Chickaloon Native Village Priority Climate Action Plan

April 1, 2024

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Acknowledgements

The Priority Climate Action Plan (PCAP) is the result of the hard work and persistence of many people (see list below), including staff from various agencies, consultants, Tribal representatives, and reviewers who spent many hours researching, writing, crunching numbers, and reviewing the Plan.

A special thanks to the Environmental Protection Agency (EPA) for providing grant funding through its Climate Pollution Reduction Grant (CPRG) Program to support the preparation of community climate action plans.

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Table of Contents

Purpose and Scope

Purpose and Scope: Tribal Roadmap for GHG Reduction

The primary purpose of the Priority Climate Action Plan is to create a roadmap for reducing greenhouse gas (GHG) emissions by utilizing this planning phase to develop impactful projects for the benefit of the community.This Climate Action Plan, developed with the support of the EPA's Climate Pollution Reduction Program, represents the concerted effort of the Chickaloon Village Traditional Council and its dedication to preserving their way of life and the environment. This document is a strategic approach to quantifying and addressing the urgent challenge of climate change, encompassing both the Priority Climate Action Plan (PCAP) and the Comprehensive Climate Action Plan (CCAP), reflecting the Tribe's role as stewards of their ancestral lands.

Phase I: Priority Climate Action Plan (PCAP) – April 1, 2024

The focus of this phase is to identify actionable strategies to reduce greenhouse gas (GHG) emissions. The PCAP will quantify and identify near-term priorities, reflecting the Tribe's unique community and environmental challenges. This plan will enable the Tribe to pursue the necessary funding through the EPA CPRG Implementation Phase and support for its envisioned projects, as well as additional opportunities in the future.

Phase II: Comprehensive Climate Action Plan (CCAP)

With the foundational work of the PCAP in place, the Tribe will expand its vision in the CCAP, due Summer 2025. This comprehensive plan will delve deeper, covering significant GHG emission sources and carbon sinks within the surrounding community. It will outline both short- and long-term goals, strategies, and measures, encompassing a broad spectrum of environmental, economic, and project opportunity considerations. The CCAP is the Tribe's path to setting a course for the future.

Implementation Grant Applications

Application Type	Applicant Eligibility	PCAP Deadline	Grant Application Deadline
General Competition ($2MM - $500MM)	State, Municipality, Tribe, Tribal Consortium, Territory	March 1, 2024	April 1, 2024, at 11:59 p.m. (ET)
Tribal Competition ($1MM - $25MM)	Tribe, Tribal Consortium, Territory	April 1, 2024	May 1, 2024, at 11:59 p.m. (ET)

**Note – Measures/Projects must be listed in a PCAP to be eligible to be included in an Implementation Grant Application. See: https://www.epa.gov/inflation-reduction-act/about-cprg-implementation-grants for more information.*

Tribal Territory Description

Chickaloon Native Village (CNV) is an Ahtna Athabascan (Dene) federally recognized Tribal Government located in south-central Alaska (see Figure 1). CNV's Ahtna name is *Nay'dini'aa Na'Kayax*, meaning "the river with two logs across it." The most recent ancestral village site was located on the Chickaloon River, a tributary of the Matanuska River. The below map identifies the general location of the community.

CNV's ancestral territory spans hundreds of miles of boreal forests teeming with wildlife, snow-capped mountains with ancient glaciers and bountiful rivers between Canada and the Upper Cook Inlet of southcentral Alaska. CNV has been nurtured by, and survived off the lands, plants, and animals of this region for millennia, including salmon, moose, caribou, grizzly and black bear, Dall sheep, beaver, hare, birch trees, spruce trees, and numerous other animals and plants for food, medicine, tools, and fiber. The Matanuska River and its tributaries are an important part of the foundation of CNV ancestral cultural lifeways.

There are four primary population centers within CNV's ancestral territory located along the North Glenn Highway of the Matanuska River watershed: Palmer, Sutton, Chickaloon, and Glacier View. CNV Tribal residences are now spread along the thirty-five miles of the North Glenn Highway between Palmer and Chickaloon. In addition, numerous CNV Tribal citizens reside in other communities of Alaska, other states and even other countries.

Chickaloon Village Traditional Council (CVTC) is the governing body of CNV. In response to the historical environmental and social injustice suffered by CNV Tribal citizens, coupled with the passing of the Alaska Native Claims and Settlement Act (ANCSA) of 1971, CNV Elders re-established the Traditional Council in 1973, to reassert Tribal sovereignty and reunify Tribal citizens. CNV gained federal recognition in 1973 and on November 24, 1982, according to Federal Register Vol. 58, No. 202. CVTC is governed by elected Traditional Council Members tasked with reasserting CVTC's identity, restoring the ancestral Ahtna Dene worldview and cultural traditions (values, stories, songs, dances, language, and spirituality), and create economic self-sufficiency for CNV and CNV Tribal citizens.

CVTC is comprised of eleven (11) departments including: Accounting and Administration, Ahtna Language & Culture, Culture & Historic Preservation, Education, Environmental Stewardship, Facilities and Housing, Health & Social Services, Information Technologies, Justice, Language and Culture, and Transportation. In addition, CVTC operates a Federally Qualified Rural Community Health Center located in Sutton, Alaska and the Harvard award winning Ya Ne Dah Ah School located at Moose Creek between Palmer and Sutton. CVTC Offices are located in Palmer, at Moose Creek, and in Sutton, about a 90-minute drive from Anchorage, along the Glenn Highway National Scenic Byway. CNV is less remote than many other villages within Alaska off the main road system, however CVTC confronts unique challenges in providing services and maintaining CNV traditions in this rapidly growing area. CNV has experienced significant impacts as a community due to resource

development, specifically coal mining, which has caused harm to traditional subsistence resources, tribal members health, and devastation to Tribal lands.

Climate change is a significant and increasing threat to the Tribe's region, resulting in unpredictable weather and accelerating natural processes. Rising temperatures, unusual precipitation, accelerating erosion and changing ecological conditions are impacting the traditional ways of life, wildlife populations, and the natural landscapes of this area. These environmental shifts are not only a concern for the health of the region but also for the cultural heritage and future sustainability of the surrounding community. The Tribe will adapt to changes and endeavors to lead the region into a more sustainable future.

CNV is a dispersed Tribal community covering a large region. Most Tribally owned facilities, infrastructure and households lie within the service territory of a single electric utility, the Matanuska Electric Association (MEA). Electric rates in the region are significantly higher than the national average. 85% of MEA's grid power is generated with fossil fuels, primarily natural gas. The majority of households in the tribal community, and Tribally owned community facilities are heated with diesel fuel, sometimes supplemented with wood stoves and cord wood heating systems.

While not remote by Alaska's standards, the majority of the CNV traditional territory is considered rural and remote, with limited transportation access points, and vast distances between population centers. These conditions result in high transportation costs, including for critical heating fuel. Additionally, while the vast majority of homes are connected to the MEA electrical grid, due to the extensive geographic dispersal of the region and the harsh environmental conditions, power outages are more frequent, and longer lasting than is typical. This can result in severe impacts to residents and facilities during blackout events, especially if the event occurs during the wintertime, as it can take many hours for repair crews to complete work at the far reaches of the electrical grid.

The key climate action initiatives for CNV area comprehensive set of measures, developed to address the pressing challenges of climate change while simultaneously providing opportunities for sustainable economic development for the region. A pillar of the Tribe's approach is to reduce dependence on fossil fuels both directly through reducing heating requirements and indirectly through reductions in electrical use from the carbon intensive grid.

The Tribe is focusing on three primary types of projects – the first is implementing energy efficiency in facilities, both residential and community facilities operated by the Tribe. Additional measures considered include rooftop residential and community solar opportunities for residents. And finally, electrification of the Tribes fleet of vehicles was evaluated.

