

# The Railbelt Transmission Grid (now and future)

Presentation to: House Energy Committee  
March 26<sup>th</sup>, 2024

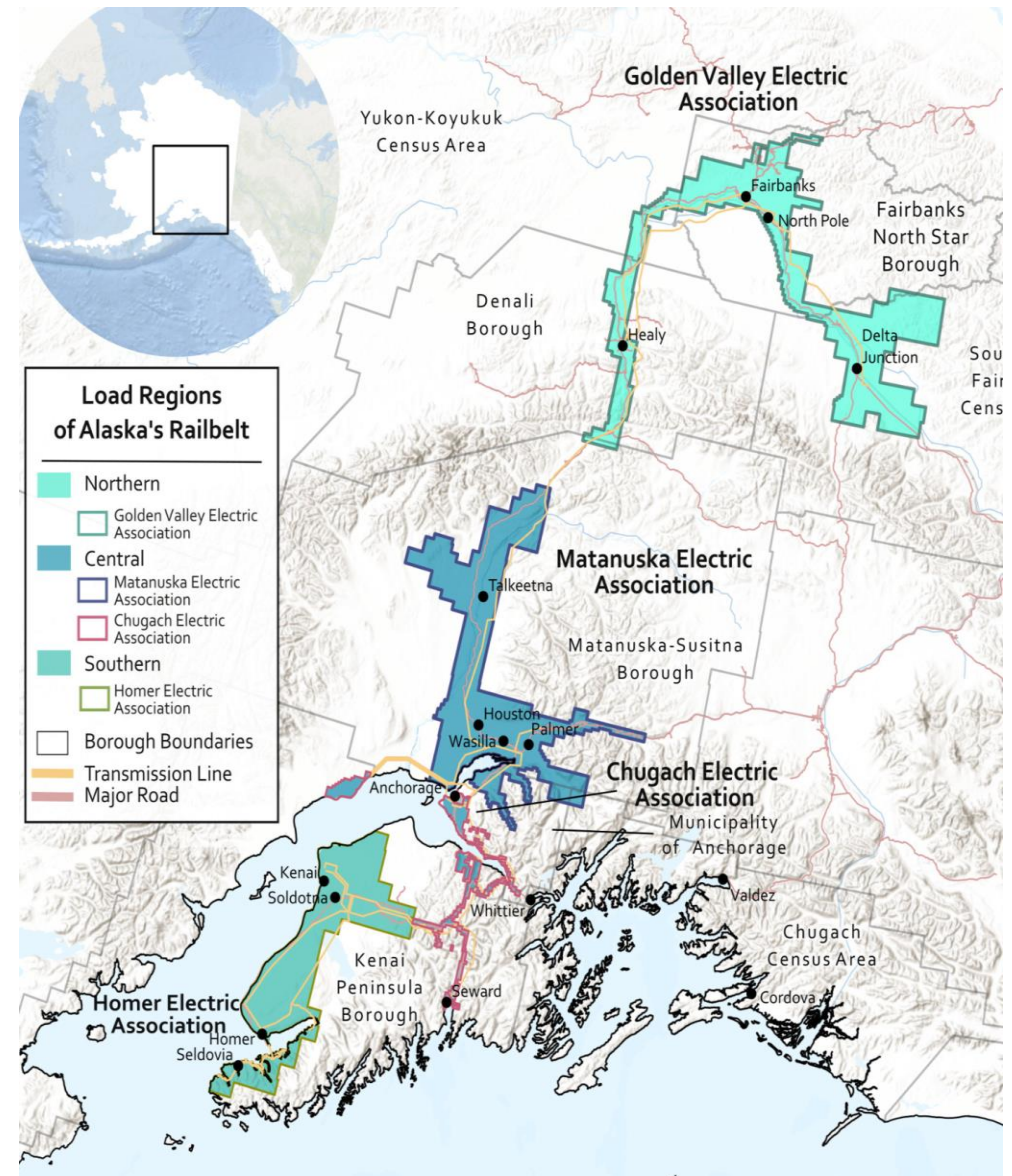
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*Image: Anchorage Daily News*

