MTERA

Midwest Tribal Energy Resources Association, Inc.

EPA Climate Pollution Reduction Grant

Priority Climate Action Plan

Midwest Tribal Energy Resources Association

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Acronyms

AC	Alternating Current
ASHP	Air Source Heat Pump
BESS	Battery Energy Storage System
BTU	British Thermal Unit
CAP	Criteria Air Pollutant
CCAP	Comprehensive Climate Action Plan
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
COP	Coefficient of Performance
CPRG	Climate Pollution Reduction Grant
DC	Direct Current
DMV	Department of Motor Vehicles
DOE	Department of Energy
DOT	Department of Transportation
EIA	Energy Information Administration
EPA	Environmental Protection Agency
EV	Electric Vehicle
GHG	Greenhouse Gas
GPM	Gallons per Minute
GWH	Gigawatt-hours
HAP	Hazardous Air Pollutant
HUD	Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
IOU	Investor-Owned Utility
IPCC	International Panel on Climate Change
IRA	Inflation Reduction Act
ITC	Investment Tax Credit

kW, kWh	Kilowatt, Kilowatt-hours
LED	Light-emitting Diode
LIDAC	Low Income and Disadvantaged Communities
LNG	Liquified Natural Gas
MBH	Mega British Thermal Units per Hour
MEP	Mechanical, Electrical, Plumbing
MPG	Miles per Gallon
MROE	Midwest Reliability Organization East (EPA eGRID region)
MROW	Midwest Reliability Organization West (EPA eGRID region)
MT	Metric tons
MTERA	Midwest Tribal Energy Resources Association
MW, MWh	Megawatt, Megawatt-hours
N_2O	Nitrous Oxide
NEI	National Emissions Inventory
PCAP	Priority Climate Action Plan
PUC	Public Utilities Commission
PV	Photovoltaic (solar panels)
RFCW	Reliability First Corporation West (eGRID region)
SF	Square Feet
SLOPE	State and Local Planning for Energy (from National Renewable Energy Lab)
SOV	Single-occupancy Vehicle
TUA	Tribal Utility Authority
VMT	Vehicle Miles Traveled
WHO	World Health Organization

Definitions

Carbon Dioxide Equivalent (CO_2e): A unit of measure for the amount of global warming potential (GWP) that a greenhouse gas (GHG) has compared to carbon dioxide. For example, 1 kg of methane (CH_4) = 29.8 kg of CO_2e, which is the amount of CO_2 that would be emitted to cause the same amount of global warming. This allows for more accurate comparison of GWP between different GHG from various sources of emissions.

Clean / Renewable Energy: The production of energy to be used for electricity or heat through renewable energy sources that do not emit carbon into the air. These sources include solar, wind, water, and geothermal to name a few.

Decarbonization: The effort of eliminating carbon dioxide emissions from a process, project, or group.

EPA eGRID Region: U.S. Environmental Protection Agency (EPA) designated regions differentiated by specific electricity grid provider operation.

Fossil Fuels: A type of fuel made from decomposing plants and animals deep in the earth's crust that can be burned for energy. Natural gas, oil, and coal are all fossil fuels.

Greenhouse Gases (GHG): Gases that trap heat in the atmosphere. These gases include carbon dioxide, nitrous oxides, methane, and fluorinated gases. The Earth needs these gases in the atmosphere to trap heat and make the planet habitable, but the excess of GHG emissions leads to increased levels of heating resulting in a changing climate.

Mitigation: Prevention or intervention of climate harming activities. This includes reducing emissions and stabilizing levels of greenhouse gases in the atmosphere.

Natural Gas: Fuel source categorized as a fossil fuel. Natural gas can create harmful environmental impacts, such as pollution.

Particulate Matter (PM): Also called particle pollution, the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. PM causes severe health issues as well as contributing to environmental degradation.

Priority Climate Action Plan (PCAP): A document that is developed as part of a U.S. EPA Climate Pollution Reduction Grant (CPRG) Phase I Planning Grant, identifying priority measures for reducing GHG emissions and achieving other goals of the CPRG program, as well as a Low Income and Disadvantaged Community (LIDAC) benefits analysis.

Resilience: Ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies.

Scope 1 Emissions: Direct GHG emissions that occur from fossil fuel combustion. Common fuel sources are natural gas, propane, fuel oil, and coal, and these sources are most often used for heating systems and vehicles.

Scope 2 Emissions: Indirect GHG emissions that occur when fuel combustion occurs offsite and generates electricity to power a building or vehicle.

Sequestration or Carbon Sequestration: Reducing the amount of carbon in the atmosphere through capturing carbon dioxide. This is done naturally through either geological or biological measures. For example, forests are a large source of carbon sequestration.

Introduction

The Midwest Tribal Energy Resources Association (MTERA) has developed this Priority Climate Action Plan (PCAP) to support investment in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, spur economic growth, and enhance the quality of life for all 35 Midwest Tribes. Developed through the Climate Pollution Reduction Grant (CPRG) Planning Grant, this Priority Climate Action Plan intends to tackle damaging climate pollution, accelerate work to address environmental injustice, and empower community-driven solutions in Midwest Tribal communities.

The development of this Priority Climate Action Plan was developed in partnership with the eight participating Tribes listed below, guided by the Board Members representing the 23 Member Tribes and provides findings that are indicative of all 35 Tribes in the MTERA ecosystem.

- The Bad River Band of Lake Superior Chippewa
- The Fond du Lac Band of Lake Superior Chippewa
- The Grand Portage Band of Lake Superior Chippewa
- The Ho-Chunk Nation
- The Lac Courte Oreilles Band of Lake Superior Chippewa Indians
- The Leech Lake Band of Ojibwe
- The Minnesota Chippewa Tribe
- The Oneida Nation of Wisconsin

The decision to develop this PCAP in partnership with an eight-Tribe subset was guided by MTERA's goal to maximize the impact of CPRG Planning Grant funding by developing an in-depth Priority Climate Action Plan representative of all Tribes in the MTERA ecosystem, while ensuring that the benefits of such effort are available to all Midwest Tribes. These eight Tribes, comprising nearly a quarter of all Midwest Tribes, exhibit a mix of characteristics including size, location, economic resources, energy resources, and population density, and are intended to be an indicative sample of all Midwest Tribes that permits the findings in this priority climate action plan to be extrapolated to all 35 Tribes in the MTERA ecosystem. While the quantitative findings from the in-depth analysis of the eight Tribes data cannot be considered directly representative of all Midwest Tribes due to Tribal-specific limitations (including varying building stock and unique eGRID emissions factors that vary throughout EPA Region 5), the qualitative analysis provided in this PCAP paired with an understanding of each Midwest Tribe's individual circumstances can provide a meaningful synopsis of Midwest Tribal communities with regard to climate pollution reduction. The Priority Climate Action Plan and its components have been made available to all 35 Tribes in EPA Region 5 through a repository of CPRG Implementation Grant application resources.

The measures contained herein are intended to be broadly available to all federally-recognized Tribes in Environmental Protection Agency (EPA) Region 5 pursuing funding under the EPA's Climate Pollution Reduction Implementation Grants (CPRG) through both the General competition and Tribes & Territories competition as well as other funding streams, as applicable.

Following this PCAP, further detail and refinement of the inputs will be included in the Comprehensive Climate Action Plan (CCAP) scheduled to be completed no later than July 2025.

