

# 2024

## PRIORITY CLIMATE ACTION PLAN



PREPARED FOR:  
State and Local Climate and Energy  
Program  
U.S. Environmental Protection  
Agency  
Tribal partnerships

*KING ISLAND  
NOME ESKIMO  
COMMUNITY  
NATIVE VILLAGE OF  
COUNCIL  
VILLAGE OF SOLOMON*

TABLE OF CONTENTS

ACKNOWLEDGEMENTS .....2

MEMORANDUM OF UNDERSTANDING..... 4

WHAT IS CPRG.....9

WHO IS CPRG .....9

APPROACH TO DEVELOPING PCAP .....9

    Methodology & Data Overview .....10

EMISSIONS BY SECTOR.....11

GHG REDUCTION MEASURES SUMMARIZED.....13

EMISSIONS FORECAST .....15

..... 24

..... 25

CLIMATE ACTION PLANNING COMMITTEE..... 25

REVIEW OF AUTHORITY TO IMPLEMENT..... 26

GHG Reduction Targets..... 27

KING ISLAND.....30

NATIVE VILLAGE OF COUNCIL .....33

NOME ESKIMO COMMUNITY .....35

VILLAGE OF SOLOMON ..... 37

NOME JOINT UTILITY SYSTEM .....44

NEXT STEPS .....46

APPENDIX A: Inventory Methodology .....47

## ACKNOWLEDGEMENTS

LAND ACKNOWLEDGEMENT: Recognizing the land in which this document is referring to, is a wide variety of tribal people enrolled with various federally recognized tribal entities primarily Inupiat peoples.

The PCAP will help Tribes and Territories to: 1. Improve their understanding of current and future greenhouse gas (GHG) emissions, 2. Identify priority strategies to reduce these emissions and the potential other benefits of those strategies, and 3. Engage a variety of stakeholders in an emissions reduction planning process.

The PCAP will inform the Comprehensive Climate Action Plan (CCAP), which is due at the close of the grant period for Tribes and Territories. This outline document pertains to both required and suggested content for the Tribal and Territorial PCAP only.

The EPA encourages Tribes and Territories to collaborate with each other and other entities (states, municipalities, etc.), explore opportunities to leverage other federal funds, and prioritize durable and replicable GHG reduction measures.<sup>1</sup> If you have any questions regarding this outline, please contact [CPRG@epa.gov](mailto:CPRG@epa.gov).

### Key Definitions and Acronyms

Priority Climate Action Plan (PCAP): a narrative report that includes a focused list of near-term, high-priority, and implementation-ready measures to reduce GHG pollution and an analysis of GHG emissions reductions.

Comprehensive Climate Action Plan (CCAP): a narrative report that provides an overview of the Tribe or Territory's significant GHG sources/sinks and sectors, establishes near-term and long-term GHG emission reduction goals, and provides strategies and identifies measures that address the highest priority sectors to help the Tribe or Territory meet those goals.

Greenhouse gas (GHG) Inventory: a list of emission sources and sinks and the associated emissions quantified using standard methods. The PCAP must include a "simplified" inventory (see Section 3.1). The CCAP must include a comprehensive inventory of emissions and sinks for the following sectors: industry, electricity generation/use, transportation, commercial and residential buildings, agriculture, natural and working lands, and waste and materials management.

VOS: Village of Solomon

KINC: King Island Native Community

NVC: Native Village of Council

NEC: Nome Eskimo Community

NJUS: Nome Joint Utility System

A JOINT PLAN BETWEEN THE VILLAGE OF SOLOMON, NOME ESKIMO  
COMMUNITY, NATIVE VILLAGE OF COUNCIL & KING ISLAND NATIVE COMMUNITY

FUNDED BY THE ENVIRONMENTAL PROTECTION AGENCY; CLIMATE POLLUTION  
REDUCTION GRANT PROGRAM

Jointly Approved on March 15, 2024

**MEMORANDUM OF UNDERSTANDING**  
**BETWEEN THE VILLAGE OF SOLOMON, KING ISLAND NATIVE COMMUNITY,**  
**NATIVE VILLAGE OF COUNCIL, AND NOME ESKIMO COMMUNITY**  
**TO ADDRESS MITIGATING CLIMATE CHANGE, POLLUTION AND EMISSIONS**

This agreement (“Agreement”) is hereby made between the King Island Native Community (“King Island”), Village of Solomon (“Solomon”), Native Village of Council (“Council”), and the Nome Eskimo Community (“Nome Eskimo”) (collectively “the Parties”).

**BACKGROUND AND PURPOSE**

The four federally recognized tribes located within the municipal boundaries of Nome, Alaska, as listed above, are dedicated to addressing pollution caused by greenhouse gas emissions where each tribe is currently headquartered. The Environmental Protection Agency Climate Pollution Reduction Grant Program addresses this ultimate goal by providing resources, funding and guidance in developing a Priority Climate Action Plan (PCAP).

Each tribal partner will nominate a point of contact to sit on the Climate Action Planning Committee to ensure appropriate representation for each tribal community moving forward in planning, implementing and gathering resources to address the overall climate change efforts.

This EPA CPRG Planning grant is made available by the Inflation Reduction Act, allocating \$25 million to tribes and tribal consortia.

Fall 2023, EPA will announce their Implementation Grant, made available by the Inflation Reduction Act providing \$4.6075 billion for grants to implement measures from the GHG reduction plans developed with the planning grant funding.

**GOALS AND OBJECTIVES**

Funding through the EPA Climate Pollution Reduction Grant Program; each respective party to this agreement shall have the following responsibilities which include working with Village of Solomon’s staff, providing an appointee onto the Climate Action Planning Committee who will meet regularly in developing all climate action plans, brainstorm action items to mitigate climate change, decrease pollution, pollution prevention and funding opportunities to implement plans. Within the plan; improving and understanding of current and future Greenhouse Gas (GHG) Emissions so that tribal governments can prioritize actions that reduce such emissions and harmful air pollution where the parties reside, work, play, subsist, go to school and to adopt and implement ambitious policies and programs to reduce GHG emissions and accelerate decarbonization across multiple important sectors.

### Village of Solomon's Responsibilities

- Village of Solomon shall serve as the fiscal agent, point of contact and Lead organization for purposes of the EPA Grant management, reporting, and facilitating meetings.
- The Village of Solomon Traditional Council shall appoint one (1) member to serve on the Climate Action Planning Committee who works directly with the Council.
- VOS shall provide staff support for grant writing to explore additional funding avenues for implementation.

### King Island's Responsibilities

- King Island shall appoint one (1) member to serve on the Climate Action Planning Committee, who represents the Council and directly reports to the Council. Should a representative be unavailable to sit on the CAPC, VOS Staff will/can attend King Island meetings for input, feedback, questions and reporting interim a Council representative becomes available.

### Council's Responsibilities

- Council shall appoint at least one (1) council member or staff member to serve on the Climate Action Planning Committee. Should a representative be unavailable to sit on the CAPC, VOS Staff will/can attend Council meetings for input, feedback, questions and reporting interim a Council representative becomes available.

### Nome Eskimo's Responsibilities

- Nome Eskimo shall appoint at least one (1) council member or staff member to serve on the Climate Action Planning Committee. Should a representative be unavailable to sit on the CAPC, VOS Staff will/can attend NEC meetings for input, feedback, questions and reporting interim, an NEC representative becomes available.

### Mutual Responsibilities

In order to properly plan and coordinate for the development of a Climate Action Plan, the parties agree to form a Climate Action Planning Committee. This committee shall provide guidance on steps needed to ensure each tribal partner is well represented in the developed plans. The goal of this committee is to promote collaboration among all the tribes of Nome in

developing a successful Climate Action Plan that will serve the tribally diverse community of Nome.

The Climate Action Planning Committee (“CAPC”) shall be composed of representatives from each party to this MOU, with discretion to add additional members from other organizations upon a majority vote of approval from the existing CAPC members. Each party shall have at least one seat on the CAPC, with the ability to request additional staff or council members be allowed to join upon approval from the existing CAPC members. If a party is designating more than one initial CAPC member, it is noted in the respective party responsibilities above.

The CAPC shall meet at least quarterly, with additional meetings being called at the discretion of the CAPC and EPA Deadlines, or by VOS staff facilitators. Members of the CAPC shall be tasked with working with EPA and identifying and implementing the steps needed to establish both climate plans

- Tackle damaging climate pollution while supporting the creation of good jobs and lowering energy costs for families
- Accelerate work to address environmental injustice and empower community-driven solutions in the Nome area, directly affecting all parties
- Deliver cleaner air by reducing harmful air pollution, such as offsetting diesel fuel for heating their homes, work, public facilities, schools, etc.
- Identifying funding sources
- Complying with any grant reporting
- Creating timelines
- Doing community outreach and education to their respective communities

Additional duties may be taken on by the CAPC at their discretion.

## **AMENDMENTS AND TERMINATION**

The parties may amend this agreement upon mutual consent and in writing.

This agreement will be in effect once signed by all parties, and shall remain in effect indefinitely unless the parties agree in writing to modify or dissolve parts or all of this agreement.

Parties wishing to terminate their involvement in this agreement should provide one (1) month notice to all other parties of their intent to withdraw.

## **ASSIGNMENT**

The parties may not assign, transfer or pledge this agreement without prior written consent of all parties.

## **SIGNATORIES**

The following individuals are authorized by their respective tribal councils to sign onto this agreement, and hereby agree to the terms as set forth above.

**KING ISLAND NATIVE COMMUNITY**

  
c fs.spec (Apr 4, 2024 10:17 AKDT)

CHIEF

**NATIVE VILLAGE OF COUNCIL**

  
Barbara Gray (Apr 4, 2024 10:25 AKDT)

CHAIRMAN

**NOME ESKIMO COMMUNITY**

  
Allison Johnson (Apr 4, 2024 11:18 AKDT)

PRESIDENT

**VILLAGE OF SOLOMON**

  
Kirsten Timbers (Apr 4, 2024 09:16 AKDT)

PRESIDENT



# EXECUTIVE SUMMARY

There are four Nome Based Tribes to be served within this Priority Climate Action Plan. With careful planning, collaboration and partnering, this plan has been developed. As displaced tribes, with the exception of Nome Eskimo Community, the three other tribal communities reside in Nome year-round and seasonally within their villages.

To cover the larger section of the GHG emissions inventory, would cover all of the tribal citizens residing in Nome, Alaska. Collectively, this equates to 70% of the Nome, Alaska population.

VOS had the staff capacity when the EPA announced a funding opportunity to plan for mitigating greenhouse gas emissions and developing prevention strategies in devastating climate change impacts, especially to a region that is still recovering from the detrimental effects of the September 2022 Typhoon Merbok. Because VOS' Environmental Dept. has already focused and prioritized on renewable energy, energy efficiency measures and partnerships to achieve education, outreach and resources to the VOS tribal community, and at the time, the local tribal consortia was not planning to apply for the CPRG program. Given this, the VOS environmental dept decided to reach out to the 3 surrounding Nome based tribes and ask if they would like to partner in a grant application to include and serve all 4 Nome based tribes in developing climate action items to target decreasing GHG's in the shared geographic location of Nome, Alaska. It only made sense to partner and share resources to understand, and set a specific goal to decrease the pollution that we all live with in Nome as a subarctic climate, all citizens rely on heavy heating resources, which is 90% heating fuel to heat commercial and all residential buildings. VOS' knowledge is that it is realistic, feasible and achievable to implement efficiency measures and renewable energy technologies. This funding opportunity, partnering with surrounding tribes and developing such a planning document is the path forward in a cleaner living environment for all sectors of the City and providing the resources for future generations to have mitigated devastating climate tragedies, giving our future leaders the tools to educate and maintain such operating systems, building envelopes and clean technologies as we begin to implement these action items given forth within this document.