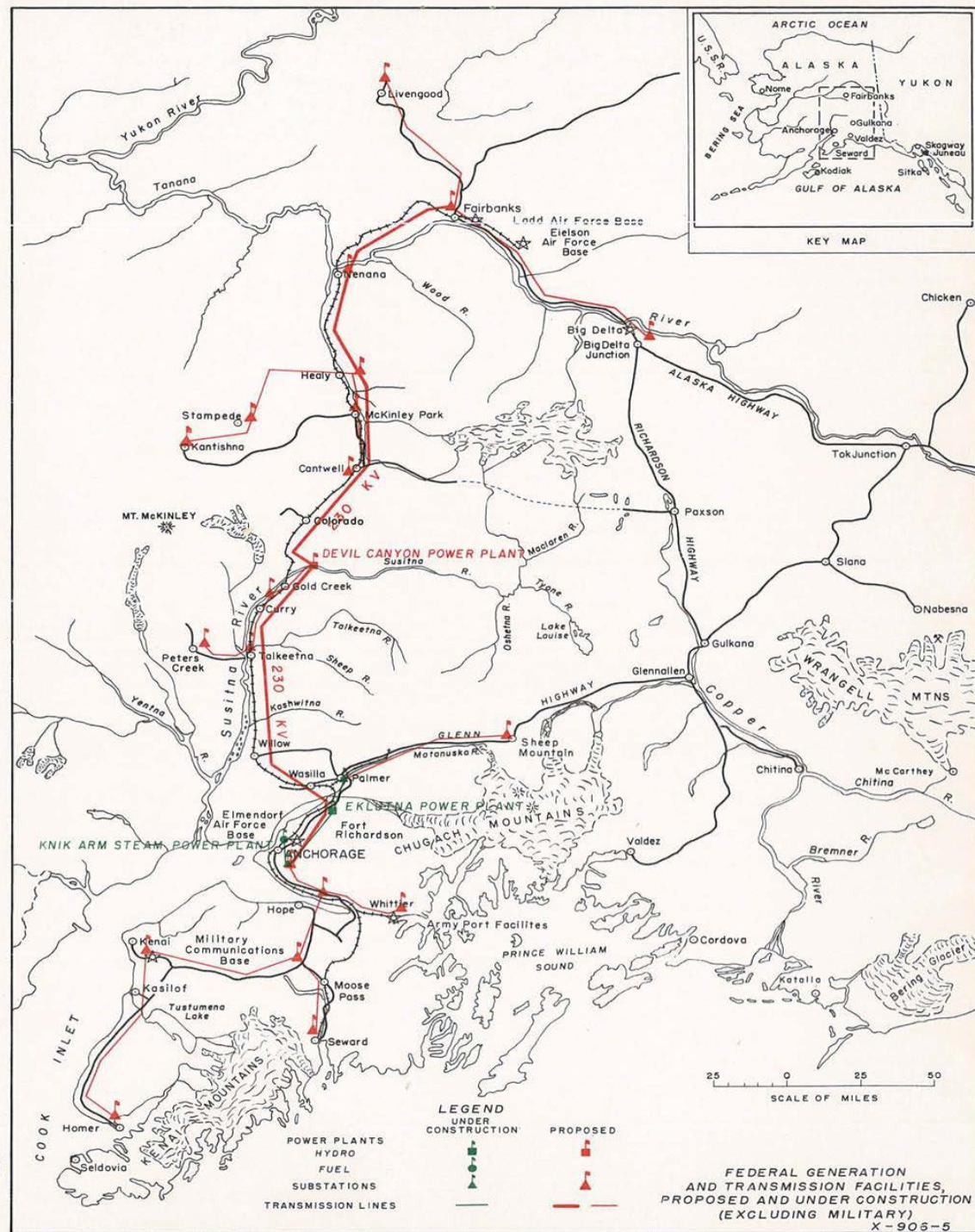
# A Vision for our Railbelt

We want a system that:

- Allows cheapest cost power to get to end-users wherever it is produced, whatever the source is, and wherever that generation is located.
- Facilitates clean energy projects at scale for energy security and diversification.



# These are not new issues or ideas



1952 – First map of a proposed integrated Railbelt Grid. Joseph M. Morgan of the Alaska Office of the Bureau of Reclamation/



# Historically, transmission has not been prioritized

Railbelt utilities solved reliability issues with local and regional generation rather than investing in interregional high-voltage transmission due to long distances with few members to pay the cost.

The history of the Railbelt has been compared to an Alaskan “Prisoner’s Dilemma” - prioritizing individual utilities’ needs has resulted in a suboptimal system for everyone.

There has never been single unified operator who was concerned about the grid as a whole.

## Prisoners Dilemma:

A paradox in decision analysis in which two individuals acting in their own self interests do not produce the optimal outcome.

# Shared opportunities create incentives for cooperation

Effective Railbelt cooperation most often occurred when state entities (legislature or AEA) provided capital for generation and transmission (Bradley Lake and Alaska Intertie).