1. GHG Inventory

This greenhouse gas (GHG) inventory is a record of quantified emissions by source measured in carbon dioxide equivalent (CO_2e) for the CPRG PCAP. GHGs quantified account for the following three gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O). Emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) were not estimated to be emitted in traceable amounts. In cases where data inputs were not available to collect, proxy data was calculated from a representative boundary. This inventory is used to understand the current sources of GHG emissions for Tribes and understand sectors to prioritize for priority emission reduction measures. The data provided in this section is based on GHG inventories provided by the eight participating Tribes and has been extrapolated by population data provided by MTERA to demonstrate the emissions of all 35 MTERA Tribes. The scaling factor was determined by taking the sum total of population on Tribal Lands for all 35 MTERA Tribes and dividing by the eight-Tribe subset. Due to differences in available data for each Tribe, Appendix B provides individual Tribe GHG inventories and calculation methodologies.

Table 1: Tribal GHG Emissions Inventory

Sector	**Emissions – Eight-Tribe Subset (Metric Tons of CO_2e)**	**Emissions – MTERA 35 Tribes (Metric Tons of CO_2e)**
Stationary Energy (Buildings)	179,543	433,159
Transportation	217,605	524,985
Waste	4,874	11,759
Agriculture, Other Land Use	1,107	2,671
Total	**403,129**	**972,573**

Total GHG emissions from the eight-Tribe subset are 403,000 $MTCO_2e$ (metric tons of carbon dioxide equivalent) and extrapolated total emissions for all 35 MTERA Tribes are 972,000 $MTCO_2e$. As shown in Figure 1, most of the greenhouse gas emissions produced come from the Transportation and Buildings sectors, while less than 1% of emissions are from Waste. Table 2 shows differences in the inventory parameters from the eight-Tribe subset specific to the boundary of inclusion, sectors included, and ownership information.

Table 2: Tribal-Specific Inventory Information

	Area	Population	State	Counties	Sectors Included	Building Ownership
Bad River	193 mi^2	1,423	Wisconsin	Ashland	Transportation, Buildings, Waste	Tribal-owned & Tribal-member
Fond du Lac	155 mi^2	4,168	Minnesota	Carlton, St. Louis	Transportation, Buildings, Waste	Tribal-owned commercial & all residences
Grand Portage	75 mi^2	630	Minnesota	Cook	Transportation, Buildings, Waste	Tribal-owned buildings and Tribal-member residential buildings
Ho-Chunk	N/A	5,505	Wisconsin	Dane, Jackson, Juneau, La Crosse, Monroe, Sauk, Shawano, Wood	Transportation, Buildings, Waste	Tribal-owned and Tribal-member buildings
Lac Courte Oreilles	120 mi^2	8,200	Wisconsin	Sawyer	Transportation, Buildings, Waste	Tribal-owned buildings
Leech Lake	1,350 mi^2	11,456	Minnesota	Beltrami, Cass, Hubbard, Itasca	Transportation, Buildings, Waste	Tribal-owned commercial & all residences
Minnesota Chippewa	N/A	N/A	Minnesota	Cass	Buildings	Tribal headquarters buildings
Oneida	102 mi^2	4,648	Wisconsin	Brown, Outagamie	Transportation, Buildings, Waste	Tribal-owned buildings

1.1 Summary Across Sectors

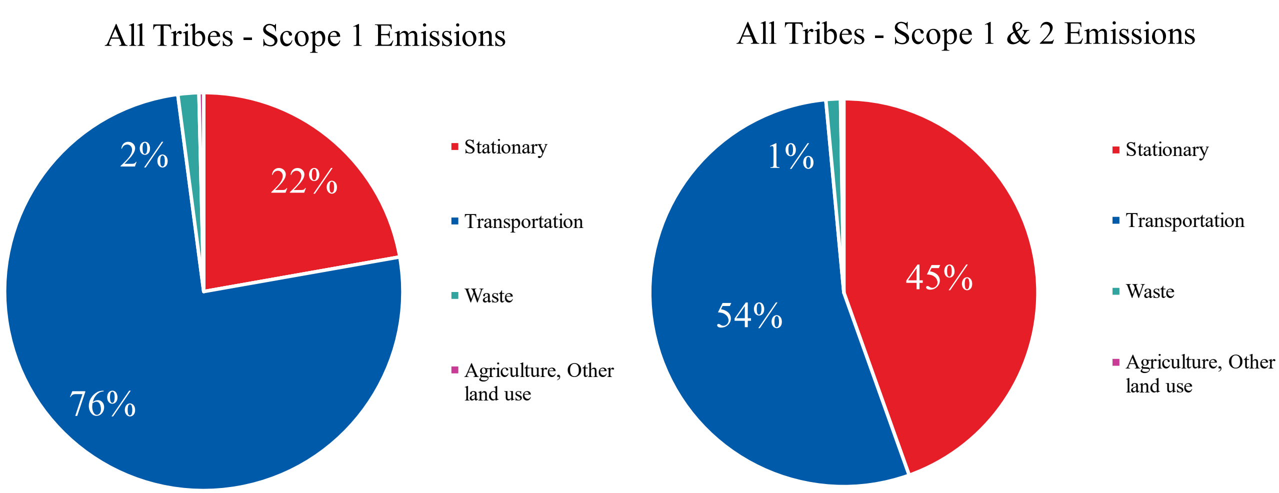

Figure 1: Summary of Emissions

GHG emissions are classified as direct (Scope 1) and indirect (Scope 2) based on the level of control a reporting entity has of the emitting source. Figure 1 shows the summary of all Tribal emissions; the first plot shows the Scope 1 emissions split across sectors, and the second plot shows the Scope 1 and 2 emissions split across sectors. In total, Transportation is the largest proportion of GHG emissions at 54%, followed closely by Stationary (from Buildings) with 45% of total emissions. Waste makes up 1% of total emissions, while Agriculture and Other Land Use makes up less than 1%. The majority of emissions for Stationary and

Transportation emissions occurs from carbon dioxide (CO2), whereas for Waste and Agriculture, methane (CH4) is often the most significant source of GHG emissions.

1.2 Buildings

1.2.1 Summary of Major Emissions

Based on PCAP estimates, commercial buildings emit the same amount of CO_2e as residential buildings (single-family and multifamily emissions combined). Within residential buildings, single-family buildings have 32% more emissions in aggregate than multifamily buildings. Some common commercial building types within the eight-Tribe subset are: gaming/entertainment, lodging, retail, healthcare, office, police/fire station, courthouse, recreation/community center, schools/colleges, museums, and storage/warehouse. For this PCAP analysis, a similar building type mix is assumed to exist on the Reservations of all 35 Tribes in the region with a similar expected emissions profile.

Industrial sector emissions were not found to be a significant source across the Tribes based on available data. Figure 2 shows the split of Scope 1 and 2 emissions across the eight-Tribe subset within the buildings sector. Scope 1 emissions (depicted in purple) are primarily resulting from the combustion of fuels, such as natural gas; while Scope 2 emissions (depicted in red) are from electricity. Figure 2 breaks down building emissions by both emission source and property type, showing that single-family buildings are most prevalent.