In having discussions with a Chairwoman of a Nome Based Tribe, understanding the need for all tribal community members be served for the purposes of this planning document.

Acknowledging that, each tribal citizen should be served if given the opportunity under the umbrella of our partnership, capacity in developing our priority climate action plan and educating ourselves in the efficiency of our communities. If each tribe so chooses, can and will serve each tribal citizen through the approval of this PCAP.

## WHAT IS CPRG

The Climate Pollution Reduction Grant (CPRG) provides grants to states, local governments, tribes, and territories to develop and implement plans for reducing greenhouse gas emissions and other harmful air pollution. It is an opportunity to develop your tribal climate mitigation plans to reduce pollution and open the door to new available funding for implementation.

## WHO IS CPRG

The Nome based tribes have signed a memorandum of understanding to develop climate action plans through this funding opportunity, conducting a greenhouse gas emission inventory for all public facilities, residential and commercial sectors in order to develop the action plans to address and mitigate pollution as a rural cold climate census area in Nome, reliant upon fuel for heating all sectors. Basing the priority climate action plan and comprehensive climate action plan on existing tribal plans, such as the Village of Solomon's Tribal Resolution adopting and supporting the Paris Agreement, Renewable Energy Plan, Integrated Solid Waste Management Plan and all of the tribe's Local Economic Development Plans will be reviewed and dissected as a framework for the PCAP and CCAP. Each tribe will have a representative committed to the Climate Action Planning Committee to develop new policies collaboratively, working directly with the local utility to understand the demand for energy use, the primary sources of energy demand and how we can mitigate the GHG's in providing the demand. The Committee will reach out to their respective communities and facilitate joint community gatherings for updates, feedback and input to include on top of meeting with their Tribal Council's for updates and input. There will be transparency between all the stakeholders, to ensure the development of both climate plans are sufficient in addressing each community, each stakeholder and every community member.

## APPROACH TO DEVELOPING PCAP

VOS' Environmental Dept. was tasked with facilitating discussions with all of the tribal representatives to ensure appropriate input was provided in representation of each tribal partner. Including educating each tribal rep and tribal stakeholders, in understanding exactly what CPRG is, GHG inventories are, mitigation measures and concerns of their own for their people in climate change and pollution. After educating stakeholders and representatives, it was smooth sailing in discovering the action items to develop and put down in a document for each tribe to utilize as a resource tool in moving forward in acquiring appropriate funding in order to implement their action items to better serve their communities. In order for a successful and whole approach to developing action items in efforts to reduce greenhouse gas emissions and mitigate climate change in a geographic location that has huge negative impacts from extreme weather events, it only made sense to include and collaborate with the only utility serving the Nome based tribes, Nome Joint Utility Systems. Because NJUS is the only utility serving the City of Nome, NJUS' aim is to decrease the heavy reliance on fuel for electricity, heating and water needs within Nome. The overarching goal of this PCAP, is to establish all the ghg reduction measures that will ensure the future of the subarctic climate

geographic location to be healthy, renewable, efficient and sustainable for all entities within the City of Nome.

In order to achieve, approaching in a collaborative effort is the only way to achieve the reduction of GHG's.

Conducting surveys, input and meeting for collaborative discussion in developing energy action items to decrease greenhouse gas emissions from each tribal community.

## GHG INVENTORY

With the tribal partners signing and agreeing to the MOU, all parties have agreed upon having representation on the establishment of a Climate Action Planning Committee which will meet quarterly. The CAPC will be working directly with the local NJUS utility manager, Ken Morton, on all electrification within Nome in preliminary GHG inventory data collection over a period of seven months, completed by December 2023. Preliminary GHG inventory data collection will include the identified tribes, their inventory year, baseline measurements, as well as emissions based on ICLEI's Global Protocol for Community-Scale GHG Emissions Sectors for the following Scopes 1, 2, and 3 defined below.

### Methodology & Data Overview

GHG emissions are quantified in two ways:

1. Measurement-based methodologies refer to the direct measurement of GHG emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility.
2. Calculation-based methodologies calculate emissions using activity data and emission factors. To calculate emissions accordingly, the basic equation below is used:

$$\text{Activity Data} \times \text{Emission Factor} = \text{Emissions}$$

**Scope 1** - Stationary Fossil Fuel Combustion, Mobile Fossil Fuel Combustion, Solid Waste Management, Wastewater Treatment

**Scope 2** - Electricity Consumption

**Scope 3** - Agriculture & Land Management, Forestry, Waste Generation (offsite disposal), Water Use (offsite disposal), Water Use (offsite supply/treatment), Additional Sources

Meeting with the CAPC on a quarterly basis, will give the development of the PCAP all tribal priorities, goals, action items, specific to the tribes they represent. Collectively, the overarching

goal will be to mitigate pollution, to get there; the CAPC will address their concerns and the committee will create short term and long term implementation plans. The CAPC will include any and all existing climate actions, energy plans, environmental plans that each tribal partner already has and tie in specified priorities as they correlate to climate action planning. Additional required and recommended elements include, GHG planning, measuring, benefits analysis, outline, a final draft approved by Tribal Partners, as well as the final PCAP publication.

This vision can be met with goals that are realistic and consistent with Alaska’s current conditions and aspirational future. The State of Alaska’s goals are to:

Leverage available federal funding to achieve a widespread and impactful transformation at the residential, commercial, and public sector levels, and across sectors.

Deliver equitable benefits such that disadvantaged communities have access to resources that decrease their vulnerability and improve resilience.

Align activities with beneficial economic impacts that include improving job quality, increasing workforce opportunity, and strengthening business development.

Achieve corresponding environmental and public health benefits, including improving air quality.

Significantly diversify power generation with an emphasis on local, reliable, and affordable energy.

Support and incentivize energy efficiency, renewable energy, decarbonization, and beneficial electrification across all sectors.

Sustainably increase value-added economic activities (e.g., fisheries, transportation, agriculture, mariculture) that leverage clean energy and maximize in-place opportunity for residents.

## EMISSIONS BY SECTOR

| Sector             | Fuel or Source | 2022 Usage | Usage Unit | 2022 Emissions |
|--------------------|----------------|------------|------------|----------------|
| Residential Energy | Electricity    | 5,568,972  | kWh        | 3,160          |
|                    | Fuel Oil #1    | 305,849    | Gallons    | 3,126          |

|                                          |                          |            |         |        |
|------------------------------------------|--------------------------|------------|---------|--------|
|                                          | Fuel Oil #2              | 1,387,275  | Gallons | 14,254 |
| Residential Energy Total:                |                          |            |         | 20,540 |
| Commercial/Public Buildings Energy       | Electricity              | 3,397,379  | kWh     | 1,928  |
|                                          | Fuel Oil #1              | 118,187    | Gallons | 1,208  |
|                                          | Fuel Oil #2              | 535,997    | Gallons | 5,507  |
| Commercial Energy Total::                |                          |            |         | 8,643  |
| Transportation & Mobile Sources          | Gasoline                 | 63,587,913 | VMT     | 25,735 |
|                                          | Aviation                 | 1,592,786  | Gallons | 15,495 |
| Transportation and Mobile Sources Total: |                          |            |         | 41,230 |
| Solid Waste                              | Waste Generation         | 1,820      | Tons    | 2,887  |
| Solid Waste Total:                       |                          |            |         | 2,887  |
|                                          | Water supply electricity | 546,025    | kWh     | 310    |

|                           |                        |              |        |
|---------------------------|------------------------|--------------|--------|
|                           | Wastewater electricity | 494,006 kWh  | 280    |
|                           | N2O Emissions          | 3,500 people | 33     |
| Water & Wastewater Total: |                        |              | 622    |
| Community Emissions Total |                        |              | 73,922 |

## GHG REDUCTION MEASURES SUMMARIZED

1. Energy Efficiency Education
2. Renewable Energy Education
3. Energy audits
4. Weatherization guidebook development
5. Household weatherization
6. HRV/Ductless Heat Pump installation
7. Upgraded efficient boilers for all households
8. Weather stripping for all doors
9. Insulation on all homes and buildings
10. SMART Meter installations
11. Solar panels to scale on buildings and homes
12. Battery storage for all buildings and homes

## Summarizing Narrative Action Items

- Establish programs to finance and support energy efficiency retrofits for residential, commercial, and public buildings.
- Support and incentivize energy efficiency, renewable energy, decarbonization, and beneficial electrification across all sectors.
- Sustainably increase value-added economic activities (e.g., fisheries, transportation, agriculture, mariculture and marine biotechnology, and petrochemicals) that leverage clean energy and maximize in-place opportunity for residents.

- Improve electric generation efficiency in rural Alaska through optimized power generation
- maintenance, improved renewable integration strategies, and reduced line loss.

Benefits flowing to disadvantaged communities will be realized via:

- a decrease in energy burden and utility costs with community dependent reductions in home heating of up to 75%
- increase in access to low-cost capital through both energy savings and financial assistance programs
- decrease in environmental exposure due to less use and storage of diesel or heating fuel and improvements in indoor air quality
- increase in high-quality jobs through disadvantaged and local hire and workforce
- development training, and equipment operations and maintenance in each community
- increased access to clean energy and home retrofit technologies such as high-quality heat pumps, ventilation, insulation

Weatherization, energy efficiency measures, and beneficial electrification of Alaska's public, non-residential facilities like schools, universities, and state and city/tribal office buildings has great potential to provide emissions reduction and broader community benefits through money saved on energy expenses. Importantly, these measures are among the short list of efforts that can be undertaken with expedience and expertise by resource-limited governmental entities. In Alaska, the government is one of the largest economic sectors. This is reflected in many small communities where public facilities, such as schools, are critical to human infrastructure, serving a changing role as lodging for out-of-town guests, emergency shelter, and community gathering space. AHFC's 2014 Energy Efficiency in Public Buildings, among other evidence, points clearly to the economic and environmental benefits

These facilities are also a major driver of costs for governments that are already fiscally distressed or lack access to sufficient revenue to meet growing costs, especially when the buildings are not energy efficient and use expensive heating oil, which in some communities is priced as high as \$13/gallon.

The proposed actions support programs by public entities that promote greater energy efficiency through weatherization, energy efficiency measures, and beneficial electrification in public facilities across Alaska. Other public assets, like vehicle and equipment fleets, may be considered as part of this measure as well. They would be implemented by the University of Alaska, Department of Transportation; Public Facilities, Department of Education and Early Development, municipal school districts, and other public entities like municipal and tribal governments.

Reduced fuel consumption can mean big differences for rural communities in Alaska. First of all, revenue for municipal governments in rural Alaska can be quite limited as communities can have a very restricted tax base; by reducing a reliably costly expense like heating oil, these essential governments may have greater fiscal resilience to economic shock and they may have more flexibility to invest in other needed areas. Reduced fuel use also may mean that fuel deliveries do not need to happen as regularly, resulting in greater resilience to freight disruption by weather and disaster that might delay fuel shipments. Over the long-term

reduced residential dependence on diesel may mean that bulk fuel systems in some rural Alaska communities will not need to maintain as much capacity. This reduced reliance on importation of fossil fuels can make a huge difference for the most remote communities in Alaska.

Upgrades are anticipated to significantly reduce line losses, improving energy efficiency and environmental impact. Reduced reliance on diesel generators will lead to lower emissions, better air quality, and lower costs at the local and only utility serving the Nome based tribes.