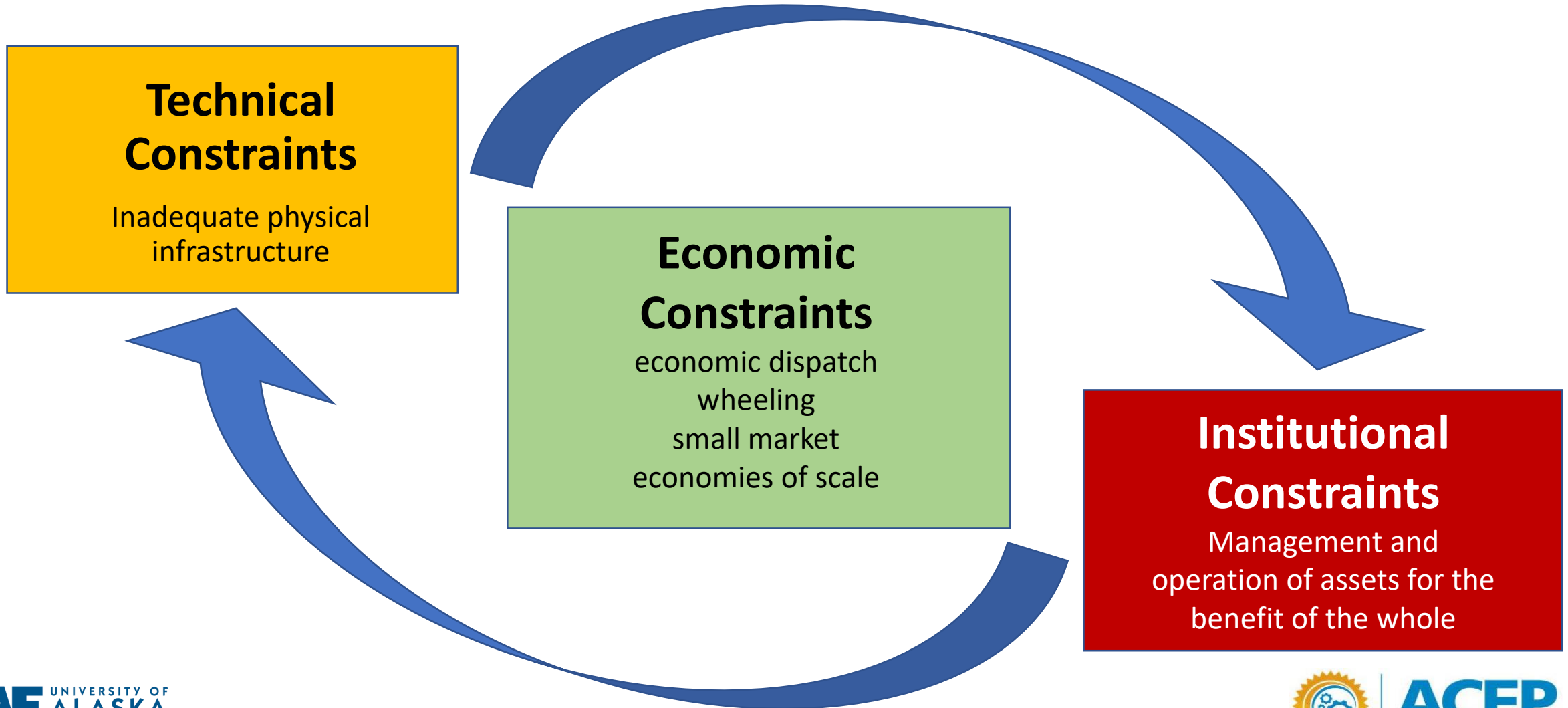
To operate these joint assets, Railbelt utilities had to find a way to work together.

Federal Funding (GRIP) create that incentive today.



