ALASKA ENERGY AUTHORITY

Solar for All

PROGRAM NARRATIVE

Program Strategy Narrative

1. Impact Assessment

Market Environment

There are two distinct grid categories in the State of Alaska: Railbelt and remote. The majority of the state's population (70%) resides in urban areas of what's known as the Railbelt. The remaining 30% of the population reside in isolated rural communities served by independent utilities. This relatively small interconnected electrical system is home to significant Department of Defense assets, tribal governments, highly diverse populations, and a remarkable variety of carbon and non-carbon energy resources.

Alaska's Railbelt is serviced by five electric utilities (four cooperatives and one municipal utility) and is an interconnected grid that loosely follows the route of the Alaska Railroad. The State of Alaska, through the Alaska Energy Authority (AEA), owns significant transmission and generation infrastructure on the Railbelt system. The residents and businesses along the Railbelt consume approximately 80% of the state's electricity across a service area similar to the distance from West Virginia to Maine. On an annual basis, the Railbelt generates approximately 4800 GWh. Interconnection between regions is by single transmission lines, which limits economic transfers and negatively affects system resiliency. The opportunity for residential solar is high in this market.

The remaining 30% of the state's population resides in over 200 rural and tribal communities and rely on local and regional power generation, and over 100 isolated and independent utilities provide those services. Most rural Alaska communities are only accessible by plane or marine vessel, with over half classified by the Denali Commission as distressed communities.

Alaska's solar program offers an opportunity to reduce entry barriers for underserved Alaskans, enabling them to enjoy the advantages of residential rooftop solar along the Railbelt, and community-based solar in rural Alaska. The collaborative approach between AEA and the Alaska Housing Finance Corporation (AHFC) will result not only in lower energy costs for disadvantaged Alaskans, but it will also provide access to critical resilience assets in rural Alaska. Further market analysis will be conducted in the first year's planning effort, including focusing on residential-serving distributed solar and storage deployment, and the participation of low-income and disadvantaged households. While Alaska is data-poor, there are program models that have been used effectively and that experience is described below.

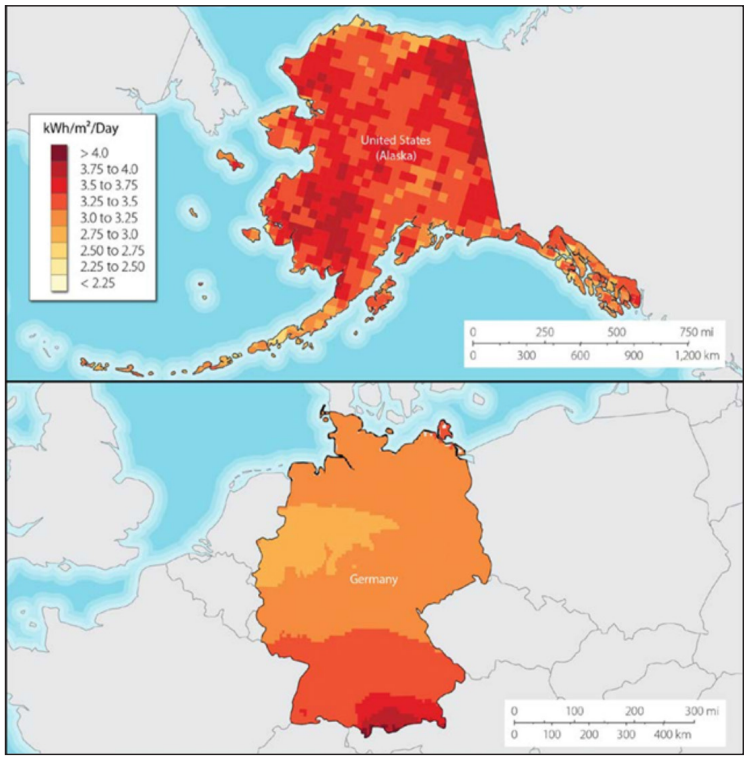


FIGURE 1: Solar resource comparison of Alaska and Germany (NREL).

Despite having a solar insolation value similar to Germany (Figure 1), Alaska has not fully embraced solar energy as a widespread source of power. With 19 MW of solar installed at the end of 2022, according to the Solar Energy Industries Association (SEIA), the state ranked 49th in total deployment capacity.

The high-level results of a 2016 NREL analysis indicate there are plausible scenarios in which photovoltaic (PV) can be economically competitive with diesel fuel prices at low PV penetration levels. In this analysis, the cases where PV appears economically competitive generally requires a combination of (1) high diesel fuel prices (at least 40 cents/kWh), (2) relatively low, for Alaska, PV prices (approximately $6 to $9 per W installed), (3) relatively high, for Alaska, solar production levels (capacity factor of nearly 10% or higher), and (4) the ability to make use of economically valuable tax benefits provided by the federal government. Solar development is likely favorable for other Alaskan villages, not considered in this analysis, but have a similar combination of characteristics.

Solar projects accounted for 2% of investment in Alaska in renewable energy between 2010 and 2020, including the state's first utility-scale solar farms constructed in Healy and Willow. Solar generation in the spring and fall is often impressive in northern latitudes where clear skies, cool temperatures, dry air, and bright, reflective snow all support solar generation. Solar PV systems can exceed their rated output during these times of year. A good example is the Native Village of Hughes, a community of 85 people located on the Koyukuk river accessible only by boat or plane, which recently installed a 120 kW solar PV system to help advance the community's renewable energy goal of 50% by 2025. In 2022, the Native Village of Hughes generated 500 MWh with diesel and 8.7 MWh through solar. The 8.7 MWh of solar power saved the community $21,353 in diesel costs.

Alaska's solar market is relatively immature compared to many other states. Alaska ranks 52nd out of the 56 States and Territories in both total Solar Jobs and Solar Jobs per Capita and 49th in installed solar capacity.[1] In 2022, only 0.2% of the state's electricity was from solar with an installed capacity of 19 MW. That's enough to power 2,281 of Alaska's approximately 329,285 housing units.

Alaska's solar installation rate has steadily increased over the years. Before 2018, the yearly installation was less than 1 MW. In both 2019 and 2020, it rose to over 4 MW, before the effects of COVID-19 shutdowns slowed the pace of installation. Per IREC's Solar Job Census,[2] Alaska

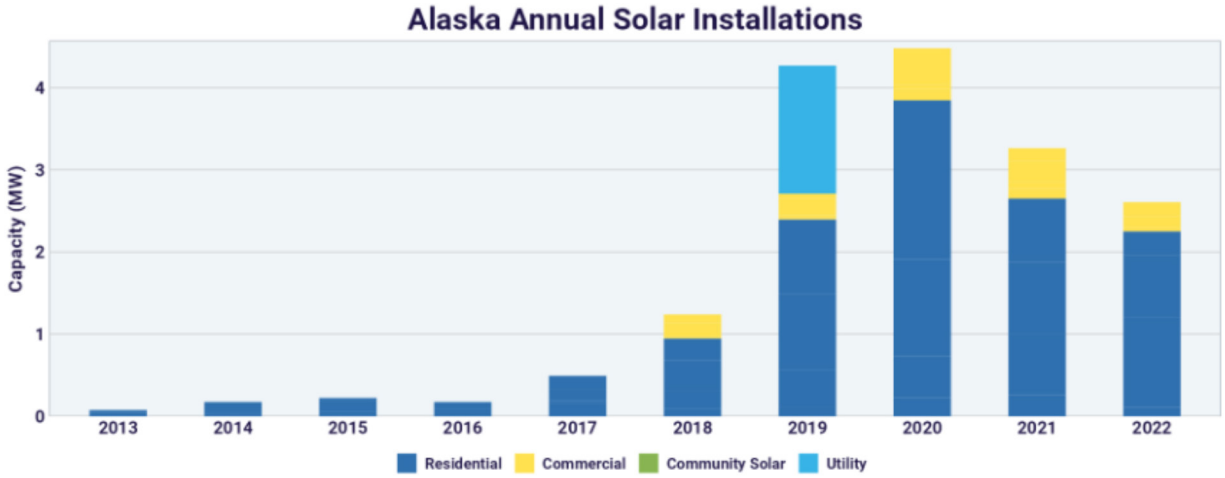


FIGURE 2: Alaska Annual Solar Installations (https://www.seia.org/state-solar-policy/alaska-solar).

has 74 total solar jobs and 14 solar companies, with a growth projection over the next five years of 2.8%. Overall costs to install solar infrastructure decreased by 43% in the past decade. The challenge of Alaska's high latitude, resulting in extended periods of limited solar exposure during long, dark winters, presents challenges as well as opportunities for program implementation.

1. Market-wide historical deployment rates

The Alaska Energy Authority has a strong understanding of the market for community solar, having funded through 15 rounds of its Renewable Energy Fund Program (REF). In its most recent round (16), six of 31 applications were for solar projects and totaled over $8 million. Through REF funding, multiple projects have proven the effectiveness of solar energy in rural Alaska. A good example is the hybrid solar + storage microgrid[3] supporting the residents of Shungnak, a remote community above the Arctic Circle in Alaska. Funded by the United States Department of Agriculture (USDA) and Northwest Arctic Borough (NWAB), the microgrid addressed the numerous challenges of operating in extreme conditions and break the community's dependence on its expensive diesel generator power plant. The microgrid's 225-kW solar array can offset much of Shungnak's energy needs, while battery systems each store excess energy for later use. Uniquely designed to enable a "diesels off" operation, the system automatically coordinates between solar and energy storage to ensure lowest cost power and communicates with the utility's power plant about the best times to turn diesel generation off. The microgrid is expected to save 25,000 gallons of fuel per year and an estimated $200,000 per year on fuel costs, based on $7 to $8 per gallon calculations.

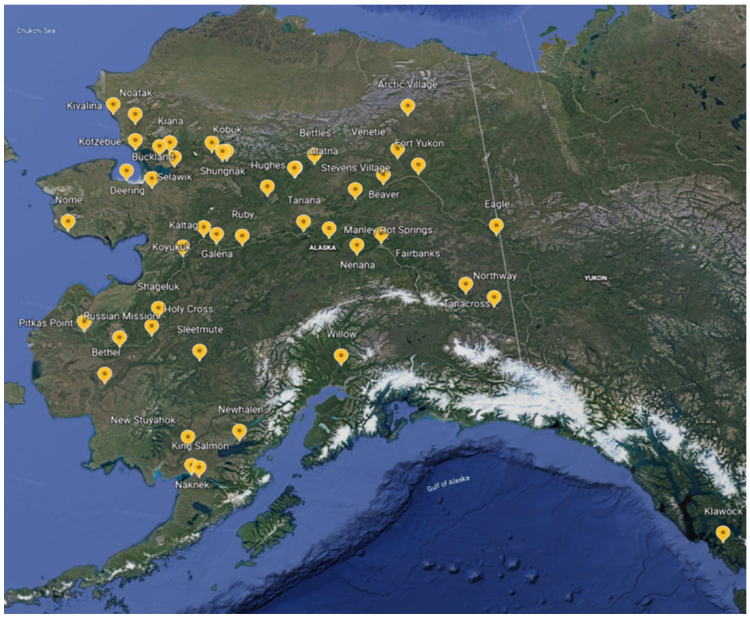


FIGURE 3: Solar installation across Alaska (ACEP).

The Alaska Center for Energy and Power (ACEP) produced a map of installed solar in communities across the state, tracked by its Solar Technologies Program[4], which helps this project identify current locations to scale and a visualization of market need.

2. Participation of low-income and disadvantaged households and communities

AHFC is an independent statewide agency working to provide access to safe, quality, affordable housing, which has achieved success in engaging and partnering with underserved and disadvantaged communities across the state. Specifically, AHFC's experience with its weatherization programs led to positive outcomes for these communities. AHFC, working with and through its Weatherization Assistance Program partners, increased the energy efficiency of 20,917 low income or disadvantaged homes between 2008 and 2018. This is when the program received a high amount of State funding due to high oil prices.

- The average affected household experienced a 29% reduction in energy consumption.
- 42% of participating households were outside of urban centers.
- 38% of households were comprised of at least one Alaska Native member.

- 34% included an elderly member and 24% included a child younger than age six.
- Median household income for participants was $28,263.

Since 2018, with state and federal funding, AHFC's weatherization program continued its work annually 200-300 benefiting low-income and disadvantaged households.

Output and Outcome Targets

Based on their experience in delivering projects in Alaska and past program deployment rates, AEA and AHFC have worked together to determine the following output and outcome targets for Community Solar and Residential Solar. The justification for achieving these targets is outlined under Underlying Methodologies, Data, Inputs and Assumptions.

1. The megawatts of solar capacity deployed over time (both as an absolute number of megawatts of solar deployed and dollars of award funding requested per megawatts of solar):
   - Residential: 10.38 MW | Community: 3.91 MW
   - Total: 14.29 MW deployed, $6,995,828 award funding requested per MW deployed.
2. Megawatt hours of storage capacity deployed over time (both as an absolute number of megawatt hours of storage deployed and dollars of award funding requested per megawatt hours of storage):
   - Residential: N/A | Community: 5.712 MWh
   - $17,507,003 per MWh storage deployed.
3. The number of households projected to benefit from the solar program (both as an absolute number of households and award funding requested per household);
   - Residential: 2,596 households | Community: 3,504 households
   - Total: 6,100 households, $16,393 funding per household.
4. Short tons of annual carbon dioxide (CO_2) emissions avoided over time (both as an absolute number of tons of CO_2 reduced and dollars of award funding requested per tons of CO_2 reduced):
   - Residential CO_2 avoided: 8,137 tons/yr, 244,102 tons over 30-year life.
   - Community CO_2 avoided: 3,065 tons/yr, 91,956 tons over 30-year project life.
   - Total CO_2 avoided: 11,202 tons/yr, $8,927 award funding per ton per year.
     – 336,060 tons avoided over 30-year life, $297 award funding per ton CO_2 avoided.
5. Absolute amount of household savings realized over time (both as an absolute number of dollars saved and dollars of award funding requested per dollars of household savings).
   - Residential: 42%, $49,849,977 over 30 years.
   - Community: 39.8% $40,004,160 over 30 years.
   - Total: $1.11 of award funding per dollars household savings (over 30 years)

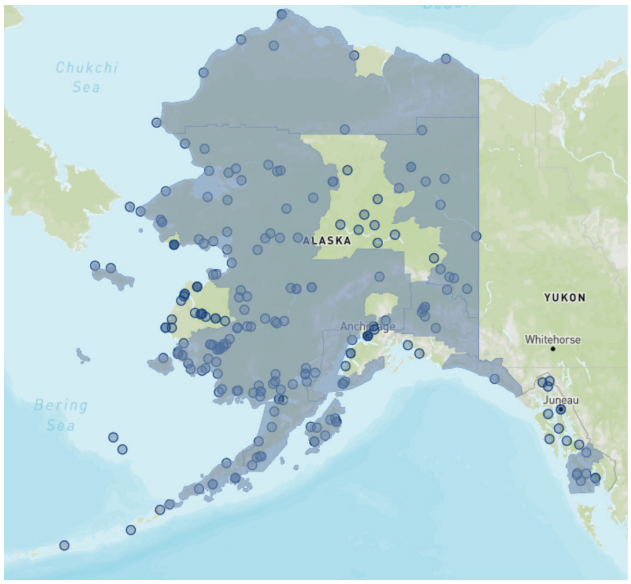
2. Meaningful Benefits Plan

Delivering Meaningful Benefits

The project team has utilized a variety of tools to thresholds of burden faced by project communities and households. CEJST and EPA's EJScreen identify areas in Alaska that are overburdened or underserved, consistent with Solar for All guidance, which will direct Alaska's program investments. This is generally consistent with where Power Cost Equalization (PCE) communities fall in AEA's 10 rural energy regions (which are geographically dispersed), where high cost is relative to an average of three urban communities. Community solar will focus on eligible projects in rural communities that are considered disadvantaged or Tribal. Disadvantaged communities within the Railbelt will be eligible,

where residential solar might be a more viable option. AEA's review of the CEJST produces a map of Alaska that indicates the majority of the State's eligibility to qualify as disadvantaged. This is further enhanced by the White House Executive Order identifying all Tribal lands as disadvantaged, which applies to almost all of Alaska.

