

# Energy Summary

## Strengths *Internal attributes that contribute to success*

### Natural Resources & Environment

- Proximity to coal and renewable resources such as solar, wind, biomass, and geothermal (and hydro via inertia)

### 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)
- Solarize Fairbanks

### Funding & Markets

- Net metering program that allows Golden Valley Electric Association (GVEA) members to install renewable energy

### 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

## Weaknesses *Internal barriers to success*

### Natural Resources & Environment

- Air quality challenges associated with burning wood, coal, heating fuel, and other contributors, exacerbated by inversion conditions in winter
- 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 and variable cost of energy
- No natural gas transport options except trucking
- Single provider for power

### Infrastructure

- Delays in completion of the Titan liquefied natural gas (LNG) plant expansion
- Limited natural gas line network and lack of funding for phase buildout; 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, diesel, and naphtha infrastructure for power generation

## Opportunities *External forces that contribute to success*

### Natural Resources & Environment

- Renewable energy development throughout the Railbelt
- Emerging technologies such as heat pumps

### 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

## 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 development and/or fossil fuel use

### 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
- Climate change impacts on health, environment, infrastructure (flooding, wildfires, etc.)

Where We Are	What measurements can we use to track progress? Where do we want to be in 5 years?	2027 Targets
<b>311</b> (2021)	<b>New Annual Natural Gas Service Lines</b> – Number of homes being converted + new homes with natural gas connections	<b>500</b> (annual)
<b>\$5,292</b> (2018)	<b>Annual Household Cost</b> – Total annual energy cost per household - <i>This 2018 amount is 1.3 times the Alaska average, 2.3 times the national average, and 33% higher than Anchorage in 2018</i>	<b>\$3,500</b> (1/3 reduction)
<b>15.3%</b> (2022)	<b>Renewables</b> – Percentage of Railbelt energy that comes from renewable sources – <i>total renewable energy generation for GVEA alone is 10.4%</i>	<b>25%</b> (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 equally important (if not more important) than the adding of the renewable resources itself.”

“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.”

## 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, adaptive, resilient solutions to climate change impacts and 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.”

“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 objectives & targets. See Chapter 3 for a detailed action plan.

Icon Key: Capital Project    Military-related

**1. 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 and solar farms in Interior Alaska.
- c. Collaborate with other Railbelt utilities to develop renewable energy projects 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.

**2. Increase Energy Efficiency** – Implement energy efficiency measures in residential, government, and commercial facilities. (Objective 2)

- a. Encourage installation of heat pumps.
- b. Implement energy efficiency measures in FNSB facilities.
- c. Conduct consumer education on the benefits of energy efficiency and weatherization.
- d. Grow local capacity to conduct energy audits and construct energy efficient facilities, including pursuing infrastructure grant funding opportunities from the U.S. Department of Energy.
- e. Bring back the Alaska Housing Finance Corporation home energy efficiency upgrade rebate program.
- f. Pursue weatherization assistance funding opportunities in the infrastructure bill.

**3. Promote 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. Invest in electric vehicle charging infrastructure.
- e. Explore carbon capture/reduction technologies.

- f. Support research and implementation of value-added uses of energy sources, such as heating greenhouses with waste heat. 🔧

**4. Develop a 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 Anchorage to Fairbanks along the Richardson and Glenn Highways. 🔧
- d. Identify opportunities to collaborate with other sectors (e.g., shared utility easements with telecommunications). 🔧

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

- a. Support continued efforts to assist homeowners in converting their homes to natural gas, including funding FNSB’s Oil to Gas Conversion Program. 🔧
- b. Increase natural gas liquefaction capacity. 🔧
- c. Implement Phase 2 of the Interior Gas Utility (IGU) buildout. 🔧
- d. Continue to build out main line extensions; include natural gas in new subdivisions. 🔧
- e. Support long-term planning for a natural gas pipeline, with structurally and financially integrated Fairbanks connector. 🔧
- f. Secure State LNG storage tax credit rebate.

**6. 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, with opportunities for community input.
- 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 Roadbelt 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, and identify outstanding workforce development needs such as solar installers and energy auditors. See *education & workforce development for related strategies and actions*.

## Other Relevant Resources

- **FNSB Climate Action and Adaptation Plan.** Fairbanks North Star Borough. In progress. [View here.](#)
- **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 Action Plan

See Appendix A for a list of acronyms.

## Strategy #1: 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, FEDC	Varies	Ongoing
✓	b. Support wind and solar farms in Interior Alaska.	GVEA	FCAC, REAP, AEA, UAF ACEP, Delta Wind Farm, FEDC	Varies	Ongoing
✓	c. Collaborate with other Railbelt utilities to develop renewable energy projects that can reliably meet shared energy needs, reduce carbon output, and lower energy costs.	GVEA	FCAC, Other Railbelt utilities, FEDC	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, FEDC, TCC	Varies	Ongoing

## Strategy #2: Increase Energy Efficiency – Implement energy efficiency measures in residential, government, and commercial facilities