*Bradley Lake Hydroelectric Project*

# Constraints on the Railbelt Grid



# Realities of the Railbelt Today

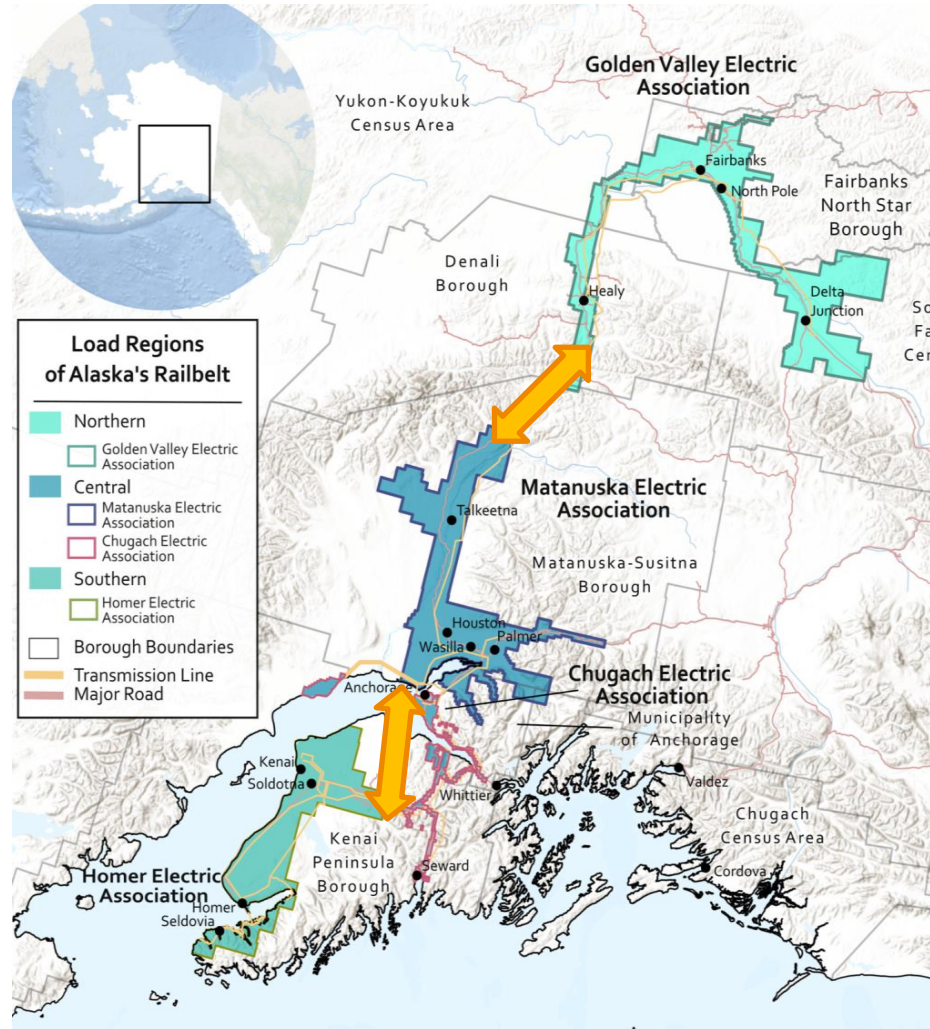
- Railbelt politics are *inherently local*
- Our energy sources are becoming more diverse
- Projects are more economical when **built at scale**
- The Railbelt transmission system needs to be upgraded. We have an **opportunity for federal funding** to help defray those costs.
- Alaska has avoided transmission deregulation because we are not grid connected (thus not subject to FERC)
- Finding analogous correlatives to Alaska can be challenging

# The *location* of generation will change in the future

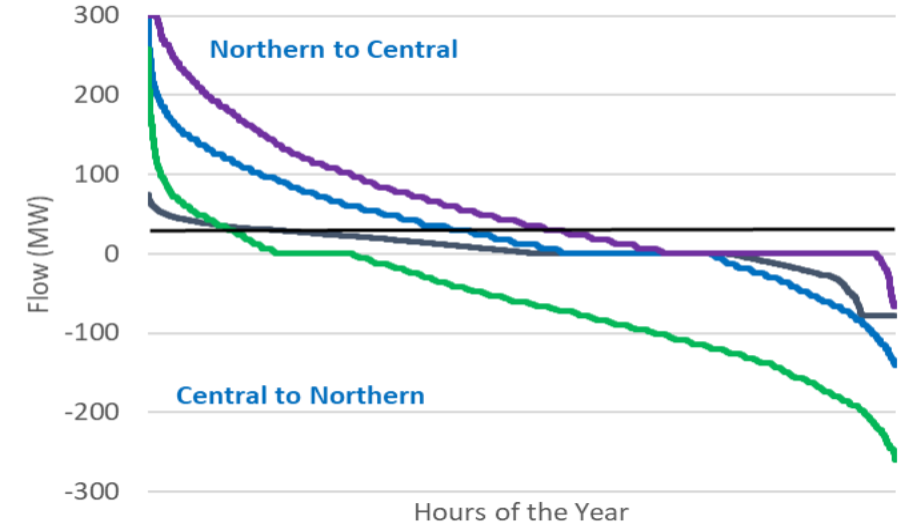
(and transmission network utilization increases across all scenarios)

*“Power flows between regions will increase as new generation is sited in the best places.”*

