

Energy Summary

Strengths *Internal attributes that contribute to success*

Natural Resources & Environment

- Proximity to coal, biomass resources

Businesses, Organizations, & Government

- Chena Hot Springs annual renewable energy fair
- National Renewable Energy Laboratory (NREL) joined with Cold Climate Housing Research Center (CCHRC)
- The reopening of the Arctic Energy Office at the University of Alaska Fairbanks (UAF)

Funding & Markets

- Net metering program that allows Golden Valley Electric Association (GVEA) members to install renewable energy, with over 500 participants

Infrastructure

- FNSB has rail and road connectivity and an airport to move equipment, supplies, and products
- Connected to the Railbelt power grid
- Improvements to the power grid including battery energy storage, solar and wind investments, and transmission and distribution enhancements
- New facilities including a wood kiln, PetroStar's asphalt plant, UAF's coal-fired power plant
- Progress with natural gas expansion, including line extensions, tank storage, utility consolidation, and cost stability through contracting agreements

Opportunities *External forces that contribute to success*

Natural Resources & Environment

- Renewable energy development throughout the Railbelt

Businesses, Organizations, & Government

- Creation of a Railbelt Electric Reliability Organization
- Increased collaboration between adjacent communities
- State and federal interest in increasing renewables

Funding & Markets

- Federal funding opportunities for new infrastructure through the American Rescue Plan Act, COVID-19 relief funds, Infrastructure Investment and Jobs Act, and more

Infrastructure

- Alaska Gas Line
- Eielson selected as pilot location for the Air Force's first nuclear microreactor
- Electric car charging infrastructure expansion
- Improved battery storage technology that can help utilities better integrate variable sources (wind, solar)
- Transportation of natural gas by rail

Weaknesses *Internal barriers to success*

Natural Resources & Environment

- Air quality challenges associated with wood burning
- Environmental concerns with fossil fuel use

Education & Workforce

- Workforce challenges, including high turnover and challenges recruiting a skilled workforce

Funding & Markets

- Challenge of integrating low carbon energy sources without sacrificing cost or reliability
- High costs, and variability of costs, of energy
- No natural gas transport options except trucking
- Single provider for power

Infrastructure

- Delays in completion of the Titan LNG plant expansion
- Limited natural gas line network and lack of funding for main line extensions; limited liquefaction capacity
- Low density, small population create challenges to achieve economies of scale for new infrastructure
- Maintaining infrastructure in a harsh environment
- Reliance on aging coal infrastructure for power generation

Threats *External forces that could be barriers to success*

Natural Resources & Environment

- Ongoing designation as an Environmental Protection Agency (EPA) nonattainment area due to air quality, and potential cuts in federal funding

Businesses, Organizations, & Government

- Evolving safety, emissions, cybersecurity, and legal requirements from federal, state, and local agencies can create administrative and compliance challenges
- Federal policies that restrict resource development

Funding & Markets

- Ongoing supply chain disruptions and increasing supply costs due to the pandemic and workforce shortages
- Reliance on imported fuel sources
- Reliance on oil and gas and negative impacts from market price fluctuations and availability

Infrastructure

- Cyber threats and the cost of upgrading communication infrastructure for protection and security enhancements

Where We Are	What measurements can we use to track progress? Where do we want to be in 5 years?	2026 Targets
311 (2021)	New Annual Natural Gas Service Lines – Number of homes being converted + new homes with natural gas connections	500 (annual)
\$5,292 (2018)	Annual Household Cost – Total annual energy cost per household - <i>This amount is 1.3 times the Alaska average, 2.3 times the national average, and 33% higher than Anchorage</i>	\$3,500 (1/3 reduction)
15.3% (2022)	Renewables – Percentage of Railbelt energy that comes from renewable sources – <i>total renewable energy generation for GVEA alone is 10.4%</i>	25% (2030)

Sources: Natural gas connections from the Interior Energy Project; annual energy costs from the 2018 Alaska Housing Finance Corporation (AHFC) Statewide Housing Assessment; renewable percentage provided by GVEA



“The cost of energy isn’t just about the cost of the fuel itself, but also the cost of operations and maintenance to use that fuel, and costs on the environment.”