Map

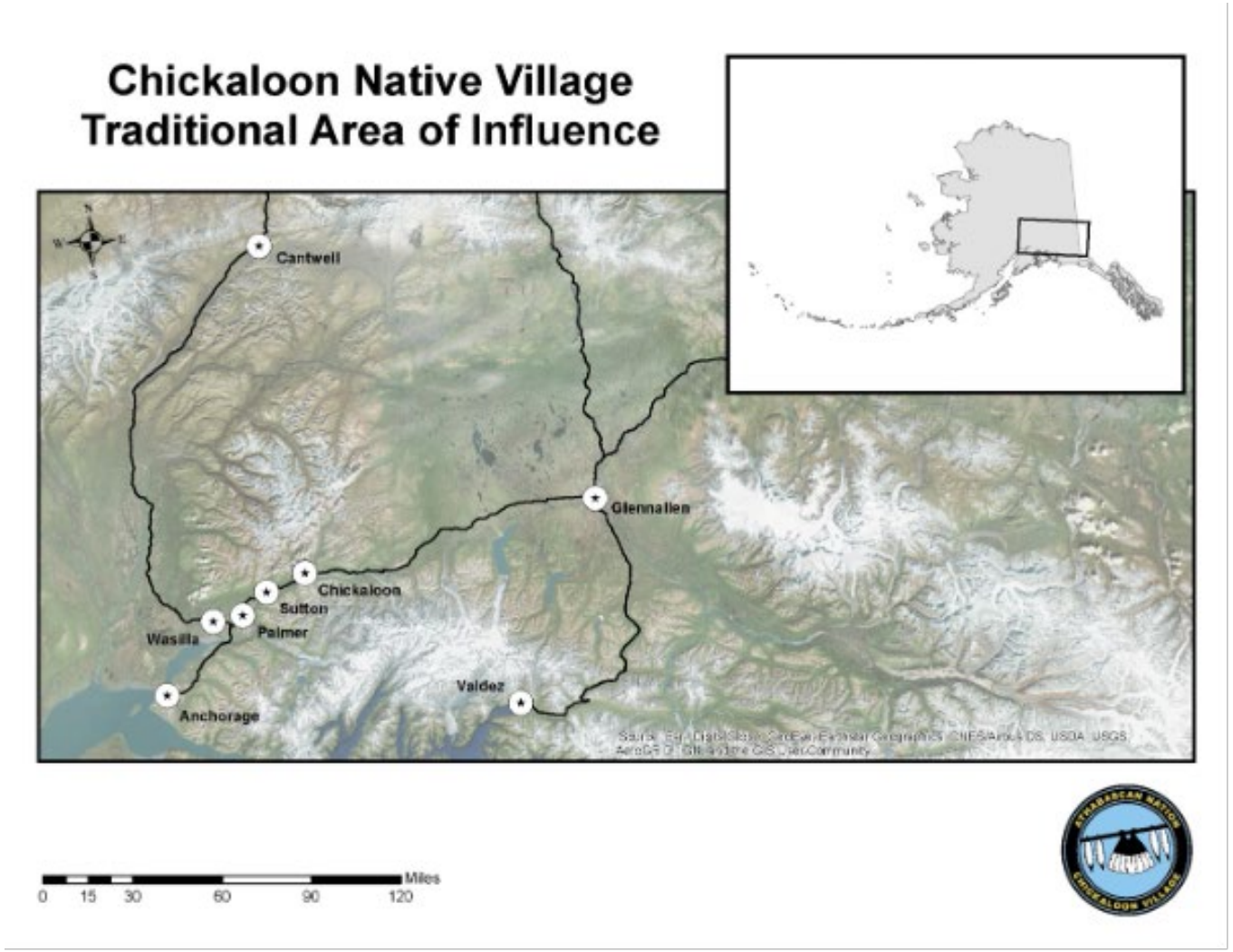

Figure 1 – Map of the Chickaloon Native Village Traditional Area of Influence

Tribal Partners

This PCAP focuses on assets and opportunities that are directly under the responsibility of the CVTC However, there are multiple overlapping Tribal entities and partners in the region. CVTC will evaluate in the CCAP inclusion of additional community partner infrastructures and facilities. It is easy to get confused and there are some common misconceptions about the various Tribal affiliated entities and their roles. There are also other entities that provide services in the region. Below is information regarding the different regional entities including what their role is and how they can be a resource.

Tribe

Tribal governments are sovereign entities in the U.S., recognized by the Constitution as having the same powers as federal and state governments for internal regulation. These governments, predating the U.S. and the State of Alaska, have their own laws primarily for their citizens, and manage various programs for their communities. Federally recognized Tribes are considered sovereign governments by the U.S. Most organized under the Indian Reorganization Act, adopting constitutions and forming "IRA Councils," while others are governed by traditional councils. Both types of councils are legitimate, federally recognized sovereign entities with the authority to create laws and justice systems. They also provide social and economic services, often in partnership with an Alaska Native Regional Non-Profit. Tribal Councils, consisting of elected members including a President or Chief, govern these Tribes. Membership requirements vary by Tribe. CVTC is the governing body for the CNV. Chickaloon works closely with nearby Tribes, to include the Knik Tribe, The Native Village of Eklutna, and many others.

Alaska Native Regional / *Cook Inlet Regional, Inc.*

Under the Alaska Native Claims Settlement Act (ANCSA), Regional Corporations and Village Corporations were established as for-profit entities with different focuses and scales of operation. Regional Corporations were created to manage land and financial assets on a broad scale, aiming to generate revenue for shareholders—Alaska Natives enrolled at the time of ANCSA's enactment in 1971 and those born afterward. They typically hold rights to subsurface estate and engage in various business ventures, including the exploitation of natural resources, to increase shareholder value through dividends.

Village Corporations/ *Chickaloon-Moose Creek Native Association*

Village Corporations, in contrast, operate at a more localized level, holding title to the surface estate of lands received under ANCSA. Their focus is on using and developing this land for community benefits, such as housing and local commercial projects. Shareholders are Native individuals from specific villages, and these corporations aim to foster economic growth within their immediate areas, often focusing on the village's social and economic well-being.

While both types of corporations serve the economic interests of their shareholders, Regional Corporations focus on large-scale economic development and subsurface rights across extensive

geographic areas. In contrast, Village Corporations concentrate on surface rights and local development. This approach under ANCSA offered a unique method for economic self-determination for Alaska Natives, differing from the reservation system in the "Lower 48" by promoting corporate structures and asset management.

Service Organizations

Regional Non-Profit | Cook Inlet Tribal Council

In Alaska, there are 12 regional non-profit organizations focused on serving Alaska Native communities. These non-profits were established to administer a wide array of social services, healthcare, and educational programs, aiming to improve the welfare of Alaska Native peoples. Unlike the corporations formed under the Alaska Native Claims Settlement Act (ANCSA), these regional non-profit corporations operate independently, focusing primarily on service delivery rather than corporate benefits.

The mission of these organizations often includes enhancing healthcare access, promoting cultural and educational opportunities, and supporting the preservation of Alaska Native heritage. To achieve these goals, they rely on a combination of federal contracts, grant funding, support from ANCSA Regional Corporations, and partnerships with village non-profits. Their services range from providing comprehensive healthcare and behavioral health services to offering scholarships for Alaska Native students, sponsoring cultural events, preserving Alaska Native languages, and protecting sites of historic or spiritual significance.

These regional non-profits play a crucial role in the Alaska Native community by bridging the gap between federal support and local needs. ANCSA Regional Non-Profit Corporations contract with the federal government to ensure that Alaska Native people in their regions have access to essential social, education, and health services. The non-profits are tasked with the administration of these services, ensuring that programs are effectively targeted to meet the community's needs. Through this collaborative effort, Alaska Native regional non-profit organizations work to ensure the health, education, and cultural vitality of Alaska Native peoples, operating with a deep commitment to the communities they serve.

Regional Health Corporation | South Central Foundation

Regional Health Organizations (RHOs) serve as key healthcare providers across various regions, operating as non-profit health corporations. These organizations are not federally recognized Tribal governments but play a crucial role in delivering healthcare services to all residents within their respective regions, regardless of Native status. Their operations are characterized by a strong commitment to community health and well-being, offering a comprehensive range of medical services that cater to the needs of the local population.

Funding for RHOs typically comes from a mix of sources, including the Indian Health Service (IHS) of the U.S. Government, state and federal grants, and reimbursements from programs like Medicare and Medicaid, as well as private insurance. This diverse funding base supports the RHOs in their mission to provide accessible and quality healthcare services.

The governance of RHOs is typically overseen by a Board of Directors, which includes representatives from Tribal governments within the region, appointments from local municipalities, and representatives from key regional organizations. This governance structure ensures that the RHOs' policies and strategies are closely aligned with the community's needs, allowing for effective management and decision-making that reflects the interests and well-being of Alaska Natives and other residents in the region.