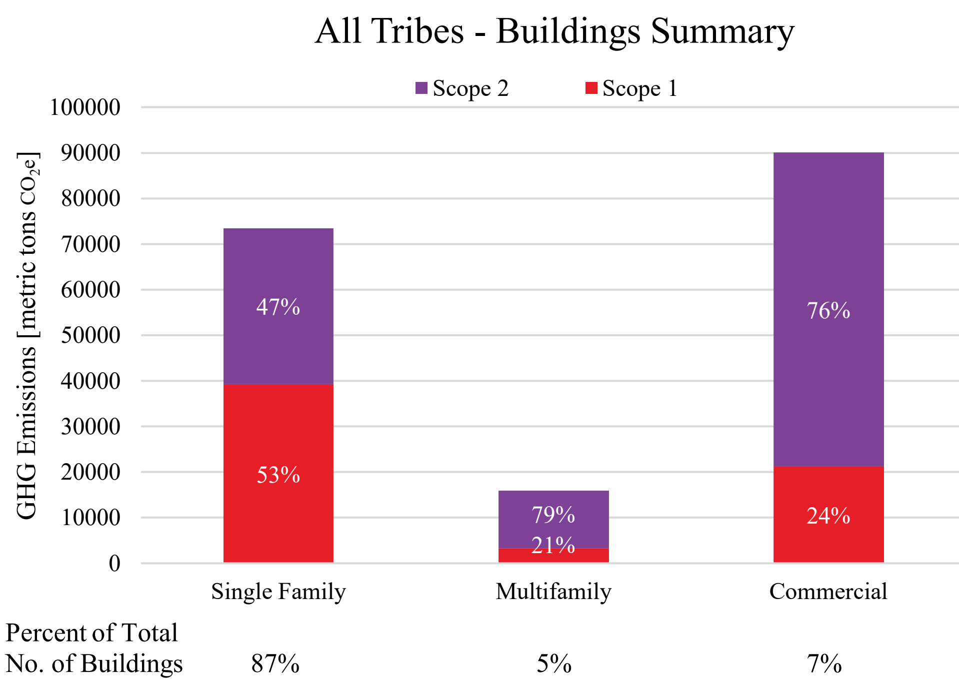

Figure 2: Building Emissions Summary

1.3 Transportation

1.3.1 Summary of Major Emissions

All reported Transportation emissions are Scope 1 from combustion vehicles. The majority of transportation emissions occur from on-road passenger cars and vehicles, which is calculated using proxy data when actual gasoline and diesel data was unavailable. Figure 3 shows the split between on-road gasoline vehicle emissions, on-road diesel emissions, and waterborne transportation emissions.

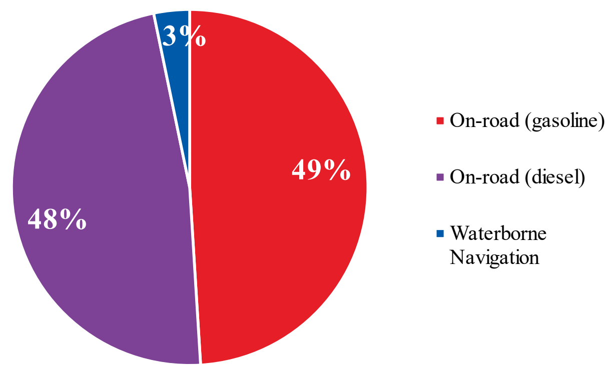

Figure 3: Transportation Emissions

1.4 Waste

1.4.1 Summary of Major Emissions

Waste information provided includes number of burn barrels, landfills, people served by anaerobic wastewater, aerobic wastewater, and septic systems. For the eight-Tribe subset there were no landfills onsite, and none of the Tribes were served by anaerobic wastewater treatment.

1.5 Processes for Improved Data Collection for Future Reporting

Future reporting will be improved as the data collection process continues. Several Tribes have requested data directly from third parties that that was unavailable for the PCAP but will be updated in the CCAP. This includes electric, gas, and propane utility data from utility companies, vehicle registration data from departments of motor vehicles, ridership numbers for public transportation, wastewater treatment plant data, gas station data on amount of sold fuel, and data on livestock and emissions associated with agriculture.

2. Priority GHG Reduction Measures

Reduction measures in this section are not exhaustive to reach all climate goals and GHG reduction targets of MTERA Tribes. The priority measures have been outlined in line with the EPA PCAP requirements of being near-term, high priority and implementation ready programs, policies, or projects.

The following section outlines GHG reduction measures across four categories: Energy Generation, Building Energy Consumption, Vehicle Emissions, and Environmental Management & Planning Techniques. At the beginning of each category, a summary table of estimated measure costs and annual GHG reduction is provided, both for the eight-Tribe Subset and extrapolated to the 35 MTERA Tribes based on population. The scaling factor was determined by taking the sum total of population on Tribal Lands for all 35 MTERA Tribes and dividing by the eight-Tribe subset. Appendix C: Reduction Measure Methodology includes further details for each measure, including baseline emissions, key assumptions, emissions methodology, emissions calculation, cost calculation, and cost methodology (as applicable).

2.1. Reduce Energy Generation Emissions

The following measures develop clean energy sources for electricity generation (including solar photovoltaics (PV), wind, and hydropower), heating and cooling energy through geothermal, and energy storage through battery systems integrated within microgrids. For each measure, the reduction in GHG comes from avoiding the generation of an equivalent amount of energy from the predominantly fossil-fuel powered electricity grid specific to each Tribal region.

2.1.1 Renewable Energy Development

Table 3: Renewable Energy Measures

		Eight-Tribe Subset		35 MTERA Tribes	
Reduction Measure	**Measure Description**	**Cost per Measure**	**$MTCO_2e$ Reduced**	**Cost per Measure**	**$MTCO_2e$ Reduced**
Install single-family renewables (PV, geothermal, wind)	29 MW of solar PV installed	$78,310,000	20,700	$188,920,000	49,900
	11 MW of wind installed	$92,240,000	21,100	$222,540,000	50,900
	30% of single-family homes install geothermal heat pumps	$67,500,000	9,400	$162,850,000	22,700
Install multifamily facility-scale renewables (PV, geothermal, wind)	15 MW of solar PV installed	$36,030,000	9,500	$86,930,000	23,000
	6 MW of wind installed	$45,270,000	10,400	$109,230,000	25,000
	30% of multifamily buildings install geothermal heat pumps	$10,750,000	800	$25,930,000	1,900
Install commercial facility-scale renewables (PV, geothermal, wind)	23 MW of solar PV installed	$61,550,000	16,300	$148,500,000	39,200
	11.5 MW of wind installed	$96,680,000	22,100	$233,240,000	53,400
	30% of commercial buildings install geothermal heat pumps	$26,350,000	4,700	$63,580,000	11,300
Implement community-scale renewables.	20 MW of solar PV installed	$35,220,000	14,200	$84,970,000	34,200
	20 MW of wind installed	$65,400,000	38,600	$157,780,000	93,000
	5 MW of hydropower installed	$12,870,000	8,700	$31,050,000	21,100
Implement utility-scale renewables	90 MW solar PV installed	$104,490,000	63,800	$252,090,000	153,800
	75 MW of wind installed	$131,250,000	144,600	$316,650,000	348,800

2.1.1.1. Solar Photovoltaics

Solar energy is a form of renewable energy that uses photovoltaics to generate power by absorbing energy from sunlight and converting it to electrical energy through semiconductor materials. The generation potential of solar photovoltaic systems on single-family homes and multifamily buildings was calculated using the PVWatts Calculator.[1] An average solar irradiance, representing the amount of sunlight reaching a solar panel, is based on data from Duluth, MN and Wausau, WI in the PVWatts software.