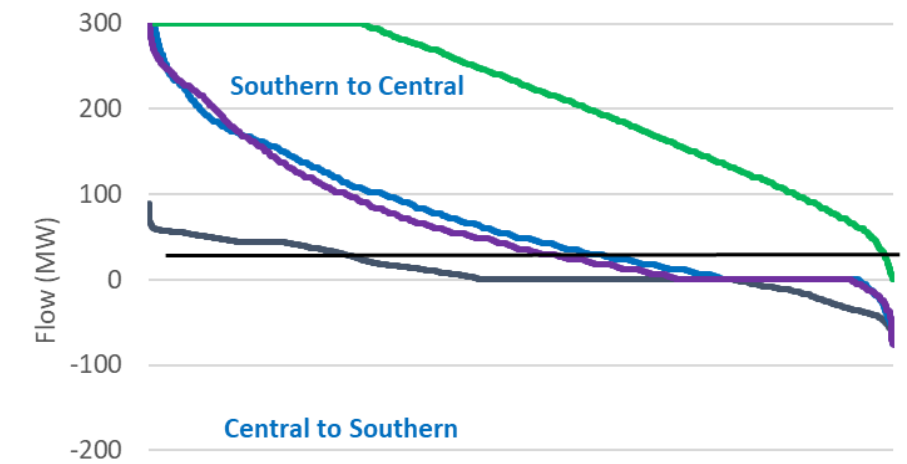
- Finding from ACEP Railbelt Decarbonization Project



AK Intertie Flow Duration Curve



Kenai Intertie Flow Duration Curve



— BAU      — Wind/Solar/Hydro  
 — Wind/Solar/Tidal      — Wind/Solar/Nuclear



# Three Goals:

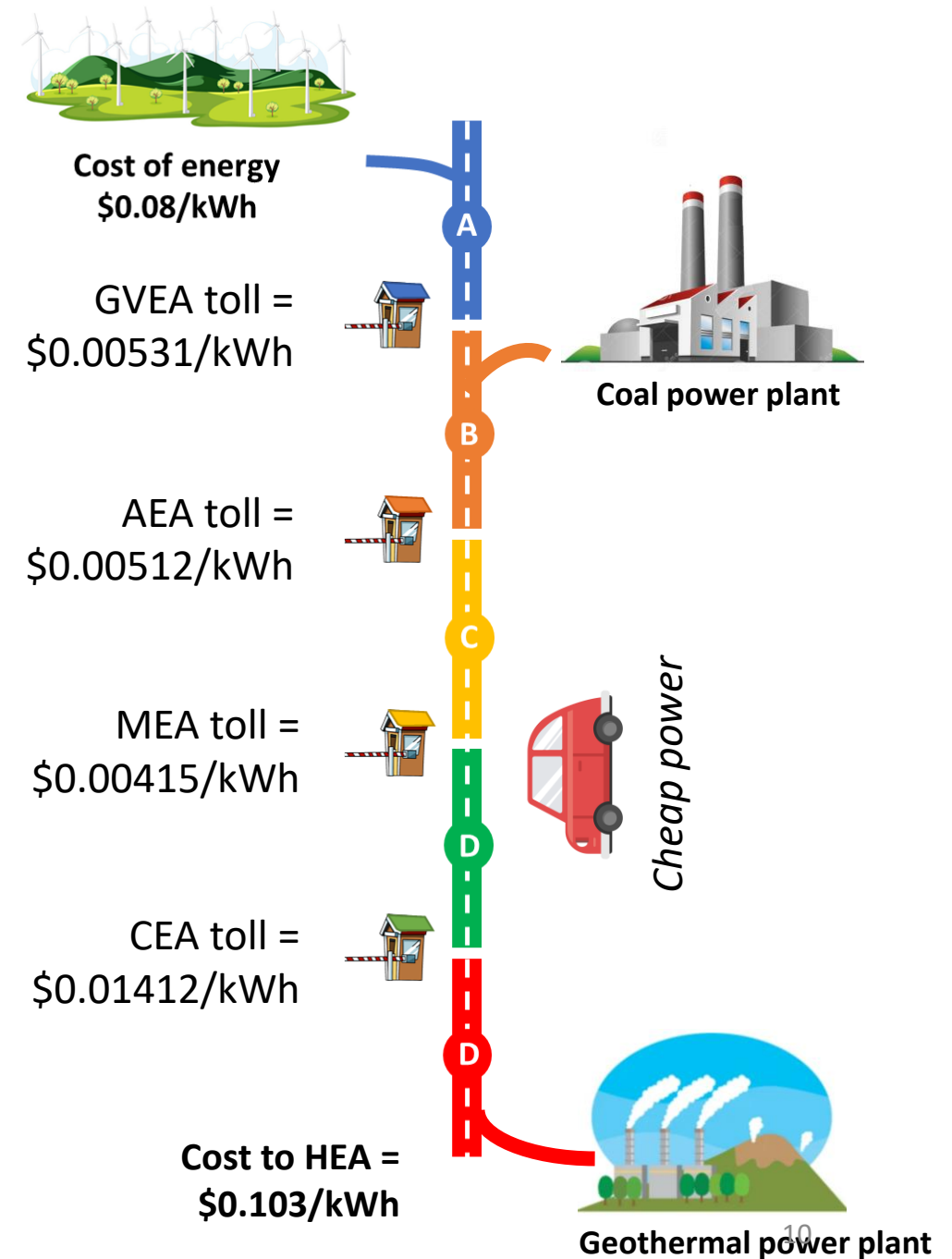
1. Eliminate pancaking wheeling rates and establish a framework for how transmission costs will be recovered and allocated
2. Create an organization that can oversee, manage and develop backbone transmission assets and that is subject to appropriate regulation
3. Re-imagining a planning process that uses a whole-system approach (transmission, generation, and distribution)