“Laying the groundwork for a successful Railbelt system which can integrate renewable resources is as equally important (if not more important) than the adding of the renewable resources itself.”

Energy Objectives – Long term improvements and changes we want to see in five years or more



1. Interior Alaska will have access to low-cost energy through its diversified, sustainable, reliable energy portfolio.



2. Interior Alaska will be a hub for piloting innovative solutions to unique cold climate energy challenges.

“We need a shared energy vision for Interior Alaska that everyone buys into and supports.”

“We are struggling, as are many other businesses in the Interior, from the lack of qualified personnel available and interested in working for the utility.”

“Material costs and lead times were (and continue to be) a challenge. Even common components have double or tripled in price and have lead times approaching 3 years.”

“We need to maximize the benefit of available federal infrastructure funding to establish infrastructure upgrades which could dynamically change the way energy is generated and transmitted across the Railbelt (and potentially new areas as well).”

Strategies & Actions – Activities we will implement over the next five years to accomplish goals & targets

1. Expand Natural Gas – Secure and implement more low-cost natural gas in the Interior. *(Objective 1)*

- a. Support continued efforts for homeowners to convert their homes to accept natural gas, including funding FNSB’s Oil to Gas Conversion Program. 🔑
- b. Increase liquefaction capacity. 🔑
- c. Implement Phase 2 of the Interior Gas Utility (IGU) buildout. 🔑
- d. Continue to build out main line extensions (e.g., Pearl Creek); include natural gas in new subdivisions. 🔑
- e. Support long-term planning for a natural gas pipeline, with Fairbanks connector. 🔑

2. Energy Innovation – Promote Interior Alaska as a site for energy innovation. *(Objectives 1, 2)*

- a. Support safe installation of the Air Force’s first microreactor on Eielson Air Force Base. 🔑 📖
- b. Support microgrid research and development. 🔑
- c. Support other pilot projects that advance and test new energy technologies in the Interior. 🔑 📖
- d. Expand weatherization and energy efficiency initiatives. 🔑
- e. Invest in electric vehicle charging infrastructure. 🔑
- f. Explore and invest in carbon capture/reduction technologies. 🔑
- g. Support research and implementation of value-added uses of energy sources, such as for coal and waste heat. 🔑 📖

3. Resilient Power Grid – Collaborate with other Railbelt utilities to achieve a resilient, efficient power grid that can better integrate future renewable energy sources for power generation. *(Objectives 1, 2)*

- a. Add an additional 45-50 megawatt (MW) of battery storage to help regulate variable power load from renewables and create backup power during outages/disruptions. 🔑
- b. Upgrade existing Railbelt intertie from 138 kV to 230 kV. 🔑

- c. Complete planning for and construct the Roadbelt intertie, 230kV line connecting Healy to Nikiski. 🔑
- d. Identify opportunities to collaborate with other sectors (e.g., shared utility easements with telecommunications). 🔑

4. Plan for Renewables – Integrate renewables into Interior Alaska’s long-range energy portfolio. *(Objectives 1, 2)*

- a. Support geothermal projects in areas with geothermal potential (e.g., Chena Hot Springs). 🔑
- b. Support wind farms in Interior Alaska. 🔑
- c. Collaborate with other Railbelt utilities to develop renewable energy projects (e.g., Bradley Lake Hydroelectric Project) that can reliably meet shared energy needs, reduce carbon output, and lower energy costs. 🔑
- d. Continue to expand and encourage participation in GVEA’s SNAP Plus net metering system, where members can install renewable generation that is connected to the grid. 🔑

5. Increase Collaboration – Improve collaboration between Interior Alaska energy stakeholders. *(Objectives 1, 2)*

- a. Convene utility providers and local policymakers to develop an Interior Alaska Energy Plan.
- b. Encourage greater Department of Defense (DoD) participation in regional energy planning. 🏠
- c. Encourage regional stakeholder participation in the Alaska Nuclear Energy Working Group.
- d. Continue to participate in conversations with regional Railbelt partners such as the Roadbelt Electric Reliability Organization, Bradley Lake Management Committee, and Railbelt Utility Managers groups.
- e. Work with education and workforce development providers to expand outreach about and availability of training opportunities to support the needs of the energy sector.