Greenhouse Gas (GHG) Inventory Baseline

The baseline Greenhouse Gas (GHG) Inventory for the Tribe represented through this Climate Action Plan is a comprehensive accounting of all greenhouse gas emissions by prioritized sectors. Baseline data includes:

- Baseline GHG emissions in the primary sectors of opportunity in the community: Residential Energy Consumption, Tribal Community Facility Energy Consumption, and Tribal Vehicle Infrastructure. Its purpose within this Climate Action Plan is to identify where the most significant emissions are occurring and opportunities for reductions.
- This inventory focuses on direct carbon dioxide emissions from the use of electricity from Matanuska Electric Association, heating from a variety of sources, primarily diesel fuel. Emissions are expressed in terms of metric tons of CO2 equivalents. MEA's self-reported generation mix and carbon emissions intensity from that resulting generation profile was used as a basis for carbon emissions each kilowatt hour.
- Usage data on all relevant activities that lead to GHG emissions within the prioritized sectors of residential energy consumption consumption was collected on the community scale for non CVTC owned housing, and directly for each individual facility for each individual unit of CVTC housing. The source of the number of Tribal households was based upon HUD IHB formula allocations for Chickaloon adjusted for average household occupancy in the region from the 2020 Census. Average energy use is determined by the EIA. Other sources of data are referenced in the methods section of each measure.
- Community Facilities usage data is based upon actual annual energy usage with data provided directly by the Tribe in the form of fuel and electricity reports for each building by month or annually, as available for each facility.
- Tribal vehicle usage data is based upon actual miles driven on an annual basis for each individual vehicle and provided by vehicle operators and managers from each Tribal department.
- Emission Factors are coefficients that quantify the emissions or removals of greenhouse gases per unit of activity. Emission factors were used to convert units of energy into estimates of GHG emissions or removals.
- A Data Management plan ensured data quality, including accuracy, completeness, consistency, transparency, and comparability.
- An independent review of the inventory to ensure its accuracy and reliability was conducted in accordance with the approved CVTC Council Quality Assurance Project Plan.

This baseline GHG inventory serves as a crucial tool for the Tribe to understand the Tribe's impact on climate change, set reduction targets, and track progress over time.

The table below summarizes the baseline greenhouse gas emissions for the Tribe

Sector	Baseline GHG Emissions by Sector (MTCO2e)
Residential Energy Consumption	
Residential Buildings	1,728
Community Building Energy Consumption	
Community Buildings	271.01
Tribal Vehicle Fleet	
Tribal Fleet Vehicles	126.2
Total Emissions	2,125

GHG Reduction Targets

CVTC intends to target a 50% reduction by 2030 and net-zero GHG emissions target by 2050; though the Tribe recognizes these targets are ambitious.

In alignment with the United States' commitment to climate action, this PCAP has established ambitious GHG reduction targets. The following table outlines values for 50% reduction by 2030 and net-zero by 2050.

2022 Baseline GHG Emissions (CO_2e)	2030 50% Reduction Target (CO_2e)	2050 100% Reduction Target (CO_2e)
2,125	1,062	0

GHG Emissions Projections

Below are projections of GHG emissions in two scenarios. Scenario 1 – is in the absence of plan measures being implemented. Scenario 2 – assumes the plan is fully implemented and all measures are completed.

GHG reductions for each measure were calculated by identifying the electricity reductions for projects reducing electrical usage and heating fuel reductions for heating-related measures, as well as gasoline reductions for vehicle fleet related projects. The displaced fossil fuel energy units were converted to GHG emissions using the emission factors summarized in the Assumptions page of the detailed calculations in Appendix C.

The goal of net-zero emissions is ambitious, and contingent upon identification of additional GHG reduction measures and projects as well as securing sufficient funding to implement proposed measures Our proposed projects have identified projects to reduce GHG emissions by 74% by 2050, and the community is committed to aggressively incorporating the adoption of green technologies as they become more economically and technically viable. Net-zero emissions are crucial for the health of the communities environment and communities.

	2022 Baseline GHG Emissions (CO2e)	2030 Near-term Projections (CO2e) (percent +/- from baseline)	2050 Long-term Projections (CO2e) (percent +/- from baseline)
Scenario 1 – No measures implemented	2,125	2,125 (0%)	2,125 (0%)
Scenario 2 - Fully Implemented	N/A	552 (-74%)	552 (-74%)

Quantified GHG Reduction Measures

Measures refer to proposed projects, programs, and policies that would reduce greenhouse gas emissions if implemented.

The strategy for selecting greenhouse gas (GHG) reduction measures is informed by data on the highest sources of GHG emissions. Our Tribe is distributed across a wide region, and the Tribe's authority to impact emissions is limited to supporting Tribal members directly as well as the infrastructure that is owned and controlled by the Tribe. Consequently, GHG mitigation strategies are focused on three key areas:

1. **Residential Energy Consumption**
2. **Community Building Energy Consumption**
3. **Tribal Vehicle Fleet Energy Consumption**

The objective in concentrating on these areas is to decrease energy demand for heating and electricity as well as gasoline and diesel for transportation, thereby lessening the reliance on fossil fuel-generated electricity and both natural gas and fuel oil heating. Such initiatives not only aim to conserve energy but also significantly reduce GHG emissions, aligning with broader environmental sustainability goals.

Although these primary sectors do not encompass all sources of emissions within the community, they represent the largest contributors to controllable GHG emissions, offer the most substantial opportunities for reductions, and are identified as the highest priority for emissions reduction efforts across the region. Below, the plan outlines specific measures for each prioritized sector to achieve these goals.

Sector – Residential Energy Consumption

Residential energy consumption refers to the amount of energy used within households or residential buildings. This includes energy for various purposes such as heating, cooling, lighting, cooking, water heating, and running appliances and electronic devices. The type and amount of energy consumed in residential settings can vary widely depending on factors such as geographic location (homes in colder regions often consume more energy for heating), building characteristics (size, design, insulation, age of building), how efficient the household appliances are, and personal preference (thermostat setting). Monitoring and managing residential energy consumption is important for reducing environmental impact, controlling costs, and ensuring sustainable energy usage. Under this sector, the prime measure to reduce residential energy consumption is the reduction in energy usage for both heating and electrical needs, largely the recommendations are weatherization related energy efficiency.

Measure 1 - Residential Energy Efficiency

The proposed measure would provide weatherization and energy efficiency retrofits to all Tribal households in the community that could benefit from the improvements. Some residences have possibly received retrofits in the past decade, but even within these homes there are still significant opportunities for improvements.

In 2019, the Alaska Housing and Finance Corporation (AHFC) recommended $11,000 per house for weatherization in remote, rural Alaska communities. For the purposes of this plan this value was increased by 20% based on inflation. Thus, it is assumed that each house in the region will cost approximately $13,200 for materials and labor to retrofit. These are ballpark cost estimates and are useful for requesting funding but are not refined based on the needs of each individual home. Additionally, this cost estimate does not account for project management or overhead costs associated with weatherization improvements. A project budget would be required to include the total of all costs associated with carrying out this measure for every home In the community.

Typical energy efficiency retrofits may include actions such as increased insulation in walls, floors, and roofs, more efficient windows and doors, boiler replacement or maintenance, maintenance of heating distribution devices, woodstove change outs, LED lighting retrofits, set-back thermostats, and replacement of appliances with more energy efficient appliances.

Methods for Quantifying the Measure

The annual average electricity consumption of a residential home was collected from actual usage data for housing units owned by the CVTC and estimated from the EIA at 7,848 kwh per year for residential units not owned by the Tribe. For this plan, it is estimated that residential energy efficiency measures could result in a 10% reduction in electricity usage. Because 100% of the electricity in the region is provided by Matanuska Electric Association the reduction in electricity was based upon the average generation mix of the MEA; the self reported MEA emissions factor per kilowatt hour of .00039 MT is based upon their average generation mix in 2021. Cost savings for the reduced electricity consumption were calculated from the reduced annual kWh and the actual 2023 average cost of electricity for residential users on the MEA rate schedule.

The annual heating oil usage for a residential home was developed using the 2014 AHFC Alaska Housing Assessment report. From this 2014 AHFC data, the Tribe estimates that a typical home in the Matanuska Susitna Borough uses 501 gallons of heating oil.

Based on contractor reports on previous building shell and heating system energy efficiency retrofits, it is estimated that implementing residential energy efficiency can achieve a 20% reduction in heating fuel consumption across all residences in the region. The 20% reduction is measured in gallons of heating oil which were converted to reduced MTCO2e of greenhouse gas emissions.

The benefits of Residential Energy Efficiency were quantified as total greenhouse gas reductions for both electricity and heating oil usage. The simple payback was calculated by using an implementation cost of $13,200 per residential energy efficiency retrofit and dividing by the total cost savings to the owners, resulting in a simple payback period in years.