A distinguishing feature of this initiative is its unwavering commitment to directly benefit low-income and disadvantaged households. With no financial burden imposed on participants, the program becomes readily accessible to such low-income and disadvantaged households, granting access to the transformative potential of renewable energy to those who might otherwise never have the opportunity. For an average participating household, the program is projected to yield approximately a 40% reduction in their annual electricity bills, making it a compelling proposition for those seeking economic relief from rising energy costs.

Beyond the immediate cost savings, installing Community Solar PV and Battery projects will play a pivotal role in bolstering the reliability and resilience of aging and isolated microgrids scattered throughout the Nome census area. The risk of damage to associated community infrastructure for microgrid-communities face significantly increases when blackouts occur, especially during the harsh winter months when rapid freeze-ups can damage the fragile above-ground water and sewer systems. Integration of Solar PV and Battery systems into the existing diesel grid will be a game-changer, significantly diminishing the frequency, duration, and impacts of these disruptive events. In essence, this program serves as a lifeline for communities in dire need of enhanced energy stability.

Furthermore, the Residential solar program is set to cultivate a local Alaskan-grown solar workforce. This endeavor is provided for by substantial investment in workforce development programs and a surge in demand for solar installations. This dual approach not only promises to expand and augment the expertise and capacity of the domestic Alaskan solar industry but also paves the way for future solar development opportunities that extend beyond the scope of the program. It is an endeavor that not only promises immediate benefits but also lays the foundation for future sustainable growth and innovation in Alaska's energy sector.

## EMISSIONS FORECAST

Community emissions were projected using the following variables for business-as-usual (BAU):

- *Projected Population Growth:* Population was projected based on historical population data from the US Census. The 2010 population for Nome was reported as 3,598 and the 2020 population was reported as 3,699, for 2.8% growth in one decade. Projecting 2.8% growth per decade forward results in a 2030 population of 3,803, and a 2050 population of 4,019.

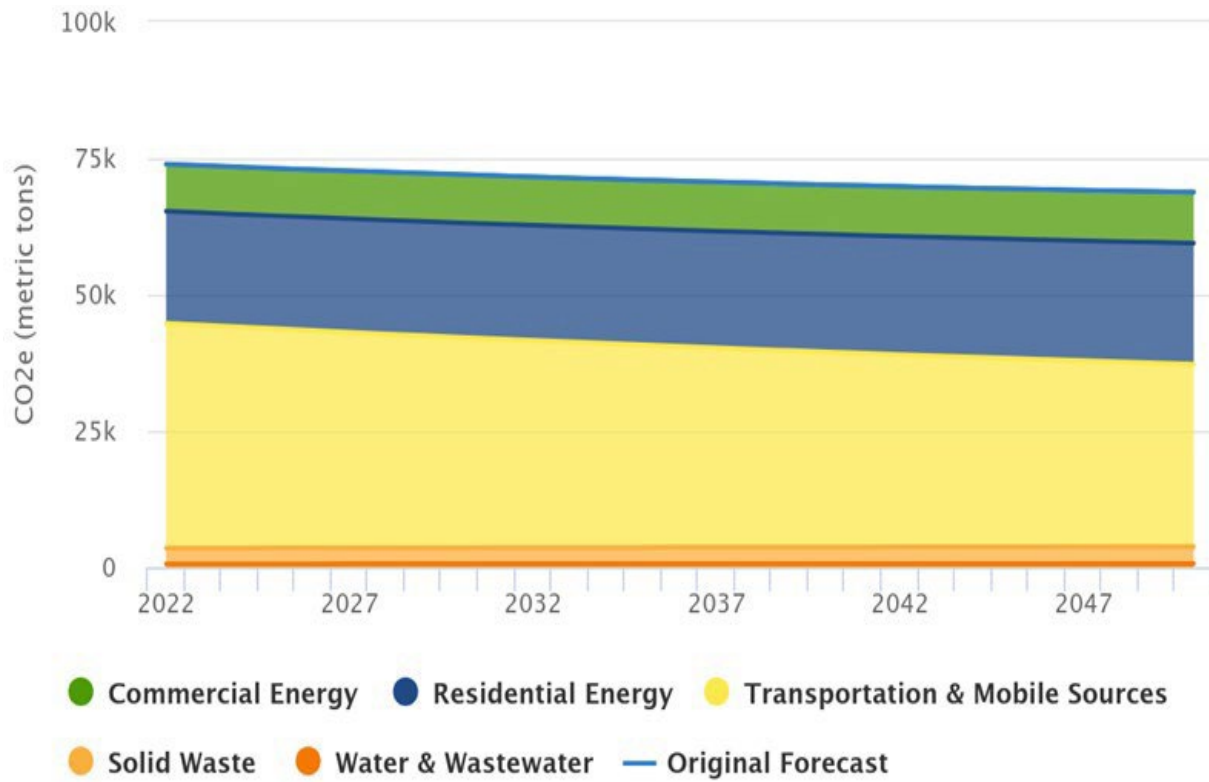
- *Electricity emissions intensity projections:* For business as usual, it was assumed that the NJUS generation mix of 92% diesel generator and 8% wind would remain constant, resulting in a constant emissions intensity (lbs CO<sub>2</sub>e/kWh) for electricity.
- *On-Road Transportation Fuel Efficiency Standards<sup>[1]</sup> (CAFE Standards):* Fuel efficiency standards are used to project the reduction of emissions intensity for each mile driven by gasoline on-road vehicles. Fuel efficiency standards decrease emissions due to federally mandated improvements in vehicle fuel economy. ICLEI developed variables from fuel efficiency projections provided by the Center for Climate and Energy Solutions<sup>[2]</sup> (C2ES).

Nome's 2022 emissions were estimated at 73,922 Metric Tons Carbon Dioxide Equivalent (million MT CO<sub>2</sub>e). Based on the above growth rates and emissions intensity factors, 2030 emissions are projected to be 72,014 MT CO<sub>2</sub>e, and 2050 emissions at 68,781 MT CO<sub>2</sub>e. Emissions decrease in the BAU case because the efficiency gains from federal vehicle CAFE standards outweigh the effects of population growth.

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<sup>[1]</sup> [Default Fuel Efficiency Standards:](https://docs.google.com/document/d/1WwVVlpNBxY8vkbN1zVqv5J2JOtYld4CV/edit?usp=sharing&ouid=114957718777074117870&rtpof=true&sd=true)

<https://docs.google.com/document/d/1WwVVlpNBxY8vkbN1zVqv5J2JOtYld4CV/edit?usp=sharing&ouid=114957718777074117870&rtpof=true&sd=true>



<sup>[2]</sup> Center for Climate and Energy Solutions: <https://www.c2es.org/content/regulating-transportation-sector-carbon-emissions/>

Table reflects no reduction measures implemented.

**Table: Strategies with net reduction (MT CO<sub>2</sub>e) and level of impact in 2030 and 2050**

| Action                                                                                     | MTCO <sub>2</sub> e reduced in 2030 | MTCO <sub>2</sub> e reduced in 2050 |
|--------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| Clean electricity - 20% wind                                                               | 676                                 | 715                                 |
| Clean electricity - 40% wind                                                               | 1,132                               | 1,196                               |
| Clean electricity - 80% wind*                                                              | 0                                   | 2,392                               |
| Building efficiency and electrification - new construction of community center and housing | 79                                  | 107                                 |
| Building electrification - existing houses                                                 | 1,994                               | 11,369                              |
| Building electrification - existing commercial buildings                                   | 773                                 | 4,408                               |

\*Reduction from 80% wind is zero in 2030 because it is modeled to be implemented in 2035.

### Funding Analysis

For many of these proposed measure action items, funding avenues will come from the EPA implementation grant application awards, partnering with the State of Alaska from their state programs to assist and spread the funds further in serving, if not all, at least 80% of the residential and community buildings within Nome.

Alaska Energy Authority - Solar For All

Alaska Housing Finance Corporation - Weatherization assistance

Nome Joint Utility Systems EPA implementation general competition

Village of Solomon Tribal Consortia Tribal Implementation for tribes competition

Within this table, is a list of soon to be new programs to serve the Nome census area with the new Home Electrification and Rebate program development

| Measure Title                                                    | Measure Subtitle                      | General Notes                                                                                                                  | Calculator to use                                               |
|------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Residential New Construction or Retrofit Incentives and Programs | Residential All-Electric              | General approach is to electrification of all end uses in housing unit - > electrifying 5% of housing units = 5% of gas demand | High impact action - residential efficiency and electrification |
| Residential New Construction or Retrofit Incentives and Programs | Residential HVAC Heat Pumps           | Can be separated if there is data on portion of gas used for space heating, otherwise included in all-electric                 | High impact action - residential efficiency and electrification |
| Residential New Construction or Retrofit Incentives and Programs | Residential Water Heating Heat Pumps  | Can be separated if there is data on portion of gas used for water heating, otherwise included in all-electric                 | High impact action - residential efficiency and electrification |
| Residential New Construction Incentives and Programs             | Voluntary Stretch Code and Incentives | Would need to know % savings for stretch compared to base code                                                                 | High impact action - residential efficiency and electrification |
| Residential Retrofit Incentives and                              | Residential Weatherization            | Need estimate of percent of housing units affected. <a href="#">ACEEE reports</a> 10%                                          | High impact action -                                            |

|          |  |                                                                                 |                                            |
|----------|--|---------------------------------------------------------------------------------|--------------------------------------------|
| Programs |  | typical savings for a 'light' retrofit and 29% savings for a 'medium' retrofit. | residential efficiency and electrification |
|----------|--|---------------------------------------------------------------------------------|--------------------------------------------|

Based on the historical performance of the Weatherization Assistance Program, households that go through weatherization experience an average reduction of energy consumption of an equivalent of 6,740 lbs of carbon dioxide a year, a 21 percent reduction. A reduction of 61.7 million BTU;s or 453 gallons of fuel oil per year representing an average of 29% energy cost savings per household.

The Weatherization Assistance Program has historically delivered substantial benefits to low-income and disadvantaged communities.

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#### Alaska Weatherization Assistance Program Statistics

Median household income \$28,263

Households in rural Alaska communities 42%

Alaska Native households 38%

Households with elderly members 34%

Households with children under 6 24%

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A life-cycle cost analysis of the program shows a Savings to investment ratio of 1.5, so energy cost savings from Alaska's weatherization program will earn back the money spend plus 50 percent over the course of the improvement's life. During the 2008-2018 period when the weatherization program had a state surplus of funds to work with, the program created an estimated 5,460 annual jobs.

These savings are especially significant in rural Alaska, where in Winter 2023 heating fuel in 92 unsubsidized communities had an average cost of \$6.72 per gallon 33 in contrast to the national average of \$4.60 during the same period. In Alaska's Western region, which has some of the lowest average household incomes in the country, the 2023 average heating fuel price rises to \$7.50. While diesel use for electricity is supported by Power Cost Equalization (PCE) funds, this is not the case for household heating fuel. Given these statistics, it's evident why reducing the residential fuel needs in rural Alaska has such a disproportionate impact in reducing the economic burden of energy on individual households.

An important function of properly-done residential weatherization is making homes more livable and comfortable for its residents. Residential weatherization can help prevent moisture management issues that, left untreated, can lead to mold growth, poor indoor air quality, and worse health outcomes.

Less fuel consumption also means that fuel deliveries do not have to happen as regularly, resulting in greater resilience to freight disruption by weather and disaster that might delay fuel shipments. Over the long-term reduced residential dependence on diesel may mean that bulk fuel systems in some rural Alaska communities will not need to maintain as much capacity.

Information provided and content provided by the State of Alaska Ak Priority Sustainable Energy Plan.

An NREL study on distributed renewables for Arctic energy <sup>67</sup>, found that community buy-in and ownership is essential, as this extract demonstrates and the project anticipates and responds to. DEC 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 buy-in 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.