# Why does eliminating wheeling matter?

Decisions about investment in projects or economic dispatch should not be inhibited by the cost of transmission, or the need to move power across transmission lines with different ownership



*Get rid of the toll road, create an open access highway that does not discriminate in terms of who generates the power, or what form of generation is used*



# Goal # 1: Remove pancaking wheeling rates ... *and establish a framework for how costs will be recovered and allocated*



Transmission lines (like highways) are typically built for peak demand, not how much energy (traffic) flows through the system.

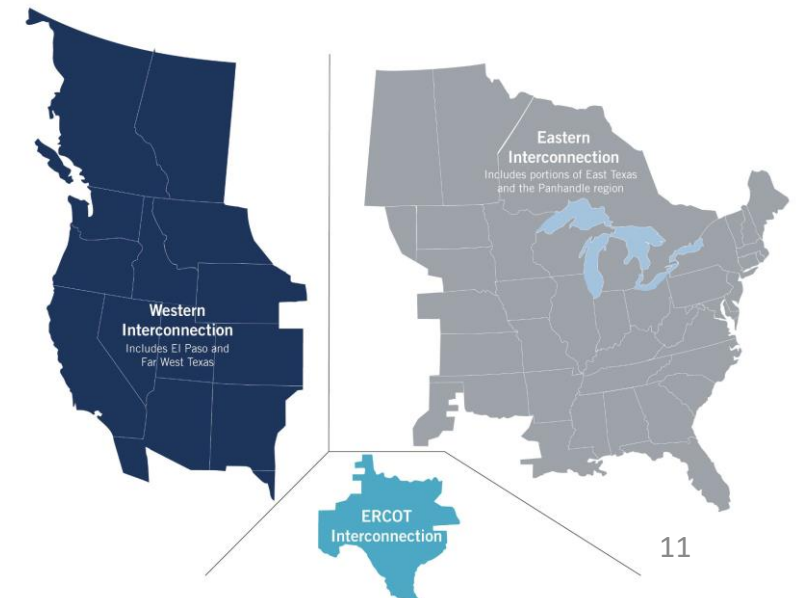
Texas operates as an electrical “island” and because power generated in Texas is not sent outside of the state, Texas is exempt from federal FERC regulation (like Alaska and Hawaii)

*“pool backbone transmission system costs and allocate those costs based on a coincident peak or load share ratio basis”*