2.1.1.2. Wind Energy

Wind Energy is a renewable energy source created by using wind to make electricity through wind turbines. The wind spins the wind turbine's rotors, which in turn spin a generator to generate electricity. This reduction measure considers different scales of wind turbines; distributed wind turbines at the home or buildings scale, community scale wind turbines, and utility scale wind turbines. This measure assumes a capacity factor of 40%, in accordance with the Department of Energy's Land-Based Wind Market Report: 2023 Edition.[2]

2.1.1.3. Geothermal Heating and Cooling

Geothermal heat pump systems use the earth's natural heat to provide heating and cooling to a building. They are more energy efficient than the typical air-source heat pump (ASHP) due to the consistent temperature of the ground, unlike air temperature which is constantly changing. The coefficient of performance (COP) of geothermal heat pumps can range from 3.0 – 6.0, which is also much larger than typical ASHPs. There are three types of geothermal heat pump systems: vertical, horizontal, and pond/lake, all of which are space intensive; the system is chosen according to site constraints and feasibility, as it requires extensive site work to install geothermal heat pumps under an existing building.

2.1.1.4. Hydropower

Hydropower is a renewable source of energy that generates power from the use of a dam or other diversion that alters the natural low of a river. Hydropower uses turbines and generators to convert kinetic energy of water flowing across the diversion or dam into electricity. This measure focuses on what the DOE considers "small hydropower" sized between 100 kW and 30 MW.[3]

2.1.2. Energy Resilience

[1] *NREL PVWatts Calculator*. (1999). NREL PVWatts. Retrieved January 5, 2024, from https://pvwatts.nrel.gov/

[2] Department of Energy Office of Energy Efficiency and Renewable Energy. (2023). *Land-Based Wind Market Report: 2023 Edition* (R. Wiser & M. Bolin ger, Authors).

[3] Water Powers Technologies Office. (n.d.). *Types of Hydropower Plants*. Office of Energy Efficiency and Renewable Energy. Retrieved January 5, 2024, from https://www.energy.gov/eere/water/types-hydropower-plants

Table 4: Energy Resilience Measures

		Eight-Tribe Subset		35 MTERA Tribes	
Reduction Measure	**Measure Description**	**Cost per Measure**	**$MTCO_2e$ Reduced**	**Cost per Measure**	**$MTCO_2e$ Reduced**
Install building-level solar & storage	40 MW of solar PV paired with 4-hour storage	$117,760,000	30,700	$284,100,000	74,100
Develop clean energy microgrids	200 MW of solar PV paired with 4-hour storage	$588,800,000	153,900	$1,420,520,000	371,300

2.1.2.1. Building Level Solar PV + BESS

Building level solar, paired with Battery Energy Storage Systems (BESS), are designed for smaller-scale installations. This measure is meant for smaller solar and storage systems integrated at the building scale. Its emissions methodology is identical to that of the preceding Solar Microgrids measure.

2.1.2.2. Solar Microgrids

Microgrids collect, store, and distribute energy. Solar microgrids are microgrids that are supplied by solar PV energy. The solar panels connected to a microgrid provide energy for either direct use by buildings that are connected to the microgrid or to batteries for storage and later use. Microgrids reduce emissions to a greater degree than solar PV systems alone by providing renewable energy that can be used during times when the electric grid has a high emission factor from generating electricity using fossil fuels.

2.2. Reduce Building Energy Emissions

Table 5: Building Energy Measures

		Eight-Tribe Subset		35 MTERA Tribes	
Reduction Measure	**Measure Description**	**Cost per Measure**	**$MTCO_2e$ Reduced**	**Cost per Measure**	**$MTCO_2e$ Reduced**
Electrify heating equipment	60% of all buildings retrofit to heat pumps	$148,980,000	33,300	$359,420,000	80,400
Install high-efficiency appliances, low flow fixtures for residences	60% of single-family & multifamily buildings install low-flow fixtures	$190,000	1,700	$460,000	4,200
	60% of residential buildings upgrade appliances	$72,340,000	1,600	$174,540,000	3,800
Install weatherization – insulation and weatherstripping	60% of single-family homes & multifamily buildings implement air sealing & insulation	$28,920,000	21,800	$69,770,000	52,500
	60% of commercial buildings install roof & wall insulation, window films	$6,560,000	3,200	$15,840,000	7,700

Retrofit interior lighting to LEDs	100% of interior & exterior lighting of all buildings to LEDs	$5,530,000	8,300	$13,340,000	20,100
Install smart thermostats	60% of buildings install smart thermostats	$3,210,000	8,600	$7,750,000	20,800
Adopt green building standards for major renovations	15% of buildings undergo major renovation projects	*	4,000	*	9,700

*No hard costs were calculated for the green building standards due to variability of existing building stock, regulations, and policy strategy. See Appendix C for more details.

2.2.1. Building Retrofits & Energy Conservation Measures

2.2.1.1. Electrification of Heating Equipment

Residential and commercial heating can be a large source of emissions. Many buildings are heated using combustion-based equipment and if the system is older, it can often be inefficient, leading to further energy consumption. Transitioning from combustible fuels for heating involves replacing existing equipment with all-electric systems, such as heat pumps. Heat pumps are significantly more efficient than other heating systems due to their ability to utilize existing heat, making them a valuable heating choice for higher efficiency and emissions reductions.

2.2.1.2. Installation of High-efficiency Appliances

Residential electricity use is made up of many components, including appliances used daily for cooking, cleaning, and cooling. These appliances include refrigerators, dishwashers, washing machines, clothes dryers, and air conditioning, among others. Installing newer appliances that are more energy- and water-efficient or abide by higher efficiency standards and certifications, such as EnergyStar rating, can help conserve energy and reduce emissions.

2.2.1.3. Installation of Low-flow Fixtures

Low-flow fixtures are specifically designed plumbing components that help reduce the flow rate of water to reduce water waste in relevant applications, such as sink or kitchen faucets, and showerheads. Reducing water waste helps conserve water, which also reduces the amount of energy needed to heat water, providing energy and cost savings.

2.2.1.4. Building Weatherization Retrofits

Weatherization is a series of energy efficiency retrofits that apply to a building envelope to reduce air infiltration and increase thermal resistance, to protect the interior of the building from exterior weather and temperature. Reducing air infiltration and adding insulation allows for a more stable indoor temperature, and therefore reduces the heating and cooling loads for buildings. This leads to a significant amount of energy savings and emissions reduction.

2.2.1.5. Interior & Exterior Lighting Upgrade to LEDs

Lighting emitting diode (LED) light bulbs are currently the most energy efficient products on the market. Switching to LED light bulbs is a low effort energy efficiency measure that has a significant impact on a building's energy use, particularly for commercial buildings.