The recent 200-page report by ANTHC and DCRA, “Unmet Needs of Alaska’s Environmentally Threatened Alaska Native Villages” makes a number of recommendations with relevance to state and federal policymakers. There are many particular findings, including agency programmatic and legislative barriers such as required match, that are currently preventing needed investment for climate adaptation.

Fuel transportation to remote Alaska communities is becoming more susceptible to weather-related disruptions. In these communities, fuel is typically delivered by barge, which for inland communities is only available during the summer when the rivers are free of ice. Changes in river paths, low water levels, increasing sediments, or unexpected storms can put shipments at risk, leaving a community without the energy stores needed to meet high heating loads during the long winter. Alternative methods of delivery, such as ice roads and winter-based overland routes, are becoming less secure. The emergency alternative—flying diesel in on small planes or even by helicopter—increases costs exponentially, with some communities paying over \$16/gallon. Burning diesel also releases greenhouse gases and other pollutants, reducing local air quality. The effects of severe weather are being experienced acutely in Arctic regions like Alaska, as melting permafrost further reduces transportation options and puts building foundations at risk.

Remote Alaska communities have and will continue to lead in community-based renewable energy development, serving as an example for similar communities throughout the world. Many communities have excellent wind, solar, hydropower or biomass resources waiting to be utilized. Sixty-nine Alaskan communities have so far integrated some form of renewable energy, and between 2014 and 2018, 5,210 households in rural Alaska received building energy efficiency improvements to reduce overall energy demand. A variety of funding sources and programs are available to support communities in the complex transition to renewable energy. Remote locations may be rich in renewable energy sources, but the intermittent nature makes their integration into the power grid a challenge.

Energy planning can offer enhanced protection against the threats of natural disasters and terrorism to make our communities more resilient, sustainable and livable for generations to come, which lowers the price of mitigation for building owners. The many challenges to public health and safety and Environmental sustainability in our increasingly complex global society calls for a holistic approach to public policy development and business models, including how we construct buildings. Thoughtful consideration of performance goals prior to taking action is important for budget planning and for establishing priorities, such as: public health and safety; protection of ecosystems and the important functions they serve; accessibility and mobility for all citizens; affordable housing; and economic sustainability. Implementation of new policies and practices should start by identifying the intersections and synergies that will achieve the performance goals (which may change) in the most responsible and cost-effective way possible.

Alaska has the potential for some of the most significant transformations from diesel power generation to renewables in the nation, and already has communities that have taken these steps. While overall adoption is high and the EIA identifies 33% of Alaska's electricity generation comes from renewable sources, the isolated nature of its microgrids makes transformation a community-by-community effort.

Funded projects under this award will use technology that has been deployed with success in Alaska, with proven innovation that is adapted to remote, isolated systems that face challenging weather and operational extremes. The following section describes renewables that are applicable to and proven for rural microgrids, battery systems that complement their use, and integration expertise that has been demonstrated by project partners.

(Alaska Native Tribal Health Consortium, Division of Community and Regional Affairs, 2024)

<https://www.adn.com/alaska-news/rural-alaska/2022/05/18/fuel-in-the-alaska-village-of-noatak-was-16-a-gallon-the-costs-are-more-than-just-money/>

<https://www.nrel.gov/docs/fy23osti/84391.pdf>

|                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Do existing Tribal/Territorial goals or policies work towards emissions reduction? Can these be modified or expanded?                                                                                                                                                 | VOS has approved a tribal resolution (2019-02) to adopt and support the Paris Climate Accord to mitigate carbon pollution. All tribes within the partnership are targeting the decrease of GHG's.                                                                                                                   |
| How can Tribes or Territories measure or quantify anticipated GHG emission reductions from a proposed priority measure?                                                                                                                                               | The tribal partnership will measure the target reductions by continuing to utilize the ClearPath software as an ICLEI member to conduct future GHG inventory analysis                                                                                                                                               |
| The Tribal and Community Greenhouse Gas Inventory Tools are Excel spreadsheet tools that both Tribes and Territories can use to calculate their own greenhouse gas inventories. These tools and their user guides can be found in the accompanying resource document. | The tribal partnerships will also utilize and learn how to conduct GHG analysis, projections and real-time data using the EPA resource tools for Greenhouse Gas inventories                                                                                                                                         |
| Do Tribes or Territories currently have the authority to implement this measure? If not, can Tribes or Territories obtain authority in the near future or partner with the authoritative agency to implement this measure?                                            | Yes, each tribe within this partnership have authority to implement all reduction measures stated and developed by each community for their respective communities. The similar reduction action items will be the collective effort managed by the lead applicant, with the benefit of each community partnership. |
| <b>Tribes and Territories should include the following information for each GHG reduction measure:</b>                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                     |
| Estimate of the quantifiable GHG emissions reductions                                                                                                                                                                                                                 | 60% Reduction                                                                                                                                                                                                                                                                                                       |
| Implementing agency or agencies                                                                                                                                                                                                                                       | Village of Solomon, Nome Eskimo Community, Native Village of Council, King Island Native Community and Nome Joint Utility Systems                                                                                                                                                                                   |

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Implementation schedule and milestones                         | Implementation schedule will be as follows:<br>Applying for EPA's CPRG Implementation funding where collaborative partnerships will be proposed, by May 1st, 2024. GHG inventory review and recommendations to achieve GHG reduction measure goals will also have a specific milestone implementation plan by seeking additional funding resources, partnerships and collaborative resource pooling. Once the PCAP is an approved document and signed by all partners, the respective tribal representatives will seek resources to begin implementation beginning early spring 2024 and continue to implement as resources allow for the entire 2024 year, into 2025 with another GHG inventory data collection review |
| Geographic location (if applicable)                            | Nome census area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Milestones for obtaining implementing authority as appropriate | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Funding sources (if relevant)                                  | EPA CPRG Implementation Funding Opportunity. DOE EECBG formula grant. MSU/Iowa VOS partnership for home energy assessments on all Nome homes and commercial buildings as selected by tribal partners; which is funded by the National Science Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Metrics for tracking progress                                  | Following timeline after approval of PCAP document, seeking funding resources, using a live spreadsheet for action items tied to funding sources and a 2024 GHG inventory data collection, seeking any necessary additional funding resources, using the live spreadsheet for action items tied to funding resources and a 2025 GHG inventory data collection to measure quantifiable reduction measures                                                                                                                                                                                                                                                                                                                |

|                                                                                                                                                                           |                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicable sector (e.g., solid waste management, electricity generation and consumption, agriculture and land management). One measure may apply to more than one sector. | Residential. Commercial/Institutional. Industrial. Energy Generation                                                                                     |
| Quantitative cost estimates                                                                                                                                               | Residential estimates: \$3.6 Million; Commercial estimates: \$4 Million; Industrial: \$600,000 and Energy Generation: \$100,000. In total: \$8.3 Million |



## CLIMATE ACTION PLANNING COMMITTEE

Joint Collaboration between Village of Solomon (VOS), King Island Native Community (KINC), Nome Eskimo Community (NEC) and Native Village of Council (NVC)

The Climate Action Planning Committee (CAPC) is composed of nominated and/or appointed representatives for the Nome based tribes described above. In order to be provided the stipends for participation during facilitated CAPC meetings the duties of each member are as follows;

Responsibilities of CAPC Members:

- Bring forth climate change concerns from each of their respective communities
- Report directly to their respective Tribal Councils regularly
- Attend quarterly meetings with CAPC members, facilitated by VOS staff

- Guide the development of two main deliverables of the EPA CPRG grant; Priority Climate Action Plan & Comprehensive Climate Action Plan
- Brainstorm action items with CAPC to address GHG inventory baseline
- Attend joint community gatherings annually
- Assist VOS staff in outreach and education to each of the tribal communities included in the MOU and CAPC

\*Subject to change at the direction of VOS staff, Tribal Councils and/or CAPC members to adhere to member/council/staff turnover and/or due to EPA reporting requirements.

#### CLIMATE ACTION PLANNING COMMITTEE MEMBERS:

DEILAH JOHNSON- VILLAGE OF SOLOMON

KEVIN BAHNKE - NOME ESKIMO COMMUNITY

BARBARA GRAY - NATIVE VILLAGE OF COUNCIL

LEONA MAYAC - KING ISLAND

#### Collaborations

- Individual tribal citizens
- Community organizations
- Local, state government and federal government
- Private businesses
- Nome Joint Utility Systems
- Nome Public schools

SUPPORTIVE MEMBERS: Dr. Kristen Cetin Michigan State University; Cristina Poleacovschi; Kenneth Morton (NJUS), Jacob Pomeranz, Electric Power Systems; Trish Perryman, Electric Power Systems; ICLEI technical staff and member support staff

## REVIEW OF AUTHORITY TO IMPLEMENT

Nome Eskimo Community has the authority to implement their own specific GHG reduction measures for their community, as a federally recognized tribal entity with elected leaders.

Native Village of Council has the authority to implement their own specific GHG reduction measures for their community, as a federally recognized tribal entity with elected leaders.

King Island Native Community has the authority to implement their own specific GHG reduction measures for their community, as a federally recognized tribal entity with elected leaders.

Village of Solomon has the authority to implement their own specific GHG reduction measures for their community, as a federally recognized tribal entity with elected leaders.

NJUS has the authority to implement their reduction measures through their approval process with the Utility Board and the City of Nome elected Common Council.

## GHG Reduction Targets

Collectively, all 4 Nome based tribes have decided to target at minimum 40%- aiming for 60% GHG reduction by 2032.

The biggest benefit of having such a targeted GHG reduction, is understanding that lowering the cost of heating in cold climates for comfortability, air quality and healthy homes is also contributing to mitigating the GHG atmosphere and pollution that our community members are breathing in, relying on our land/environments for eating, surviving and culturally thriving.

With the CPRG grant funding for planning, the funds have been utilized to budget an annual ICLEI membership, with access to ClearPath in measuring the 2022 year of GHG inventory vs. another year after implementation actions in various sectors to re-measure the difference.

All 4 tribes have the authority, as their own self governing bodies, to implement all listed GHG reduction measures and climate action priority activities.

Using ICLEI, their member support staff have made it clear that they will be there for assistance, feedback, suggestions and support in acquiring further inventories.

# BENEFIT ANALYSIS

## Action Descriptions and Modeling

*Clean Electricity:* Nome is not connected to any larger electric grid, so must rely entirely on local generation. Nome Joint Utility System (NJUS) reports generation is currently 92% from diesel generators and 8% from wind. Use of diesel generation not only produces significant GHG emissions, but the fuel is expensive, reflected in electric rates per kWh several times those typical in the lower 48. Based on studies conducted by NJUS, wind generation would be the most cost effective potential resource to replace diesel. At higher percentages of wind generation, battery storage would also be needed in order to align the timing of supply with demand. Three levels of increased wind generation are modeled:

- 20% wind generation. NJUS has identified the ability to achieve this by adding two 1 MW turbines to the existing turbines on Baner Ridge, which would be the maximum possible for the space at Banner Ridge.
- 40% wind generation. NJUS has identified the ability to achieve this by adding four 1 MW turbines along the north side of Cape Nome, 12 miles east of the city.
- 80% wind generation. NJUS does not specifically examine this scenario, but they do note the Cape Nome wind site would have room for additional expansion, which would allow enough wind turbines to meet this level of generation. A larger amount of battery storage would be needed, with diesel generators used to meet times of high demand or multi-day lulls in wind. 100% wind generation is not modeled as that would likely require longer term energy storage. In the longer term, emerging technologies such as wave energy may be available to complement wind generation.