Ownership	Housing Unit	Baseline Annual GHG Emissions (MTCO2e)	Estimated Annual Cost Savings	Estimated Cost to Implement	Authority to Implement	Near Term / Long Term
CVTC Housing	Transitional Housing	5.28	$ 344	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit A	4.01	$ 279	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit B	5.61	$ 383	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit C	6.43	$ 437	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit D	7.64	$ 519	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit E	8.41	$ 566	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit F	2.12	$ 144	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit G	4.44	$ 310	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit H	5.08	$ 347	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit I	4.16	$ 285	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit J	4.97	$ 347	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit K	1.67	$ 112	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	Unit L	2.33	$ 159	$ 13,200	Housing Authority, Tribe	Near Ter
CVTC Housing	**13 Units**	**62.14**	**$ 4,231.00**	**$ 171,600**		

CNV	198 Units	1,666.02	$110,154.92	$ 2,613,600	Housing Authority, Tribe	Near Ter
Total	**211 Units**	**1,728.16**	**$114,385.92**	**2,785,200.00**		

Measure 1A - Residential Energy Efficiency

The proposed measure would provide weatherization and energy efficiency retrofits to all Tribal households in the community that could benefit from the improvements. Some residences have possibly received retrofits in the past decade, but even within these homes there are still significant opportunities for improvements.

In 2019, the Alaska Housing and Finance Corporation (AHFC) recommended $11,000 per house for weatherization in remote, rural Alaska communities. For the purposes of this plan this value was increased by 20% based on inflation. Thus, it is assumed that each house in the region will cost approximately $13,200 for materials and labor to retrofit. These are ballpark cost estimates and are useful for requesting funding but are not refined based on the needs of each individual home. Additionally, this cost estimate does not account for project management or overhead costs associated with weatherization improvements. A project budget would be required to include the total of all costs associated with carrying out this measure for every home In the community.

Typical energy efficiency retrofits may include actions such as increased insulation in walls, floors, and roofs, more efficient windows and doors, boiler replacement or maintenance, maintenance of heating distribution devices, woodstove change outs, LED lighting retrofits, set-back thermostats, and replacement of appliances with more energy efficient appliances.

Methods for Quantifying the Measure

The annual average electricity consumption of a residential home was collected from actual usage data for housing units owned by the CVTC and estimated from the EIA at 7,848 kwh per year for residential units not owned by the Tribe. For this plan, it is estimated that residential energy efficiency measures could result in a 10% reduction in electricity usage. Because 100% of the electricity in the region is provided by Matanuska Electric Association the reduction in electricity was based upon the average generation mix of the MEA; the self reported MEA emissions factor per kilowatt hour of .00039 MT is based upon their average generation mix in 2021. Cost savings for the reduced electricity consumption were calculated from the reduced annual kWh and the actual 2023 average cost of electricity for residential users on the MEA rate schedule.

The annual heating oil usage for a residential home was developed using the 2014 AHFC Alaska Housing Assessment report. From this 2014 AHFC data, the team estimated that a typical home in the Matanuska Susitna Borough uses 501 gallons of heating oil.

Based on contractor reports on previous building shell and heating system energy efficiency retrofits, it is estimated that implementing residential energy efficiency can achieve a 20% reduction in heating fuel consumption across all residences in the region. The 20% reduction is measured in gallons of heating oil which were converted to reduced MTCO2e of greenhouse gas emissions.

The benefits of Residential Energy Efficiency were quantified as total greenhouse gas reductions for both electricity and heating oil usage. The simple payback was calculated by using an implementation cost of $13,200 per residential energy efficiency retrofit and dividing by the total cost savings to the owners, resulting in a simple payback period in years.

Ownership	Housing Unit	Baseline Annual GHG Emissions (MTCO2e)	Estimated Annual Cost Savings	Estimated Cost to Implement	Authority to Implement	Near Term / Long Term	Near Term - 2030 GHG Reductions (MTCO2e)	Long Term - 2050 GHG Reductions (MTCO2e)
CVTC Housing	Transitional Housing	5.28	$ 344	$ 13,200	Housing Authority, Tribe	Near Term	0.82	0
CVTC Housing	Unit A	4.01	$ 279	$ 13,200	Housing Authority, Tribe	Near Term	0.76	0
CVTC Housing	Unit B	5.61	$ 383	$ 13,200	Housing Authority, Tribe	Near Term	1.01	0
CVTC Housing	Unit C	6.43	$ 437	$ 13,200	Housing Authority, Tribe	Near Term	1.14	0
CVTC Housing	Unit D	7.64	$ 519	$ 13,200	Housing Authority, Tribe	Near Term	1.35	0
CVTC Housing	Unit E	8.41	$ 566	$ 13,200	Housing Authority, Tribe	Near Term	1.46	0
CVTC Housing	Unit F	2.12	$ 144	$ 13,200	Housing Authority, Tribe	Near Term	0.38	0
CVTC Housing	Unit G	4.44	$ 310	$ 13,200	Housing Authority, Tribe	Near Term	0.85	0
CVTC Housing	Unit H	5.08	$ 347	$ 13,200	Housing Authority, Tribe	Near Term	0.91	0

CVTC Housing	Unit I	4.16	$ 285	$ 13,200	Housing Authority, Tribe	Near Term	0.76	0
CVTC Housing	Unit J	4.97	$ 347	$ 13,200	Housing Authority, Tribe	Near Term	0.95	0
CVTC Housing	Unit K	1.67	$ 112	$ 13,200	Housing Authority, Tribe	Near Term	0.29	0
CVTC Housing	Unit L	2.33	$ 159	$ 13,200	Housing Authority, Tribe	Near Term	0.42	0
CVTC Housing	**13 Units**	**62.14**	**$ 4,231.00**	**$ 171,600**			**11.09**	
CNV	198 Units	1,666.02	$110,154.92	$ 2,613,600	Housing Authority, Tribe	Near Term	272.60	0
Total	**211 Units**	**1,728.16**	**$114,385.92**	**2,785,200.00**			**283.70**	**0**

Measure 1B - Residential Rooftop Solar

The proposed measure would provide rooftop solar to all Tribal households in the community that could benefit from the improvements. Some residences are unlikely to be able to benefit from solar due to orientation, condition, shading or other factors, an assumed 50% of households would benefit.

Average cost of rooftop solar installations in Railbelt Alaska communities has been changing, however recent estimates establish an expected cost of $.50/watt of installed power. Thus, it is assumed that each house in the region will cost approximately $14,000 for installation. Potential tax credits were not used to adjust the price, as the source of funding for implementation could limit or eliminate the potential for tax credit application. These are ballpark cost estimates and are useful for requesting funding but are not refined based on the needs of each individual home. Additionally, this cost estimate does not account for project management or overhead costs associated with a solar PV household program.

Methods for Quantifying the Measure

The annual average electricity consumption of a residential home was collected from actual usage data for housing units owned by the CVTC and estimated from the EIA at 7,848 kwh per year for residential units not owned by the Tribe. An estimated size of solar installation per household was established at 4 kW per household. Average generation was established using PV Watts modeling estimates from the National Renewable Energy Lab, production was based upon an average household in Sutton, AK with mild shading, south facing orientation, and 20 degree angling of panels. Resulting modeling indicated an average annual production of 3,458 kwh per year. For households using less than this amount of electricity annually, benefits were reduced to the total electricity use. For households using more than 3,468 kilowatt hours of electricity annually, 100% of offset energy was assumed to be offset following Alaska Net Metering guidelines.

The benefits of Residential Rooftop Solar were quantified as total greenhouse gas reductions for electricity based upon avoided generation from MEA. The simple payback was calculated by using an implementation cost of $14,000 per residential solar installation and dividing by the total cost savings to the owners, resulting in a simple payback period in years.