The table below demonstrates for relevant census areas and boroughs (county equivalent), their FIPS identification for reference, population, Rural status according to the Office of Management and Budget (OMB), their Social Vulnerability Index (SVI) according to the Centers for Disease Control and Prevention (CDC), whether they are Areas of Persistent Poverty (APP) according



MAP 1: CEJST Mapping Tool - Alaska Disadvantage

City/Borough	FIPS*	Pop.	Rural (OMB)	National SVI* Ranking (CDC)	APP* (DOT)	DDA* (HUD)	Distressed Communities
Aleutians East Borough	2013	3,515	Yes	Moderate to High	No	Yes	No
Aleutians West Census Area	2016	5,723	Yes	Low to Moderate	No	Yes	No
Bethel Census Area	2050	18,216	Yes	High	Yes	Yes	Yes
Bristol Bay Borough	2060	877	Yes	Low to Moderate	No	No	Yes
Valdez- Cordova Census Area	2063	9,202	No	Low to Moderate	No	No	Yes
Denali Borough	2068	2,059	Yes	Low	No	Yes	Yes
Dillingham Census Area	2070	5,000	Yes	High	No	Yes	Yes
Haines Borough	2100	2,474	Yes	Low	No	No	Yes
Hoonah- Angoon Census Area	2105	2,151	Yes	Low to Moderate	No	No	Yes
Ketchikan Gateway Borough	2130	13,918	Yes	Moderate to High	No	Yes	Yes
Kodiak Island Borough	2150	13,345	Yes	Moderate to High	No	Yes	Yes
Kusilvak Census Area	2158	8,049	Yes	High	Yes	No	Yes
Lake and Peninsula Borough	2164	1,587	Yes	High	No	No	Yes
Nome Census Area	2180	10,008	Yes	High	No	Yes	Yes
North Slope Borough	2185	9,872	Yes	Moderate to High	No	Yes	Yes
Northwest Arctic Borough	2188	7,671	Yes	High	No	Yes	Yes
Wrangell- Petersburg Census Area	2195	5,910	Yes	Moderate to High	No	Yes	Yes
Prince of Wales – Hyder Census Area	2198	6,422	Yes	High	No	No	Yes
Sitka	2220	8,458	Yes	Low to Moderate	No	No	No
Skagway	2230	1,240	Yes	Low	No	Yes	No
Southeast Fairbanks Census Area	2240	6,918	Yes	Moderate to High	No	Yes	Yes
Wrangell	2275	2,127	Yes	Moderate to High	No	No	Yes
Yakutat	2282	662	Yes	Moderate to High	No	Yes	No
Yukon- Koyukuk Census Area	2290	5,327	Yes	High	Yes	No	Yes

to United State Department of Transportation (USDOT), whether they are Difficult to Develop Areas (DDA) according to Department of Housing and Urban Development (HUD), and whether the Denali Commission considers communities within Distressed.

AEA will conduct an equity assessment as part of project identification and as part of the award process. This will include reviewing available datasets to ensure distribution of project benefits to 40% disadvantaged communities and to structure the project for sponsors and contractors to implement strategies that maximize equitable benefits.

Rural Alaska faces some of the highest energy costs in the nation. Most of Alaska's rural communities are islanded microgrids and rely on diesel power generation. Program benefits will vary substantially across the state, contingent on several factors such as solar resource availability (determined by project's geographic location), ease of site accessibility (whether the community is road-accessible or if materials need to be transported by air or barge), and the level of complexity associated with incorporating the system into the existing diesel microgrid.

Given the geographically dispersed locations of Alaska's rural communities, electric rates are frequently three to five times greater than those incurred by customers residing in urban areas of the state. AEA, along with the Regulatory Commission of Alaska (RCA), administers the Power Cost Equalization (PCE) program to provide economic assistance and reduce the effective electric rates for rural consumers to be comparable to in urban areas of the state. The PCE program serves 82,000 Alaskans in 193 communities that are largely reliant on diesel fuel for power generation, providing payments to households in high-cost energy communities to effectively lower residential energy costs, up to 750 kWh per month. Savings from residential solar in a PCE community would be applied to their PCE benefit and would have no impact on a homeowner's effective utility bill, making residential solar more challenging in these communities.

The project team recognizes constraints to solar implementation based on previous work in these communities, including that many houses in rural Alaska may not be suitable for rooftop solar. The necessary upgrades are prohibitively expensive and would quickly run up to the utility's limit of 6% of nameplate capacity of the grid coming from solar generation. However, these constraints have been successfully managed for community solar and battery projects in rural Alaska. The model that has been successfully deployed in Alaska and is the planned model for the Community portion of this program is the community owned Independent Power Producer (IPP) model. This model aims to build a community owned Solar PV array with battery storage, operated by a community owned IPP. The community owned IPP will sell power to the local utility through a Power Purchase Agreement (PPA). Revenue from the sale of power from the utility will fund operations and maintenance (O&M) of the asset, and excess funds will be distributed back to the community as a diesel avoidance payment, equivalent to more than 20% of the average household's electric bill.

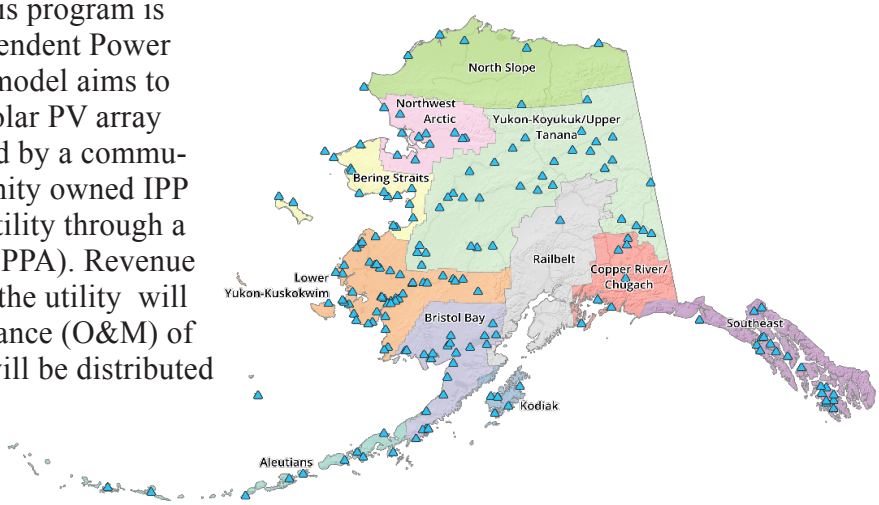


FIGURE 4: 193 PCE Communities that AEA works with monthly

This community owned solar PV plus battery integrated into the existing microgrid model has been successfully implemented in Shungnak-Kobuk, which was a grand prize winner of the Sunny Award for equitable community solar. The community owned IPP model is the best method to increase access to the benefits of solar in rural Alaska and delivers on all five of the meaningful benefits targeted in Solar for All.

- **Benefit 1: Delivering a minimum 20% of household savings to program beneficiaries.**
  - *Residential Program:* On the Railbelt, residential electric rates average $0.22/kWh. Under the assumed base case 4kW rooftop solar array, in this program, an average household can expect to save $640 annually, or 42% of annual electric bill.
  - *Community Program:* With the above described IPP model, preliminary estimates based on past projects indicate that households will receive diesel avoidance cost benefits equivalent to 40% of their effective electric bill.
- **Benefit 2: Increasing low-income and disadvantaged households' access to solar through financing products and deployment options.**
  - *Residential Program:* Solar deployment in Alaska has remained largely out of reach for low-income and disadvantaged communities. This program will have no match requirements for qualifying households, significantly lowering the barrier to entry. The program will aim to reduce the administrative burden as much as possible for these households through simple applications and net-metering permits handled by the installers similar to the approach AHFC took with its COVID-19 Emergency Rental Assistance and Homeowner Assistance Fund programs.
  - *Community Program:* The IPP deployment option allows disadvantaged communities in rural Alaska to realize the benefits of solar and battery storage.
- **Benefit 3: Increasing resiliency and grid benefits by creating capacity that can deliver power to low-income and disadvantaged households and/or critical facilities serving low-income and disadvantaged households during a grid outage.**
  - *Community Program:* Many Rural Alaska communities rely on outdated infrastructure past its useful life and are subject to frequent power outages, especially during fall and winter storms. The importance of reliable energy in Rural Alaska cannot be overstated. Short outages can have drastic detrimental impacts to the well-being of a community. Water and sewer distribution systems can quickly freeze up in the winter months. If power generation isn't quickly restored, residents can go the entire winter without access to clean water and working sewer system in their homes. Community-owned battery backup generation can greatly reduce the frequency and severity of these events.
- **Benefit 4: Facilitating ownership models that support low-income households and communities building equity in projects.**
  - *Community Program:* The community IPP model has proven to work well in Alaska, and one of the critical aspects is that the solar array is community-owned. The power produced will be sold to the utility, and the revenue generated will be dispersed to the community and back into the project for O&M. Having the community own the asset allows residents to receive Power Cost Equalization (PCE) while still seeing a direct positive impact of havingsolar in the community. Alaska's Solar for All program will score and evaluate proposals for community-based solar, and one of the criteria will be the use of local hire labor. Hiring local labor to build a community solar array encourages pride and ownership of the asset and develops a local workforce to have the skills to perform routine O&M tasks. This is particularly important in Rural Alaska. Flying a technician can be a prohibitively expensive and lengthy process.
- **Benefit 5: Investing in quality jobs and businesses fits under the Administration's Good Jobs Principles and Executive Order 14082 (Implementation of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022). The following Job**

Creation describes the project's approach to this benefit for both the Residential and Community Program.

Job Creation

The project team is committed to fostering safe, healthy, and inclusive workplaces with equal opportunity, free from harassment and discrimination. AEA will provide multiple pathways for creating high-quality, middle-class jobs in the residential-serving distributed solar energy industry based on principles outlined below. In addition, the partners have considered ways to invest in training, education, and skill development and support the corresponding mobility of workers to advance in their careers. The project will assess collective bargaining agreements as identified throughout the life of the project.

i. Wages, benefits, and other worker support provided - The project sponsors and partners approach to quality jobs means that project staff will have (1) fair, transparent, and equitable pay that exceeds the local average wage for an industry, while delivering; (2) basic benefits (e.g., paid leave, health insurance, retirement/savings plan); (3) providing workers with an environment in which to have a collective voice; and (4) helps the employee develop the skills and experiences necessary to advance along a career path. In addition, the partners will offer good jobs that provide (5) predictable schedules and a safe, healthy, and accessible workplace devoid of hostility and harassment. With good jobs, (6) employees are properly classified with the limited use of independent contractors and temporary workers. Workers have a (7) statutorily protected right to a free and fair choice to join a union under the National Labor Relations Act (NLRA).

ii. Commitments to support workforce education and training - The partners will encourage project staff to participate in training programs and encourage contractors to offer paid time for employees to participate in skills training. This will include the provision of personalized, modularized, and flexible skill development opportunities, such as on-demand and self-directed virtual training. This will be included as part of the cohort support system established through the project. The project will identify and provide continuing education programs for employees to earn credentials and degrees relevant to their career pathways.

AEA's plan for job creation includes active partnership with public and private sector partners that will help implement the deployment of Alaska's Solar for All program and is complemented by a robust workforce development program. AEA has identified multiple components, elaborated in later sections.

High Quality Jobs and Shared Economic Opportunity

AEA's job creation plan is centered on delivering meaningful benefits to low-income and disadvantaged communities, which these examples exemplify. AEA has decades of experience developing projects that increase shared economic opportunity and will apply that to its implementation of community and residential solar energy.

An NREL study on distributed renewables for Arctic energy,[5] found that community buy-in and ownership is essential. AEA knows that projects must be community-driven and supported, with community members understanding and participating in the value proposition of moving to a stronger reliance on renewable energy. It is critical to include and receive sanction from key stakeholders like utility managers, operators, project champions, and local government officials. Beyond project development, community engagement must be ongoing, and continue after the project is deployed to maintain community support and ownership. Long-term engagement is an essential element of sustainability. For example, a strong community focus enabled Galena, a city of 472 people in the Yukon-Koyukuk area, to hire and train an all-local workforce provided enhanced job satisfaction, increased local capacity, and strengthened the community overall.

Multi-sectoral Partnerships

AEA has a successful record partnering both as owner and project manager in community capital projects and in advancing State energy goals and priorities. AEA also has established relationships with tribal entities, local governments, and other State departments, with a focus on workforce, permitting, and community development. Early engagement with these stakeholders will help to ensure that the project is responsive to local energy plans and goals.

AEA has assembled a strong list of partners that start with AHFC, which will deliver the program's residential solar activities. AEA and AHFC will collaborate with academic, public and private sectors, labor, training centers, utility, and community-based organization partners to deliver job creation and workforce development.

AEA and Alaska's public and cooperative utilities are accustomed to engaging with local governments and tribal entities through permitting and regulatory processes for rural energy projects. The applicable projects would establish milestones urging earlier dialogue with local governments and Tribal entities. These conversations should begin sufficiently early to inform project development in response to local communities' needs and concerns. Local governments and Tribal entities are uniquely situated to help identify the most effective actions the projects can take toward partnerships that advance workforce issues; diversity, equity, inclusion, and accessibility; and the flow of project benefits to disadvantaged communities. AEA and partner utilities have extensive experience engaging with residents and businesses in town halls and similar formats.

AEA is planning to ensure that proposed systems should commensurate with the training, education, and availability of the local workforce. AEA knows using community-appropriate technology reduces system failures and the community's dependence on long-term, expensive, external assistance. Local capacity will determine how simple or complex the system should be, and what assets it can include. Robust operations and maintenance plans must be considered from the start. Technical assistance must be provided to complete and maintain the systems. Communities have found that small, easy-to-maintain pilot systems with solar PV, batteries, and/or wind can be a good stepping-stone to larger, more complex systems with higher contributions of renewable energy. Community-based technical capacity may be increased over time through community education and expanded experience from operating power systems. Many communities have been successful in engaging local youth, with energy providers gaining traction by speaking through credible, community-based educators. In Kotzebue, a hub community of 3,102 residents, on the Northwest Coast of Alaska, installing small wind turbines (50-kW capacity through 3 turbines) provided the technical capacity for subsequent installations of much larger wind turbines (17 turbines totaling 915 kW capacity), batteries, and solar PV systems. In Galena, a focus on community education and training allowed the community to perform increasing portions of system maintenance locally, enabling to set its sights on future solar projects.

