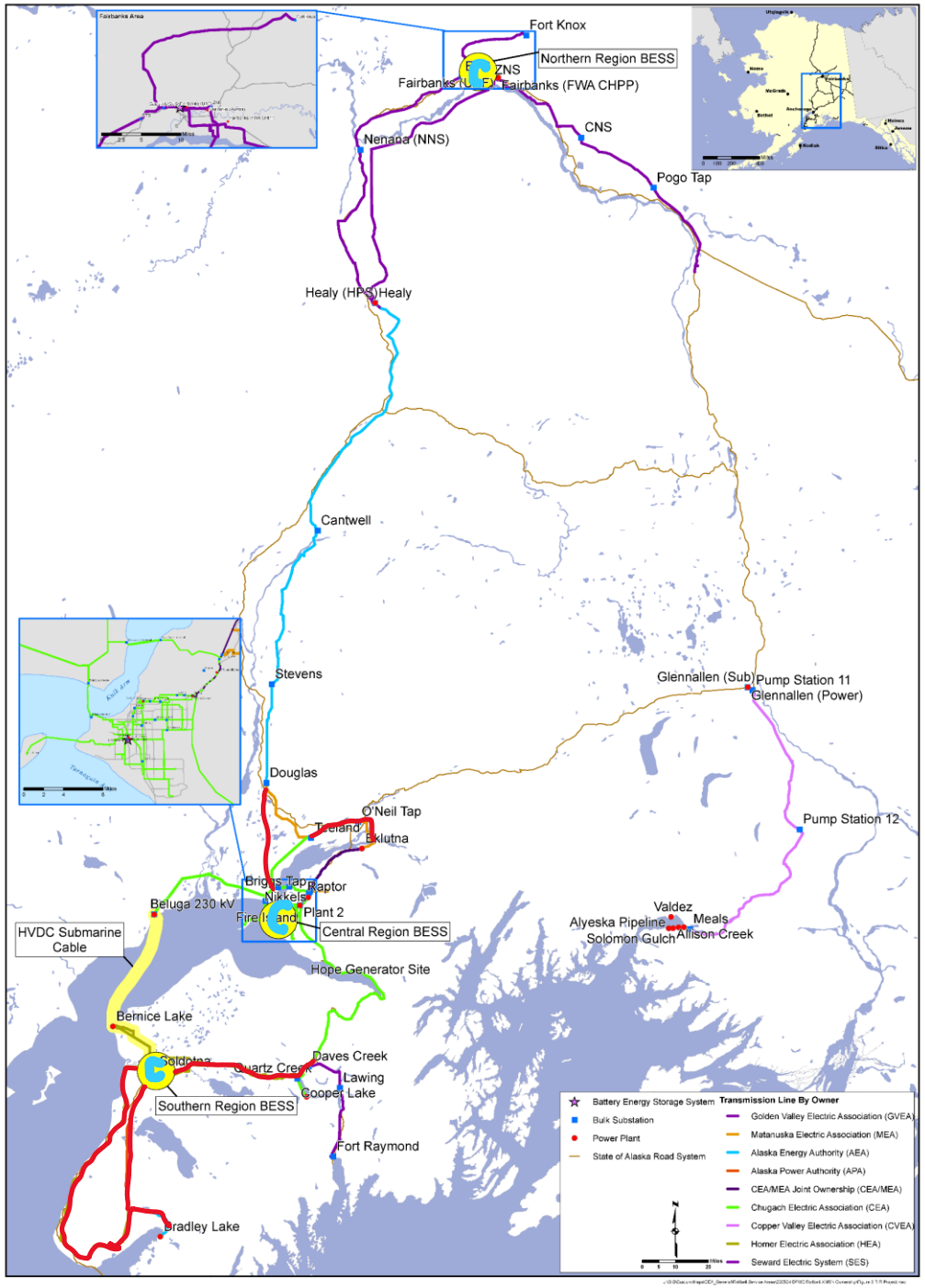
This combines with the Bipartisan Infrastructure Law that included 3 transmission grid programs. AEA is applying for as competitive grants with either 30% or 50% match. The concept paper submissions that the U.S. Dept. of Energy have been approved. Selection of successful grants are expected in late summer or fall with awards a quarter later.

- Grid Resiliency – Railbelt Backbone Reconstruction = Bradley to Delta Jct.
- Smart Grid – Control system for Railbelt integrated battery storage
- Grid Innovation – Railbelt Innovative Resilience – battery storage systems in South Central and Interior, and looking toward the Roadbelt proposed transmission line from Wasilla to Glenallen then up to Ft. Greely.