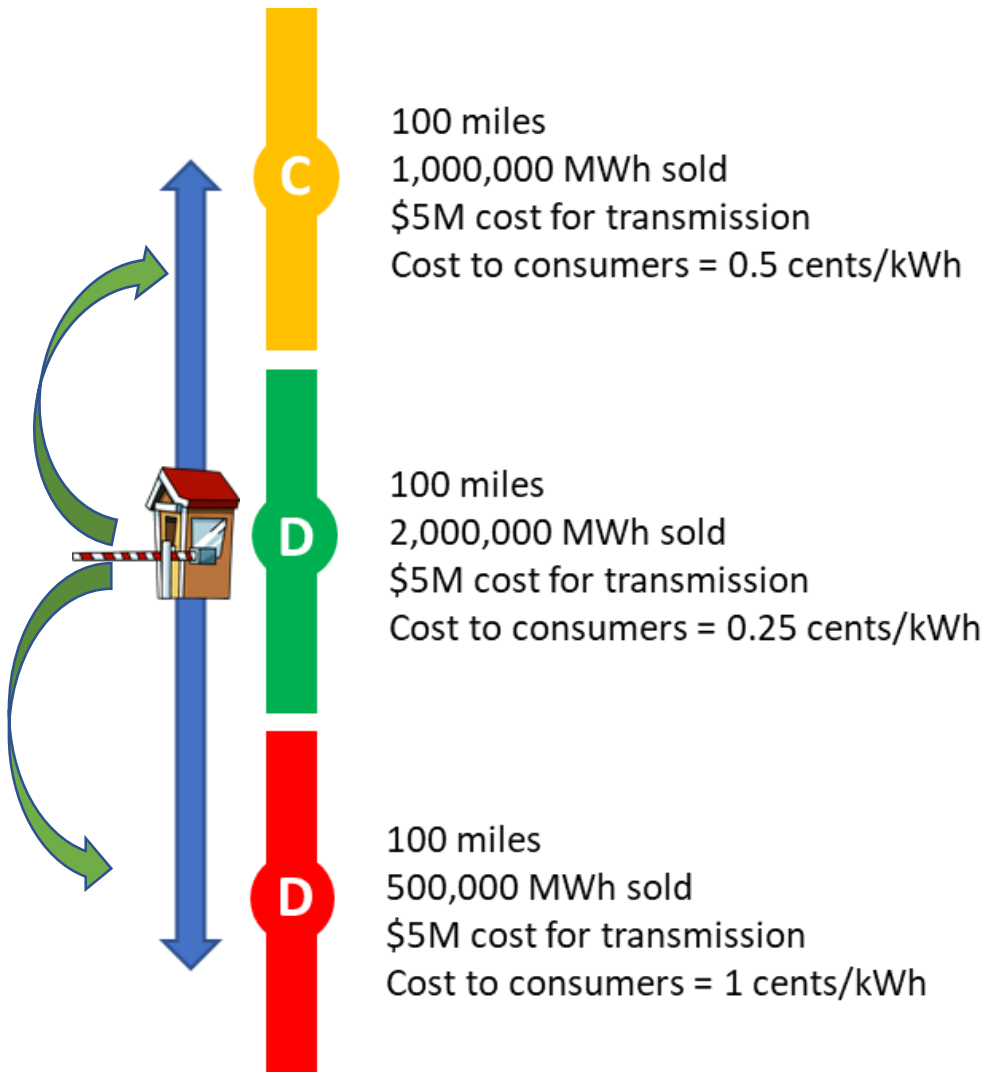
*- Adapted from Texas Substantive Rule 25.192*