Ownership	Housing Unit	Baseline Annual GHG Emissions (MTCO2e)	Estimated Annual Cost Savings	Estimated Cost to Implement	Authority to Implement	Near Term / Long Term	Near Term - 2030 GHG Reductions (MTCO2e)	Long Term - 2050 GHG Reductions (MTCO2e)
CVTC Housing	Transitional Housing	5.28	$ 778	$ 14,000	Housing Authority, Tribe	Near Term	1.35	0

CVTC Housing	Unit A	4.01	$ 243	$ 14,000	Housing Authority, Tribe	Near Term	0.42	0
CVTC Housing	Unit B	5.61	$ 655	$ 14,000	Housing Authority, Tribe	Near Term	1.14	0
CVTC Housing	Unit C	6.43	$ 778	$ 14,000	Housing Authority, Tribe	Near Term	1.35	0
CVTC Housing	Unit D	7.64	$ 778	$ 14,000	Housing Authority, Tribe	Near Term	1.35	0
CVTC Housing	Unit E	8.41	$ 778	$ 14,000	Housing Authority, Tribe	Near Term	1.35	0
CVTC Housing	Unit F	2.12	$ 281	$ 14,000	Housing Authority, Tribe	Near Term	0.49	0
CVTC Housing	Unit G	4.44	$ 222	$ 14,000	Housing Authority, Tribe	Near Term	0.39	0
CVTC Housing	Unit H	5.08	$ 589	$ 14,000	Housing Authority, Tribe	Near Term	1.02	0
CVTC Housing	Unit I	4.16	$ 419	$ 14,000	Housing Authority, Tribe	Near Term	0.73	0
CVTC Housing	Unit J	4.97	$ 257	$ 14,000	Housing Authority, Tribe	Near Term	0.44	0
CVTC Housing	Unit K	1.67	$ 257	$ 14,000	Housing Authority, Tribe	Near Term	0.44	0
CVTC Housing	Unit L	2.33	$ 257	$ 14,000	Housing Authority, Tribe	Near Term	0.44	0
CVTC Housing	**13 Units**	**62.14**	**$ 6,290.33**	**$ 182,000**			**10.90**	
CNV	198 Units	1,666.02	$77,026.95	$ 2,772,000	Housing Authority, Tribe	Near Term	133.51	0
Total	**211 Units**	**1,728.16**	**$ 83,317**	**$2,954,000**			**144.42**	**0**

Measure 1C - Residential Community Solar

The proposed measure would develop a community solar to be available fir all Tribal households in the community that could benefit from the benefits of solar PV. Some residences are unlikely to be able to benefit from household solar due to orientation, condition, shading or other factors; community solar can provide benefits for those whose homes can't directly benefit.

A professional cost estimate was developed for a specific community solar project under development by the CVTC. The proposed project identified a 2.35 MW solar PV array with an estimated project construction and implementation cost of $7,767.520. This third party estimate serves as the basis of the cost of the proposal.

Methods for Quantifying the Measure

The annual average electricity consumption of a residential home was collected from actual usage data for housing units owned by the CVTC and estimated from the EIA at 7,848 kwh per year for residential units not owned by the Tribe. Generation estimates were established using site specific helioscope modeling software by a qualified consultant. Important factors included spacing of panels, the site location in Sutton, AK, 40 degree angling of panels, inverter selection, bifacial panel selection, and other factors. Resulting modeling indicated an average annual production of 2,595,155 kwh per year. Due to the State of Alaska's lack of community solar legislation and regulations, 100% of offset energy was assumed to be offset following an independent power producer model, resulting in cost savings of only $.07/kwh as opposed to a net metering benefit of $0.22/kwh as is seen in residential rooftop solar.

The benefits of Residential Community Solar were quantified as total greenhouse gas reductions for electricity based upon avoided generation from MEA. The simple payback was calculated by using an implementation cost of $7,767,520 and dividing by the total cost savings, resulting in a simple payback period in years.

Ownership	Housing Unit	Baseline Annual GHG Emissions (MTCO2e)	Estimated Annual Cost Savings	Estimated Cost to Implement	Authority to Implement	Near Term / Long Term	Near Term - 2030 GHG Reductions (MTCO2e)	Long Term - 2050 GHG Reductions (MTCO2e)
Total	211 Units	1,728.16	$ 181,661	$7,767,520	Tribe	Near Term	1,012.11	0

Sector – Community Building Energy Consumption

In Alaska, community building energy consumption is notably distinct due to the State's unique climatic, geographical, and infrastructural characteristics. The harsh and long winters demand extensive energy use for heating and maintaining comfortable indoor environments in community buildings, such as offices, schools, hospitals, and retail spaces. These buildings often rely on a mix of energy sources, which in this region is largely characterized by diesel fuel for heating and electricity from the MEA grid. Sometimes natural gas or propane is available for heating and in limited quantities, some energy is generated with renewables. This Priority Climate Action Plan will focus on measures that increase community and building energy efficiency thereby decreasing fossil fuel consumption and reducing greenhouse gas emissions.

Measure 2 - Community Building Energy Efficiency

The proposed measure would provide weatherization and energy efficiency retrofits to all community buildings that could benefit from improvements.

Typical energy efficiency retrofits may include actions such as increased insulation in walls, floors, and roofs, more efficient windows and doors, boiler replacement or maintenance, maintenance of heating distribution devices, woodstove change outs, LED lighting retrofits, set-back thermostats, and replacement of appliances with more energy efficient appliances.

Methods for Quantifying the Measure

A list of all tribal community facilities owned or operated by the Tribe was compiled. Actual heating fuel usage and electricity usage annually was compiled for each facility by each responsible tribal department.

Baseline emissions were determined by calculating emissions impact for fuel by multiplying emissions factors by the actual quantity of diesel fuel used by each individual facility. Electricity emissions were determined by applying emissions factors for the specific generation mix of the MEA grid by the actual electrical consumption for each facility.

Based on past weatherization and energy efficiency retrofits to reduce heating oil usage, it was estimated

that weatherization and energy efficiency could achieve a 20% reduction in heating oil consumption across all community buildings. The 20% reduction is measured in gallons of heating oil which were converted to reduced MTCO2e of greenhouse gas emissions. Potential electricity reductions were estimated at 10%. Resulting reductions in kilowatt hour consumption for each facility were converted to reduced MTC02e of greenhouse gas emissions based upon the carbon intensity of MEA's generation mix.

The financial savings from this reduced electricity consumption were calculated by considering the decrease in annual kWh usage and the corresponding reduction in energy costs based upon actual energy costs from MEA. Current prices for both electricity and diesel fuel were used to determine a savings impact.

The potential benefits of this measure were quantified as total greenhouse gas reductions for both electricity and heating oil consumption reductions. The simple payback was calculated by using an implementation cost of $10/square foot for each community building for weatherization and energy efficiency retrofits and dividing by the total cost savings to the building owners, resulting in a simple payback period in years.

Facility Name	Baseline Annual GHG Emissions (MTCO2e)	Estimated Annual Cost Savings	Estimated Cost to Implement	Authority to Implement	Near Term / Long Term	Near Term - 2030 GHG Reductions (MTCO2e)	Long Term - 2050 GHG Reductions (MTCO2e)
Government Building	23.82	$1,584.16	$ 31,360	Tribe	Near Term	3.97	0
C'eyiits' Hwnax Life House Community Health Center	89.88	$6,074.81	$ 81,550	Tribe, RHO	Near Term	15.71	0
Transportation Shop	38.60	$2,682.19	$ 40,000	Tribe	Near Term	7.30	0
Transportation Sandcastle	13.73	$963.17	$ 24,000	Tribe	Near Term	2.66	0
Greenhouse (Located Adjacent Transportation Office)	0.66	$44.03	$ 800	Tribe	Near Term	0.11	0
Admin	19.18	$1,174.52	$ 43,360	Tribe	Near Term	2.43	0
Ya Ne Dah Ah School	28.92	$1,940.04	$ 43,200	Tribe	Near Term	4.94	0

Environmental Outbuilding & THPO Outbuilding	10.75	$685.43	$ 10,000	Tribe	Near Term	1.57	0
Raven House	9.60	$646.95	$ 18,100	Tribe	Near Term	1.66	0
Raven House Shop	15.40	$937.77	$ 30,800	Tribe	Near Term	1.91	0
Hemmer House & Garage	18.65	$1,279.64	$ 35,000	Tribe	Near Term	3.40	0
River view	1.81	$125.51	$ 6,280	Tribe	Near Term	0.34	0
Total	**271.01**	**$ 18,138**	**$ 364,450**			**46.00**	

Measure 3 – Tribal Vehicle Fleet Electrification

Measure - Transportation Electrification

This measure refers to a set of strategies and actions aimed at promoting the adoption and use of electric vehicles as a means to reduce greenhouse gas emissions. This measure is crucial because transportation is often a major source of carbon emissions in rural Alaska. Examples of what this measure entails include:

- Fleet Electrification: Transitioning public and government vehicle fleets to electric models. This not only reduces emissions but also sets an example for private consumers and businesses.
- Infrastructure Development: Establishing a widespread and accessible charging infrastructure is vital. This includes the installation of public charging stations in strategic locations such as parking lots, workplaces, and high-traffic areas.
- Incentives and Subsidies: Offering financial incentives such as tax rebates, grants, or subsidies to individuals and businesses for purchasing electric vehicles. This strategy makes EVs more financially accessible.
- Awareness and Education Campaigns: Conducting public awareness campaigns to educate the community about the benefits of electric vehicles, both environmental and economic, thereby encouraging a shift in public perception and adoption.