For modeling purposes we assume that 20% could be achieved in 2028, 40% in 2030, and 80% in 2035.

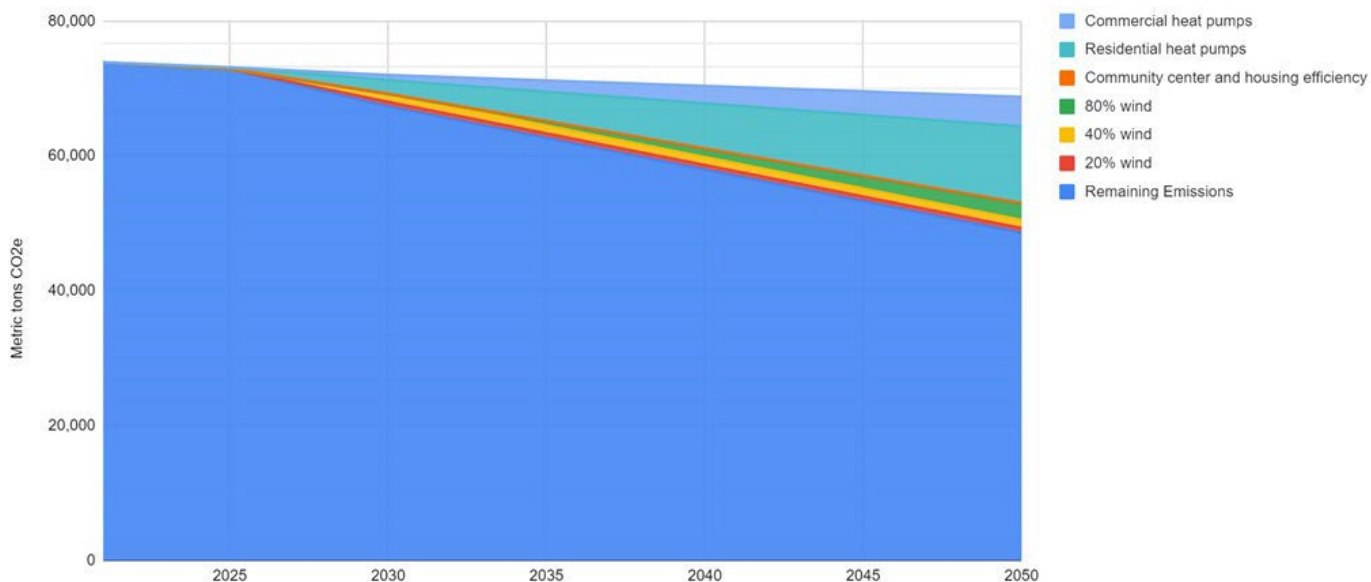
*Building Efficiency and Electrification - New Construction of Community Center and Housing:*

This project would construct a community center building that includes a two-bedroom apartment, and would also construct nine new single family homes. All buildings would be built following the Energy Efficiency Building Standards for New Construction development by NREL and the Village of Solomon in 2022. The Building Standards document estimates a 60% reduction in heating energy demand compared to typical construction. In addition, we model buildings with cold climate heat pumps as the primary heat source, providing 74% of annual heating needs, with heating oil providing backup for the remaining 26% (see discussion in community-wide building electrification action).

*Building electrification - community wide:* Cold climate heat pumps can effectively produce heat down to about -15F. Low temperatures in Nome typically drop below -15 for about 20 days per year, so some backup heat source is needed, which could be fuel oil, electric resistance heat, or wood stoves. For modeling, we assume the existing heat source is fuel oil, and that fuel oil will continue to be used as backup. The [Alaska Mini-Split Heat Pump Calculator](#) shows a heat pump meeting 74% of annual heating demand in Nome, with a coefficient of performance 2.2 (meaning for every 1 kWh used, 2.2 kWh of heat is delivered to the home). This efficiency creates the potential for significant cost savings for households and businesses adopting heat pumps, especially in light of the high cost of heating oil.

We model heat pump adoption based on the lifetime of existing heating equipment, which typically lasts 15 to 20 years. Based on this, we model 5% (1/20) of existing buildings per year (starting in 2025) being electrified, and an additional 5% receiving an efficiency retrofit that produces a 20% reduction in heating energy demand. This continues until 100% of buildings have been retrofitted and electrified in 2044 (the 20th year after the start of implementation). Based on this gradual process, the emissions reduction in 2050 is more than twice the reduction in 2030 (2030 being less than halfway through the time needed to reach all buildings). This is the standard rate of adoption that ICLEI models throughout the US. With educational programs, deployment of financing and/or incentives for up-front cost, and development of a local contractor base, it is possible this transition could occur more quickly in Nome, in light of the significant fuel cost savings noted above.

GHG Reductions by Strategy (MT CO<sub>2</sub>e)



# TRIBES



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## KING ISLAND

King Island is located in the Bering Straits, approximately 40 miles due south of Cape Prince of Wales and the village of Wales. The village site on King Island which is located on the south side facing Russia, is called Ukivok (OO-Q-Vok).

King Island was located and named by Captain James Cook in 1778, although no mention is made in a history of the regions of any inhabitants on the island at that time. Photography of King Island in the late Nineteenth Century indicated a settlement of walrus-skin dwelling lashed to the face of King Island's cliffs.

By the early Twentieth Century, King Island was reported as the winter home of 200 Eskimos, proving a good base for walrus and seal hunting. Each summer the entire population voyaged

by kayak, and umiak to the Alaskan mainland for a few months of fishing and, later, to sell traditional handicrafts. After Nome was founded, they summered near the town, where they sold intricate ivory carvings and seal skin sewing to tourists and locals.

In 1937 there were 190 residents, 45 houses, a Catholic church, and a school in the village. In the early 1960's, social and economic pressures and opportunities persuaded island residents to relocate to Nome. In Nome, King Islanders have maintained a distinct community identity. Former residents visited King Island in the spring and summer months to hunt walrus, pursue other subsistence activities, and maintain dwellings.

Although vacant most of the year, King Island is recognized as a distinct village corporation under the Alaska Native Claims Settlement Act (ANCSA), has an operative IRA Council, and conducts itself as a community organization based in Nome, Alaska. The King Island Native Corporation has 206 shareholders and owns several businesses.

Source: State of Alaska DCRA



[https://www.google.com/imgres?imgurl=https%3A%2F%2Fstatic.wixstatic.com%2Fmedia%2Ff93d50\\_b57423a38ab74077bfeafcb9665c0e10~mv2.jpg%2Fv1%2Ffill%2Fw\\_640%2Ch\\_808%2Ca\\_t%2Cq\\_85%2Cusm\\_0.66\\_1.00\\_0.01%2Cenc\\_auto%2Ff93d50\\_b57423a38ab74077bfeafcb9665c0e10~mv2.jpg&tbnid=QozLzBN46pJxqM&vet=12ahUKEwiq6YTN\\_O6EAXUzPEQIHagRBa0QMygDegQIARBX..i&imgrefurl=https%3A%2F%2Fwww.kingislandnativecommunity.org%2F&docid=Rn720KUPF8oDaM&w=640&h=808&q=king%20island%20native%20community&ved=2ahUKEwiq6YTN\\_O6EAXUzPEQIHagRBa0QMygDegQIARBX](https://www.google.com/imgres?imgurl=https%3A%2F%2Fstatic.wixstatic.com%2Fmedia%2Ff93d50_b57423a38ab74077bfeafcb9665c0e10~mv2.jpg%2Fv1%2Ffill%2Fw_640%2Ch_808%2Ca_t%2Cq_85%2Cusm_0.66_1.00_0.01%2Cenc_auto%2Ff93d50_b57423a38ab74077bfeafcb9665c0e10~mv2.jpg&tbnid=QozLzBN46pJxqM&vet=12ahUKEwiq6YTN_O6EAXUzPEQIHagRBa0QMygDegQIARBX..i&imgrefurl=https%3A%2F%2Fwww.kingislandnativecommunity.org%2F&docid=Rn720KUPF8oDaM&w=640&h=808&q=king%20island%20native%20community&ved=2ahUKEwiq6YTN_O6EAXUzPEQIHagRBa0QMygDegQIARBX)

“King Island’s biggest concern is the rising cost of heating fuel and utilities/electricity. If there’s a way to decrease that, whether working with NJUS on subsidizing costs or working with individual homeowners on different projects (solar, geo-thermal, and/or other).

Energy goals = overarching is making Nome a more manageable place to live (we've consistently heard the fuel surcharges on utility bills are a backbreaker)" - Chief Heather Payenna

#### Demographics:

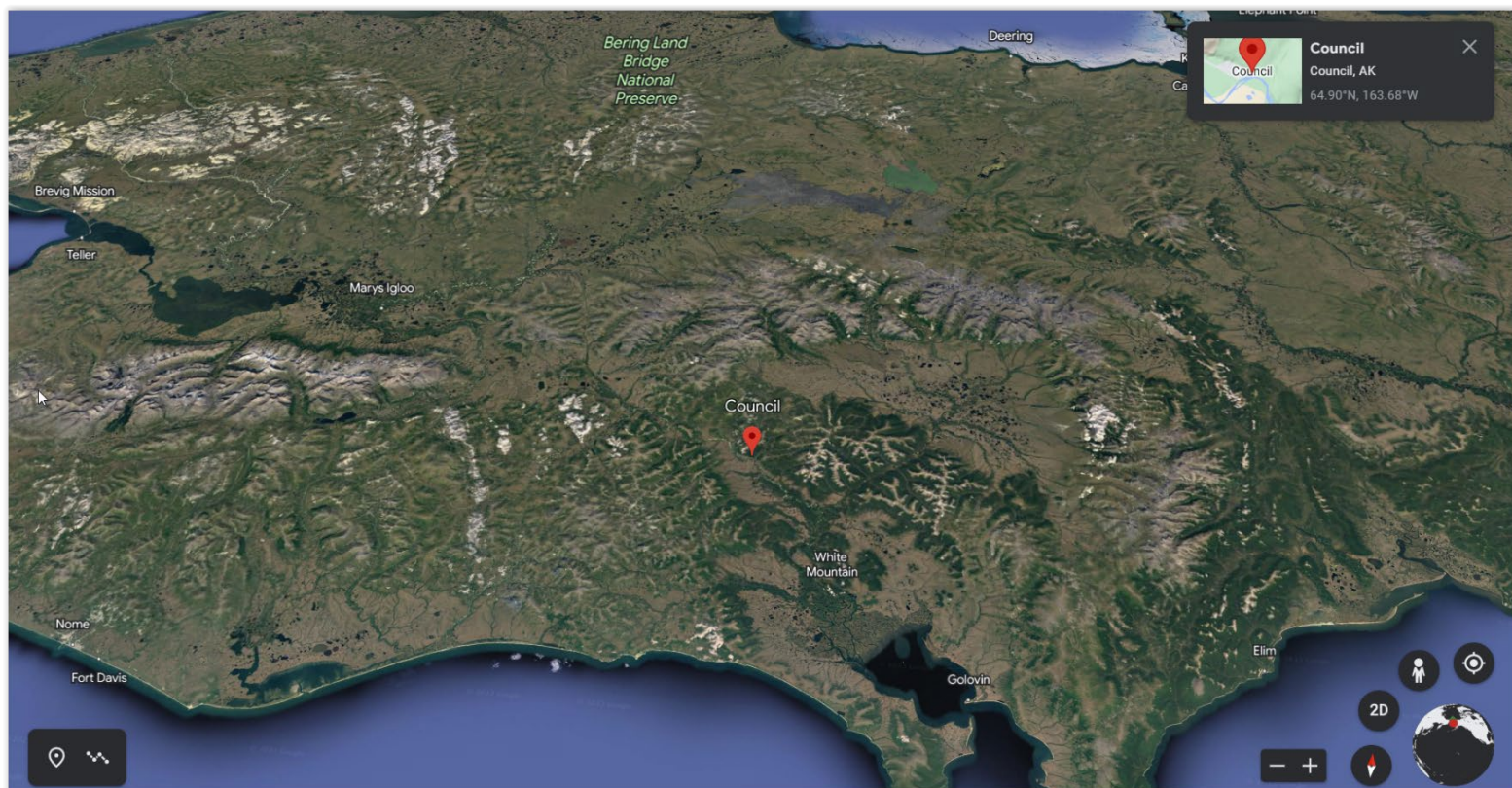
King Island has a community office building and tribal hall located in Nome, as a displaced tribal community, many of their members reside in Nome yet much like the other tribes in this partnership, their community members are scattered with headquarters in Nome.