AEA knows that having a regional or statewide pool of support resources increases the likelihood of success, which its cohort and technical assistance approach will support. Having a network of knowledgeable people actively engaged in operating projects, such as an energy cooperative, that can provide targeted or technical education, increases the likelihood of project success. This network allows communities to install systems that they may not be able to support on their own. Allowing a process for communities to access this network will streamline the renewable energy development process including planning, financing, installation, and operations. Such a network is especially helpful for small communities with limited human capital. A face-to-face knowledge sharing network would increase the number and success rate of community projects.

AEA will identify and support competent, practical project managers that are required to ensure the project's success. The technical, financial, managerial, and community engagement components of a renewable energy project must be overseen by experienced personnel to help ensure effective delivery of projects. Managers must be able to validate project proposals from engineers and external entities, compare those proposals to community needs, and decline when necessary. Some communities also face rapid turnover of bookkeeping and managerial staff, reducing their financial and managerial capacity for projects. Such seemingly minor problems can have long-term impacts.

3. Distributed Solar Market Strategy

Adoption of solar PV in Alaska on a substantial scale faces multiple market barriers both common to the rest of the nation, and specific to the state. Barriers such as net metering, third party ownership (TPO), obscure interconnection processes, and renewable portfolio standards (RPSs) all exist here as they do across the country. Additionally, the substantial variance in seasonal generation and the astronomic cost of installation for remote communities pose geography specific problems.

The prevailing net metering legislation established by the Regulatory Commission of Alaska (RCA) dictates that all utilities under their economic jurisdiction must provide net metering options to their customers, provided that the total nameplate capacity of all net metering participants does not exceed 1.5% of the previous year's average retail demand. Utilities with annual retail power sales below 5,000 MWh or those generating electricity entirely from approved renewable sources are exempt from this requirement.

Several leading utilities in the Railbelt region, notably Chugach Electric Association (CEA) and Golden Valley Electric Association (GVEA), offer net metering limits exceeding the RCA's cap, extending up to 5% of average retail demand. Homer Electric Association (HEA) goes even further, allowing up to 7%. Meanwhile, Matanuska Electric Association (MEA) has not set a specific limit on net metered capacity but currently operates at approximately 3% of retail demand, with no recent refusal of new net metered capacity applications according to the latest RCA filing. Payment for net metering occurs monthly through bill credits, determined by each utility's non-firm avoided cost rate registered quarterly with the RCA. These credits have no expiration date and can be applied to subsequent monthly bills. Individual net metered systems must have a nominal capacity between 400 W and 25 kW. Utilities are prohibited from imposing additional fees, such as standby, interconnection, or capacity charges, unless approved by the RCA.

Utilities can limit net metering amount if it causes stability or operational issue. In case of a decrease in retail sales, resulting in the net metering amount exceeding the limit of 1.5%, utilities are not allowed to disconnect the metering of a member. The utilities can require net metering customers to have insurance with the condition that it is attainable and priced reasonably.

The RCA has not instituted statewide mandates regarding the implementation of virtual net metering or other aggregative/alternative net metering policies. In 2019, the RCA rejected a utility-sponsored proposal for a community solar project, citing specific plan details regarding subscription policies. However, they expressed support for innovative renewable energy programs and emphasized that this decision did not set a precedent for community solar. CEA and GVEA have shown interest in revisiting community solar projects, addressing the issues raised in 2019. Various public interest groups are actively engaging with the legislature and drafting legislation to encourage and facilitate community solar initiatives. In Senate Bill 152, the state legislature codified the ability of the RCA to make rulings on community energy producers, strengthening the language that existed regarding small power producers.

No explicit rulings regarding third party ownership (TPO) have been made by the RCA. Insofar as small power production facilities are concerned (as would be the case for a community solar installation) the Alaska Administrative Code (AAC) utilizes the definitions for a qualifying facility laid out in 18 C.F.R. 292.101(b) and has protections and guarantees that they must be offered interconnection by the RCA regulated utilities. Specifically, for any electric utility subject to RCA regulation interconnection must be offered to a qualifying facility so long as it doesn't cause the utility to become subject to federal regulation under the Federal Power Act (interstate operation) and so long as the qualifying facility complies with safety and reliability standards prescribed in 3 AAC 52.485. This regulation also provides for financing options with regard to interconnection fees laid out in 3 AAC 50.760 d/e. The utility can charge interconnection fees, including: the reasonable cost of connection, switching, metering, transmission, distribution, safety provisions, administration, and other costs related to the installation and maintenance of the physical facilities necessary to permit interconnected operations, to the extent that these costs are in excess of the costs that the utility would have incurred if it had not engaged in interconnection. Additionally, the utility must offer the option to pay these fees over a reasonable period of time, with an interest rate described in their tariff or in a special contract between the qualifying facility and the utility with RCA approval.

In sum, there are protections for third party ownership, at least of community scale renewable generators. TPO, as it pertains to rooftop residential solar, would likely be considered individual net metered capacity, with the ownership of the panels and power a separate issue to be defined by those respective parties and thus outside RCA's purview. While the regulatory framework doesn't provide explicit support for installations of either type, it at the least protects their right to connect and sell power to the grid. As demonstrated by the recent opening of the 8.5 MW solar farm in the Mat Su Borough by a third party, there is interest from the Railbelt utilities and general support from the RCA and legislative framework to add renewable generators. Multiple successful implementations of rural solar IPP systems indicate their viability from regulatory and utility perspectives.

Interconnection processes are not regulated on a statewide basis. Streamlining this is a significant opportunity to reduce the barriers for residential rooftop applications. All four Railbelt Co-ops offer applications and supplementary information via their websites with varying degrees of complexity. CEA has a clause in their application allowing for combination of some required system drawings and streamlining of approval procedures for "type-tested" or previously approved and installed system designs, and implementation of similar language by the other Railbelt utilities will be sought by project partners. For the residential portion of the program, AHFC would provide a standardized system design for households and leverage said language to expedite the approval process and substantially enhance approval and installation rates. As it relates to the rural portion of the program, interconnection will be protected by the RCA rulings related to small power producing facilities. Grid stability is of significant concern in those scenarios, and early communication and involvement with the local utilities will facilitate successful solar integration.

While there is currently no binding statewide renewable portfolio standard (RPS) in Alaska, there is pending legislation looking at Renewable Portfolios Standards or Clean Energy Standards for Alaska. These bills propose renewable generation targets of 25% by 2027, 55% by 2035, and 80% by 2040 for Railbelt utilities, which currently operate at approximately 15% renewable generation. The state's overall renewable portfolio is bolstered to around 25% by various small-scale hydropower projects in southeast Alaska. Notably, any net metered capacity is presently included in the utilities' generation statistics, potentially incentivizing utility collaboration and investment in distributed solar projects.

Furthermore, the results of an NREL study, initially commissioned by Alaska Governor Mike Dunleavy, examined five scenarios to achieve 80% renewable generation by 2040. The study found that nearly all of these approaches would yield substantial savings compared to continuing the use of natural gas as a primary fuel source. The depleting gas reserves in the Cook Inlet have prompted major utilities to explore alternative fuel sources, leading to several ongoing utility-scale wind and solar feasibility studies.

Addressing the substantial geographic and jurisdictional diversity across our impacted regions could pose some barriers for program efficacy. The respective experience of the coalition applicants, working collaboratively with multiple entities across the state, ranging from tribal councils, village governments, municipalities, non-profit organizations, and more will prove invaluable in this endeavor. The splitting of rural community and residential Railbelt funds is indicative that the partners are aware of the need to provide aid in different ways to address the individual circumstances in different parts of the state. AEA's outreach partners will be made up of a variety of groups chosen to maximize their interaction with disadvantaged communities across the state.

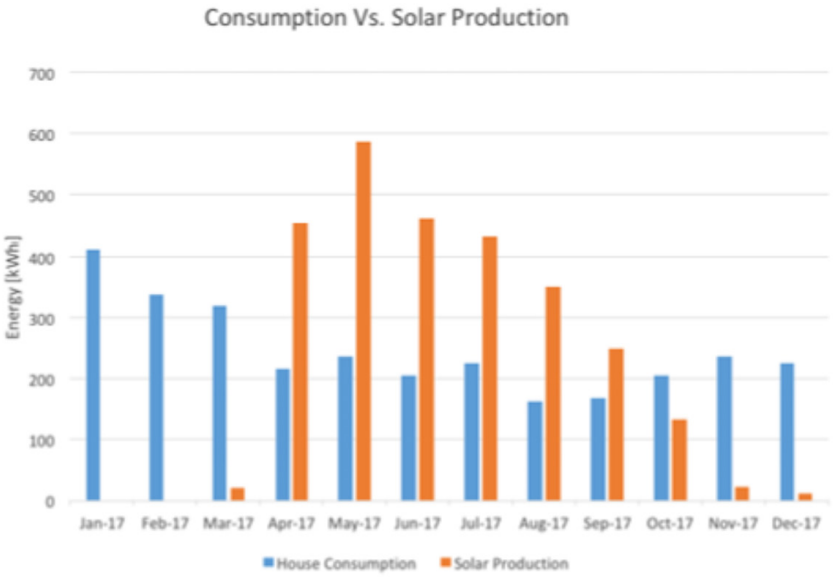


FIGURE 5: Household electricity consumption and the production from the 4 kW rooftop solar PV system. The solar system produced more energy than the home consumed from April through September. Note that the solar system was installed at the end of March.

As is predictable in sub-arctic to arctic environments, the seasonal variation in solar generation poses a substantial barrier to its economic viability. The conditions during the springtime with cold temperatures, long daylight hours, and light snow cover lend themselves even to the point of surpassing nameplate production for the panels. Conversely the shorter days of winter and substantial snow cover during late fall drastically limit solar energy production. The Alaska Center for Energy and Power (ACEP), in conjunction with some of the national laboratories, has performed pilot studies attempting to limit some of this variance on a daily interval and seasonally by combining multiple panel orientations to optimize average production. Leveraging their research to inform system design for the rural portions of the program could dramatically improve system performance.

Based on research at the University of Alaska Fairbanks and industry consultation, the cost of a rooftop residential solar installation can fall anywhere between $10,000 and $30,000.[6] Installations in urban Alaska typically range from $1.25 to $3.50 per watt, while remote installations range from $2.20 to $4.60 per watt, according to a 2019 report from ACEP. The cost of installing solar is typically more expensive in rural Alaska due to the high transportation and labor costs.

4. Financial Assistance Strategy

Providing Eligible Financial Assistance

Alaska's program is designed to enable low-income and disadvantaged communities to deploy and benefit from solar, storage, and enabling upgrades, while ensuring all projects deliver household savings, among other benefits. 84.8% of program funds will be used for financial assistance. AEA's community solar program will be deployed as subgrants to eligible and successful project applicants. AEA anticipates 16 awards benefiting 3,504 households over the performance period, based on available funds. AHFC's residential solar program may utilize a wider variety of tools, though envisioned currently as subgrants to partner organizations that can deliver programmatic benefits. AHFC anticipates serving 2,596 households through individual residential rooftop solar arrays and multi-family projects, as well as $3.5 million set aside for enabling roof upgrades for qualifying homes.

Additional financial assistance mechanisms will be identified during the planning period, including the opportunity to leverage private equity, loan programs, incentive payments, and rebates. 84.8% of program funds will be used for financial assistance.

Financial Assistance Model

Residential Solar: AHFC will make available $40 million for a statewide residential solar program that targets disadvantaged, low-income households where net metering applies. AHFC may model its financial assistance off its Weatherization Assistance Program, which has successfully deployed funds to low-income households. AHFC's financial assistance will provide subgrants to eligible recipients, including local solar programs, and incentive payments or subsidies as determined by the project team.

Community Solar: AEA will make available $41.3 million for a rural solar project program focusing on disadvantaged communities where modeling shows high potential for both the resource and ability for microgrid integration. AEA will model its financial assistance off its Renewable Energy Fund program, that has successfully awarded 17 rounds of grants to communities statewide. This financial assistance will be structured as grants to eligible community-level project sponsors, including local and Tribal governments, and utilities. Grants applications will not require a local match requirement; however, AEA will score projects that include a match more favorably and will communicate these criteria to all stakeholders. This approach aims to optimize the utilization of the Solar for All funding without creating barriers to entry for program applicants.

Solar Project Financial Assistance

This project will provide financial assistance through two platforms, with the goal of evenly distributing funds between the two.

- Rooftop Residential Solar – AHFC will deliver the rooftop residential program, based on its experience working directly with low-income and disadvantaged households.
- Residential-Serving Community Solar – AEA will deliver community solar projects, based on its experience managing the Renewable Energy Fund and delivering projects across rural, disadvantaged communities.

AHFC has initiated discussions with non-profit investment funds that are interested in bringing energy financing solutions to Alaska. These discussions will be finalized during the planning period, to the extent that additional partners can be included in program implementation.

There is currently legislation (SB125 and HB154) proposed to create a state Green Bank, which may be housed at AHFC. Depending on if this legislation passes, AHFC will determine how to proceed with its Solar Financing Program. If a State Green Bank is created, AHFC would partner with that entity to operate the financing program either in-house or in partnership with national or regional non-profit green financing companies. If the Green Bank is not created during the 2024 legislative session, prior to EPA award of this program, AHFC will use the planning period to design a program and either partner with or sub-grant a regional or national non-profit to bring low-cost loans and financing tools to low to moderate income households in Alaska. These households are outside the income parameters of the fully subsidized low-income and disadvantaged Rooftop Solar program but would struggle to access the benefits of Solar through traditional financing means.

Storage Project Financial Assistance

AEA will determine utility-level investments in storage that facilitate community solar or increase the potential for success of rooftop residential. AEA expects that all community solar project applications will include storage components and project funds will be used to ensure adequate storage occurs relative to demand. AEA and ACEP technical experts will evaluate storage considerations for appropriate financial assistance on a project-by-project basis.

Complementing Existing Financial Assistance

AEA and AHFC manage many programs that provide existing but limited financial assistance, which this program will complement. AEA is not aware of any duplication of financial assistance, though its REF has financed community solar projects in the past. The REF will complement Alaska's Solar for All program by further advancing clean energy and storage options for disadvantaged communities in Alaska.

If awarded, AEA would seek to strategically leverage funds provided under its Grid Resilience and Innovation Partnerships (GRIP) Program application for innovative rural microgrids development funded via the Infrastructure Investment and Jobs Act (IIJA) in conjunction with funds sub-awarded under its Solar for All (SFA) Residential-Serving Community Solar competitive project solicitation. A community selected under AEA's GRIP project solicitation would also apply for and be awarded funding under AEA's Solar for All project solicitation, further capitalizing on federal funding programs. For example, if a project selected and funded under SFA would assist in funding the solar energy element of a particular innovative microgrid development under GRIP, those GRIP funds (which would have been otherwise allocated for solar portion of the project) would be re-allocated and expended on other aspects of the microgrid development, enhancing the overall impact of the GRIP funds.

With its federal partners, AEA would seek to leverage the impact of SFA award funds with programs, such as, the High Energy Cost Grant program as administered by the Denali Commission. These grants provide funding assistance for energy generation, transmission, and distribution initiatives. AEA notes that further cost-matching opportunities for the leveraging of those monies awarded under its SFA program, if awarded, and which may be acceptable, or financially feasible for such low-income and disadvantaged communities, include but are not limited to the Powering Affordable Clean Energy (PACE) Loan Program and the Rural Energy Savings Program both administered by the U.S. Department of Agriculture (USDA).