**Coincident peak demand** - period when electricity usage (demand) is at its highest across the entire system

**Load share ratio** - considers users' overall energy consumption over a specific period



# Cost recovery under current model



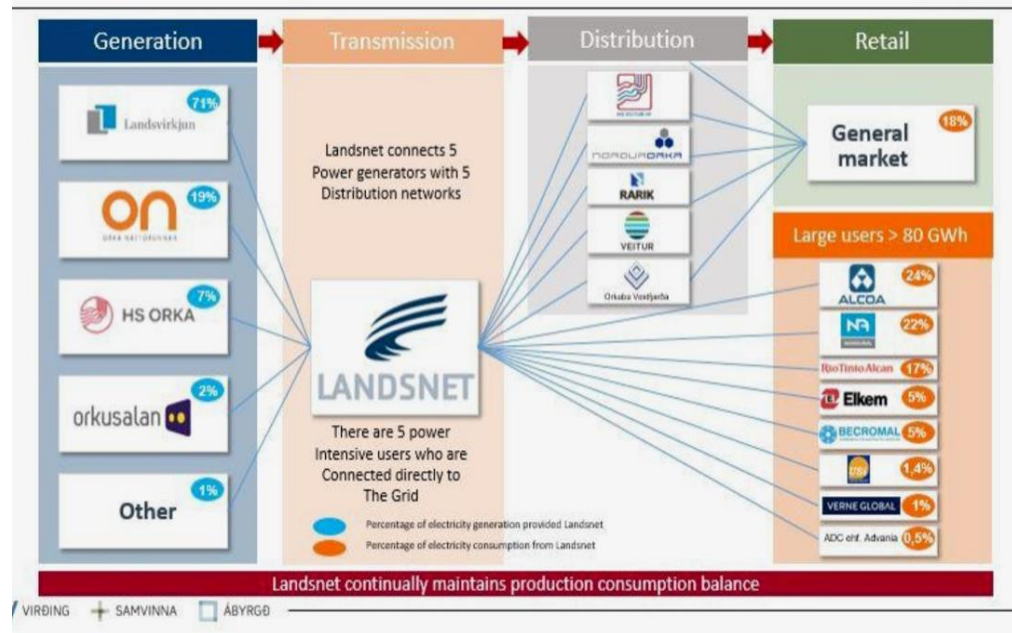
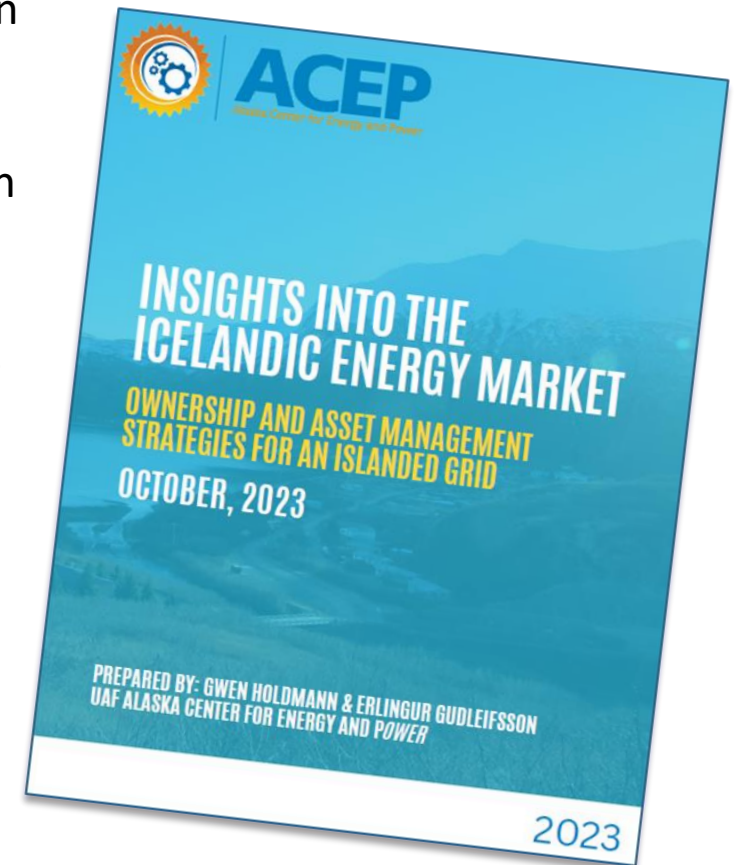
Currently, each utility is responsible for the capital and O&M costs of its transmission assets, but some of the cost burden can be shifted to the members of other utilities when power is transferred (wheeled) across their system.

*Note: this is illustrative only and is not based on actual metrics from any of the Railbelt utilities*

## Goal # 2: Create an organization that can oversee, manage and develop backbone transmission assets and that is subject to appropriate regulation

Iceland provides an interesting analog to Alaska's Railbelt due to similar transmission length, population served, and high prevalence of public power.

Iceland has a competitive energy market, with Landsnet as the national transmission system operator, overseeing the country's transmission infrastructure. Examining Iceland's governance and asset management strategies, particularly their evolution over the past three decades, presents an invaluable learning opportunity for Alaska.



\*Under recent legislative action, Landsnet has acquired transmission assets from other owners, consolidating ownership of the transmission infrastructure. Initially, however, asset owners had the flexibility to choose whether to sell or lease their transmission assets.

## Goal # 2: Create an organization that can oversee, manage and develop backbone transmission assets and that is subject to appropriate regulation

Borrow from a simple governance structure that has passed the test of time (in Alaska)



The Bradley Lake Project Management Committee governance structure can be used as a starting point to design a Railbelt Transmission Organization



The transmission tariff that establishes the rate that consumers pay should be subject to regulation (the Bradley Project is exempt)

Room for additional stakeholders:



**ACEP**  
Alaska Center for Energy and Power

## Goal # 3: Design a planning process that uses a whole-system approach

Integrated Grid Planning (IGP) is a successor concept to Integrated Resource Planning. IGP emphasizes whole-system planning across generation, transmission, and distribution resources.

**Hawaii** was an early adopter of IGP and may have coined the term. According to the Hawaii Public Utilities Commission, “In 2018, the Hawaii Public Utilities Commission opened the Integrated Grid Planning (“IGP”) Docket (2018-0165) to replace earlier grid planning efforts, namely Hawaiian Electric’s Integrated Resource Planning (1990 – 2014) and Power Supply Improvement Planning (2014 – 2017)

*Hawaii differs from Alaska in that power is not transmitted over long distances, and it is primarily served by a single investor owned utility, HECO, which also owns the transmission assets (with the exception of Kauai)*



# Three Goals:

- ✓ Eliminate pancaking wheeling rates and establish a framework for how transmission costs will be recovered and allocated
- ✓ Create an organization that can oversee, manage and develop backbone transmission assets and that is subject to appropriate regulation
- ✓ Re-imagining a planning process that uses a whole-system approach (transmission, generation, and distribution)