2.2.1.6. Smart Thermostat Installation

Smart programmable thermostats have the potential to significantly reduce energy use from heating and cooling by adjusting setpoints based on occupancy patterns. For example, office buildings can be set higher temperatures during the summer and lower temperature during the winter to avoid cooling or heating the space more than necessary – and can be programmed to reduce space conditioning after 6pm, when the building is likely to be empty. This reduction measure quantifies the reduction in emissions due to energy savings from installing smart programmable thermostats in buildings.

2.2.2. Introduce New Building Standards

2.2.2.1. Adopt Green Building Standards for Major Renovations

Green building standards are a comprehensive way to upgrade building systems for greater energy efficiency. Implementing energy codes and minimum efficiency standards facilitates emissions reduction for existing buildings and new construction. Green buildings tend to have heating, ventilation, and air conditioning (HVAC) and mechanical, electrical, and plumbing (MEP) systems that are more efficient, more insulation, better window constructions, and can be all-electric.

2.3. Reduce Vehicle Emissions

2.3.1 Mode Shift

Table 6: Vehicle Measures

		Eight-Tribe Subset		35 MTERA Tribes	
Reduction Measure	**Measure Description**	**Cost per Measure**	**$MTCO_2e$ Reduced**	**Cost per Measure**	**$MTCO_2e$ Reduced**
Increase transit service	10% mode shift to bus	*	5,700	*	13,900
Influence ridesharing	50% mode shift to rideshare	*	4,400	*	10,500
Develop active transport network	30% mode shift from SOVs to biking/walking	*	5,200	*	12,600

* No hard costs were calculated for mode-shift measures due to the variability of implementation strategy and existing transit infrastructure, see Appendix C for more details.

2.3.1.1 Increase Transit Service

This reduction measure calculates emissions associated with mode shift from single-passenger vehicles to transit buses. According to the U.S. Department of Transportation (DOT), bus transit produces 33% less greenhouse gas emissions per passenger mile than an average single-occupancy vehicle[4] (SOV). This statistic was used to calculate emissions associated with a 10% mode shift to buses from single-occupancy vehicles. 10% of the baseline emissions from gasoline-powered SOVs was reduced by 33% to calculate the ultimate emissions reduction.

2.3.1.2 Increase Ridesharing

Ridesharing or carpooling can significantly reduce emissions associated with SOVs. This reduction measure calculates emissions associated with mode shift from SOVs to rideshare vehicles. A 2018 research study demonstrates a 5% VMT reduction by carpooling rather than driving SOVs for trips.[5] This calculation uses the baseline emissions associated with gasoline-powered SOVs and assumes 50% of the Tribal population shifts to rideshare vehicles.

2.3.1.3 Develop Active Transport Network

This reduction measure calculates emissions associated with a mode shift from SOVs to an active transport mode such as walking, running, or biking. Research demonstrates that walking or cycling can save nearly 10% of CO_2e emissions from car travel (assuming 41% of short car trips less than 3 miles are avoided).[6] In order to quantify this measure across all Tribes, a 30% mode shift to active transport was assumed.

2.3.2 Introduce Vehicle Electrification & Alternative Fuel Vehicles

Table 7: Vehicle Electrification & Alternative Fuel Measures

		Eight-Tribe Subset		35 MTERA Tribes	
Reduction Measure	**Measure Description**	**Cost per Measure**	**MTCO₂e Reduced**	**Cost per Measure**	**MTCO₂e Reduced**
Electrify SOV vehicles & provide charging infrastructure / hydrogen fuel cells	Assumes 80% of single-occupancy vehicles are converted to electric vehicles (EVs)	$6,920,000	65,600	$16,690,000	158,300
Convert bus fleet to electricity, hydrogen, or lower-emission fuels	Assumes half of buses converted to lower-emission fuels and half converted to electricity or hydrogen	$13,130,000	2,000	$31,690,000	4,900

[4] *Public transportation's role in responding to climate change.* (2010, January). U.S. Department of Transportation Federal Transit Administration. Retrieved January 5, 2024, from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PublicTransportationsRoleInRespondingToClimateChange2010.pdf

[5] Shaheen, S., Cohen, A., & Bayen, A. (2018). *The benefits of carpooling.* UC Berkeley Transportation Sustainability Research Center. Retrieved January 5, 2024, from https://escholarship.org/uc/ item/7jx6z631

[6] *Assessing the potential for carbon emissions savings from replacing short car trips with walking and cycling using a mixed GPS-travel diary approach.* (2019, May). Transportation Research Part A: Policy and Practice. Retrieved January 5, 2024, from https://www.sciencedirect.com/science/article/pii/S0965856417316117#:~:text=Taking%20into%20account%20individual%20travel,to%20existing%20walking%20and%20cycling.

2.3.2.1 Electrify Bus Fleet & Provide Charging Infrastructure

Electric buses result in much lower GHG emissions than diesel-burning buses; not only do they have zero tailpipe emissions, but as the electric grid continues to decarbonize, the emissions associated with powering electric buses will continue to decrease. If electric buses are powered 100% by on-site renewables, this would result in a full offset of baseline diesel emissions.

This reduction measure assumed an average grid emissions factor to calculate associated emissions. The baseline case for all buses within Tribes were assumed to run on diesel. To calculate the emissions associated with electrifying bus fleets, the miles per gallon (mpg) of the vehicles was conservatively assumed to be 6.2, based on data released by the U.S. Department of Energy (DOE) on average fuel economy for school buses,[7] last updated in February 2020. The annual miles traveled based on this mpg and gallons of diesel from the gallons of diesel from the GHG inventory were used to calculate kWh by assuming electric buses would have an efficiency of 1.5 kWh/mile, based on data from the DOE's alternative fuels data center[8]. An average of the EPA eGRID emissions factors from both MROW and MROE were used to calculate emissions associated with the annual electricity used to power the converted electric vehicles.

2.3.2.2 Provide Alternative Fuel Buses (Biodiesel, CNG, LNG, Propane)

"Alternative fuel buses" refers to buses that run on fuels other than diesel. In this reduction measure, biodiesel, compressed natural gas (CNG), liquified natural gas (LNG), and propane were used. These fuels all run cleaner than diesel, releasing fewer lbs CO_2e into the atmosphere than a diesel engine.

2.3.2.3 Electrify SOV & Provide Charging Infrastructure

The second reduction measure related to vehicle electrification is providing EV infrastructure to influence adoption among passenger vehicles. For the PCAP, 80% of SOVs were assumed to adopt EVs. In order to calculate emissions associated with this reduction, the emissions from gasoline-powered cars were compared to the emissions associated with electric vehicles for the equivalent number of miles traveled.

2.4 Implement Environmental Management & Planning Techniques

Table 8: Environmental Management & Planning Measures

		Eight-Tribe Subset		35 MTERA Tribes	
Reduction Measure	**Measure Description**	**Cost per Measure**	**$MTCO_2e$ Reduced**	**Cost per Measure**	**$MTCO_2e$ Reduced**
Sequester carbon through plants	100,000 trees planted	$30,000,000	1,200	$72,380,000	2,900
	100,000 shrubs planted	$2,500,000	20	$6,030,000	50

[7] *Average fuel economy by major vehicle category*. (2020, February 5). U.S. Department of Energy, Energy Efficiency and Renewable Energy, Alternative Fuels Data Center. Retrieved January 5, 2024, from https://afdc.energy.gov/data/10310

[8] *Flipping the Switch on electric school buses: charging infrastructure: module 1.* (n.d.). U.S. Department of Energy, Energy Efficiency and Renewable Energy, Alternative Fuels Data Center. Retrieved January 5, 2024, from https://afdc.energy.gov/vehicles/electric_school_buses_p4_m1.html#:~:text=A%20typical%20bus%20can%20travel,energy%20for%20every%20mile%20traveled

	1 million sf of grassland restored	$500,000	70	$1,210,000	180
Develop green infrastructure	800,000 sf of bioswales developed	$400,000	60	$970,000	140
Implement responsible development & zoning policies	20% of population affected by responsible development	*	4,000	*	9,700

* No hard costs were calculated for responsible development measure due to the variability of implementation strategy and existing zoning and policy; see Appendix C for more details.