Key	★	Priority (TBD)	🔑	Capital Project	🏠	Military-related
------------	---	----------------	---	-----------------	---	------------------

“Success is not going to come overnight and a staged approach needs to be done to ensure that reliability, cost, and environmental impacts are all considered in the decision-making process.”

“One of the biggest challenges is trying to integrate low carbon energy resources in such a way that does not sacrifice cost or reliability.”

Other Relevant Resources

- **Small Scale Nuclear Power: an option for Alaska?** UAF Alaska Center for Energy and Power. January 2021. [View here.](#)
- **Alaska State Energy Profile.** U.S. Energy Information Administration. 2022. [View here.](#)
- **Interior Energy Project.** Alaska Industrial Development & Export Authority. [Project website here.](#)
- **FNSB CEDS Economic Impact Analysis: Interior Gas Utility Phase 2 Buildout.** Fairbanks North Star Borough, Nov. 2021. [View here.](#)



Energy

See Appendix A for a list of acronyms.

Strategy #1: Expand Natural Gas – Secure and implement more low-cost natural gas in the Interior.

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	a. Support continued efforts for homeowners to convert their homes to accept natural gas, including funding FNSB’s Oil to Gas Conversion Program.	FNSB	Alaska Industrial Development and Export Authority (AIDEA)	\$3.2 million	2023
✓	b. Increase liquefaction capacity.	IGU	TBD	TBD	2026
✓	c. Implement Phase 2 of the Interior Gas Utility buildout.	IGU	TBD	TBD	TBD
✓	d. Continue to build out main line extensions (e.g., Pearl Creek); include natural gas in new subdivisions.	IGU	FNSB, developers	~\$1 million annually	Ongoing
✓	e. Support long-term planning for a natural gas pipeline, with Fairbanks connector.	Alaska Gasline Development Corporation	AIDEA, IGU	TBD	TBD

Strategy #2: Energy Innovation – Promote Interior Alaska as a site for energy innovation.

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	a. Support safe installation of the Air Force’s first microreactor on Eielson Air Force Base. Learn more here .	DoD	GVEA, Department of Energy, the Nuclear Regulatory Commission	TBD	Select vendor 2022, begin construction 2025, begin operations 2027
✓	b. Support microgrid research and development.	UAF Alaska Center for Energy and Power (ACEP)	National Renewable Energy Laboratory (NREL), Renewable Energy Alaska Project (REAP); Intelligent Energy Systems; UA Institute for Social & Economic Research (ISER)	Varies	Ongoing
✓	c. Support other pilot projects that advance and test new energy technologies in the Interior.	NREL/CCHRC	REAP, GVEA, UAF Arctic Energy Office, DoD, Alaska Native Tribal Health Consortium (ANTHC), entrepreneurs, UAF ACEP	Varies	Varies
✓	d. Expand weatherization and energy efficiency initiatives.	NREL/CCHRC	Fairbanks Climate Action Coalition (FCAC), Solarize Fairbanks, Interior	Varies	Ongoing