Methods for Quantifying the Measure

For purposes of the PCAP, electrification of the Tribal fleet was evaluated in detail.

To determine baseline emissions, actual milage driven for each tribal vehicle was determined based upon Tribal records maintained by each Tribal department. Vehicle fuel efficiency was determined from actual records of fuel expenditures and purchases for each vehicle. Actual fuel consumed for the year was then multiplied by Emissions Factors to determine annual emissions impacts for each vehicle.

To determine emissions reductions implementation costs, a cost estimate was prepared identifying the cost of replacement for each tribal fleet vehicle with a similar or equivalent electric vehicle; several vehicles have no electrical equivalent available to date, no capital cost or emissions reductions were identified for these vehicles.

Emissions impacts from the new electric vehicle replacement are based upon an average electric vehicle electric efficiency of .36 kwh/mile as provided by the EPA multiplied by the annual miles driven for the vehicle being replaced in the Tribal fleet. This total kwh usage per vehicle number was then multiplied by the average emissions impact per kilowatt hour for the MEA grid. Total electrical charging emissions were deducted from avoided emissions from eliminating gasoline and or diesel fuel use in the existing fleet to determine a final emissions impact of the measure.

Cost Savings for this measure were determined by multiplying annual fuel usage for vehicles by the current average gasoline or diesel fuel price, as appropriate for each vehicle. Costs of electrical charging for anticipated annual kwh demand for each vehicle were based upon the current full price of MEA electricity multiplied by annual kwh requirements for driving the vehicles. The costs of electrical power procurement were deducted from the cost savings of avoided fuel use. Lastly, due to electric vehicles reduced maintenance requirements without an internal combustion engine, and average maintenance savings of $949/15,000 miles driven was calculated for each vehicle.

Tribal Department	Vehicle Year	Vehicle Make	Vehicle Model	Baseline Annual GHG Emissions (MTCO2e)	Total Cost Savings	Total Cost to Implement	Authority to Implement	Near Term / Long Term	Near Term - 2030 GHG Reductions (MTCO2e)	Long Term - 2050 GHG Reductions (MTCO2e)
Transportation	2022	Freightliner	M2	1.04			Tribe	Long Term		0
Transportation	2021	International	HX520 Dump Truck	1.79			Tribe	Long Term		0
Transportation	2023	International	HX520 Semi	0.91			Tribe	Long Term		0
Transit	2021	Ford	Transit 350	16.60	$6,646.98	$ 65,000	Tribe	Near Term	13.19	0
Transit	2004	Ford	Explorer	1.67	$657.43	$ 45,000	Tribe	Near Term	1.25	0
Transit	2022	Ford	Transit 350	4.78	$1,591.63	$ 65,000	Tribe	Near Term	3.96	0
Admin	2018	Chevrolet	Equinox	1.44	$534.52	$ 40,000	Tribe	Near Term	0.80	0
Admin	2022	Ford	Escape	0.46	$158.26	$ 55,000	Tribe	Near Term	0.16	0
Admin	2010	Chevrolet	Tahoe	2.88	$1,131.62	$ 60,000	Tribe	Near Term	2.11	0
Admin	2023	Ford	TRN	0.07	$25.61	$ 40,000	Tribe	Near Term	0.04	0
ESD	2011	Ford	Escape	1.78	$687.07	$ 40,000	Tribe	Near Term	1.22	0
ESD	2022	Ford	F-150 Super	2.96	$1,139.20	$ 60,000	Tribe	Near Term	1.98	0
ESD	1989	Ford	F-150	0.32	$130.72	$ 60,000	Tribe	Near Term	0.27	0
Tribal Police	2014	Ford(Stewlow)	Explorer	10.46	$4,104.16	$ 70,000	Tribe	Near Term	7.65	0

Tribal Police	2014	Ford(LD)	Explorer	10.46	$4,104.16	$ 70,000	Tribe	Near Term	7.65	0
Tribal Police	2014	Ford(Donna)	Taurus	5.80	$2,205.74	$ 45,000	Tribe	Near Term	3.69	0
Tribal Police	2019	CAN-AM	Maverick 1000cc	1.57	$615.62	$ 45,000	Tribe	Near Term	1.15	0
Tribal Police	2009	Dodge(Terri)	Charger	6.11	$1,952.91	$ 45,000	Tribe	Near Term	4.42	0
Tribal Police	2017	Ford	F250	3.18	$1,264.90	$ 45,000	Tribe	Near Term	2.47	0
Tribal Police	2013	Polaris	Ranger 500	0.04	$15.18	$ 45,000	Tribe	Near Term	0.03	0
THPO	2015	Chevrolet	Silverado	8.01	$2,576.50	$ 45,000	Tribe	Near Term	5.91	0
Transportation	1986	Chevrolet	Blazer	0.10	$41.04	$ 45,000	Tribe	Near Term	0.08	0
Transportation	1996	Chevrolet	Cheyenne (K3500)	0.38	$123.12	$ 45,000	Tribe	Near Term	0.29	0
Transportation	2019	Ford	F350 XL	0.42	$141.50	$ 45,000	Tribe	Near Term	0.35	0
Transportation	2021	Ford	F550	1.56	$526.37	$ 45,000	Tribe	Near Term	1.35	0
Transportation	2017	GMC	Sierra 3500HD	2.25	$899.96	$ 60,000	Tribe	Near Term	1.79	0
Facilities	2011	GMC	Sierra	4.81	$1,839.43	$ 55,000	Tribe	Near Term	3.14	0
Facilities	2022	Ford	F150	2.39	$924.71	$ 55,000	Tribe	Near Term	1.64	0
Facilities	2023	Ford	F150	3.97	$1,532.85	$ 55,000	Tribe	Near Term	2.71	0
Facilities	2012	Ford	F350	4.11	$1,644.11	$ 65,000	Tribe	Near Term	3.26	0
Justice (Courts)	2021	Ford	F150	3.80	$1,468.66	$ 55,000	Tribe	Near Term	2.60	0
Justice (Courts)	2018	Chevrolet	Sonic	2.34	$856.73	$ 40,000	Tribe	Near Term	1.23	0

Health & Social Services	2023	Ford	Escape	0.30	$104.71	$ 40,000	Tribe	Near Term	0.12	0
Health & Social Services	2023	Ford	Escape	1.01	$353.06	$ 40,000	Tribe	Near Term	0.39	0
Health & Social Services	2022	Ford	Escape	1.25	$434.61	$ 40,000	Tribe	Near Term	0.48	0
Health & Social Services	2022	Ford	Escape	1.50	$523.23	$ 40,000	Tribe	Near Term	0.58	0
Health & Social Services	2022	Ford	F150	2.90	$1,113.65	$ 55,000	Tribe	Near Term	1.94	0
Health & Social Services	2021	Ford	Ecosport	2.39	$900.83	$ 40,000	Tribe	Near Term	1.45	0
Health & Social Services	2021	Jeep	Renegade	0.26	$99.76	$ 40,000	Tribe	Near Term	0.16	
Health & Social Services	2020	Ford	Transit	1.54	$588.72	$ 60,000	Tribe	Near Term	1.00	0
Health & Social Services	2020	Ford	Transit	2.09	$797.85	$ 60,000	Tribe	Near Term	1.36	0
Education	2023	Ford	Transit Wagon	1.81	$676.09	$ 60,000	Tribe	Near Term	1.06	0
Education	2017	Chevy	Express Van	2.78	$1,112.78	$ 60,000	Tribe	Near Term	2.21	0
Total				**126.27**	**$46,245.99**	**$2,040,000**	**Tribe**		**87.14**	**0**