KINC has also been working with the Village of Solomon on affordable housing development, on undeveloped land on the east side of Nome. With this collaborative work, both tribes have been able to successfully secure funds to expand the utility to reach their plots of land, hire a project management company, construct gravel pads for all 10 lots and prioritize the building envelope and design of the future homes to include all efficiency measures, renewable energy aspects and support VOS in their advocacy to develop and distribute renewable energy as backup power to the line of homes on the E. 6th generated through their mini microgrid, constructed on their largest lot at the end of the road.

King Island also recognizes the affordability of a home, is not the upfront construction cost, whereas the affordability of being a homeowner, is the operation and functionality of the home that also brings comfort and meets the needs of the occupancy.

#### KINC Priority Action Items to mitigate GHG's

- Energy efficiency and renewable energy education
- Widespread energy assessments on all residential and commercial buildings
- Upgraded and efficient appliances for all spaces i.e. hot water boilers, ductless heat pumps/HRV's, energy star rated refrigerators, freezers, washer/dryers, dishwashers and heating systems with programmable thermostats.
- Weatherization recommendations to implement efficient building envelopes including, but not limited to; meeting high R-value insulation standards, appropriate efficient exterior doors, efficient windows and sealing leaking gaps
- Installation of solar panels, battery storage and to serve the future KINC residential homes, including the King Island Tribal Hall
- Smart Metering installation on residential homes in Nome



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## NATIVE VILLAGE OF COUNCIL

Council is located at the terminus of the Nome/Council road, 60 miles northeast of Nome. It lies on the left bank of the Niukluk River.

Historically, this was a fish camp for the Fish River Tribe, who originally lived 12 miles downstream. Council's history is synonymous with the gold rush period. Gold was first discovered in the area by Daniel B. Libby and party in 1897. By 1898 there were 50 log houses. The gold found at Ophir Creek was the second richest claim in the world. During the summers of 1897-99, the population of "Council City" was estimated at 15,000. It had a hotel, wooden boardwalks, a 20-bed hospital, a post office, and numerous bars.

The discovery of more gold at Nome in 1900 caused many of the boomers to leave Council. However, the population in 1910 was 686. The depletion of gold, the flu epidemic of 1918, the depression, and World War II all contributed to the decline of the population. By 1950, only nine people remained. The post office closed in 1953. Today, the community is not occupied year-round. The community is primarily a summer fish camp site for Nome residents.

Council is a seasonal fish camp. Several Nome residents have homes in Council, used for summer subsistence food-gathering activities. Council is connected by road to Nome. There is a state-owned 3,000' long by 60' wide gravel airstrip, but it is not maintained in the winter. Air charter services are available from Nome. Dogsleds and snowmachines are the main means of transportation during the winter.

Source: State of Alaska DCRA

#### Energy Concerns:

Cost of electricity, heating fuel expenses all within the geographic location of a subarctic climate

Decreasing the pollution and including recycling, reducing and reusing approaches to the community. Reducing waste within the community

#### Energy Action Items:

- Development and adoption of energy efficient building standard recommendations for all future construction of residential and commercial buildings
- Efficient bathroom appliances; toilets, showerheads, bathtubs, sinks to reduce the water flow and water consumption
- Widespread Energy efficiency and alternative/renewable energy education
- Energy Audit Weatherization audit recommendations
- Upgraded energy star rated appliances included but not limited to; washer/dryer appliances, freezer, refrigerators, ductless heat pump systems, hot water heaters/boilers, eskimo vents
- Installation of solar panels, battery storage and scaled inverters to meet the loads after evaluating the energy audit
- Conducting feasibility studies on alternative and renewable energy resources to serve the Native Village of Council's geographic boundaries in order to serve all citizens and community buildings
- Hiring staff with expertise that can facilitate, manage and monitor the efficiency and energy program for Native Village of Council



## NOME ESKIMO COMMUNITY

### Who We Are

As an organization, Nome Eskimo Community's origins date back to 1939 when it was formed under the Indian Reorganization Act as a federally recognized tribe. NEC's members, however, have roots in the region that extends back over millennia.

Initially, NEC operated in a political manner, functioning as the tribal governing body for the area. As we have grown, our focus has expanded to provide social services and programs to improve the quality of life for our tribal members, Alaska Natives, and Native Americans who reside in Nome.

NEC now offers a multitude of services organized under the following service programs: Family

Services, Tribal Services, Youth Services, Tribal Resources, and Housing Program. Learn more about these programs and their specific offerings.

### **One Organization, Many Communities**

As NEC grows, so does our role in the community. While maintaining and expanding our services to tribal members, NEC is also branching out through partnerships with other organizations. These collaborative efforts benefit both our membership and the community as a whole.

NEC's partnerships with organizations such as the Nome Recreation Center, Nome Community Center, Nome Public Schools, Kawerak, Inc., Nome Youth Facility, and Norton Sound Health Corporation have broadened our reach into the community and provided positive activities for our youth. With our partners, we have organized basketball camps, cultural outings, summer camps, and after-school study programs for those attending grades K-12. NEC is also working with the local school district to establish a program to provide culturally-based education.

NEC's Tribal Transportation Program serves the community as a whole, helping to safeguard the resources on which we all depend.

As NEC looks to the future, we will strive to continue to improve the community's well-being while honoring and preserving the rich cultural heritage of the area's Native peoples.

### **Facts At A Glance**

**ESTABLISHED:** 1939

**ENROLLMENT:** 2,900+ members

**WHAT WE REPRESENT:** The political, social, and cultural interests of Native peoples in the community of Nome and the Bering Strait region

**SERVICE PROGRAMS:** Family Services, Tribal Services, Tribal Youth, Tribal Resources (Environmental Activities), and the Housing Program

**MISSION STATEMENT:** Nome Eskimo Community is a federally recognized tribal government improving the quality of life of those we serve.

**VISION STATEMENT:** Nome Eskimo Community will be a proud, active, functional, and leading tribal government that provides a broad spectrum of services that benefit our tribal members and community.

<https://www.necalaska.org/about/>

NEC Priority Action Items to mitigate GHG's

- ➔ Continued energy efficiency and renewable energy education
- ➔ Widespread energy audits on all residential and commercial buildings

- Upgraded and efficient appliances for all spaces i.e. hot water boilers, ductless heat pumps/HRV's, energy star rated refrigerators, freezers, washer/dryers, dishwashers and heating systems with programmable thermostats.
- Weatherization recommendations to implement efficient building envelopes including, but not limited to; meeting high R-value insulation standards, appropriate efficient exterior doors, efficient windows and sealing leaking gaps
- Installation of solar panels, tesla battery storage and scaled inverters to meet the loads after evaluating the energy audit, estimated at 15 existing residential homes, 10 future residential homes and 2 community buildings, that include 2 apartment rentals.
- Smart Metering installation on residential homes in Nome



## VILLAGE OF SOLOMON

The Village of Solomon was originally settled by Eskimos of the Fish River Tribe, and was noted on the map as "Erok" in 1900. The original site was at the mouth of the Solomon River Delta, where it became a miners camp and later moved to the present location on Jerusalem Hill. The gold rush of 1899-1900 brought thousands of people to the Solomon area. By 1904 Solomon had seven Saloons, a Post Office, a ferry dock, and between 3 and 7 big land dredges along the Solomon River. It was also the terminus of the Council City and Solomon River Railroad

that serviced miners from Solomon to Council. In 1913 the Railroad was washed out by storms and in 1918 the flu epidemic struck. In 1940 the Bureau of Indian Affairs (BIA) built a school, but it was shut down in 1956 in a cost saving effort. The Post Office shut down in 1958. Families relocated to Nome or Anchorage so their children could continue their education. Pete Curran

operated the Roadhouse until the 1970s and it served as a checkpoint for the Iditarod sled dog race, during its first few years.

The Village of Solomon (VOS) is a federally recognized tribe under the Indian Reorganization Act of 1993. The Solomon Traditional Council is the governing body of the Village of Solomon. The primary purpose of the Village of Solomon is to design and implement programs to increase the quality of life and well-being of its tribal membership while protecting their environment.



Solomon is located on the west bank of the Solomon River, one mile north of the Norton Sound, 34 miles east of Nome on the Nome-Council Highway. It lies at 64.560830 North Latitude and -164.43917 West Longitude. Solomon is located in the Cape Nome Recording District. The climate is both continental and maritime. Summers are short, wet and mild. Winters are cold and windy. The temperatures

range from -30 to 56 degrees.

In 2010, the Village of Solomon tribal membership and Solomon Native Corporation together completed their Local Economic Development Plan (LEDP) with the help of Kawerak, Inc. With this plan, the Solomon Traditional Council creates a list of village priorities and meets as a community every 5 years for strategic gatherings to update the list and plan. The first LEDP was written in 1998 and had not been updated until 2010.

The VOS' Environmental Dept. has been building capacity through an Environmental Protection Agency Indian General Assistance Program since 2012 and has been able to develop an Integrated Solid Waste Management Plan, Water Quality Assurance Project Plan, Tribal Environmental Plan, Renewable Energy Plan and worked with the Council and tribe on supporting and adopting the Paris Agreement Climate Accord in a 2019-02 Tribal Resolution.

While all these plans have been developed through the VOS Environmental Dept., it has taken many partners, collaborations, support and grant writing to implement projects within these plans.

Examples include;

- the erection of a meteorological tower in Solomon to collect solar and wind data,
- a Community Center energy audit,
- Solomon's Energy Efficiency Standards (SEES)
- Distribution of custom weatherization kits to households
- Installation of a 7kW rooftop solar panel system at the Community Center in Solomon

### Demographics

The Village of Solomon has about 197 tribal citizens, scattered throughout Alaska, a few in the contiguous 48 states and 40% residing in Nome. As a seasonal village, many of the citizens travel out to Solomon through the entire summer. Additionally, each August the Council applies for various grants to provide airfare for those outside of Nome to attend the annual Youth & Elder Camp at the Community Center. During the summer season however, the Community Center is a source of income for the tribe as a Bed and Breakfast. Aside from the Community center, there are 3 dwellings, families camp in without running water or electricity. The Community Center has a solar panel system, battery storage and a generator should any Solomon citizens want to utilize the kitchen space, common areas or restrooms, as long as the building is open, they are welcome to use the building.

VOS would like to construct all new buildings, homes, facilities green utilizing the highest efficiency building envelopes using Building Standards and Codes, renewable energy technologies and backup heating systems.

VOS would also like to see home and building energy audits, with a table of prioritized recommendations in energy efficiency progressing toward installing and replacing inefficient appliances/heating systems, and to install renewable energy to offset GHG's in all buildings. VOS has been long time supporters of utilizing renewable energy and have been eager to implement renewable energy technologies within all sectors of the community.

