

PRIORITY A.

RAILBELT TRANSMISSION, GENERATION, AND STORAGE

PLANNING PROCESS HIGHLIGHTS

Task Force Meetings by the Numbers

73 *Total Number
of Meetings*

158 *Total Hours
of Meetings*

Railbelt Generation, Transmission, and Storage Subcommittee Meetings by the Numbers

9 *Total Number
of Meetings*

22.5 *Total Hours
of Meetings*

Note: Some Task Force Meetings include break-out subcommittee meetings.

STRATEGIES:

- A-1 Unify & Upgrade Transmission & Storage
- A-2 Diversify Generation
- A-3 Increase Demand



INTRODUCTION

The Railbelt Generation, Transmission, and Storage (RGTS) subcommittee of the Task Force was created to develop an energy plan that will move the Railbelt towards energy independence while lowering the cost to its residents over the long-term. In order to complete this plan, it was important to understand the current state of our energy portfolio. Since Statehood, the Railbelt utilities and their customers have benefited from the significant natural gas finds in the Cook Inlet. Over time, this basin has supported approximately 80% of the power generation, and a majority of the population hubs' space and water heating needs.

Sixty years later, local supplies of natural gas are getting harder to find and the quantities of gas behind pipe and available for market consumption are dwindling. This fact is causing commodity prices to increase, presenting the region with an opportunity to diversify our power generation and build for the future. It also forced the RGTS to acknowledge the fact that we must include solutions for space and water heating in our plan recommendations. In order to develop our recommended plan, the RGTS determined the most efficient approach would be to establish long-term, mid-term, and short-term goals that reflect our desired outcomes here along the Railbelt. Here are the recommended goals:

- Short-term: Minimize regret cost while providing reliable service.
- Mid-term: Invest in infrastructure improvements to advance our long-term goal of energy diversification.
- Long-term: Significantly diversify power generation with an emphasis on in-state, reliable, and more affordable clean energy.

The RGTS was motivated to seek transformational approaches to reach these goals that might provide electrical energy to residents at a target price of \$0.10/kwh in the future. The RGTS reviewed numerous generation and transmission configurations and strategies from publicly available data but did not complete independent or internal cost estimates in developing action items and strategies.

In the short-term, the RGTS acknowledges that continued reliability along the Railbelt generation and transmission system may require certain actions that are likely to increase costs. The expected increase in costs is directly tied to the local gas supply market in Cook Inlet. There are no other options for electric and gas utilities that can reliably serve the local demand in the short to mid-term. The magnitude of the rising costs, and the ability to arrest and then reverse these rising costs as energy sources are diversified, will depend upon our collective response to the recommendations set forth within. Therefore, it is important that investments in the short term do not hinder mid-term and long-term goals of infrastructure improvements for diversified power generation sources.

In the mid-term (2-20 years), significant state and federal investment must be made in energy and power infrastructure to enable the long-term goal of diversified, local, reliable, and affordable energy. Alaska must invest in its future. Transmission system upgrades must be made to allow cost competition to optimize all generation, including clean energy. Energy storage is another much needed investment area; where it is viewed that shared costs and control will help optimize overall energy cost across the Railbelt and enable diverse generation forms to expand in the Railbelt. Transmission upgrades, further deployment of energy storage and improved operating models are necessary to facilitate economic dispatch of electrical energy.

In the long term, for 2040 and beyond, the RGTS has established a goal that the system for generation, transmission and space heating within the Railbelt should reflect a significant diversification of energy supply from 2023 metrics and be affordable, sourced within the State of Alaska and, most importantly, reliable. Energy generation sources also need to be considered in the context of a sustained supply for the years that follow.



STRATEGY A-1:

Unify & Upgrade Transmission & Storage

ACTIONS

- A-1.1** Unify all existing transmission assets along the Railbelt and Bradley Lake under Alaska Energy Authority or a new not-for-profit regulated utility.