Implementation Milestones & Schedule

CVTC PCAP Implementation Milestones and Schedule																								
Project Tasks																								
Years	**2025**				**2026**				**2027**				**2028**				**2029**				**2030**			
Quarters	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Residential Energy Efficiency Retrofits																								
Identify detailed scope for building retrofits	■																							
Identify Funding for Project Implementation	■	■	■	■	■	■																		
Competitively Procure Implementation Contractor							■	■																
Procure materials and implement retrofits									■	■	■	■	■	■	■	■	■	■	■	■				
Verify Proper Operation and Track Metrics																					■	■	■	■
Close-out Project																								■
Residential Solar PV																								
Identify Funding for Project Implementation	■	■	■	■																				
Competitively procure an installation contractor					■	■	■																	
Complete project installation							■	■	■	■														
Complete commissioning and monitor key metrics									■	■														
Close-out Project											■	■	■											
Community Scale Solar PV Construction																								
Identify Funding for Project Implementation	■	■	■	■																				
Competitively procure engineering contractor and complete Final Design - if required					■	■	■																	
Competitively Procure Equipment Supply and Implementation Contractor								■	■	■														
Procure Equipment (Competitive or Sole Source Qualified)											■	■	■											
Complete project installation														■	■									
Complete commissioning and monitor key metrics																■	■	■	■					
Close-out Project																				■				
Community Building Energy Efficiency Retrofits																								
Identify detailed scope for building retrofits	■																							
Identify Funding for Project Implementation	■	■	■	■	■	■																		
Competitively Procure Implementation Contractor							■	■																
Procure materials and implement retrofits									■	■	■	■	■	■	■	■	■	■	■	■				
Verify Proper Operation and Track Metrics																					■	■	■	■
Close-out Project																								■
Tribal Fleet Electrification																								
Identify Funding for Project Implementation	■	■	■	■																				
Identify replacment EV's					■	■																		
Identify Charging Infrastuructre Requirements					■	■																		
Procure Charging Infrastrcuture							■	■			■	■	■											
Install Charging Infrastructure									■	■				■	■									
Procure Electric Vehicles							■	■	■	■	■	■	■	■	■									
Close-out Project																■								

Methods for Tracking Progress

General metrics for measuring progress towards reducing greenhouse gas emissions were contemplated broadly for each measure. These metrics are intended to measure effectiveness of the measure once implemented and do not consider interim, pre-implementation milestones.

Measure 1A – Residential Energy Efficiency

- Post implementation electrical usage will be derived from a survey of billing and usage data will be collected from the electric utility or the utility customer directly.
- A survey of heating fuel usage will be conducted post retrofit and compared to pre-retrofit data.

Measure 1B – Residential Rooftop Solar PV

- Post implementation electrical usage will be derived from a survey of residential billing and usage data will be collected from the electric utility or the utility customer directly.

Measure 1C – Residential Community Solar PV

- Post implementation electrical generation will be derived from bidirectional metering from electric utility.

Measure 2 – Community Building Energy Efficiency

- Post implementation electrical usage will be derived either on direct billing and usage data will be collected from the electric utility or from Tribal records.
- A survey of heating fuel usage will be conducted post retrofit and compared to pre-retrofit data through each Tribal department responsible for each facility.

Measure 3 – Tribal Vehicle Fleet Electrification

- Records of vehicle mileage and efficiency will be maintained by each Tribal department responsible for each vehicle.

Benefits Analysis

This section explores each of the measures that were laid out in the previous section and expands on the additional benefits of the measures if implemented including a list of additional benefits not captured elsewhere.

The implementation of the measures included in this PCAP are anticipated to have a broad range of benefits beyond GHG emission reductions. Emission reductions in the Residential Energy Efficiency and Community Facilities sector are primarily due to reducing diesel fuel for building heating uses and

electricity. Likewise, reductions in the Community-Scale Solar PV and Distribution sector are primarily reducing emissions from electrical generation from the grid. Emissions reductions from Tribal electrification will be through reduced gasoline and diesel usage from vehicle emissions.

Diesel fuel combustion for building heat does not have a detectable or uniquely identifiable impact on criteria and toxics pollutant concentrations in CNV's region. Instead, any benefit would primarily be identifiable as reductions in the overall emissions inventory. A reduction in diesel fuel consumed will reduce the fine particulate, NOx, black carbon, and VOC emissions and ambient concentrations near those activity locations.

Note: Quantified co-pollutant reductions were omitted from the Benefits Analysis section per the guidance from the EPA's Climate Pollution Reduction Grants Program: Technical Reference Document, Benefits Analyses: Co-Pollutant Impacts (May 30, 2023) which states "Tribes and territories are not expected to quantify co-pollutant impacts associated with non-industrial GHG reduction measures." None of the proposed measures were considered "industrial." All of the proposed measures are "non-industrial" encompassing a range of sectors and activities beyond traditional heavy industrial processes. It includes various aspects of energy consumption and emissions reduction measures associated with four primary sectors including community-scale electricity generation, residential energy consumption, commercial facilities energy consumption, and community facilities energy consumption. Here are definitions for each of these sectors:

Authority to Implement

Many of the entities in the community work together to carry out projects. This is explained in more detail in the *Entities in the Region* section within the *Introduction* to this report. For a particular measure, the identified authority may be required to get permission from the building or system owner through a formal document such as a Cooperative Project Agreement.

For residential measures directly impacting households, the Tribe or the home owner is an eligible entity, though they make work together to secure funding or implement the proposed measures.

The tables above (by measure) capture current authorities to implement proposed measures based on ownership or historical project development and implementation and lines of formal or informal responsibility of the entities in the community. Broadly, this climate action plan identified the entity in the community that has authority to carry out a proposed measure. In general, the PCAP focuses on measures that the Tribe can directly provide support or has authority to implement.

Identification of Funding Sources

The financing strategy and funding opportunities for implementing the proposed measures is detailed in the section titled "Intersection with Other Funding Availability" which mostly contemplates federal grants. A non-federal match is often required, which refers to the portion of project funding that comes from non-federal sources, which is a common stipulation for securing federal grant money. This requirement ensures that local stakeholders have a vested interest in the project's success and that the financial burden is not solely borne by federal funding.

The sources for non-federal matches are diverse, allowing for flexibility in financial planning and the opportunity to create a robust funding model. Potential sources include:

System or Building Owner Contributions: Owners of the systems or buildings that will benefit from the project may contribute a portion of the necessary funds. This investment reflects their direct interest in the project's success and the expected benefits to their properties, such as increased resilience and energy efficiency.

Regional Partnerships: Collaboration with regional partners, such as neighboring municipalities, regional development organizations, or consortia of local governments, can provide a significant source of matching funds. These partners may share a common interest in the project's objectives, such as enhancing regional resilience to climate change or improving local infrastructure.

State Funding: State-level grants or loans represent another critical source of non-federal matching funds. Many states offer financial assistance programs for projects that align with state priorities, such as sustainability, disaster preparedness, and community development.

Non-federal Grants or Loans: Beyond state-specific programs, other non-federal grants or loans may be available from philanthropic foundations, non-profit organizations, or private sector partners interested in supporting sustainability and resilience efforts. These sources often seek to fund projects that demonstrate innovation, community benefit, and potential for scalability.

Intersection with Other Funding Availability

The table below aims at identifying likely Federal, State and other funding sources that cover a majority of the proposed measures including energy efficiency, electric utility upgrades, and renewable energy integration.

FUNDING OPPORTUNITY	ELIGIBLE PROJECTS
Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) Tribal Energy Program Various grants available for energy efficiency and renewable energy projects: https://www.nrel.gov/docs/fy13osti/54396.pdf http://www.energy.gov/indianenergy/office-indian-energy-policy-and-programs	Biomass, energy efficiency, geothermal, hydropower, solar photovoltaics, solar water heat, wind, and other renewable energy projects.
Department of Energy Office of Indian Energy (DOE-OIE) Federal agencies provide grant, loan, and technical assistance programs to support Tribal energy projects: https://www.energy.gov/indianenergy/current-funding-opportunities	Weatherization, technical assistance, economic development, community facilities, community water, energy audits, renewable energy development, and energy efficiency.
Department of Energy (DOE) – Other Grants available for energy efficiency, renewable energy, technical assistance, pilot projects, and Tribal government energy projects: https://www.energy.gov/energy-economy/funding-financing	Weatherization, biomass, energy efficiency, geothermal, hydropower, solar photovoltaics, solar water heat, wind, other renewable energy projects, and education & outreach.
Denali Commission Grants Improve the effectiveness and efficiency of government services, to develop a well-trained labor force employed in a diversified and sustainable economy, and to build and ensure the operation and maintenance of Alaska's basic infrastructure: https://www.denali.gov/grants/ https://www.denali.gov/funding-requests/	Energy reliability, bulk fuel safety, infrastructure protection, transportation, sanitation, health facilities, housing, broadband, and economic development.