In 2010, the VOS community decided in their 2009 Strategic Planning gatherings, that prioritizing renewable and alternative energy was how they envisioned moving forward in their community goals, therefore, Alternative and renewable energy (backup power) has sat on their village priority lists in their 5 year Local Economic Development Plans since 2010.

VOS Priority Action Items to mitigate GHG's

- Continued energy efficiency and renewable energy education
- Widespread energy audits on all residential and commercial buildings

- Upgraded and efficient appliances for all spaces i.e. hot water boilers, ductless heat pumps/HRV's, energy star rated refrigerators, freezers, washer/dryers, dishwashers and heating systems with programmable thermostats.
- Weatherization recommendations to implement efficient building envelopes including, but not limited to; meeting high R-value insulation standards, appropriate efficient exterior doors, efficient windows and sealing leaking gaps
- Installation of solar panels, tesla battery storage and scaled inverters to meet the loads after evaluating the energy audit, estimated at 15 existing residential homes, 10 future residential homes and 2 community buildings, that include 2 apartment rentals.
- Implementing the SEES document; Solomon Energy Efficiency Standards which was developed under a DOE Technical assistance request, contracted with Cold Climate Housing Research Center. Please see table for referenced screenshot of the table in the SEES document on the following page.
- Smart Metering installation on residential homes in Nome
- Utilizing the NREL overview of the new construction on the Affordable Housing Development on the property lots at E. 6th avenue in Nome for renewable and efficient energy for the vertical construction. Screenshot is also on the following page

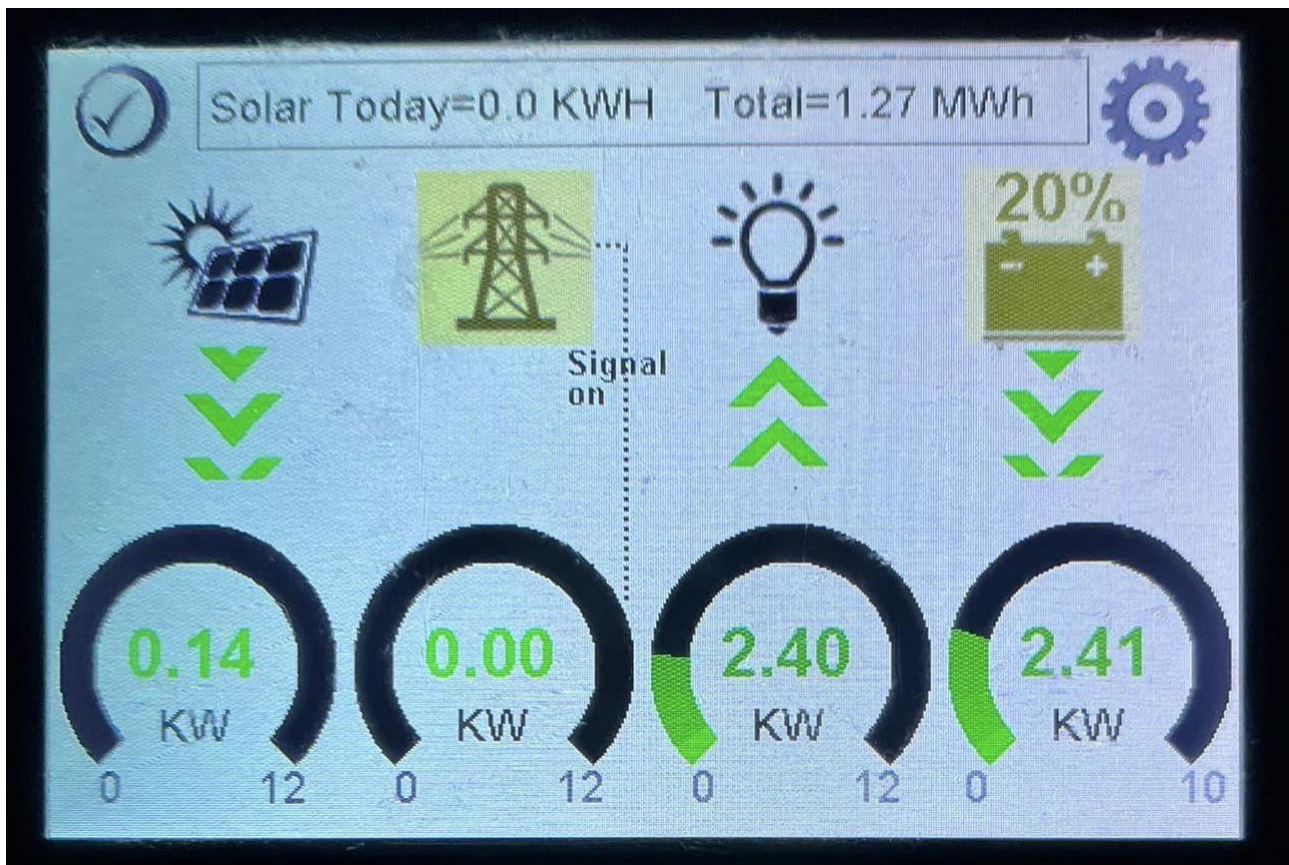
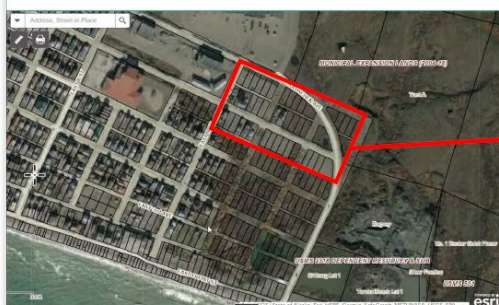


Photo of inverter screen at the Solomon Community Center taken Fall 2023

|                                                        | SEES                                                                                           | AK BEES                                                      |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Air leakage rate                                       | Not exceeding <b>two</b> air changes per hour at 50 pascals                                    | Not exceeding <b>four</b> air changes per hour at 50 pascals |
| Windows placements are to be south/north facing egress | U-factor 0.18                                                                                  | 0.042                                                        |
| Exterior walls                                         | R-Value 59                                                                                     | R-30                                                         |
| Floors                                                 | R-value 60                                                                                     | R-38                                                         |
| Attic/ceiling                                          | R-value 60                                                                                     | R-59                                                         |
| Arctic Entry                                           | Required, oriented away from the east/west winds                                               | Not addressed                                                |
| Building orientation                                   | Roof slope south facing                                                                        | Not addressed                                                |
| Backup heat source                                     | Building must have alternative off-grid backup heat source. Efficient wood stove is preferred. | Not addressed                                                |

Table 1: Summary of Key Values for Solomon Energy Efficiency Standards (SEES) vs Alaska Housing Building Energy Efficiency Standard (BEES)

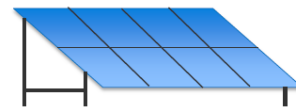
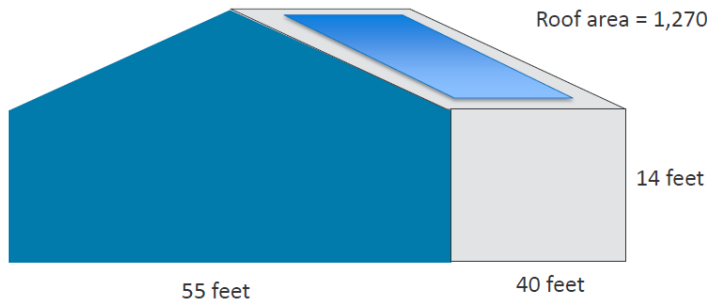
## Site Overview



## Building Assumptions

### Residential Building

- 2,200 sq ft., 1 story building with a south-facing, 30 degree angled roof
- Land area for PV: 3,250 sq ft



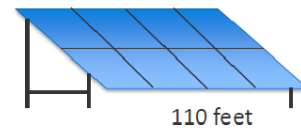
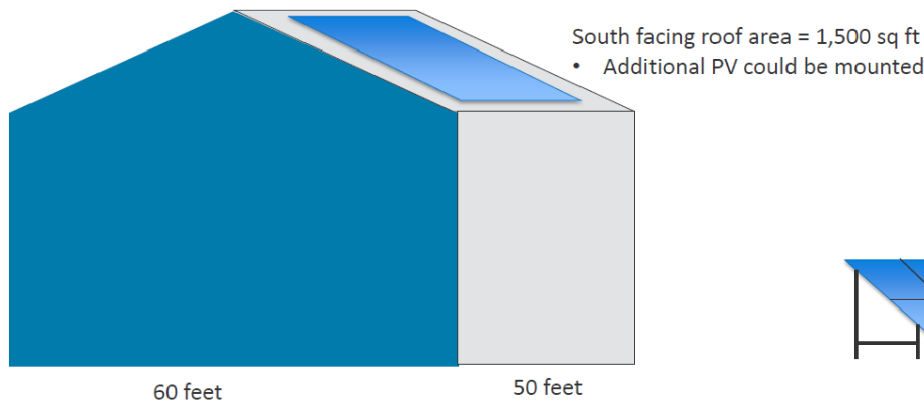
Single row of PV panels, up to 28, 300 W panels = 8.4 kW PV maximum

NREL | 9

## Building Assumptions

### Community Center

- 6,000 square foot, 2 story building
- 5,731 sq. ft. land area for PV
- Estimated 1,500 sq ft, 30 degree angled roof



Single row of PV panels, up to 66, 300 W panels = maximum of 19.8 kW

NREL | 10

## Results Summary: Community Center Building

|                             | 1B                         | 2B                  | 3B                      |
|-----------------------------|----------------------------|---------------------|-------------------------|
| Description                 | Baseline: No PV or battery | Rooftop solar –only | Ground-mount solar only |
| PV (DC kW)                  | 0                          | 23 kW               | 19.8 kW                 |
| Battery                     | 0                          | 0.6 kW / 3.4 kWh    | 0 kW / 0 kWh            |
| Carbon Free Electricity %   | 0                          | 12.8 %              | 11.3 %                  |
| NPV (\$)                    | 0                          | \$22,262            | \$29,783                |
| Lifecycle Capital Cost (\$) | 0                          | \$34,485            | \$20,221                |
| Year 1 utility costs (\$)   | \$40,234                   | \$35,078            | \$35,698                |
| Year 1 utility savings (\$) | 0                          | \$5,156             | \$4,536                 |

## Results Summary: Resilience Scenarios

|                                         | 1C                                             | 2C                                            | 3C                                              | 4C                                                          |
|-----------------------------------------|------------------------------------------------|-----------------------------------------------|-------------------------------------------------|-------------------------------------------------------------|
| Description                             | Baseline: Cost optimal rooftop solar + battery | Design A: PV + Battery (1 day outage defined) | Design B: PV + battery (72 hour outage defined) | Design C: PV + battery + generator (24 hour outage defined) |
| PV (DC kW)                              | 64 kW                                          | 126 kW                                        | 134 kW                                          | 63 kW                                                       |
| Battery                                 | 131 kW / 34 kWh                                | 131 kW / 640 kWh                              | 131 kW / 873 kWh                                | 131 kW / 33 kWh                                             |
| Generator (input value)                 | 0 kW                                           | 0 kW                                          | 0 kW                                            | 158 kW                                                      |
| Carbon Free Electricity %               | 12.4 %                                         | 25.6%                                         | 27.2 %                                          | 12.4 %                                                      |
| NPV (\$)                                | -\$44,840                                      | -\$130,437                                    | -\$186,271                                      | -\$141,533                                                  |
| Lifecycle Capital Cost (\$)             | \$225,724                                      | \$505,548                                     | \$585,973                                       | \$303,835                                                   |
| Year 1 utility costs (\$)               | \$114,584                                      | \$97,238                                      | \$95,038                                        | \$114,430                                                   |
| Year 1 utility savings (\$)             | \$16,265                                       | \$33,610                                      | \$35,810                                        | \$16,419                                                    |
| % of year that a 4-hr. outage survived  | 29%                                            | 97%                                           | 100%                                            | 100%                                                        |
| % of year that a 12-hr. outage survived | 7%                                             | 77%                                           | 86%                                             | 100%                                                        |
| % of year that a 24-hr. outage survived | 0                                              | 59%                                           | 68%                                             | 100%                                                        |
| % of year that a 48-hr. outage survived | 0                                              | 47%                                           | 51%                                             | 99%                                                         |