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	a. Expand weatherization and energy efficiency initiatives.		FCAC, Solarize Fairbanks, Interior Weatherization, REAP, ANTHC, Interior Regional Housing Authority (IRHA), Alaska Housing Finance Corporation (AHFC), UAF ACEP, TCC	Varies	Ongoing
✓	b. Encourage installation of heat pumps.	NREL/CCHRC	FCAC, Interior Weatherization, REAP, ANTHC, Interior Regional Housing Authority (IRHA), Alaska Housing Finance Corporation (AHFC), UAF ACEP, TCC	Varies	Ongoing
✓	c. Implement energy efficiency measures in FNSB facilities.	FNSB		Varies	Ongoing
	d. Conduct consumer education on the benefits of energy efficiency and weatherization.	TBD		Varies	Ongoing
✓	e. Grow local capacity to conduct energy audits and construct energy efficient facilities, including pursuing infrastructure	TBD	NREL/CCHRC, Interior Weatherization, REAP, ANTHC, Interior Regional Housing Authority (IRHA), Alaska	Varies	Ongoing



Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
	grant funding opportunities from the U.S. Department of Energy.		Housing Finance Corporation (AHFC), UAF ACEP, FEDC, TCC		
	<b>f.</b> Bring back the Alaska Housing Finance Corporation (AHFC) home energy efficiency upgrade rebate program.	AHFC		TBD	TBD
	<b>g.</b> Pursue weatherization assistance funding opportunities in the infrastructure bill.	TBD	NREL/CCHRC, Interior Weatherization, REAP, ANTHC, Interior Regional Housing Authority (IRHA), Alaska Housing Finance Corporation (AHFC), UAF ACEP, TCC	Varies	Ongoing

### Strategy #3: Promote Energy Innovation – Promote Interior Alaska as a site for energy innovation.

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	<b>a.</b> Support safe installation of the Air Force’s first microreactor on Eielson Air Force Base. Learn more <a href="#">here</a> .	DoD	GVEA, Department of Energy, the Nuclear Regulatory Commission	TBD	Select vendor 2022, begin construction 2025, begin operations 2027
✓	<b>b.</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
✓	<b>c.</b> 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, FEDC, Tanana Chiefs Conference (TCC), Fairbanks Climate Action Coalition (FCAC)	Varies	Varies
✓	<b>d.</b> 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 <a href="#">here</a> .	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

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	e. Explore carbon capture/reduction technologies, including the <a href="#">Fairbanks Carbon Reduction Fund</a> .	UAF ACEP, UAF Alaska Center for Climate Assessment & Policy (ACCAP)	FCAC, Alaska Native Corporations, Alaska Village Corporations, FEDC	Varies	Ongoing
✓	f. Support research and implementation of value-added uses of energy sources, such heating greenhouses with waste heat.	UAF ACEP	REAP, GVEA, UAF Arctic Energy Office, DoD, ANTHC, entrepreneurs, UAF ACEP, NREL/CCHRC, FEDC	Varies	Ongoing

#### Strategy #4: Develop a 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, U.S. Department of Energy (DOE)	\$70-\$75 million	2025
✓	b. Upgrade existing Railbelt intertie from 138 kV to 230 kV.	Railbelt utilities	AEA, Denali Commission, GVEA, FCAC	\$170 million	TBD
✓	c. Complete planning for and construct the Roadbelt intertie, 230kV line connecting Anchorage to Fairbanks along the Richardson and Glenn Highways (see the Denali Commission Roadbelt Intertie Project Report <a href="#">here</a> for more information).	Roadbelt Electric Reliability Organization (ERO)	AEA, utility providers, municipalities, Denali Commission, Tribes, FEDC	\$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, Golden Heart Utilities, FCAC	Varies	Ongoing

#### Strategy #5: Expand Natural Gas – Secure and start utilizing more low-cost natural gas in the Interior.

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	a. Support continued efforts to assist homeowners in converting their homes to natural gas, including funding FNSB's Oil to Gas Conversion Program	FNSB	Alaska Industrial Development and Export Authority (AIDEA), FEDC	\$3.2 million	2023
✓	b. Increase natural gas 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; include natural gas in new subdivisions.	IGU	FNSB, developers	~\$1 million annually	Ongoing

Capital Project?	Action	Lead	Support	Estimated Resources	Target Completion
✓	e. Support long-term planning for a natural gas pipeline, with structurally and financially integrated Fairbanks connector.	Alaska Gasline Development Corporation	AIDEA, IGU	TBD	TBD
	f. Secure State LNG storage tax credit rebate.	IGU	AIDEA, FNSB, FEDC	TBD	TBD

### Strategy #6: 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.	FEDC	AEA, Utilities, FNSB, UAF, DoD, 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.	ACEP	FEDC	Varies	Ongoing
	d. Continue to participate in conversations with regional Roadbelt partners such as the Roadbelt Electric Reliability Organization, Bradley Lake Management Committee, and Railbelt Utility Managers groups.	GVEA	AEA, FNSB, FEDC, FCAC	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, and identify outstanding workforce development needs such as solar installers and energy auditors.	UAF	Alaska Works Partnership, Alaska Job Center Network, Doyon Foundation, FNSB School District, FEDC, TCC, GFCC	Varies	Ongoing