2.4.1 Sequester Carbon Through Plants

The carbon sequestration potential of planting trees, grasses, and shrubs was calculated using the Climate Positive Design's Pathfinder tool[9] which provided carbon sequestration rates, which were used to assume appropriate values for the generalized plants.

2.4.2 Develop Green Infrastructure

Green infrastructure is a method of low-impact development that protects, restores, or mimics the natural water cycle. It reduces emissions by treating water naturally via rain gardens, bioswales, permeable pavements, and green streets. Stormwater can be treated through these methods rather than by a central wastewater treatment plant that collects runoff from hardscapes. Ultimately, this results in a reduction of energy used for water pumping and treatment. Additionally, bioswales provide carbon sequestration.

To quantify this reduction measure, bioswales were assumed to replace parking spots. While there are many diverse types of vegetation that can be used to develop a bioswale, the most common one used to calculate carbon sequestration is perennial grasses.

2.4.3 Implement Responsible Development & Zoning Policies

Changing zoning to support more transportation-efficient land use patterns ultimately reduces vehicle miles traveled (VMT). Transportation emissions are reduced due to minimized driving distances from denser housing & increased proximity to commercial spaces. The resulting emissions associated with gasoline from that reduction in VMT was calculated as the emissions reduction for this measure.

[9] *Get started using the Pathfinder*. (n.d.). Climate Positive Design. Retrieved December 19, 2023, from https://climatepositivedesign.com/pathfinder/; this online tool and application requires a sign-in to access the tool and underlying values for this measure.

3. Benefits Analysis

In addition to reducing greenhouse gas emissions, the priority measures included in this PCAP reduce co-pollutants including Hazardous Air Pollutants (HAP) and Criteria Air Pollutants (CAP) within Tribal communities. This analysis includes a baseline air pollution emissions inventory of co-pollutants for the counties associated with each of the eight-Tribe subset. The qualitative components of the benefits analysis described in this section can be broadly applied to all 35 Midwest Tribes.

3.1. Co-Pollutant Emissions Inventory

To develop the co-pollutant baseline emissions inventory, data was pulled from the EPA National Emissions Inventory (NEI) at the facility and county level. For the eight MTERA Tribes included within this PCAP, Fond du Lac is the only Tribe with facility-level data from the NEI pertaining to the Cloquet Carlton County Airport, which PCAP measures are not likely to influence. This analysis uses county-level data for the counties which best represent the Tribal jurisdictions for the eight-Tribes as shown in Table 20.

Table 9: Counties used for NEI data by Tribe

Tribe	State	Counties
Bad River	Wisconsin	Ashland
Fond du Lac*	Minnesota	Carlton, St. Louis
Grand Portage*	Minnesota	Cook
Ho-Chunk[10]	Wisconsin	Dane, Jackson, Juneau, La Crosse, Monroe, Sauk, Shawano, Wood
Lac Courte Oreilles	Wisconsin	Sawyer
Leech Lake*	Minnesota	Beltrami, Cass, Hubbard, Itasca
Oneida	Wisconsin	Brown, Outagamie

* Denotes Bands that are members of the Minnesota Chippewa Tribe. To avoid double-counting, Minnesota Chippewa is not listed as a unique row. See Appendix for co-pollutant inventory table specific to Minnesota Chippewa Tribe, consistent with GHG Inventory approach.

Though the 2020 NEI dataset includes emissions from many different sectors, this emissions inventory includes "Fuel Combustion" from building types "Commercial/Institutional" and "Residential" to account for PCAP building retrofit measures, as well as "Miscellaneous Non-Industrial Not Elsewhere Classified" – pertaining to "Fluorescent Lamp Breakage" due to PCAP lighting retrofit measures. Consistent with EPA guidance, base year inventories for the transportation sector were not provided. For a detailed description of how the data from Table 19 was determined for the Co-Pollutant Emissions Inventory, as well as a table presenting this info by Tribe, please see Appendix D: Co-Pollutant Emissions Inventory Analysis.

Note that due to the lack of PCAP GHG reduction measures associated with industrial categories, co-pollutant emissions changes were not reported.

[10] For the Ho-Chunk Nation, which encompasses several counties in Wisconsin, the counties with the highest concentration of Tribal membership and Tribal-owned facilities were used for the co-pollutant emissions inventory. This was done in order to stay consistent with the approach used in the GHG Inventory, which was based on conversations with representatives of the Ho-Chunk Nation.

Table 10: NEI Base Year Co-Pollutant Emissions Inventory (Total Across Eight-Tribe Subset)

CAP + HAP Total		**65,419**
CAP	**Total CAP**	**63,560**
	Ammonia	670
	Carbon Monoxide	40,814
	Nitrogen Oxides	4,552
	Volatile Organic Compounds	5,561
	Sulfur Dioxide	221
	PM10 Primary	5,927
	PM2.5 Primary	5,815
HAP	**Total HAP (see Appendix D for full list)**	**1,859**

3.2. LIDAC Benefits Analysis

Tribes are not required to complete Low-Income and Disadvantaged Communities (LIDAC) Analysis in the initial PCAP since Tribal Nations and the land within the Reservation boundaries of federally-recognized Tribes are designated as disadvantaged on resources such as the Climate and Economic Justice Screening Tool (CEJST) and the Environmental Justice Screening and Mapping Tool (EJScreen). The census tract information for all 35 Midwest Tribes in the MTERA ecosystem is included in Appendix E.

Aside from GHG and co-pollutant reductions, the priority measures within this PCAP provide additional community benefits to Tribal communities and surrounding areas. This analysis includes a qualitative outline of expected environmental, economic, social, and health benefits expected through the implementation of GHG reduction measures.

3.3. Qualitative Community Benefits

Community benefits represent the broad range of additional benefits from greenhouse gas reduction measures that influence a community's public health, economy, natural environment, and quality of life. Table 20 summarizes the community benefits anticipated through the implementation of PCAP GHG reduction measures. In the sections that follow, further details regarding these community benefits are provided, broken out by PCAP measure strategy area: renewables, building retrofits, transportation, and land use.

A core element to the majority of PCAP measures is the reduction of overall air pollution through avoided combustion of fossil fuels. Air pollution's downstream health impacts are incredibly detrimental to human health; including asthma exacerbation, cardiovascular illness, adverse birth outcomes such as low birthweight and preterm delivery, and increased emergency room visits, hospitalizations, and fatalities.[11] Any reduction in fossil fuel extraction that cause or reduction in energy use translates to improved air quality and public health.