Additionally, in collaboration with its SFA coalition members partners, and subject to those eligibility requirements as set forth in the Internal Revenue Code (IRC), AEA would encourage SFA applicants to take full advantage of those "elective pay" investment, or production tax credits as

established via the Inflation Reduction Act (see §45(Y) and §48(E) of the IRC). It is anticipated that applicants applying for AEA's SFA Residential-Serving Community Solar competitive application would be eligible for, in part owing to the low-income and disadvantaged requirements of the SFA program and also owing to the demographic and economic composition of the state of Alaska, those additional "bonus" tax credit provisions (see §48(e) and §48(h) of the IRC), including the Prevailing Wage and Apprenticeship Requirements, Domestic Content, Energy Communities, and Low-Income Communities as set forth in the IRC, established within the IRA.

C-PACER programs finance clean energy retrofits through property tax increases. If done by a third-party financier in conjunction with a municipality, they offer no-upfront cost, low-interest solar project financing. Adopted as Alaska state law in 2017, C-PACER will likely become available sometime in the next year after municipalities set up the administrative structures needed to implement and operate the program. The Municipality of Anchorage is currently the only municipality with a C-PACER program.

AHFC can build from and leverage many of its programs, including hallmark successes, such as implementing its $242.6 million Home Energy Rebate program from 2008-2018 reporting 26,587 homes improved with an average energy reduction of 34%. Most recently AHFC has been recognized for the Alaska Housing Homeowner Assistance program, helping over 12,000 Alaskans with utility, mortgage, and rent relief. AHFC is in the final year of a project funded by the DOE Advanced Building Construction Initiative workforce development funding focused on education and technical assistance for building monitoring.

AHFC administers a bundled grant program it calls *Greater Opportunities for Affordable Living* (GOAL) to encourage housing development for lower-income persons and families, including seniors, by combining Low-Income Housing Tax Credits (LIHTCs); federal Home Investment Partnership Program (HOME) funds, National Housing Trust Fund (NHTF); and state funds through the Senior Citizens Development Fund (SCHDF) into a single application and funding process. AHFC would utilize the established and successful GOAL program to administer the $10 million Solar for All Funds to install solar to low-income multifamily developments and rehabilitation projects that ensure benefits of 20% energy savings are achieved and passed to low-income and disadvantaged residents.

AHFC will work with its network of Weatherization Assistance Program providers to identify candidates for a subsidized residential rooftop solar install with electrification upgrades through Department of Energy's rebate program and a rooftop solar installation under this program. This would maximize benefits to our low-income residents while reducing administration and overhead costs.

AHFC will be administering the Department of Energy's two Home Energy Rebate programs, including the Electrification and Appliance rebate program that includes point of sale rebates for electrification improvements to help households prepare for a successful solar installation. The program includes up to $4,000 for a load center/service panel upgrade and up to $2,500 for household wiring upgrades. AHFC works with an established network of professional energy raters and building inspectors to administer its Home Energy Rating System and its Building Energy Efficiency Standards on any home financed by AHFC (such as those through its tax-exempt first time homebuyer and veterans loans for income-qualified households). AHFC anticipates being able to leverage its weatherization program such that solar installation could occur alongside broader residential improvements.

The Alaska Department of Transportation and Public Facilities (DOT&PF) has developed a Carbon Reduction Strategy (CRS) to establish efforts to reduce transportation carbon dioxide (CO2) emissions and identify projects and strategies to reduce emissions within Alaska. DOT&PF has identified its airport rights-of-way as potential sites for community solar projects and will work to further develop the concept of deployment on these ideal locations. DOT&PF planning efforts to date include developing a carbon reduction strategy, updating that strategy every four years, supporting projects that decrease emissions, quantifying emissions, and ensuring equitable implementation.

The Alaska Municipal League (AML) is the project manager delivering Alaska Department of Environmental Conservation (DEC) implementation of EPA's Carbon Pollution Reduction Program, a $3 million planning effort that will result in a greenhouse gas inventory and a climate action plan for community carbon reduction projects, including solar installation. AML will provide pathways for Solar for All activities to be part of the state's Climate Action Plan.

5. Project-Deployment Technical Assistance Strategy

Technical Assistance and Development of Project Pipeline

Between 2008 and 2023 the state legislature appropriated $317 million for Renewable Energy Fund (REF) grants, which AEA has managed. Those state monies leveraged over $250 million in private and federal funds to complete project funding. The REF is managed by AEA in coordination with a nine-member REF Advisory Committee. The program provides grant funding for the development of qualifying and competitively selected renewable energy projects. Since its inception 289 REF grants have been awarded and funded via legislative appropriations totaling $317 million. These funds have been matched by local and private contributions that have leveraged AEA's investment. 103 operating projects have been built with REF contributions, collectively saving more than 85 million gallons of diesel and 2.2 million cubic feet of natural gas since the REF's inception. These investments have resulted in the reduction of 1,110,424 gross metric tons of carbon dioxide since 2008. AEA has identified nearly a dozen projects that have the engineering and planning already in place to move quickly into construction, if funded. AEA is an active participant in many of the projects, including as project manager. The completed studies have shown that many of the projects are viable and ready for implementation. Disadvantaged communities will directly and indirectly benefit from the outcomes of the project activities. By inclusive engagement in project development, scoping, and implementation, disadvantaged communities will be exposed to learning opportunities that will enable them to improve current practices and policies. Upon completion, the projects will provide public health and safety benefits to communities.

One of the hallmarks of Alaska's community solar program will be the high level of technical assistance provided to project sponsors.

- A cohort approach – Each year's project awardees will participate in an ever-expanding cohort, which will feature the addition of project awardees in the following years. Awardees will participate in quarterly web-based sessions that provide resources and trainings on project and grant management, asset management, maintenance and operations, and governance and financial sustainability.
- Technical assistance – Potential applicants, or applicants whose applications aren't accepted in an award cycle, will be provided with additional levels of support by project partners. AML will provide project development and application support to strengthen capacity for applications to be more successful, not just through this program but for other federal opportunities.

- Leveraging financial opportunities – Funded projects will be evaluated by a team at AEA and in collaboration with project partners, such as ACEP, to determine feasibility of leveraging private capital, or other funding sources, to maximize the available federal funding and to increase the overall local contribution. This process will also identify ways in which rates will have to be structured for future maintenance and operations.

AHFC will convene a solar market stakeholder group that will include developers, contractors, and housing authorities to develop a technical assistance strategy for Alaska's residential solar project pipeline. This emerging market opportunity corresponds to the need for technical assistance, which can best be developed and delivered by active participants and owners. This stakeholder group discussion will feature technical assistance to solar developers to address interconnection challenges.

Technical Assistance that Leads to Workforce Development and Project Deployment

Alaska's utilities are experienced operators of power systems that experience challenging conditions. The local and regional workforce is skilled, and regularly provides training opportunities. In partnership with the Alaska Vocational and Technical school (AVTEC), AEA offers the Power Plant Operator training program that includes engine maintenance, troubleshooting and theory, electrical systems and generators, introduction to electrical distribution systems, diesel electric set operation, control panels, paralleling generator sets, load management, fuel management, waste heat recovery, plant management, and power plant safety. As part of this program, AEA will update course curriculum to be responsive to new and innovative solar system designs, and work with partners to deliver the course for participants.

At the same time, AEA's Circuit Rider Program[7] provides eligible utilities with technical assistance to improve the efficiency, safety, and reliability of their energy infrastructure. Circuit Riders provide skilled labor to address, diagnose, and repair rural powerhouses, including to provide training for local communities to create skilled power plant labor. This program helps to reduce the risk and severity of emergency conditions. The Circuit Rider program develops strong ties with the remote Alaskan communities. The power system operator ecosystem in Alaska is interdependent, with strong collaboration between the state and utilities in ensuring system operability and community health and safety. As part of its Solar for All program, AEA will ensure that the Circuit Riders have the tools and training to increase support for community and residential solar and continues to support and train local communities in the use of improved power systems.

Partners anticipate that there will be opportunities for workforce or community strategies to be established as a direct result of the project. AML will be responsible through its stakeholder engagement role to work with community leaders to identify ways in which the project benefits can best accrue to the community, including through siting and permitting best practices. AML's experience working to strengthen local governments will be useful in engaging communities and solar developers in technical assistance that addresses land use, building codes, and inspection and quality control. This will include planning for environmental justice, carbon reduction, workforce development, shared procurement, local hire, and asset management, including maintenance and operations planning and technical assistance. AML will reference DOE's Community Benefit Agreement Toolkit,[8] recognizing that it doesn't apply the same to federal projects as private, its intended purpose. The outcome of the CBA will be 40% of benefits should be allocated to communities of color, Indigenous peoples, low-income communities, and other marginalized groups. Each project will also evaluate the opportunity for workforce agreements,

which will help ensure equity for women, people of color, and other historically disadvantaged or underrepresented groups during the project's implementation. Project sponsors will work through a facilitated community stakeholder process to identify ways in which workforce goals will be met. Goals include local hire, family-supporting jobs (wage parity), health insurance, diverse workforce, diverse workforce participation, and resources for continuing education and certification that result in a highly skilled workforce. Contractor solicitation should reference these goals as part of criteria for an award.

Avoiding Duplication of Technical Assistance

ACEP has one of the most robust solar technical assistance programs in the state, through its Solar Technologies Program. This program works to support responsible and equitable development of solar PV technology in Alaska and other cold regions and high latitude areas where it is technically and economically warranted. ACEP is leading the state in understanding of the Alaska solar resource, identifying new technologies and novel configurations that can improve energy outputs and ease integration concerns, and improving Alaska's understanding of the cost, performance, and durability of existing systems along with common failure modes. This project will avoid duplication by working closely with ACEP and including them as a subrecipient as part of the coalition, to provide technical assistance.

AML is supporting DEC's Carbon Pollution Reduction Program, funded by the EPA, which will result in a statewide greenhouse gas emissions inventory and climate action plan. Solar projects will feature in the State's climate action plan and AEA will coordinate with AML the inclusion of potential and funded projects.

National level programs like the Clean Communities Investment Accelerator and National Clean Investment Fund, or Thriving Communities Technical Assistance Centers, are often lacking Alaska-related expertise or relationships. The project partners will maintain a line of communication to these providers, ensuring they are able to provide some level of benefit to Alaska's disadvantaged communities; however, Alaska's circumstances warrant local knowledge and experience be applied. ACEP is the leading provider in-state, which will enhance the program's deployment.

Workforce Development Plan

AML will maintain a local workforce availability and hire tracking system throughout the life of the project, enabling meet local hire goals and cross-promoting hire between projects that might occur within a region. This system will also track municipal and tribal workforce in-kind contributions, staff time that is applied to the project planning and implementation.

The project team will conduct outreach during the planning period to the University of Alaska (UA), AVTEC, and Alaska Works Partnership (AWP) to identify ways in which training, apprenticeships, and local hiring can benefit from solar integration into microgrids. In addition, the project will reference the Alaska Workforce Investment Board's strategies for workforce development, found in its Combined Plan for Workforce Innovation and Opportunity.[9]

The UA is an important mechanism for workforce development, including apprenticeships. Twenty years ago, the University of Alaska Anchorage (UAA) created the Associate of Applied Science in Apprenticeship Technologies. The University of Alaska System, the UAA Community and Technical College, and several joint apprenticeship training programs have joined the United States Department of Labor (USDOL) Registered Apprenticeship-College Consortium, which simplifies the process for an apprentice to earn college credit. AEA will identify opportunities for collaboration with UA on solar-specific or solar-adjacent courses and certifications that will advance workforce development goals.

AWP is a non-profit organization that provides Alaskans access to jobs and careers in the construction industry. AWP educates Alaskans about good paying jobs, teaches basic skills, and establishes pathways for Alaskans to learn skills that last a lifetime and earn good pay with health care and retirement benefits. AWP partners with industry employers, community organizations, educators, and the State of Alaska to develop Alaska's workforce. Several thousand Alaskans living in over 140 communities have gotten a start in construction through one of their programs.

Training Plans Lead to High-Quality Careers

Based on projections by the Alaska DOL&WD, from 2020 to 2030 there will be about 1,600 vacancies per year for positions that require postsecondary training or education. The 2022 excess unfilled job vacancies included approximately 3,000 positions for which employers typically require or prefer postsecondary education. Alaska lags U.S. averages, however, ranking 46th in October's seasonally adjusted unemployment rate[10] and 47th in job growth in 2022 through October.[11] In 2021 and 2022 the Alaska job opening rate increased, ranging between about 8 and 14% (seasonally adjusted) (Figure 7). The highest rates correspond to a ratio of only 0.4% unemployed person per job opening. The job opening rates are the highest since the survey began in 2012 and higher and more variable than those for the national 6.5% annual average.[12]

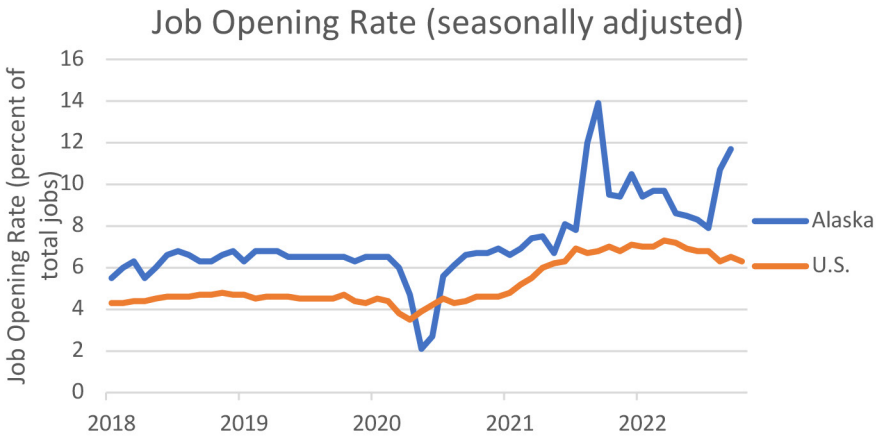


FIGURE 6: The job opening rate is the number of unfilled positions, for which employees are being sought, divided by the total number of filled and unfilled positions.

Both national and state numbers show job openings are much higher than before the pandemic. Three factors have been cited to explain this worker shortage: retirements and early retirements of the large "Baby Boom" cohort; difficulty in obtaining childcare; and in Alaska, outmigration of working-age adults. In September-October 2022, Alaska labor force participation rate was 65.6% and the labor force was 62.7% of the population, the highest values since 2017 and 2015, respectively (Figure 5). Both slightly exceeded the 2019 percentages. In the last 50 years the peak labor force participation was 75.3% and the peak labor force percentage of the population was 69.8%, both in 1989, and there has been a slow, steady decline since then. This is attributable to an aging population.[13] Alaska's participation rate is unlikely to improve further without additional resources and support.

The following describes potential careers for clean energy, including many careers that do not currently exist or marginally so in Alaska: environmental technician, wind turbine technician, planner, solar installer, air quality engineer, energy manager, utility operator, energy engineer, health and safety officer, siting assessment and permitting, feedstock development, wholesale market administration, contract management, lifecycle analyst, asset management, distribution grid developer, economist, appliance distributor, financing, contracting, and procurement. Alaska's Solar for All program will focus on the applicability of these careers to solar, specifically, but also look to leverage the interconnections across the clean energy industry. This recognizes the

interoperability necessary, especially for community solar, and the reskilling that may occur over the course of the program and upon conclusion.