GRIP Topic Concept Papers 1,2,& 3

Current Funding Cycle

RBR, BESS/HVDC Control, and RIR



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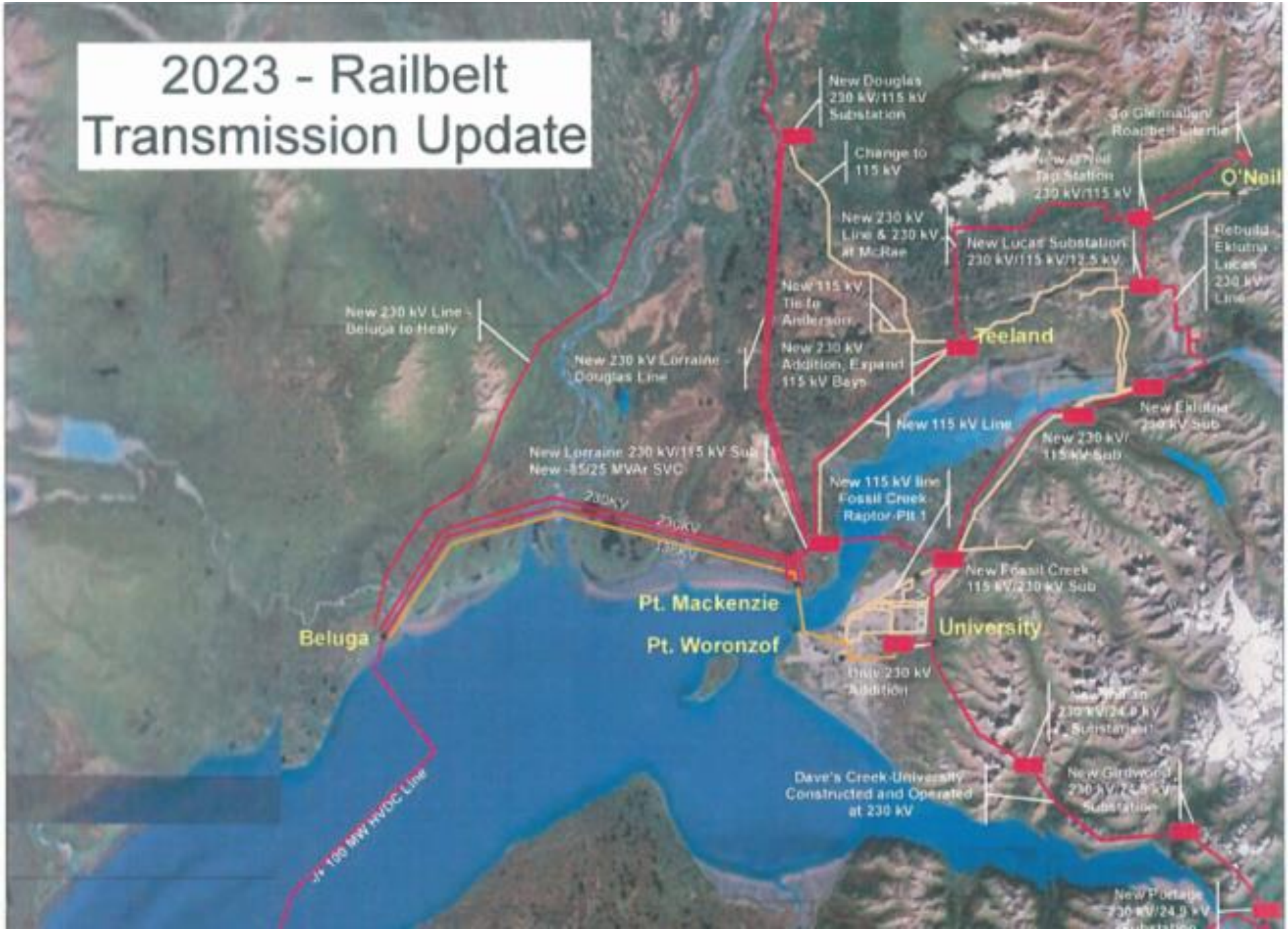
2023 - Railbelt
Transmission Update
New Douglas
230 kV/115 kV
Substation
Change to
115 kV
New 230 kV
Line & 230 kV
at McRae
New 115 kV
Tie to
Anderson
New 230 kV
Addition, Expand
115 kV Bays
New 230 kV Line -
Beluga to Healy
New 230 kV Lorraine -
Douglas Line
New Lorraine 230 kV/115 kV Sub
New -85/25 MVAr SVC
230kV
230kV
138kV
Beluga
Pt. Mackenzie
Pt. Woronzof
Teeland
New Lucas Substation
230 kV/115 kV/12.5 kV
New 115 kV Line
New 230 kV/
115 kV Sub
New 115 kV line
Fossil Creek -
Raptor-Pit 1
New Fossil Creek
115 kV/230 kV Sub
University
Dave's Creek-University
Constructed and Operated
at 230 kV
O'Neil
Rebuild
Eklutna -
Lucas
230 kV
Line
New Eklutna
230 kV Sub
+/- 100 MW HVDC Line

State of Alaska Contribution

The total cost of all the upgrades needed without the Roadbelt is about $1.9 billion. AEA and the Railbelt utilities have asked the Legislature to consider these upgrades for the benefit of the entire state and suggest a 5 year matching contribution from the state of $250 million per year. This is not insignificant in balancing out other state needs, but the benefit of an affordable and reliable grid for our members cannot be overstated.

GVEA Efforts

As part of the Strategic Generation Plan, GVEA is also looking at:

- BESS - Battery Energy Storage System options, prices of which have escalated sharply in the last year.
- Wind generation – with improved transmission capacity and storage, a larger wind system can benefit from economy of scale.

How all of these simultaneous funding efforts and work will pan out are being worked on now. The Board and management will be reviewing the progress on the Strategic Generation Plan at an all day meeting March 30, 2023.

The Railbelt Plan *must be* the State's Plan

Building out the Railbelt grid will benefit all Alaskan's and *must be a State priority*

PCE *shares the benefit of lower Railbelt electric rates* throughout the State

Economies of scale *are necessary* to hold down projects costs and minimize the impact of diversification and decarbonization on the State's economy

Access to federal funding *is contingent* on the catalyzation and deployment of additional capital

Transmission upgrades are required to maintain and advance reliability, resiliency, fuel diversification, and carbon reduction… irrespective of the generation solutions