Purpose:

Provide a strong transmission system which enables new generation projects to integrate to the grid. Investing in transmission and storage infrastructure and unifying assets will enable the long term goal to significantly diversify Railbelt generation and provide energy that is reliable, affordable and generated in-state. We recommend accomplishing this by:

- Unify all existing transmission assets along the Railbelt and Bradley Lake under AEA or a new not-for-profit regulated utility.
- Identify state and federal funding opportunities for transmission upgrades
 - Complete HVDC transmission line from the Kenai peninsula
 - Complete HVDC transmission line from Anchorage to Fairbanks
 - Complete additional necessary system upgrades
- Develop transmission, operation, and control reform with a regulated version of management committee.
- Establish a single transmission rate for the Railbelt.
- Align ERO statute and regulations with transmission reform.

Background:

The Railbelt system is made up of five electric utilities providing service to the communities from the Kenai peninsula to Fairbanks. These five utilities all generate power through various means including hydro-electric generation, natural gas powered generation and coal fired generation. The transmission system ownership and operatorship is split up across its length and transmitting generation from one region to another currently incurs wheeling charges which may be multiple depending on the number of operating areas energy is transmitted across. The transmission lines have current bottleneck points and generally lack redundancy. Battery energy storage systems are being added to the grid to stabilize operations and additional storage is needed to enable generation diversification and ensure reliability.



The AEA, in partnership with the five Railbelt utilities, has identified several opportunities for transmission line upgrades and battery energy storage systems that will reduce existing constraints on the Railbelt grid by increasing the Kenai Peninsula’s transmission capacity to export power from Bradley Lake hydropower, while also allowing for the integration of additional clean energy generation.

Further, AEA and Railbelt utilities are seeking federal funding to construct a second line between Soldotna and Healy to allow Bradley Lake power to reach consumers along the Railbelt even when one line is out of service on either a scheduled or unscheduled basis.

Benefits:

- Reduces transmission constraints on Railbelt grid, while also allowing for the quicker integration of additional clean energy generation.
- Provides system redundancy, resilience, and increases reliability.
- Benefits utilities and ratepayers by sharing power throughout the region.
- Reduces costs for consumers and promotes job creation.
- Coordinates planning, financing, and construction of new infrastructure.
- Augments and diversifies Environment, Social, and Governance investment portfolio holdings.

Expected Results:

This strategy will result in a more resilient and reliable transmission and electric grid system that will lower rates, help bring online clean energy, reduce costs for consumers, and promote job creation.



Wasilla, Alaska



STRATEGY A-2: Diversify Generation

ACTIONS

A-2.1 Adopt Clean Energy Standard and incentives to diversify generation.

A-2.2 Modify existing statute(s) requiring the Regulatory Commission of Alaska to consider long term diversification goals when approving additional/new Railbelt power generation.

A-2.3 Progress known near term energy diversification projects to a go/no-go decision:
2.3.1: Dixon Diversion

A-2.4 Progress known long term energy diversification projects to a go/no-go decision:
2.4.1: Susitna Watana

2.4.2: AKLNG, Bullet Line & Alternatives



Alaska Intertie, Alaska (Source: GVEA)

Purpose:

Encourage and coordinate the diversification of Railbelt generation assets through projects and policy that provide opportunities to maximize energy cost savings.

Background:

Today, 80-90% of the Railbelt's energy (heat and power) is generated using Cook Inlet (CI) natural gas, a supply source which is forecasted to fall short of demand as soon as 2027. Alaska utilities may likely need to import Liquefied Natural Gas (LNG) to meet short term supply needs and this is anticipated to increase the cost of energy and introduces potential energy security concerns. In order to ensure a secure, local supply of energy that is affordable and reliable, the Task Force Railbelt Subcommittee set a long term goal of significantly diversifying the Railbelt's energy generation.