Alaska Energy Authority (AEA) Supports the State's communities and energy infrastructure by administering grant funding programs and a loan program: http://www.akenergyauthority.org/What-We-Do/Grants-Loans AEA Renewable Energy Grant Fund: http://www.akenergyauthority.org/What-We-Do/Grants-Loans/Renewable-Energy-Fund	Solar water heat, photovoltaics, landfill gas, wind, biomass, hydroelectric, geothermal electric, fuel cells, geothermal heat pumps, combined heat and power/cogeneration, hydrothermal, waste heat, transmission or distribution infrastructure, anaerobic digestion, tidal energy, wave energy, fuel cells using renewable fuels, and geothermal direct-use.
Alaska Housing Finance Corporation (AHFC) Financing for permanent energy-efficient improvements to public buildings owned by regional educational attendance areas, by the University of Alaska, by the state or by municipalities in the state: Alaska Energy Efficiency Revolving Loan Program: https://www.ahfc.us/efficiency/non-residential-buildings/energy-efficiency-revolving-loan-fund-aeerlp/	Borrowers obtain an Investment Grade Audit as the basis for making cost-effective energy improvements, selecting from the list of energy efficiency measures identified.
USDA Rural Development High Energy Cost Grant: https://www.rd.usda.gov/factsheet/high-energy-cost-grants	Funds may be used to acquire, construct, extend, upgrade, or otherwise improve energy generation, transmission, or distribution facilities and to establish fuel transport systems that are less expensive than road and rail.
Rasmuson Foundation Capital projects and technology upgrades for eligible Alaska organizations: Tier 1 Grants: https://www.rasmuson.org/grants/tier-1-grants/	Capital projects, technology updates, capacity building, program expansion and creative works, including building construction/renovation/restoration, technology upgrades in community facilities, and capacity building grant support.
Housing and Urban Development (HUD) http://portal.hud.gov/hudportal/HUD?src=/topics/grants	Energy efficiency and housing weatherization.

Bureau of Indian Affairs (BIA) Energy and Mineral Development Program Grant (EMDP): https://www.bia.gov/service/grants/emdp/what-energy-and-mineral-development-program-emdp-grant	Resource assessment, exploration studies, feasibility studies, market, studies, engineering studies, economic evaluation, and defining potential targets for development.
Bureau of Indian Affairs Tribal Energy Development Capacity Grant (TEDC): https://www.bia.gov/service/grants/tedc	Developing the legal infrastructure to create any type of Tribal energy business. Establishing an energy-focused corporation under Tribal or state incorporation codes. Establishing an energy-related Tribal business charter under federal law.
Bureau of Indian Education http://bie.edu/Programs/index.htm	School energy programs.
The Honnold Foundation Grid Alternatives Tribal Program: https://www.honnoldfoundation.org/	Unrestricted grant funding to organizations or projects that use solar energy to increase social and economic equity and reduce environmental impact.
USDA Rural Development Many various grants. Listed below. www.rd.usda.gov/ak	Diverse eligible activities.
Bipartisan Infrastructure Law – Clean Energy & Power 1. Delivering Clean Power ($21.3 billion) 2. Clean Energy Demonstrations ($21.5 billion) 3. Energy Efficiency & Weatherization ($6.5 billion) 4. Funding for Clean Energy Manufacturing & Workforce Development ($8.6 billion) https://www.whitehouse.gov/build/guidebook/ https://www.whitehouse.gov/wp-content/uploads/2022/05/BUILDING-A-BETTER-AMERICA-V2.pdf#page=152	Delivering clean energy, clean energy demonstrations, energy efficiency, clean energy manufacturing and workforce. May be limited in ability to fund upgrades and improvements to existing diesel electric utility systems. This gap may better fit into an EPA Implementation grant.

Bipartisan Infrastructure Law - Electric Vehicles, Buses and Ferries 1. National Electric Vehicle Infrastructure Formula Program ($5 billion) 2. Discretionary Grant Program for Charging and Fueling Infrastructure ($2.5 billion) 3. Clean School Bus Program ($5 billion) 4. Low- and No-Emission Transit Bus Program ($5.6 billion) 5. Electric or Low Emitting Ferry Program ($250 million)	Building a network of electric vehicle chargers and supporting the transition to electrification across all types of vehicles is critical to reduce emissions and help to combat the climate crisis.

Workforce Planning Analysis

This Workforce Planning Analysis addresses the unique challenges and opportunities faced by the Tribe. CVTC's goal is to ensure that the community is not only prepared to participate in, but also benefit from, the initiatives outlined in the PCAP & CCAP.

The primary objective of this analysis is to identify skills and training essential for the successful implementation of PCAP and CCAP measures. This includes understanding the specific needs for Residential and Community Building Energy Efficiency Retrofits, Rooftop Solar, Community Solar, and Tribal Fleet Vehicle Electrification. By identifying these needs, the Tribe aims to develop targeted strategies for workforce development or by importing this labor to the community.

The Workforce Planning Analysis takes a cursory look at the distinct categories for the priority projects identified in the PCAP and CCAP. Priority Projects Identified in the PCAP & CCAP largely fall into a few distinct categories: 1) Building Energy Efficiency Retrofits; 2) Solar PV; 3) Tribal Fleet Electrification

The table below explores these priority project categories, the analysis considered required workforce competencies, potential training and development needs, potential partnerships and collaborations, and the estimated time to develop local labor.

Table 1 Workforce Planning Analysis Table

Priority Project Category	Required Workforce Competencies	Potential Training & Development Needs	Potential Partnerships & Collaborations	Est. Time Needed to Develop Local Labor
Rooftop and Community Solar PV	Renewable Energy Integration: Training in solar technologies. Workshops on integrating renewable energy sources with the grid.	Renewable energy certification courses, practical workshops on system integration, field experience with renewable technologies.	Renewable energy firms, environmental NGOs, government energy departments.	Short-term training and certifications: 6-12 months ; 1-2 years for foundational knowledge and integration skills.
Rooftop and Community Solar PV	Regulatory Compliance: Sessions on understanding and adhering to local, state, and federal regulations governing electric utilities. Training in environmental and safety standards relevant to power plant operations.	Compliance workshops, safety standards training, regulatory affairs seminars.	Regulatory bodies, safety organizations, legal firms specializing in energy regulations.	3-6 months for initial training, ongoing for updates in regulations.
Rooftop and Community Solar PV	Project Management: Opportunities for Project Management Professional (PMP) certification or similar credentials. Workshops on planning, executing, and monitoring electric utility upgrade projects.	PMP certification prep courses, project management software training, leadership and management workshops. On the job training with an employer that manages energy projects in rural Alaska.	Project Management Institute (PMI), corporate training firms, business schools. AEA, ANCs, Village Corporations, others engaging in project management in the community.	6-12 months for certification, additional time for practical experience.
Building Energy Efficiency Retrofits	Basic knowledge of weatherization techniques and materials. Skills in air sealing and insulation to improve building envelope efficiency. Competency in installing setback thermostats and other basic energy-saving controls. Ability to retrofit lighting to more efficient options, such as LED. Familiarity with the use of basic hand	Hands-on training programs in weatherization and air sealing techniques. Workshops on the installation of setback thermostats and basic electrical safety. Practical sessions on efficient lighting retrofitting, including safe handling and disposal of old fixtures.	Partnerships with energy efficiency organizations for the provision of up-to-date training materials and best practices. (RurAL CAP, ANTHC, Housing Authority) Community workshops on energy-saving practices and safe installation procedures. Cooperative programs with local trade schools or adult education	Basic competency in tool use and safety: 1-2 months. Proficiency in basic retrofitting tasks like weatherization and thermostat installation: 2-4 months. Training and

	and power tools safely and effectively.	Basic tool safety and operation courses, including measures to prevent workplace injuries.	centers offering entry-level courses in home retrofitting and energy efficiency.	application of energy-efficient lighting retrofitting: 1-2 months.
Tribal Fleet Electrification	Maintenance and Troubleshooting: Knowledge of maintenance procedures for Electric Vehicles	Regular upskilling sessions on maintaining Electric Vehicles and diagnosing technical faults.	Specialized Training from vehicle manufacturer and auto repair entities.	Ongoing, with initial training taking 6-12 months and periodic updates as technology advances.

Appendices

Appendix A: Tribal Facility, Vehicle Energy Usage Data Collection Forms

This spreadsheet is the collection format with input directly provided by Tribal departments with actual infrastructure energy usage data.

Appendix B: Technical References

These spreadsheets are a comprehensive technical reference showing all calculations and assumptions that were used to develop the baseline GHG estimates and the recommended measures. These are provided as an Excel spreadsheet.