## Results Summary: Residential Building

|                             | 1A                         | 2A                  | 3A                      |
|-----------------------------|----------------------------|---------------------|-------------------------|
| Description                 | Baseline: No PV or battery | Rooftop solar –only | Ground-mount solar only |
| PV (DC kW)                  | 0                          | 4.1 kW              | 7.1 kW                  |
| Battery                     | 0                          | 0.7 kW / 3.2 kWh    | 1.4 kW / 5.9 kWh        |
| Carbon Free Electricity %   | 0                          | 12.1 %              | 19 %                    |
| NPV (\$)                    | 0                          | \$3,297             | \$6,462                 |
| Lifecycle Capital Cost (\$) | 0                          | \$9,637             | \$13,637                |
| Year 1 utility costs (\$)   | \$9,524                    | \$8,369             | \$7,716                 |
| Year 1 utility savings (\$) | 0                          | \$1,155             | \$1,808                 |

The model suggests more ground mount PV because it is cheaper than roof mount PV in the model

## NOME JOINT UTILITY SYSTEM

NJUS is a component unit of the City of Nome, responsible for electric generation, electrical distribution, water and wastewater utilities in Nome. NJUS is the only utility in the City of Nome providing these services, therefore serving all 4 Nome based tribes. Having the ability to collaborate and partner with the local utility, is one of the only ways to support the decreased reliance upon greenhouse gas emissions within the boundaries of Nome, Alaska.

NJUS is managed by the elected Utility Board members, all of which represent the city of Nome as a whole, including Larry Pederson who is a Native Village of Council elected council leader.

As NJUS is the local utility, the partnership between the utility and this Priority Climate Action Plan representing the 4 Nome based tribal partnership is integral toward implementing and planning for a cleaner, healthier, sustainable future electrification and water/wastewater alternatives to fuel consumption. The tribal partnership within this PCAP, fully supports and encourages NJUS to achieve any and all efforts to implement renewable energy solutions, tackling the decreased use of fuel.

### *CURRENTLY AT NJUS*

The City of Nome's electric power utility – Nome Joint Utility System (NJUS) – operates four diesel generators and two wind turbines to generate electrical power for Nome's energy needs. The diesel generators are two 5.2 MW capacity Wartsila models in the new power plant, and one 3.7 MW capacity Caterpillar and one 1.9 MW capacity Caterpillar in the old power plant. The wind turbines are two EWT DW52-900 models (1.8 MW combined capacity) on Banner Ridge, the site of a previous 0.9 MW capacity 18-turbine wind farm that was decommissioned and removed several years ago to make way for the larger and more efficient EWT turbines. In a 2022 report to Alaska Energy Authority, NJUS documented generation of 32.6 GWh of electricity, with 30.4 GWh from the diesel generators (93% of total) and 2.2 GWh from the wind turbines (7% of total). The 12.5% capacity factor of the wind turbines is a consequence of a lack of battery energy storage to buffer periods of high winds and low power demand, requiring curtailment of the turbines to maintain stable system frequency. Modeling indicates 21,700 MT/year of CO<sub>2</sub> generation from this baseline system and 1.93 million gallons/year of diesel fuel usage.

### *ENERGY GOALS AT NJUS*

NJUS' near-term (by year 2030) vision is to replace 50+ percent of its diesel fuel usage for electricity generation and to help offset heating fuel usage in the Nome school with an electric boiler to make use of excess energy production. This will be accomplished with an additional wind turbine and 3 MW of solar PV capacity on Banner Ridge, four wind turbines at Cape Nome with an 8-mile power distribution connection to the Cape, and installation of a 5 MWh storage capacity/5 MW converter capacity battery energy storage system (BESS) at the powerplant. The wind turbines will be new generation EWT DW58-1 MW models, yielding a total of 6.8 MW

wind power capacity. With enhanced wind turbine utilization from use of a BESS, modeling indicates 64 percent renewable energy penetration, displacement of nearly 1 million gallons of diesel fuel per year, and a decrease of 11,900 MT/year of CO2 emissions (to 9,800 MT/year). Modeling also predicts that 1.2 GWh/year of excess electrical energy not needed to meet electric load demand or necessary to charge the BESS will be diverted to an electric boiler in the Nome school hydronic system to offset 38,000 gallons of the school's 400,000 gallons of annual heating fuel usage.

NJUS' Priority Action Items to Mitigate GHG's:

- Integration of wind turbines and battery systems into the existing diesel grid to bolster the reliability and resilience of aging infrastructure.
- Divert excess renewable energy to the school to offset annual heating fuel usage.
- Route excess renewable energy to homes use to offset home heating fuel usage.
- Reduce emissions associated with generating electricity with diesel generators within the City of Nome and continue to encourage beneficial electrification.
- Maintain dependable and affordable energy access and availability to our entire community, including those with limited financial resources.
- Advance water and sewer initiatives that will help address a critical housing shortage for tribal members.

## NEXT STEPS

The first priority is to ensure this PCAP document is approved by all tribal partnerships. Once all partners sign the PCAP, an application for the EPA CPRG Implementation funding opportunity will be applied for on behalf of the tribes that sign on for the sequel of this planning project.

The tribe's will also gather to discuss and review the GHG inventory data to discuss a timeline for implementation and assuring each household has the opportunity to sign up for a home energy audit through the MSU/Iowa energy assessment sign up throughout the 2024 year. This will not only collect additional information for data collection, it will also provide more information on recommendations for a collective way to decrease GHG's in each household representing the measures within the Residential sector.

Data collection will be an ongoing process throughout the life of the CPRG planning grant and afterward, with additional funding resources as they become awarded and/or available.

Continue to work with NJUS in mitigating the demand for more diesel as affordable housing is also addressed locally in Nome.

Apply for funding in development of a mini microgrid and learn how to manage a mini microgrid for the construction of a micro grid in the Village of Solomon, isolated from the existing Nome grid.

Developing the Home Electrification and Rebate tribal allocation to address the residential home program for installation of energy star rated appliances.

Utilize the Grid Resilience tribal allocations from each Nome based tribe to address storm ready enhancements for the grid, in partnership with NJUS.

Once funding has been awarded to implement measures/actions within this PCAP, measuring the GHG to compare datasets.

## APPENDIX A: Inventory Methodology

| TABLE 3: Transportation & Mobile Sources |                                            |                                                                                                                                                                                            |
|------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity/Source                          | Data Source                                | Methodology/Data Gaps/Assumptions                                                                                                                                                          |
| On-Road                                  | Email from Sanwar Sunny with Constellation | Constellation provided VMT, broken down by vehicle types. The area covered may not exactly align with the Nome city boundary.                                                              |
| On-Road Transit                          | Transit agency                             | Transit agency provided gallons of diesel fuel and VMT. This data is recorded but emissions are not included in the GHGI total because the total on-road VMT above includes transit buses. |
| Aviation                                 | Crowley Fuels Alaska                       | Crowley provided gallons of aviation gasoline and jet fuel                                                                                                                                 |
| Waterborne                               | Not included                               |                                                                                                                                                                                            |
| Off-Road/Mobile                          | Not included                               |                                                                                                                                                                                            |

|                   |                                                                                                                                                      |     |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Emissions factors | EIA's Annual Energy Review, Bureau of Transportation Statistics Average Fuel Efficiencies, and EPA's Emission Factors for Greenhouse Gas Inventories | n/a |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

| TABLE 4: Grid Electricity |                                  |                                                                                                                                                                                                                                     |
|---------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity/Source           | Data Source                      | Methodology/Data Gaps/Assumptions                                                                                                                                                                                                   |
| Residential Electricity   | Nome Joint Utility System (NJUS) | NJUS provided residential kWh consumed                                                                                                                                                                                              |
| Commercial Electricity    | Nome Joint Utility System (NJUS) | NJUS provided commercial and public office kWh consumed                                                                                                                                                                             |
| Electricity Generation    | Nome Joint Utility System (NJUS) | NJUS provided gallons of diesel fuel. This data is recorded but emissions are not considered in the GHGI total because electricity generation emissions are captured in the residential and commercial electricity emissions.       |
| Emissions factors         | Calculated                       | Emissions factor calculated using electricity generation emissions as described above, and NJUS reported total generation of 32,500 MWh/yr. NJUS reports diesel generators produce 92% of electricity and wind turbines produce 8%. |

| TABLE 5: Stationary Combustion |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity/Source                | Data Source                                           | Methodology/Data Gaps/Assumptions                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Residential Stationary Fuel    | Sitnasuak Native Corporation and Crowley Fuels Alaska | Sitnasuak Native Corporation and Crowley are the two fuel providers to the community. Both provided total gallons of No. 2 fuel oil distributed to customers; Crowley also provided gallons No.1 fuel oil. Consumption may include some customers outside the Nome city boundary. Since the companies did not provide data broken out by residential and commercial customers, the usage was divided between residential and commercial based on the percentage of kWh consumed by each. |
| Commercial Stationary Fuel     | Sitnasuak Native Corporation and Crowley Fuels Alaska |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| TABLE 6: Solid Waste              |                                                            |                                                                                                                                                                                                                                                                                                          |
|-----------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity/Source                   | Data Source                                                | Methodology/Data Gaps/Assumptions                                                                                                                                                                                                                                                                        |
| Waste Generation (Open Landfills) | US EPA                                                     | <p>Waste collected is not weighed, so we used the national average per-capita waste disposed of 0.52 tons per person, calculated from EPA waste facts and figures for 2018.</p> <p>The landfill operator reported that there is no landfill gas collection present. US Average moisture was assumed.</p> |
| Emissions factors                 | EPA's Documentation for Greenhouse Gas Emission and Energy | n/a                                                                                                                                                                                                                                                                                                      |

|  |                                                  |  |
|--|--------------------------------------------------|--|
|  | Factors Used in the Waste Reduction Model (WARM) |  |
|--|--------------------------------------------------|--|

| TABLE 7: Water and Wastewater Treatment |                                             |                                                                                                                                                                                                                                          |
|-----------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity/Source                         | Data Source                                 | Methodology/Data Gaps/Assumptions                                                                                                                                                                                                        |
| Water Treatment Energy                  | Nome Joint Utility System (NJUS)            | NJUS provided kWh used for water treatment                                                                                                                                                                                               |
| Wastewater Treatment energy             | Nome Joint Utility System (NJUS)            | NJUS provided kWh used for wastewater treatment                                                                                                                                                                                          |
| Wastewater Treatment                    | Nome Joint Utility System (NJUS)            | Process and effluent N <sub>2</sub> O emissions calculated using population based methods. NJUS reports serving a population of 3500. NJUS reports that nitrification/denitrification is not used, and effluent discharges to the ocean. |
| Wastewater Treatment Emissions Factors  | IPCC Methods for Greenhouse Gas Inventories | n/a                                                                                                                                                                                                                                      |

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EPA CPRG Program Officer, Rebecca Derr. DeerStone Consulting through Kawerak, Inc.

**Signature:**

**Email:**