[11] US EPA,ORD. (2017, November 2). *Disease and Conditions* | US EPA. US EPA. https://www.epa.gov/report-environment/disease-and-conditions

Table 11: Community Benefits Summary Tab

PCAP Measures	Environmental	Public Health	Economic	Other
Renewable Energy • Solar PV + Storage • Wind • Geothermal • Clean energy microgrids	• Reduction in air pollution	• Reduction in hospitalization & respiratory issues	• Job creation • Potential to sell excess energy	• Energy independence • Climate resilience to grid outages through storage
Building Energy Efficiency • Electrify heating equipment • High efficiency appliances • Low-flow fixtures • Weatherization • LED lighting • Smart thermostats • Green building standards	• Reduction in air pollution	• Improved respiratory health • Improved indoor thermal comfort	• Lower energy bills • Job creation	• Greater passive survivability and resilience (in the event of a power outage) • Reduced risk of power outage from decreased loads on utility grid
Transportation • Increase transit service • Influence ridesharing • Active transport network • Electrify SOVs and provide charging infrastructure • Low-to-Zero emissions bus fleet	• Reduction in air pollution • Reduction in noise pollution	• Improved health from physical activity (walking, biking) • Reduced risk of risk of chronic diseases	• Job creation • Transit accessibility to jobs and economic opportunities	• Increased connectivity of communities • Energy independence • Improved community relationships with increased opportunity for social interactions on public transit • Decreased traffic congestion
Land Use • Plant trees, shrubs, and grass • Green infrastructure • Zoning policies	• Improved air quality • Stormwater mitigation • Reduction in soil erosion • Increased ecosystem support and biodiversity	• Improved respiratory health and faster patient recovery • Improved well-being • Improved indoor and outdoor thermal comfort	• Lower energy bills	• Addresses socio-spatial inequity by promoting better land-use and zoning • Improves resilience by reducing heat island effect

3.3.1. Renewable Energy Development

Renewable energy projects can strengthen Tribal sovereignty by providing benefits across economic, social, environmental, and cultural focus areas [12].

[12] Tsinnajinnie, L., & Begay-Campbell, S. (2006, August 25). *Benefits of Renewable Energy for Native Nations from the Environmental and Native Perspectives*. Retrieved February 8, 2024, from https://www.energy.gov/sites/prod/files/2016/01/f28/interns2006tsinnajinnie.pdf

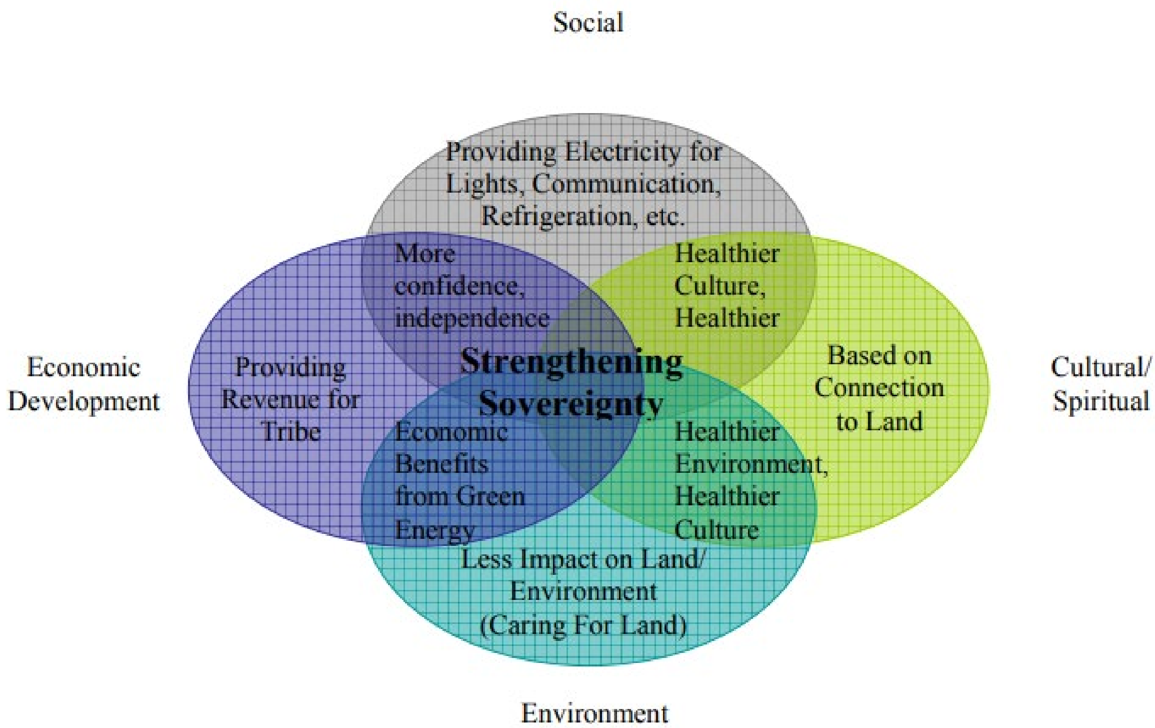

Figure 4: Categories of Renewable Energy Benefits for Tribal Nations

In addition to many human health benefits from the reduction of fossil fuel combustion, renewable energy development on Tribal land can help promote climate resilience through reduced reliance on the electric grid and the furthering of energy independence. Tribally-managed renewable energy generation and energy storage allows Tribes to maintain power during grid outages due to disruptions, such as those from extreme weather events. Further development in grid-interactive technologies can allow microgrids to also discharge to the grid during times of high stress and enable a stronger, more resilient grid infrastructure. These new projects also provide a long-term pipeline to many different careers in the clean energy industry for Tribal members.

3.3.2. Building Energy Efficiency

Energy cost savings from building efficiency projects can provide direct economic savings to building owners and renters. While some projects are easily managed by a homeowner or renter, others will spur career development and skilled labor expansion in the workforce. In addition to these key economic benefits, energy efficiency measures also can provide human health benefits in greater thermal comfort and overall wellbeing.

3.3.3. Transportation

Reduced emissions from transportation measures can support healthier communities through enhanced air quality and increased human activity.

The benefits from zero tailpipe emission vehicles, like EVs, result in improved air quality for the vehicle driver and passengers as well as the surrounding community.

Vehicle electrification also presents an opportunity for economic vitality - new jobs are emerging in vehicle maintenance, charger installation, and charger equipment maintenance.

3.3.4. Environmental Management and Planning Techniques

Planting trees, shrubs, and grasses in communities contribute many benefits towards health, air quality, stormwater mitigation, habitat preservation and mitigating urban heat islands.

Intentionally designed landscapes can help to provide wind breaks in winter months and shade in summer months. Adjacent to transportation corridors, planting can sequester CO_2 emissions and provide an acoustic barrier to surrounding areas.

In addition to planting efforts, zoning policies and land use planning can influence mental wellbeing and human health, while also driving strong economic outcomes.

4. Authority to Implement

The Midwest Tribal Energy Resources Association has reviewed existing statutory and regulatory authority to implement each priority measure continued in this PCAP. For any priority measure where authority must still be obtained, this section contains a schedule of milestones for actions needed by key entities for obtaining any authority needed to implement such measure(s).