Today, many proven and cost competitive electricity generation technologies exist and are ready for at-scale deployment across the Railbelt, and the state as a whole. Alternative technologies for central heat generation are not as ready to deploy and distributed heat generation solutions such as heat pumps point to electricity generation as their source. Based on this, the Railbelt Subcommittee recommends a near term focus on diversifying electricity generation. This will conserve natural gas for heat while increasing energy security with local and diverse electricity generation projects.

To enable this strategy the Railbelt Subcommittee supports the state adopting a Clean Energy Standard which would set electricity diversification goals. These goals should be supported with incentives rather than penalties to ensure affordable, reliable power is delivered to rate-payers. The Railbelt Subcommittee also recommends modifying state statutes to provide the Regulatory Commission of Alaska (RCA) the ability to value generation diversification (in addition to price) when reviewing and approving contracts.



The Railbelt Subcommittee did not complete comprehensive analysis or cost estimates for potential generation projects and ultimately all technologies should compete to bring the most affordable, diverse, reliable energy to the Railbelt. That said, there are projects which have previously been proposed or are currently being worked and the Subcommittee supports taking these projects through feasibility such that a “go/no-go” decision can be made. Alaska has several projects in various stages of development and permitting that could provide diversified renewable and clean power generation for Railbelt utilities including the Dixon Diversion project at Bradley Lake, and the potential mega-project at Susitna-Watana. Additionally, the Alaska LNG (AKLNG) project has the potential to open vast quantities of trapped North Slope natural gas for uses across the interior and south-central Alaska. The AKLNG is strategic in that it provides a local gas supply for heat and electricity base load for generations to come.

Benefits:

Encouraging and promoting diversification of power generation in the Railbelt and across Alaska may provide reliable, low cost energy for Alaskans.

Expected Results:

Greater diversification of power generation to provide reliable, lower cost electricity, for Railbelt rate payers.

“Today, 80-90% of the Railbelt’s energy (heat and power) is generated using Cook Inlet (CI) natural gas, a supply source which is forecasted to fall short of demand as soon as 2027.”



Seward Highway Transmission Line



Houston Solar Field
Houston, Alaska



STRATEGY A-3: Increase Demand

ACTIONS

A-3.1 Significantly increase load to drive down energy rates.

3.1.1: RFP for industrial customers

3.1.2: Energy tax credit for new industrial customers

3.1.3: Identify “load-friendly” areas already in-place



Port of Alaska, Anchorage, Alaska

Purpose:

Significantly increase load to drive down energy rates.

Background:

All other things being equal, if the fixed infrastructure costs of a power grid are spread over more customers and greater energy loads, customers will end up paying less on a per-kWh basis. This strategy has been used in Iceland, for example, where a high volume of production and sales have created efficiencies and economies of scale. According to analysis provided by Holdmann and Gudleifsson (in preparation), Iceland’s total electric production and Alaska’s tracked very closely until the mid-1990s, as did the delivered cost for electric power. After that point in time, the trajectories diverged significantly both in terms of annual production and sales as Iceland actively courted and attracted large industry (aluminum smelting) to its electric grid. This new industry increased Iceland’s energy demand by four-fold. Iceland’s cost of power delivered to the customer’s meter is now \$0.7-\$0.13 per kWh, as compared with \$0.19-\$0.26 for power from Alaska’s Railbelt grid.

A similar approach could be undertaken on Alaska’s Railbelt to drive the cost of power down for all customers and spur continued economic growth. Examples of new, large customers on the Railbelt could include ore processing of locally-resourced materials as well as new fuel generation production facilities for the transportation industry (air carriers, shipping, etc.), among others. A key insight is that Iceland simultaneously sought out new industry and committed to lower than current energy costs to incentivize industry to select Iceland as the preferred location.

Benefits:

Incentivizing and attracting large industry customers to Alaska’s Railbelt to increase electricity production demand, following a similar model to Iceland, could help lower the cost per-kWh for all Railbelt customers.

Expected Results:

The Railbelt will significantly increase its load to drive down prices for all consumers and spur economic development.

"The Railbelt system is made up of five electric utilities providing service to the communities of the Kenai peninsula to Fairbanks."