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
			Weatherization, REAP, ANTHC, Interior Regional Housing Authority (IRHA), Alaska Housing Finance Corporation (AHFC), UAF ACEP		
✓	e. Invest in electric vehicle (EV) charging infrastructure. Learn more about current efforts at the Alaska Energy Authority (AEA)'s Alaska Electric Vehicle Working Group page here .	AEA	GVEA, Alaska Electric Vehicle Association, UAF ACEP, FNSB, FCAC, state agencies, electric vehicle drivers and industry representatives	EV fast-charging network phase 1: \$1.52 M (Kenai Peninsula to Fairbanks)	Phase 1: Summer 2022
✓	f. Explore and invest in carbon capture/reduction technologies, including the Fairbanks Carbon Reduction Fund .	UAF ACEP, UAF Alaska Center for Climate Assessment & Policy (ACCAP)	FCAC, Alaska Native Corporations, Alaska Village Corporations	Varies	Ongoing
	g. Support research and implementation of value-added uses of energy sources, such as for coal and waste heat.	UAF ACEP	REAP, GVEA, UAF Arctic Energy Office, DoD, ANTHC, entrepreneurs, UAF ACEP, NREL/CCHRC	Varies	Ongoing

Strategy #3: Resilient Power Grid – Collaborate with other Railbelt utilities to achieve a resilient, efficient power grid that can better integrate future renewable energy sources for power generation.

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	a. Add an additional 45-50 MW of battery storage to help regulate variable power load from renewables and create backup power during outages/disruptions.	GVEA	AEA	\$70-\$75 million	2025
✓	b. Upgrade existing Railbelt intertie from 138 kV to 230 kV.	Railbelt utilities	AEA, Denali Commission	\$170 million	TBD
✓	c. Complete planning for and construct the Roadbelt intertie, a 230kV line connecting Healy to Nikiski. (see the Denali Commission Roadbelt Intertie Project Report here for more information).	Roadbelt Electric Reliability Organization (ERO)	AEA, utility providers, municipalities, Denali Commission, Tribes	\$1 billion (\$566 M for Sutton to Delta Junction)	2025
✓	d. Identify opportunities to collaborate with other sectors (e.g., shared utility easements with telecommunications).	GVEA	IGU, broadband providers, permitting departments of state and federal agencies, Denali Commission	Varies	Ongoing

Strategy #4: Plan for Renewables – Integrate renewables into Interior Alaska’s long-range energy portfolio.

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	a. Support geothermal projects in areas with geothermal potential (e.g., Chena Hot Springs).	Chena Hot Springs	REAP, AEA, FCAC	Varies	Ongoing
✓	b. Support wind farms in Interior Alaska.	GVEA	FCAC, REAP, AEA, UAF ACEP	Varies	Ongoing
✓	c. Collaborate with other Railbelt utilities to develop renewable energy projects (e.g., Bradley Lake Hydroelectric Project) that can reliably meet shared energy needs, reduce carbon output, and lower energy costs.	GVEA	FCAC, Other Railbelt utilities	Varies	Ongoing
✓	d. Continue to expand and encourage participation in GVEA’s SNAP Plus net metering system, where members can install renewable generation that is connected to the grid.	GVEA	Solarize Fairbanks/ FCAC, FNSB	Varies	Ongoing

Strategy #5: Increase Collaboration – Improve collaboration between Interior Alaska energy stakeholders.

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
	a. Convene utility providers and local policymakers to develop an Interior Alaska Energy Plan.	AEA	Utilities, FNSB, UAF, DoD, FEDC, FCAC	TBD	2023
	b. Encourage greater Department of Defense participation in regional energy planning.	FNSB, FEDC	DoD	n/a	Ongoing
	c. Encourage regional stakeholder participation in the Alaska Nuclear Energy Working Group.				
	d. Continue to participate in conversations with regional Railbelt partners such as the Roadbelt Electric Reliability Organization, Bradley Lake Management Committee, and Railbelt Utility Managers groups.	GVEA	AEA	Varies	Ongoing
	e. Work with education and workforce development providers to expand outreach about and availability of training opportunities to support the needs of the energy sector.	UAF	Alaska Works Partnership, Alaska Job Center Network, Doyon Foundation, FNSB School District	Varies	Ongoing