This project envisions a workforce ladder, utilizing intermediary training providers like AWP, apprenticeships facilitated by Alaska's labor organizations, and the university to deliver medium and high wage occupation opportunities to disadvantaged communities. Unemployed and under-employed residents will work through an intake and navigation process to ensure appropriate engagement in tracks and guidance, including support services. There is widespread support for expanding apprenticeship in Alaska, particularly due to federal support through previous USDOL apprenticeship expansion grants and progress made since the 2015 American Apprenticeship Initiative and continues today with two active State Apprentice Expansion grants. All partners will be involved in the ladder through a collaborative process.

Trades Track – As a coalition partner, AWP will offer pre-employment and pre-apprenticeship training through the existing Alaska Construction Academies, Women in the Trades, and Helmets to Hardhats programs. ASA will offer pre-employment and occupational certificate training required for work on solar energy projects. Residential training centers, school districts, and apprentice sponsors will be activated to join in project activities and engage in cross-industry employment and training activities. In the past 5 years, AWP has served >3,500 individuals, and 75% of those served were placed in industry jobs. Of these, > 700 entered registered apprentice-ship. AWP specializes in helping underserved and underrepresented populations enter and retain employment in industry jobs that pay above prevailing wages. AWP has established relationships with industry associations, employers, unions, apprentice sponsors, Alaska Native Organizations, educational institutions, and workforce agencies, and manages $3 million in federal, state, and local workforce grants.

University Track - AEA will work during the first year's planning process to work with the University of Alaska system, which has the potential to help meet workforce needs for solar energy by expanding key certificate programs and increasing industry access to trained workers. UA is not considered a named subrecipient within the program coalition. UA could expand the number of relevant certificates offered as well as promotes the engineering degree programs that serve the solar sector. AEA will engage with UA during the program planning year to assess and identify current occupational needs, organize career fairs, and assess the impacts of existing workforce training. AEA can communicate to UA industry needs and opportunities in the engineering and technology sectors and help connect industry partners with students, faculty, and staff. UA may consider supporting job placement, internships, job shadow opportunities for students, career fairs, mentorship opportuni-ties, interviewing/resume/skills workshops, and industry interaction with student clubs. AEA will encourage UA to assess current UA efforts and partnerships to evaluate the extent that current training programs are effectively meeting the needs of industry and make recommendations to strategically invest program funding to increase capacity, graduates, and the number of graduates becoming employed in these targeted sectors. UA will contribute to the project's information campaigns - data presented in the University of Alaska Workforce Reports shows that new graduates earn good salaries in most fields and their earnings increase substantially over five years following graduation.[14] The university will consider continued expansion of online programs, informed by discussions with partners during the planning period, with a focus on adding more of the most needed workforce programs. If hands-on instruction is needed, it will be provided with intensive face-to-face components or, in some cases, internships or other on-the-job training, including through AWP. Dual enrollment opportunities are especially important for first-generation and economically disadvantaged students to increase their college graduation rates substantially.[15],[16],[17]

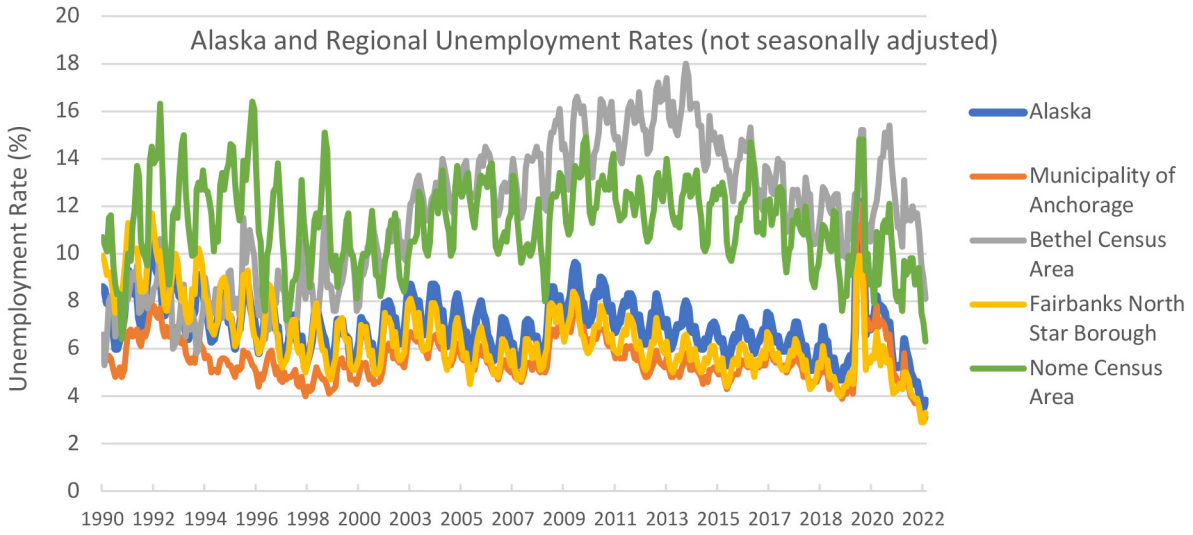


FIGURE 7: Although the unemployment rate is at historic lows in urban areas, it remains high in much of rural Alaska.

Workforce Training that Targets Low-Income and Disadvantaged Communities

The project partners understand the complexities of the labor market and will focus efforts on communities with higher unemployment or underemployment rates, key indicators of low-income and disadvantaged populations, and which are underrepresented in key occupations. Low-income populations often face higher rates of unemployment due to limited access to education, skills, and job opportunities. Economic downturns and recessions can disproportionately affect these groups as they may work in industries that are more vulnerable to economic fluctuations, such as low-wage service sectors. Low-income individuals are often concentrated in areas with limited job opportunities, which can contribute to higher unemployment rates within these communities. Limited transportation options can further restrict access to employment centers.

Alaska's unemployment rate is at a historic[18] low, averaging 4.8% in 2022 (January to October, data not seasonally adjusted), with the rate even lower in urban areas (3.6% in the Municipality of Anchorage and 3.8% in the Fairbanks North Star Borough). However, unemployment remains high in most rural areas, for example, 10.7% in the Bethel Census Area and 8.6% in the Nome Census Area (average of January to October 2022, not seasonally adjusted) (Figure 6). Alaskans' educational attainment is less than the national average, with a smaller proportion of the population holding baccalaureate and graduate degrees and a higher proportion with some college but no degree (Table 1).[19],[20]

Only 35% of Alaska's 2020 high school graduates enrolled in postsecondary education within 12 months of graduating. From 2000 to 2014, the percentage was significantly greater, 44 to 46%, but after 2014 declined steadily. The percentage of postsecondary enrollment of Alaska high school graduates is very low; the national average is 76% enrolling immediately after high school. In-state college enrollment is also low in Alaska, 52% vs. a national average of 80% in fall 2020. The Alaska percentage peaked at 71% in FY 2015 but has declined since.[22] Alaska's high school graduates peaked in 2019 at 8,590 then decreased by about 13% in 2020 and 2021.

The project team will go through a process of strategic workforce planning that includes an understanding of demographic changes, cost reductions, talent management, and flexibility. The project is responsive to current conditions, where a qualified workforce is critical for project

TABLE 1. Educational attainment of Alaskans compared with U.S. average.[21]

	Less than 9th grade	Grades 9 to 12, no degree	High school diploma	Some college no degree	Associate degree	BA degree	Graduate degree
Age 25 years and over, AK	2.4%	4.5%	28.4%	26.0%	8.7%	18.7%	11.3%
Age 25 years and over, US	4.8%	5.9%	26.3%	19.3%	8.8%	21.2%	13.8%

delivery, but the availability of skilled workers has been reduced. AEA and partners will work with project proponents to design workforce strategies that limit vacancies and overstaffing, ensure critical competencies, include cost efficiency that is manageable, and maintain a workforce that is agile, resilient, and flexible. AHFC has experience in delivering training through its Jumpstart program, which helps with job readiness, among others.

The project partners have decades of experience working with low-income and disadvantaged communities, including through their education and training partners. Employer partners, including utilities, reflect the needs and equity goals of Alaska communities. AEA and AHFC will work closely with the Railbelt utilities and with rural microgrid utilities to create efficiencies for program deployment. A utility working group will be convened during the planning period to ensure close cooperation throughout the program, including annual dialogue to review implementation challenges or opportunities. Partners engage with Alaska's communities and help them to identify and secure resources for their highest priority needs. In addition to addressing community needs for training and education, the partners have the potential to link to statewide community outreach and engagement through Cooperative Extension and the Alaska Small Business Development Center, among others.

6. Equitable Access and Meaningful Involvement Plan

Customer Acquisition Strategy

AEA and AHFC have long-standing access to and communication with disadvantaged communities across the state, spanning both rural and urban areas. AEA regularly manages recurring annual solicitations for project applications to its Renewable Energy Fund, which has funded nearly 300 awards in support of multi-phased development of clean energy projects, from microgrids to utility scale development, with nearly 70% of projects to date having been awarded to tribal or tribe-serving entities. AEA would seek to leverage its relationships with a statewide network who provide support and advocacy for their respective members including AML, representing 165 cities and municipalities and local governments, the Alaska Power Association (APA) representing rural and urban utilities alike, and regional development organizations such as the Southeast Conference (SEC), which seeks to champion the needs of the majority of southeast Alaskan communities. AEA has the opportunity to work closely with the Alaska Native Tribal Health Consortium (ANTHC) and regional Tribal health nonprofits such as the Tanana Chiefs Conference (TCC) to reach Tribal governments and stakeholders. Marketing of this program would also be conducted internally by AEA staff for dissemination to the public via AEA's website, AEA social media accounts, public notice boards, and other media. As part of its marketing strategy, AEA would focus its efforts on outreach focused on those disadvantaged communities, in recognition that support for these communities is both a requirement and central tenet to the SFA program.

At the same time, AHFC has a variety of program experience that has established its methodology for customer acquisition. AHFC developed and administered the U.S. Treasury's COVID-19 Emergency Rental Assistance and Homeowner Assistance Fund Programs whereby AHFC provided the critical infrastructure for all Alaskans to check their eligibility apply through a single portal. The process pooled resources from Anchorage, Alaska's largest city, and tribal entities resulting in an efficient application process for Alaskans and allowed AHFC and its partners to quickly evaluate applications and issue payments. This effort led to a national award in 2022 for management innovation by National Council of State Housing Agencies, and first place communications awards in the categories of community relations and special electronic and printed promotional materials by Alaska's Public Relations Society of America.

AHFC received a 2022 Sterling Achievement Award for Homelessness by the Council of State Community Development Agencies for its Alaska Housing Rent Relief program. This program distributed more than $262 million in rent relief funds across the state and was one of only a handful of states to provide rent relief to all eligible applicants, meeting distribution thresholds set by U.S. Treasury. AHFC reallocated remaining funds to its innovative Housing Stabilization and Recovery effort, working with 22 nonprofit partners in 20 key communities across the state to enroll over 2,600 households into the program, utilizing extensive street outreach, shelter visits and referrals from nonprofit organizations has helped to move clients through the stabilization effort.

Both AEA and AHFC have long-standing connections to disadvantaged communities, and the state's Solar for All program will benefit from this experience, even as it brings in new partners to augment and further its goals of reaching low-income and disadvantaged households. The program partners will utilize existing and extensive working relationships with Alaska's 14 Regional Housing Authorities to build awareness in their communities and gather participants in regions where eligibility and competitiveness align.

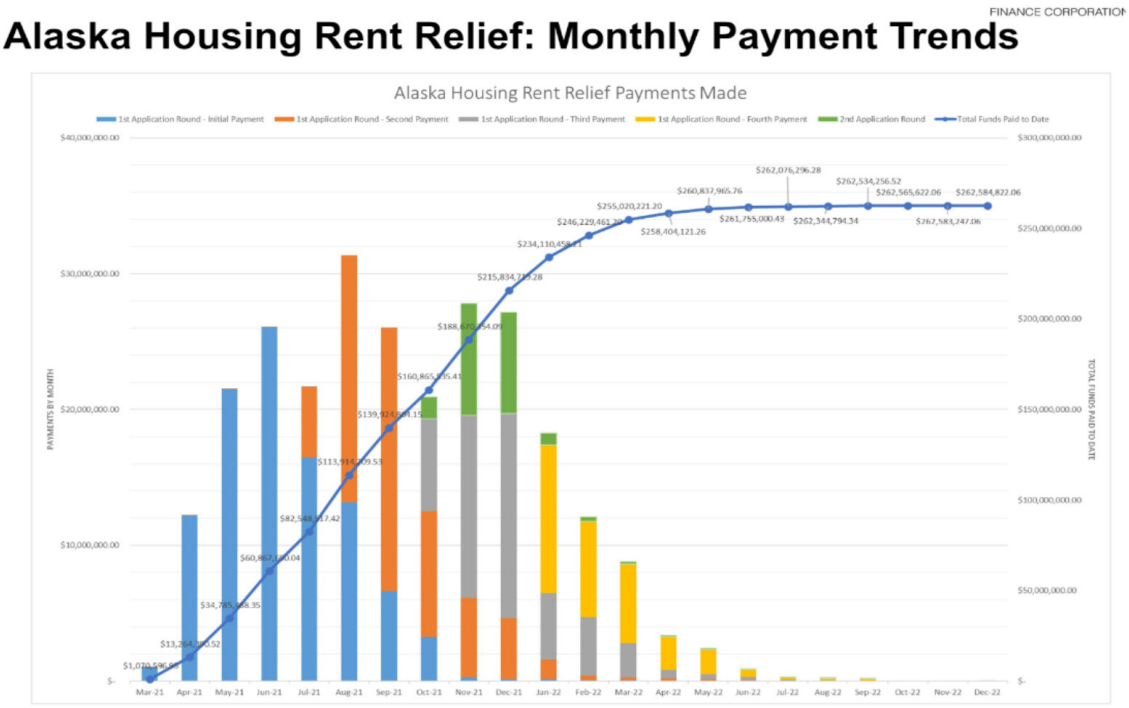


FIGURE 8: https://www.ahfc.us/newsroom/alaska-housing-rent-relief-weekly-program-update

While demand in Alaska is much greater than available resources, including through Solar for All, the partners understand that it isn't possible to reach all households across the state alone, and that delivering outreach and program information to intended beneficiaries will require partners who can help with customer outreach and acquisition. Due to Alaska's challenges, limited install capacity and the smaller scope of its proposed Solar for All than other states, the outreach and customer acquisition will need to be targeted to ensure participation is equitable with the Justice 40 and CEJST principles.

For residential solar, AHFC will engage and provide funding to non-profit "Solarize" campaigns in specific CEJST identified disadvantaged communities to provide homeowner education and participant aggregation. Alaska has had several successful Solarize campaigns performed by local non-profits at the neighborhood level that leveraged communal action and coordination to bring down install prices. AHFC will utilize that knowledge and passion to ensure participation from urban CEJST communities.

AHFC will work with its Weatherization Assistance Program partners that provide services to low-income households throughout the state to identify quality candidates. Weatherization partners are already admitting participants, income qualifying them, and improving houses across the state. AHFC wants to leverage that on the ground and work to identify households that are good candidates and enter them in the programs.

Educating and Engaging Communities on Solar Energy Benefits

AEA and partners have delivered clean energy education to Alaskans for decades, and regularly provide resources to stakeholders that includes the benefits of state programs. Most recently, the Governor has initiated and hosted Alaska's Sustainable Energy Conference, a rapidly growing opportunity to provide education, outreach, and community engagement. AEA conducts outreach to PCE communities throughout the year, and its Circuit Rider program delivers direct support and engagement. At the same time, AHFC has demonstrated an effective strategy for community education and engagement through its recent rent relief program, where it reached 26,000 households and distributed $262 million, as depicted in Figure 9. AHFC's video series on its rent relief program was highly successful, and tools such as this can be employed to advance community education and engagement.

Culturally Appropriate and Responsive Outreach and Marketing Strategies

This project has many strengths, starting with Alaska's existing well-developed cross-industry and interdepartmental cooperation between partners that can act quickly and deliver quality training and services to overcome barriers and conduct responsive outreach to disadvantaged communities. This project joins experienced leadership, trainers, strategic partners, and employers who understand the geographic, climate, technological, and cultural nuance of Alaska and are currently delivering programs, projects, and training to Alaska communities and households across the state.

One effective strategy is to engage community leaders and organizations as trusted intermediaries. These individuals and groups can bridge the gap between the solar program and the community, providing insights into culturally sensitive messaging and helping build trust. Hosting community workshops and information sessions in familiar and accessible locations, such as community centers or places of worship, can also facilitate engagement. Additionally, using culturally relevant imagery and stories in marketing materials can resonate more deeply with the target audience. Highlighting how solar energy aligns with cultural values, such as sustainability or self-sufficiency, can make the program more appealing.

Furthermore, creating partnerships with local organizations and businesses that are already embedded in the community can enhance outreach efforts. These partners can help promote the program and facilitate community engagement. Overall, culturally appropriate and responsive outreach and marketing for solar programs involve a holistic approach that respects cultural diversity, fosters trust, and addresses the unique needs and preferences of each community, ultimately promoting greater participation and adoption of solar energy solutions.

Accounting for Diversity in Community Engagement

The project team recognizes the value of a meaningful and targeted approach to advancing diversity, equity, inclusion, and accessibility. Alaska's program partners include solarize campaigns, regional housing authorities, and weatherization providers that have extensive experience working with low-income and disadvantaged communities. The program team will consult with these and others to ensure engagement with different types of communities, including those with limited English proficiency, and where different types of residential buildings occur. The following is a description of the methodology the team will implement in project design and implementation.

i. Equity: Project partners have shared commitments to 1) build a diverse workforce, supported by equitable operations and policies, and establish an informed culture that delivers authentic inclusivity; 2) promote economic opportunity for Alaskans through investments, including working with businesses owned by Black, Indigenous, People of Color, women, and others who have been historically and/or are currently marginalized; 3) utilize the viewpoints of those who reside in the communities and who are likely to be affected by the outcomes of the project; and 4) invest in the protection of marginalized communities from environmental hazards.

ii. Diversity: Project partners have shared commitments to 1) a workforce that is talented, diverse, and committed to fostering a safe, fair, and inclusive workplace; 2) ensure all voices, regardless of social identity or social demographics, are heard and their views influence project decisions; 3) work with stakeholder groups to aid in communication with the community and project personnel.

iii. Inclusion: Project partners have shared commitments to 1) include the diverse perspectives within this project's scope and deployment; 2) leverage investments and increase pathways to opportunity for minority-owned and disadvantaged business enterprises, and for individuals who face systemic barriers; 3) participate in meaningful engagement with communities that are diverse and underrepresented in the creation and implementation of the programs and projects that impact the daily lives of their communities by creating more transparent, inclusive, and on-going consultation and collaboration process; 4) ensure the project includes practices based on community engagement to avoid harm to frontline and vulnerable; and 5) provide training to staff to promote inclusion internally and externally.

iv. Accessibility: Project partners have share commitments to 1) strengthen accountability policies and procedures, create a more accessible and disability-inclusive workplace, and foster a greater respect for religious diversity; 2) ensure that reasonable accommodations are handled with tact and care to provide community members as well as employees the opportunity to fully participate in project activities; 3) develop and implement a process to increase awareness of accessibility tools and disability inclusion; 4) review and evaluate disability inclusion policies and practices in crisis and emergency management including, but not limited to, planning and response for pandemics, disasters, and evacuations in the domestic context; 5) examine options to enhance technological accessibility; and 6) increase awareness of religious accommodations.

Inclusion of Low-Income and Disadvantaged Communities in Program Design and Operations

AEA and AHFC serve low-income and disadvantaged communities as the state's energy and housing authorities. This program is responsive to the experience that respective staff have in identifying and working to meet the needs of disadvantaged residents and communities. To best involve low-income and disadvantaged communities in the design and delivery of AEA's solar energy program, a comprehensive and community-centric approach is crucial. AEA will initiate a collaborative process by conducting outreach efforts to understand the unique needs, preferences, and challenges of these communities through surveys, focus groups, and community meetings. AEA will establish strong partnerships with local community organizations that have existing trust and influence within these communities. These partnerships can help bridge the gap between the program and the community and facilitate culturally sensitive engagement. Project partners will engage community members in decision-making processes, empowering them to shape the program's design, goals, and priorities. AEA will offer educational resources and training programs to ensure that residents are well-informed about solar technology and its benefits. Finally, AEA will maintain an open and ongoing dialogue with the communities, creating feedback mechanisms to continuously refine the program based on their input. This approach ensures that the program is not only accessible but also truly responsive to the unique needs and aspirations of low-income and disadvantaged communities, fostering equitable access and community ownership of solar energy solutions.

Community Participation in Program and Project Design

AEA and AHFC held a preliminary stakeholder engagement session on August 16, 2023 as part of the project development process, with more than 30 organizations represented. This stakeholder engagement event was the first of many planned events. AEA and AHFC will deliver timely and continuous public involvement opportunities consistent with the program goals. The project team will facilitate a series of informational and engagement events across the state, encompassing both in-person and virtual formats. Outreach efforts will utilize various platforms and outreach tools. The public involvement objective is to increase Alaskans' awareness of the program and gather public input on the administration of the funds. Public involvement will provide transparency in implementation and increase understanding of and enthusiasm for solar energy.

At the preliminary stakeholder engagement session, project surveys were distributed to stakeholders to solicit feedback on the proposed program. Three areas emerged as important to participants: workforce development, maintenance and operations, and diversity and inclusion. AEA has built these focus areas into the program design. AEA will convene an advisory committee that will include community stakeholder organizations, such as housing authorities, utilities, Alaska Native regional and village corporations, local governments, and consumer groups. This committee will meet quarterly.

Serving and Meaningfully Involving Alaska Native Communities

The majority of communities in Alaska contain Alaska Native village statistical areas (ANVSAs), which are defined by the U.S. Census statistical geographic entities representing the permanent and/or seasonal residences for Alaska Natives who are members of, or receiving governmental services from, the defining Alaska Native village (ANV) located within the region and vicinity of the ANV's historic and/or traditional location. The White House considers all Tribal lands to be disadvantaged, and the project team recognizes that the majority of its program funding will fall within these communities.

AEA and AHFC have decades of experience serving and meaningfully involving Alaska Native communities. Through the Renewable Energy Fund (REF), AEA has administered nearly $190 million in grant funding to Tribal entities for development of clean energy projects throughout the State. AEA will build on this extensive network to engage with Alaska Native communities and collaboratively implement projects that address the unique needs and challenges faced in Rural Alaska. In addition to its Weatherization Assistance Program, AHFC administers approximately $3 million every year to Alaska's Regional Housing Authorities through its state funded Supplemental Housing Development Grant program that supplements Native American Housing & Self-Determination Act funding whose uses are statutorily limited. As such, housing development work in many Alaska Native communities advances by allowing regional housing authorities to leverage their HUD funding for infrastructure development and energy efficient improvements that would not be possible in isolation.

AEA and AHFC are working with the Alaska Native Tribal Health Consortium (ANTHC) and Tanana Chiefs Conference (TCC) to coordinate their application under the Tribal Organization funding opportunity. This will ensure that Alaska's programs are complementary and do not overlap in either communities served or workforce development areas, and ensuring AEA helps serve Alaska's Tribes through all aspects of the Solar for All Program.

7. Program Planning Timeline and Workplan Narrative

Planning and Implementation of Solar for All

AEA's planning and implementation of Solar for All includes a year for planning and four years for implementation. The Program Planning Workplan is included in Attachment D and describes the first year's planning activities. The Implementation Workplan is included below as a GANTT chart with steps and milestones to implement the strategies and plans of the program.

AEA will use the planning period to develop a Request for Applications, refine scoring criteria for applications, and perform extensive outreach and communication statewide. AEA will aim to solicit and evaluate one round of applications in the first year of planning. Due to the seasonality of construction in Alaska, AEA aims to award funds to construct the first community solar projects in summer 2025. AEA and AHFC will also explore the potential of bulk ordering panels to save project funds and expedite deployment. AEA will solicit applications for community solar projects on an annual basis, allowing time to evaluate and set up subgrant agreements on a timeline that allows projects to be planned for and constructed in the summer months. AEA will spend the first year planning and refining the program, and anticipates four rounds of applications for community solar projects with approximately four projects awarded each year (16 community projects in total).

The main program that AHFC will create under the Solar for All will be a Subsidized Residential Rooftop Solar program for low-income and disadvantaged households. AHFC will further develop the program, upon award, during the year of planning, including working with installers and other stakeholders to overcome the relatively immature solar market and scale of potential need.

Alaska has the 2nd highest electrical rates in the nation and is facing an uncertain energy future, with the Cook Inlet region's natural gas production over the next 10 years in a highly uncertain state. This uncertainty has been especially felt in Alaska's lower income households who have mostly been unable to access the benefits of solar energy. Traditionally a solar installation would have a payback period stretching 10 years or longer, which is a difficult debt for a low-income household in Alaska to take on. AHFC's Residential Rooftop Program aims to bring the benefits of solar power directly to households most in need.

	Task/Milestone/No-Go Decisions	Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Meaningful Benefits																
1.1	Project partners determine household savings through program delivery				■				■				■				■
1.2	Program identifies ownership models and resilience benefits			■				■				■				■	
1.3	Community education and equity assessment		■				■				■				■		
1.4	Partners actively involved in project	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
M1	20% household savings to program beneficiaries				■				■				■				■
M2	Low-income and disadvantaged households' access to solar increased					■				■				■			■
M3	Job creation and business development is documented				■				■				■				■
NG	Program unable to achieve 20% household savings.									■							
2	Market Strategy																
2.1	Community solar program evaluates potential and need		■	■			■	■			■	■			■	■	
2.2	Residential solar program evaluates potential and need		■	■			■	■			■	■			■	■	
M1	Annual analysis and progress report for community solar				■				■				■				■
M2	Annual analysis and progress report for residential solar				■				■				■				■
NG	Need met or potential unproven or limited									■				■			
3	Financial Assistance																
3.1	Call for community solar projects and project review	■	■			■	■			■	■			■	■		
3.2	Call for residential solar program delivery partners	■	■			■	■			■	■			■	■		
3.3	Project evaluation of grant compliance occurs				■				■				■				■
3.4	Additional methods for financial assistance identified	■				■				■				■			
M1	16 rural community solar projects selected and completed (4 per year)		■				■				■				■		■
M2	400-500 households served with residential solar				■				■				■				■
M3	All project funds expended																■
NG	Financial assistance determined not to be meet outcomes			■						■							
4	Technical Assistance																
4.1	Implement cohort approach for community solar.			■	■		■		■		■		■		■		■
4.2	Provide techno-economic evaluation of community solar.	■	■	■		■				■				■			
4.3	Provide application assistance for community solar.	■	■			■	■			■	■			■	■		
4.4	Implement workforce development plan.		■	■	■	■	■	■	■	■	■	■	■	■	■	■	
4.5	Conduct residential solar assessments as needed		■		■		■		■		■		■		■		
4.6	Ensure adequate installer support and training.	■		■		■		■		■		■		■		■	
M1	16 communities participate in cohort trainings and planning.			■		■				■				■			
M2	Workforce training for disadvantaged communities.		■		■		■		■		■		■		■		
M3	Installers available in each region.		■		■		■		■		■		■		■		
NG	Workforce development isn't able to attract adequate participation.									■							
5	Equitable Access																
5.1	Implement customer acquisition strategy.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
5.2	Public outreach campaign on solar benefits.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5.3	Community engagement that accounts for diversity.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
M1	Stakeholder advisory committee mobilized.	■		■		■		■		■		■		■		■	
M2	Projects are positively benefiting disadvantaged communities.				■				■				■				■
NG	Inadequate participation of low-income or disadvantaged communities.					■											

AHFC's Rooftop Solar program will be primarily providing Alaska's grid-connected low-income and disadvantaged households with fully subsidized rooftop solar installations. A household will apply for the program and their income will be verified to ensure they are eligible to participate under the parameters of the program. They will be entered into the program and will receive a household Solar Assessment that will indicate if they are a good candidate to proceed based on their roof profile, status of their electrical system and if their utility bundle and payments ensures they will receive minimum 20% savings as required by the program guidelines. AHFC will create an "Enabling Upgrades" fund as part of the program so that low-income and disadvantaged households that qualify for the program but whose household would need specific upgrades to ensure a successful solar installation can receive those upgrades. As the administrator of Department of Energy's upcoming Home Rebate program, AHFC will further leverage the Beneficial Electrification point-of-sale rebates for households that need specific electrical upgrades and qualify under that program. Once the household has been determined to be income qualified and a good candidate for rooftop solar, they will be assigned to a Solar Installer. Once the installation is complete it will have to be inspected; in municipalities and cities that require and have electrical inspectors, this will be done by the Authority Having Jurisdiction (AHJ). In other locations a third-party professional inspector will perform inspections on the first 5 installations of a Solar Installer in the program and some percentage on an ongoing basis. AHFC will use the programming period to explore using its existing Building Monitoring Software (BMON) to monitor the performance of all the installations under the program to ensure their rooftop solar system is functioning properly and providing the household with maximum benefits.

AHFC's plan involves standardizing the solar installation packages to a 4 kW system for most households with allowances to be built in for +/- a certain number of panels for households where the standard installation size would not be a success. This standardization of the installs will simplify the permitting process, simplify and standardize the procurement process for both approved installers and procurement of panels and components, streamline the assessment for households entering the program, and allow for efficient approval and monitoring of installations.

AHFC will use the planning period to design a grant program for Multi-Family Rooftop Solar. This program will address access to capital, regulatory barriers, capacity of housing owners, energy efficiency integration and tenant benefit and engagement. Specifications will be created to include master-metered and multi-metered buildings and ensure households in both buildings will receive 20% savings or an equivalent benefit. The program will include multi-family units that are HUD-supported, or where rental assistance is provided to privately owned multi-family buildings with rents not exceeding 30% of 80% of AMI for at least half the residential units and with an active affordability covenant from one of the approved federal or state housing assistance programs. AHFC will open an application period until the program is over or funding is expended. Applications will be scored on a variety of metrics, including economic or otherwise disadvantaged Alaskans served by the building, benefits to tenants and how they will be guaranteed, amount of external or private funding included in their plan, cost per kW, etc.

AHFC will identify partners such as ACEP, NREL and local installers to confirm the standard solar installation parameters during the planning period. This will be done to standardize the installations but not so detailed that it prefers one manufacturer or installer over others. After the specifications are finalized, AHFC will begin an open RFP process for Solar Installers across the state, with the goal of having one or two installers covering each urban area. An installer will need to agree to the program guidelines, be licensed, and insured.

AHFC will use its existing Weatherization Assistance Program network to identify households that have been through its weatherization process in the last five years that would be good candidates for rooftop Solar. As this is a new program being set up in the State, these initial homes will function as the initial pilot households while the program is being finalized and later opens up to more Alaskans.

AHFC will create an Enabling Upgrades fund that will be used for households that are income qualified for the subsidized Rooftop solar program and would be good candidates for a solar installation but need a structural, electrical or envelope upgrade to ensure the installation is successful and provides the benefits as required. This could include structural reinforcing, tree removal, roofing (limited), electrical upgrades. To access the enabling upgrade fund, one of AHFC's weatherization partners or Solar for All Solar Installers would have to identify the need through an initial solar assessment. Households needing upgrades to their existing electrical system will be encouraged to utilize the forthcoming DOE Beneficial Electrification Rebates that include point of sale rebates of $2,500 for electrical wiring and $4,000 for electrical panel and load center upgrades. AHFC will be administering these rebates for Alaska and will thread these benefits together to benefit low-income and disadvantaged households.

Refining Program Plan during Planning Period

AEA and AHFC have designated the first year (not more than 12 months) of its program plan to be a planning period. This will ensure that the partners establish the necessary relationships and processes identified in various components of this application. Critical to this will be the input from the program's advisory committee, which will review the activities identified to deliver meaningful benefits, technical assistance, a market strategy, and an equitable involvement plan.

AEA will conduct a feasibility study of solar potential relative to communities potentially eligible based on disadvantaged status. This will include updating the most recent assessments. AHFC will conduct a similar assessment in urban areas of Alaska, further refining its targeted approach to delivering residential solar.

The most crucial element of the planning period will be stakeholder engagement, with a focus on further developing the program's approach to inclusivity, diversity, equity, and access. Any named entity in this application should not be considered a subrecipient unless an MOA committing to coalition participation is included. AEA has included multiple organizations for reference as resources, anticipating that during the Planning Period any additional partners can be identified and formalized.

Consideration of Other Resources for Planning Purposes

AEA and AHFC will utilize this planning period to strengthen their capacity to deliver community and residential solar, utilizing best practices and leveraged resources from across the nation while also applying lessons learned to Alaska's unique geographic and cultural conditions. AEA recognizes the value of DOE's States Collaborative and National Community Solar Partnership's direct expertise and capacity building services. AEA is an active member of NCSP and the project team will reach out to these and other programs upon award and participate in trainings and information sharing as available.

AEA anticipates collaboration with other Solar for All awardees, including in Alaska where a Tribal award would be beneficial, but also in similarly situated states in Region 10.

The State will also have completed its initial greenhouse gas emissions inventory funded by EPA's Carbon Pollution Reduction Program and administered by Alaska's DEC, and Alaska's Priority Climate Action Plan should be complete. AEA's Solar for All program will fit well within further development of Alaska's Comprehensive Climate Action Plan development and the State will work in this first year to develop a structure for collaboration.

AEA and AHFC will further evaluate the potential for Alaska projects to benefit from EPA programs such as the National Clean Investment Fund and Clean Communities Investment Accelerator. This effort may include further developing the ability for other organizations in Alaska to benefit from or develop corresponding programs, including through Community Development Financial Institutions (CDFIs).

Period of Performance

This project's period of performance is five years, with the first year an extensive planning and stakeholder engagement process designed to advance the development of AEA's delivery of meaningful benefits, technical assistance, and effective financial assistance programs. All funds will be expended by the conclusion of the five-year award period.

Program Administration Narrative

1. Budget Narrative

Efficient and Cost-Effective Deployment of Funds

AEA has applied for a reasonable level of Solar for All program funding, which based on its analysis makes targeted, meaningful progress toward meeting the need for community and residential solar.

AEA and AHFC have partnered to deliver this program and evenly distributed the total $100 million request between AEA's management of community solar and AHFC's management for residential solar. AEA has budgeted $41,325,000 to directly fund community-owned solar projects, and $5,061,663 to cover administrative costs, travel, supplies, and indirect costs. AHFC has budgeted $40 million to directly fund residential and multi-family projects, $3.5 million for an enabling upgrades fund, and $3 million for program administration. The remaining $7.1 million will be allocated for workforce development, technical assistance, and outreach activities. This is an efficient allocation of funds between community and residential solar, allowing Alaska to meet different needs for different communities. Low-income households in rural Alaska will benefit most from community solar projects, while in more urban areas residential solar may be more feasible. Thus, Alaska's approach is prudent and necessary to achieve the outcomes of the program.

AEA and AHFC have budgeted $7.1 million for Technical Assistance, Workforce Development, and Community Outreach. These activities will be jointly funded and aim to benefit both the Residential and Community-based aspects of the program. Technical Assistance is budgeted at $2,365,102 over the five year period of performance and based off analog data and outreach to potential technical assistance partners. Workforce Development will be critical to ensuring a successful program and is healthily funded at $3,498,235. The potential avenues to direct these funds have been discussed in previous sections of the narrative. The overall goal is to leverage existing programs statewide to quickly and effectively create a solar workforce in Alaska. Outreach is budgeted at $1,250,000 and is a highly important aspect of this program. AEA and AHFC aim to partner with organizations throughout the state to get the word out about this program and recognize that the targeted communities and households will require a more dedicated and intensive outreach effort than previous grant opportunities administered.

The project budget total of $100 million includes and the following provides detail for relevant cost categories:

- Personnel – AEA's estimated personnel costs of $2,357,850. include a list of all staff positions by title, percentage of time assigned to the program, and total cost. While a portion of time will be spread across the agency, three program project managers will be the bulk of this expense category. Costs are estimated to increase by 4% annually.
- Fringe – AEA's fringe includes leave, employee insurance, retirement and unemployment benefits. Fringe rates range from 43.6-56.93%, and are based on actuals.
- Travel – AEA has budgeted $36,770 for limited direct travel to communities for site visits. The majority of travel will occur by subawardees and has separately been accounted for within their budgets.
- Equipment – No equipment is anticipated for this program.
- Supplies – AEA has estimated a limited budget for office supplies and equipment under appropriate thresholds, which includes office equipment for program staff.
- Contractual – AEA has included community solar project awards under Contractual, as well as contractor support of $100,000, on an as-needed basis.
  - Community Solar Projects - $41.3 million will be available for project proponents to access for community solar, and to pay for implementation through contracted awards.
- Construction – Construction costs are addressed under Other as part of subaward costs.
- Other – This cost category includes printing for outreach, participant support costs, and subaward costs. Subrecipient budgets are estimated below:
  - Alaska Housing Finance Corporation (AHFC) – As AEA's primary partner, the budget includes $46.5 million for delivery of residential solar.
  - Alaska Works Partnership (AWP) - $3.5 million is budgeted for AWP and others to coordinate and implement solar workforce development training.
  - Alaska Municipal League (AML) - $1.25 million will be available to AML and others to conduct equity and stakeholder engagement activities, including to work with communities for meaningful inclusion and benefits.
  - Alaska Center for Energy and Power (ACEP) - $2.4 million will be available to ACEP and others to used for technical assistance, which will include techno-economic analysis.
- Indirect – AEA's provisional indirect rate is calculated at 30% and is applied to all direct costs, including up to the first $25,000 of each subrecipient award.
- Total – The total budget applies 84.8% of its budget to community and residential financial assistance.

Where travel or supply needs overlap, AEA and AHFC will identify ways in which to avoid duplication and make the most of available funds. AEA and AHFC will collaborate on their approach to technical assistance and workforce development, while recognizing that skill sets, subject matter expertise, and types provided might vary according to activity. The program is designed to meet the needs of both and to utilize funds efficiently without duplicating efforts.

Achieving Target Minimum Funding Amounts for Financial Assistance

AEA has designed its budget to maximize the amount of financial assistance that will be available for project deployment. AEA has exceeded the minimum expectation of at least 75% of funds and developed a budget that allocates 84.8% to community and residential solar financial assistance.

2. Fiscal Stewardship Plan

Ensuring Compliance with Grant Terms and Conditions

AEA has mature staff and management systems in place to administer this award. AEA has a full suite of qualified individuals and a system of checks and balances in place. AEA's Finance and Accounting departments manage the fiscal compliance and reporting requirements for grants and sub awards. Additionally, AEA staffs a grants department that includes a grants manager and a grant coordinator. Internal control procedures are in place for compliance reviews, budgetary controls, invoice approvals, periodic reporting both project status and financial. AEA hires an independent audit firm to report on compliance for each major federal program; report on internal control over compliance; and report on the Schedule of Expenditures of Federal Awards required by the Uniform Guidance. In AEA's FY2022 Single Audit Report it was found that the Alaska Energy Authority complied, in all material respects, with the compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended June 30, 2022. AHFC has a robust internal audit department that ensure all departments and programs comply with relevant laws, regulations, and policies and procedures. The primary purpose of the Internal Audit Department (IAD) is to assist AHFC with achieving the highest level of quality performance and excellence.

Among other responsibilities, IAD provides compliance guidance to residential building owners/property managers and developers. The agency also has a system for grantee financial and administrative review that includes performance management.

Description of Policies and Procedures

AEA will administer program funds through reimbursable grants to selected community solar projects in Rural Alaska. Payments are made after a multi-step verification and review of submitted invoices and progress reports. AEA performs due diligence for all issued grants. All invoices and progress reports are subject to a multi-level internal review and approval process prior to reimbursement of funds. A Project Management Plan (PMP) will be written by the AEA project manager for each community solar project. The PMP will outline project objectives, known risks, reporting requirements, and specific scope and budget requirements. All PMPs will be reviewed by AEA's Grants and Finance departments as well as the Program Manager and Executive Director.

AEA policies and procedures are included online, including for Procurement, Governance, and Annual Reports and Audits. AHFC policies and procedure manuals are available for each program it operates; these are available here - https://www.ahfc.us/tenants/resources/manuals. AHFC engages an external auditor that performs compliance reviews (including site inspections) of Low-Income Housing Tax Credit, Senior Citizens Development Fund (SCHDF), HOME Investment Partnership (HOME), and Neighborhood Stabilization (NSP) funded developments. Reviews are mandated by the Housing and Urban Development (HUD) and the Internal Revenue Service (IRS).

Consumer Protection Plan

The consumer protection plan will be finalized during the first year's planning period and informed by the program's advisory committee and subject matter experts. The following provides a summary of standard practices that have been used by project partners in the past.

The program team anticipates contracting with third party inspectors to perform initial inspection on the first five solar installation performed by solar installers working under the residential rooftop program, and similarly for at least two of the first community solar projects. Annual inspections will occur on a representative sample of project installations thereafter. AHFC is exploring ways to use its in-house open source BMON Building Monitoring Software to remotely monitor rooftop solar installations performance, with permission of the homeowner, and identify and correct any issues in a timely fashion without burdening the resident.

Practices for Consumer Protection and Process for Screening Entities

Any contracted support will be secured through a procurement process prior to implementation. The companies performing solar installation will need to be licensed and insured. All partners in the program will be required to agree to the guidelines and rules of the program including compliance with applicable consumer protection laws in the State of Alaska, fair lending laws, and federal consumer protection and consumer financial laws, including laws that prohibit unfair, deceptive, and abusive practices.

AHFC has previously set up large phone banks to handle customer interaction, recently for the State Rebate Programs administered from 2008-2018, and the COVID-19 Emergency Rent Relief and Homeowner Assistance Fund programs, and likely will do the same for the forthcoming DOE Energy Rebate programs. AHFC has capacity and dedication to ensuring clients are heard and their concerns addressed. Client complaints will be monitored, tracked, and logged to ensure they are resolved in a timely fashion. There will be a procedure in which a program partner that receives too many valid and verified client complaints will be removed.

AHFC's Weatherization Assistance Program also has a well-established process in place for delivering success. The Weatherization program process starts when income eligible applicants apply with one of the weatherization service providers. If the applicant meets qualifying criteria, they are assigned a priority based on need. Weatherization service providers move through this list in order and schedule weatherization assessments. The weatherization service provider does an assessment of the home and creates a list of recommended energy efficiency, health, safety, and repair measures. These measures are prioritized and performed based on program guidelines, assessment, performance testing, professional expertise, and experience. AHFC performs quality control inspections on all its weatherization partners at regular intervals to ensure compliance with program requirements and successful outcomes for the households served.

3. Reporting Plan

Executing Grant Reporting Requirements

During the period of performance, AEA will prepare reports in compliance with program requirements including SF-425 and SF-271, unless otherwise specified in the program award. The project team will utilize a data collection, tracking, and reporting system to manage and report performance measure data. Performance measures reflect system, program, activity, and individual-level data, and will feature sharing data across systems and organizations and gathering information on individuals served. A data management agreement will govern how organizational partners share data. The partners will utilize standard tools such as a spreadsheet to track data, and data will be aggregated across the reporting period and reported across individuals served, and not per individual, to protect identities. The project team will utilize a logic model to provide a graphic illustration of how the project's planned activities will lead to the desired results. The program's logic model will clearly identify the program goals, objectives, activities, and desired results;

clarify assumptions and relationships between the program or initiative's efforts and expected outcomes; communicate key elements of the program; identify what to focus on in a program evaluation and guide assessment of underlying project assumptions and promotes self-correction. AEA will adapt our reporting requirements from grantees to comply with any additional requirements set forth by the EPA when funds are awarded.

Complying with EPA Program Performance Reporting Requirements

AEA will comply with EPA's established program performance reporting requirements consistent with and established in the terms and conditions of the grant award. AEA will establish procedures for doing so during the first year's planning period, including to work closely with EPA to ensure appropriate methodologies and processes.

Underlying Methodologies, Data, Inputs and Assumptions

AEA implemented a robust analysis to determine potential program outputs and outcomes, utilizing historical and programmatic data along with various models that can be shared with EPA. AEA will report on these metrics on an ongoing basis. A brief summary is included here, for community solar:

- AEA utilized the actuals of analogous projects in rural Alaska to determine average all-in construction cost of $10.57 per W for solar and separately $7,235 per kWh for storage.
- To determine avoided tons of CO_2, EPA's Avoided Emissions and Generation Tool (AVERT) is used.
- A capacity factor of 14% was applied to all project impact calculations, based on data supplied in Appendix F of the NOFO. 14% is likely on the high end of what AHFC and AEA would expect to get from a typical project, but used the EPA supplied value for consistency.
- To calculate households impacted and household savings, AEA referenced the "PCE FY22 statistical report by community" published by AEA. Power Cost Equalization (PCE) represents disadvantaged communities that pay higher costs than an urban equivalent.
- To determine representative energy numbers for communities, AEA filtered out regions with low solar productivity (Aleutians and Southeast Alaska), then filtered out smaller utilities (<1.5MM kWh/yr), and communities that already had renewables.
- Based on analog data we can expect an average community project to have a capacity of 234kW plus 360kWh battery for $2.475 million.
- Beyond this modeling, AEA anticipates that all rural, disadvantaged communities will be eligible for the program. Based on PCE data, a representative project community has the following characteristics:
  - Population: 634 | Avg number of residential customers: 219
  - Annual Generated kWh: 4,671,110
  - Avg residential rate: $0.48/kWh | Avg effective rate: $0.25/kWh
  - Avg fuel price: $3.30 | Avg kWh/month: 319
  - Avg fuel cost per kWh: $0.29
- To determine household savings for community projects, AEA used the effective residential rate (including PCE subsidy) of its representative community and compared that to an expected residential rate with 100% of the proceeds from solar sold being evenly distributed back to the community. Some projects will allocate a portion of those funds towards an Operations and Maintenance budget for the asset. This allocation will vary from project to project, and communities within the same region will be encouraged to coordinate and jointly fund an O&M position that serves multiple communities. Contracts will be written to ensure that a minimum amount of revenue be dispersed back to the community to meet the required 20% savings threshold.

For residential solar, the following assumptions were used:

- Data provided by local installers and university partners at ACEP show an average all-in residential rooftop solar project cost of $3.80/W, though this cost varies widely based on geography.
- To determine avoided tons of CO_2, EPA's Avoided Emissions and Generation Tool (AVERT) is used.
- To determine the number of residential households served, AEA uses the assumption that the standard array size will be 4kW.
- To determine household savings, AEA used the averages of retail and wholesale electric rates from four local utilities - CEA, GVEA, HEA, and MEA.
- According to ACEP's net metering update, 68% of net metered electricity is fed back into the grid. AEA made the conservative assumption that all electricity is bought back at the wholesale rate. In reality, this varies from house to house. In Alaska, net metering is trued up monthly with any excess that month bought back at wholesale rate.

AEA will work with EPA to ensure compliance with standardized reporting requirements, including to identify tools to support reporting.

Integrating Program Evaluation Activities

AEA will ensure that milestones are being met and that communities receive support necessary to track and report quarterly progress that includes surveying of stakeholders to determine the extent to which projects are on track to achieve beneficial outcomes for disadvantaged communities. Communities with little capacity will receive support to track and report without adding to their operational burdens.

The project team has built into the performance periods a gap year during which extensive process review will identify any weaknesses in the program delivery. Project sponsors will be interviewed to learn about challenges and solutions, which will be applied to redevelopment of the program, as necessary, to strengthen implementation through the life of the rest of the project.

The final year of the project will ensure that solar integration is completed in a timely and effective manner, consistent with scope and objectives. The project team will complete its evaluation process with an in-person workshop that includes a comprehensive review of all projects, project delivery, stakeholder engagement, and community benefits.

A summary of findings will be released when the project is completed, developed in collaboration with participating communities and project sponsors, and shared with those communities and the public at large. This approach will ensure that learning drives future performance. AEA will comply with EPA Order 1000.33 and make use of available guidance and tools to ensure accurate evaluate and reporting. As public agencies, both AEA and AHFC are subject to public records requests and will be transparent in their program development and implementation.

Programmatic Capability and Environmental Results Past Performance:

AEA is an independent and public corporation of the State of Alaska, est. 1976 and is governed by a board of directors with the mission to "reduce the cost of energy in Alaska." AEA is the State Energy Office and lead agency for statewide energy policy and program development. AEA's core programs work to diversify Alaska's energy portfolio, lead energy planning and policy, invest in Alaska's energy infrastructure, and provide rural Alaska with technical and community assistance.

The impact of AEA's programs extend to the construction of rural power generation and bulk fuel facilities, distribution systems and transmission lines, renewable energy asset construction and integration, and ad-hoc maintenance and improvement of aging infrastructure. Rural Electric Utility Workers continuously travel to rural communities to administer itinerant training to rural

utility operators, and diligently maintain an inventory and assessment record for nearly every rural powerhouse in the state by conducting comprehensive on-site assessments. This record informs the powerhouse construction schedule and ensures alignment with community needs.

AEA is committed to advancing and sustaining rural power systems across rural Alaska, and commenced the construction of powerhouses for rural and tribal communities upon its inception in 1976. Since then, AEA has touched the power generation systems, and worked with stakeholders from nearly every community in the state to provide supply and demand energy services. In the past two years, AEA has overseen ten rural powerhouse upgrade projects at different stages of development in the communities of Akhiok, Napaskiak, Nikolai, Venetie, Rampart, Nelson Lagoon, Manokotak, Circle, Akiachak (DERA) and Arctic Village (DERA). AEA maintains a strong commitment to follow through on delivering energy improvements for communities and often seeks additional project funding beyond what is provided by the Denali Commission and the State. Recently, AEA sought funding on behalf of the communities of Napaskiak and Nelson Lagoon through the USDA High Cost of Energy program and the Aleutian Pribilof Island Community Development Association's Infrastructure fund to support rural powerhouse construction projects. AEA was awarded over $3 million through these efforts. Relationships and partnerships are in place with all Alaska energy stakeholders, including small rural non-profits and utilities, large regional and village Alaska Native Corporations and tribal governments, conservation organizations, municipal governments, and technology- or solution-oriented working groups. Many organizations contribute to the development and support of infrastructure in rural Alaska, such as DOT&PF, responsible for airport infrastructure, ANTHC, focused on water and sanitation, local school districts, who support K-12 public school facilities, among others. However, when it comes to rural energy infrastructure, AEA indisputably takes the leading role.

As the market progresses toward a clean energy future, AEA's efforts have adapted accordingly. Rural utilities and powerhouses that were once exclusively powered by diesel are now seeking to transition to solar energy solutions. This shift demands careful consideration. Diesel generators in rural communities are sensitive to load fluctuations, as they can impact the efficiency of the gensets, and excessive fluctuations can result in damage to the diesel generators, which serve as the backbone of the rural microgrid. Integrating renewables into diesel microgrids is a complex undertaking that requires the expertise of qualified and responsible entities with a track record like AEA's of reliable energy infrastructure deployment across the state.

AEA is engaged in all levels of consumer energy from project and resource identification, appropriate design, and to financing and maintenance. Over decades of experience developing energy projects in Alaska, AEA has continuously improved its process, application of technology, and delivery of service. AEA integrates energy technology and advances in grid services into all program areas both on the supply- and demand-side.

AEA will partner with AHFC, as the primary partner and subrecipient to manage the residential solar program. It is worth highlighting AHFC's capabilities, with this in mind. AHFC is a quasi-state entity that makes mortgages accessible to Alaskans and provides affordable housing and energy efficiency programs. AHFC's mission is to provide Alaskans access to safe, quality, affordable housing. AHFC delivers a variety of programs to meet this mission, including building code development. AHFC has administered several code process and programs since 1992 making the organization uniquely qualified to perform this project's tasks. AHFC established the Building Energy Efficiency Standards (BEES) to promote the construction of energy efficient buildings. AHFC facilitates training and education for Energy Raters and Home Inspectors to become certified to sign off on BEES compliance. As an enforcement tool, AHFC has created a process for state inspectors to perform inspections

during construction of a new home with AHFC financing. Internal auditing and quality control policies and procedures have been developed and followed to ensure compliance.

Successful Completion and Management of Agreements

AEA manages the Renewable Energy Fund, the Rural Power System Upgrade Program, the Power Cost Equalization Program, the Diesel Emission Reduction Act (DERA) Program, and various other Energy Efficiency and Conservation Programs.

AEA has been at the forefront of supporting technology and process improvements that move Alaska communities toward renewable integration within existing power systems. AEA has managed its Renewable Energy Fund since 2008, and programs like Power Cost Equalization since 1985. AEA annually reviews the potential for microgrid projects to lower costs and reduce diesel consumption, including through the use of renewables. In addition to advancing renewable energy production for disadvantaged communities, AEA has experience with improving, upgrading, and building out rural microgrids, including through:

- Renewable power generation creation and system integration (hydro, wind, or solar)
- Modern distribution systems and controls
- Battery Energy Storage Systems (BESS)
- Modern and emission efficient diesel back-up powerhouse systems
- SCADA controls between renewables and diesel back-ups

AEA has successfully managed and completed over three-hundred grants in the last decade from many different agencies as well as private funds from the Volkswagen Environmental Mitigation Trust and Wells Fargo. AEA administers the DERA program to provide support for projects that protect human health and improve air quality by reducing harmful emissions from diesel engines. This program includes grants and rebates funded under the EPA's DERA program. AEA was a successful applicant to the BUILD (USDOT) program in 2020 for the Alaska Cargo and Cold Storage Project. In 2022, the Department of Defense awarded AEA over $12 million to extend power to the Black Rapids training site near Delta Junction with an additional $3 million expected in 2024 to accommodate the installation of underground power lines..

AEA has thirty active awards from the Denali Commission, AEA's current federal cognizant agency. These awards touch on every aspect of what the agency does. There are awards for design and construction of Rural Power System Upgrades (RPSU) and Bulk Fuel Upgrades (BFU); small renewable projects that will be integrated into a remote diesel power system; energy efficiency upgrades, Utility Clerk, Powerhouse Operator, and Bulk Fuel Operator training; small maintenance and improvements for both power systems and tank farms; as well as circuit rider technical assistance and on-site training.

History of Meeting Reporting Requirements

The wide array of current and past programs, and grant management experience, ensures that AEA is appropriately prepared to manage this project, including through a subaward and project delivery and assessment process. This is further outlined in Attachment F, but the following is a small sample of the many awards AEA manages from federal agencies:

- Department of Energy – 2023 Preventing Outages and Enhancing the Resilience of the Electric Grid (Formula Grant to States)
- Department of Defense – 2022 Black Rapids Line Extension
- USDA High Energy Cost Grant – 2021 Napaskiak Rural Power System Upgrade
- EPA – 2016-2022 State Clean Diesel Emission Reduction Act
- Denali Commission – 2019 Nikolai RPSU

Experience and Plan for Achieving Outcomes

AEA is the State's primary agency responsible for lowering the cost of energy in Alaska. AEA has experienced staff and management systems in place to administer this Solar for All program, and the overall program management. AEA has a full suite of highly qualified individuals, and a strong system of internal controls in place that facilitates meeting all compliance requirements. AEA's financial and project management capabilities are demonstrated by receipt of unqualified audit opinions for both our annual Financial Statements and Federal Single Audit report, located on AEA's website. AEA provides grants and loans for qualified energy infrastructure projects and owns energy infrastructure for the benefit of Alaskans. AEA has the legal authority to enter into a financial assistance relationship with the EPA, and is experienced with managing federal awards, including most recently the National Electric Vehicle Infrastructure (NEVI) deployment, an award of $52 million. Additionally, as an authority of the State, AEA produces an annual financial report.

AEA will dutifully manage the project to ensure consistency of the interrelated community-level projects contributing to the proposed outcomes of the overall effort. AEA will maintain frequent communication with stakeholders through all stages of the project, establish project support infrastructure to ensure success, enforce appropriate standard project management practices and processes, and control for performance, scope, and budget. AEA will be responsible for initiation, reporting, monitoring and measuring project outcomes, and project close-out. AEA will work with the following partners (described further below) to implement this program and support community benefits. AEA and AHFC work closely together to achieve and manage project outcomes, and AHFC has the necessary experience and capacity to complement AEA's program.

AEA will be responsible for program management, implementation, and reporting, as well as partner and stakeholder engagement. Additional roles have the following responsibilities performed by diverse team members:

- Project development and identification – AEA will work with ACEP to identify feasible projects and to provide technical assistance to projects in need of development.
- Stakeholder engagement – AEA will work with AML to develop a stakeholder engagement strategy that focuses on rural, disadvantaged communities and includes municipal and Tribal governments, and public and cooperative utilities.
- Application support – AML will provide application support for project grantees, to overcome capacity barriers that might exist in disadvantaged communities.
- Project review and analysis – AEA will convene a project review board comprised of project partners and technical experts to review projects for feasibility and impact.
- Innovative financing – AEA will work with partners to develop and implement a process of private and public capital mobilization in support of project delivery.
- Project deployment and support – AEA will work with AHFC and ACEP on effective ways to support project implementation, including through procurement and project management support.
- Project evaluation – AEA will annually convene project partners to conduct a thorough analysis of projects both for their technical merit and community benefits. This will be a dedicated effort in year four of the project.
- Reporting and compliance – AEA will expect quarterly reporting from all sub-awardees and provide technical assistance through ACEP and AML to ensure compliance.

There are multiple stages at which critical handoffs and interdependencies occur.

- Project selection – Project team members will be involved in soliciting and identifying projects, reviewing projects for greatest feasibility and impact, and selecting awards.
- Project management – Project team members will establish working relationships with project proponents and include technical assistance activities as part of project management, including workforce development, modeling and analysis, and project implementation support.
- Benefits tracking – Project team members will work with recipients to establish systems to track technical and community benefits, which will include avoided diesel use, cost savings, and local and Tribal benefits.

Relevant or Available Past Performance

AEA and AHFC have demonstrated relevant past performance, provided above.

Endnotes

[1] https://www.seia.org/sites/default/files/2023-09/Alaska.pdf

[2] https://irecusa.org/census-solar-jobs-by-state/

[3] https://www.solarpowerworldonline.com/wp-content/uploads/2022/04/Blue_Planet_Project_Shungnak.pdf

[4] https://www.uaf.edu/acep/research/solar-technologies.php

[5] https://www.nrel.gov/docs/fy23osti/84391.pdf

[6] https://www.uaf.edu/acep/files/projects/EEM-01255_SolarDesignManual_5thEd201805.pdf

[7] Circuit Rider Program (3 AAC 108.200 – 240)

[8] https://www.energy.gov/diversity/community-benefit-agreement-cba-toolkit

[9] https://awib.alaska.gov/pdf/WIOA_plan_2022-2023.pdf

[10] The unemployment ranking ranks the lowest rate #1.

[11] Anonymous. "Gauging the Economy." Alaska Economic Trends, October 2022.

[12] U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey, data.bls.gov; Dan Robinson, "Job Openings Near All-time High," Alaska Economic Trends, August 2022.

[13] Howard N Fullerton, Jr. "Labor force participation: 75 years of change, 1950–98 and 1998–2025." Monthly Labor Review, December, 1999.

[14] Workforce Reports. https://www.alaska.edu/research/wd/reports.php

[15] Sarah Schwartz, "Early-College High School Students More Likely to Earn Postsecondary Degrees." Education Week, September 17, 2019.

[16] J. Edmunds, F. Unlu, E. Glennie, and N. Arshavsky. 2020. "What Happens When You Combine High School and College? The Impact of the Early College Model on Postsecondary Performance and Completion." Educational Evaluation and Policy Analysis 42 (2): 257–278.

[17] Improvements to college enrollment and graduation rates have been demonstrated for structured dual enrollment programs that emphasize courses leading to an associate degree and completion of the general education requirements for a baccalaureate degree.

[18] Since 1976, when online data begin. Alaska DOL&WD, https://live.laborstats.alaska.gov/labforce/index.html

[19] U.S. Census Bureau. American Community Survey. census.gov

[20] American Community Survey questions offer "associate degree" as the first option for a college credential. Hence certificate holders without a higher degree are counted in the "some college no degree" category.

[21] U.S. Census data, 5-year average of American Community Survey, 2015-2020. census.gov

[22] The percentages are the number of Alaskans who attended college for the first time in-state relative to the total number of Alaskans who attended college for the first time. National Center for Education Statistics, Digest of Education Statistics, Table 309.10. https://nces.ed.gov/programs/digest/current_tables.asp