The path to ensuring Tribes' authority to implement GHG reduction measures varies greatly throughout EPA Region 5. Driven by a range of stakeholders including federally-recognized Tribes, state governments, local governments, utilities, and individual residents, each Tribe is characterized by a unique regulatory landscape that will define their path forward to achieving ambitious climate pollution reduction goals. **While state, local, and utility regulations are important considerations, it is crucial to note that all Tribes may choose to exercise Tribal sovereignty should state and state-regulated utility policy prevent the implementation of priority measures.** Because this situation is unique to Tribes, an overview of Tribal sovereignty and how it applies to energy-related activities on Tribal land is provided below.

4.1. Overview of Tribal Sovereignty

Sovereignty refers to the independence and autonomy of a Tribe, state, government, or political entity to govern without external interference. It enables a government to establish and enforce its own laws. Within the United States, there are specific criteria and hierarchies that define the relationships between sovereigns. The concept of supremacy, where one sovereign has authority over others for the common good of a nation, grants the federal government the power to supersede state and Tribal authority in certain instances. The United States derives its authority from its citizens, as outlined in founding documents such as the United States Constitution. The federal government, as the supreme authority, determines the areas in which states can govern themselves, effectively granting state sovereignty.

In contrast, Tribes were recognized as preexisting sovereigns with inherent authority when the United States was formed. They had established relationships, signed treaties, and interacted with the federal government as independent nations. The creation of numerous treaties led to the development of government-to-government relationships between individual Tribes and the federal government, resulting in the concept of Tribes as "domestic dependent nations." These entities possess distinct independent authority but remain subject to certain powers of the United States, including the application of certain federal laws.

Tribal sovereignty, therefore, refers to the inherent right of Tribes to govern themselves, their borders, lands, and people. It is unique in that it is directly tied to cultural beliefs, lands, and historical traditions. While sovereignty grants Tribes the right to establish their own government, determine membership requirements, enact legislation, and establish law enforcement and court systems, these rights are based on a distinct culture and history that protects an important way of life for each of the 574 federally-recognized Tribes in the United States. Sovereignty is not just a political concept that provides Tribes with power, but also a mechanism to protect important cultural and historical aspects of a Tribe, which can have a significant impact on government-to-government interactions. **Tribes are not subject to individual states' laws and are entitled to regulate and operate independently of states.** This provides a pathway to leverage sovereignty to overcome regulatory or policy barriers defined at the state-level that may hinder Tribal implementation of priority measures, as described below.

4.2. Tribal Authority to Implement Priority Measures: Reduce Emissions from Energy Generation

There is a variety of federal, state, and utility policies that impact Tribal authority to implement reduction measures associated with reducing emissions from energy generation. This section first provides an overview of the federal policies that impact Tribes' authority to implement utility-scale generation and clean energy microgrids regardless of state affiliation. This section then provides a state-by-state overview of the relevant state and federal policies that impact all 35 Midwest Tribes' authority to implement renewable energy development and energy resilience measures. For all reduction measures covered under the goal of reducing emissions from energy generation, progress will be tracked by quantifying increases in clean energy generation and metrics associated with energy resilience including outage frequency and duration. Implementation schedule of such measures will be identified and directed by individual Tribal CPRG Implementation Grant applicants.

Table 12: Goals, Strategies, and Priority Reduction Measures

GOAL	STRATEGY	REDUCTION MEASURE
REDUCE EMISSIONS FROM ENERGY GENERATION	Renewable Energy Development	Install residential single-family renewables (PV, geothermal, wind)
		Install multifamily facility-scale renewables (PV, geothermal, wind)
		Install commercial facility-scale renewables (PV, geothermal, wind)
		Implement community-scale renewables.
		Implement utility-scale renewables
	Energy Resilience	Install building-level solar & storage
		Develop clean energy microgrids
REDUCE ENERGY CONSUMPTION FROM BUILDINGS (COMMERCIAL & RESIDENTIAL).	Building Retrofits & Energy Conservation Measures	Electrify heating equipment.
		Install high-efficiency appliances, low-flow fixtures for homes & residences
		Install weatherization - insulation & weatherstripping
		Retrofit interior lighting to LEDs
		Install smart thermostats
	New Building Standards	Adopt green building standards for major renovations
REDUCE EMISSIONS FROM VEHICLES	Mode-shift	Increase transit service
		Influence ride sharing
		Develop active transport network
	Zero Emissions Single-occupancy vehicles	Electrify SOV vehicles & provide charging infrastructure / hydrogen fuel cells
	Low or Zero Emissions Bus Fleet	Convert bus fleet to electricity, hydrogen, or lower-emission fuels
ENVIRONMENTAL MANAGEMENT & PLANNING TECHNIQUES	Land Use	Sequester carbon through plants
		Develop green infrastructure
		Implement responsible development & zoning policies

4.2.1. Authority to Implement Utility-Scale Generation and Clean Energy Microgrids

All energy enterprises in the United States, including Tribal utilities, Tribal energy businesses, and Tribal renewable or traditional energy generators, must comply with applicable federal laws. Under the Commerce Clause of the U.S. Constitution, Congress has the power to regulate commerce among the states and with Indian Tribes. Generally, Congress can regulate any commodity sold across state lines, known as interstate commerce. Any commerce not governed by federal law can be locally regulated.

The federal laws that define the split between federal, state, or local jurisdiction include the Federal Power Act (FPA), the Department of Energy Organization Act of 1977, the Energy Policy Act, and the Public Utility

Regulatory Policies Act of 1978. Tribal utilities doing business in a federally regulated manner or Tribes wishing to build or own facilities connected to the grid must comply with federal law and regulations.

Because utility-scale projects are interconnected to the federally regulated transmission system, federal policy will generally apply to priority measures related to utility-scale energy development.

The question of jurisdictional authority over projects that are not interconnected to the transmission system becomes more complex. In general, the following key facts apply to the options MTERA Tribes have to implement priority measures:

- **Implement priority projects based on the de facto regulations and policies set by state regulators and local utilities.** In some cases, Tribes will choose to accept the current policy defined by non-Tribal entities because the policy does not prevent the Tribe from implementing its priority measures. The existing set of policies for each state are summarized in the following sections. Pursuing this option would be the quickest and lowest risk path for implementing priority measures; however, it may not be available to all Tribes if existing policy is not aligned with the Tribe's priority measures.
- **Leverage Tribal sovereignty to enable the implementation of priority measures that are restricted based on the current de facto regulations and policies set by non-Tribal entities**. In some cases, existing policy will constrain a Tribe's ability to implement priority measures in a way that aligns with the Tribe's energy vision and goals. Under such a scenario, the Tribe could leverage its inherent sovereignty to redefine the policies to better align with the Tribe's priority measures. The specifics of how a Tribe would pursue this route depend on *where* the activity takes place (land ownership and designation), *who* is involved, and the type of interests at stake.

In terms of where the activity takes place, there are four common Tribal land holdings:

Allotted lands: Land owned by the United States in trust for one or more individual Tribal members. Allotments may not be within a Reservation's boundaries and may not be affiliated with a Tribe.

Restricted fee lands: Land to which a Tribe or individual Tribal member holds legal title, but the title is subject to restrictions by the United States against alienation or encumbrance.

Fee or fee simple lands: Lands previously conveyed out of Tribal ownership that are freely alienable or can be encumbered without federal approval. Fee lands may be owned by non-Indians or may be repurchased and owned by a Tribe or individual Tribal members. Tribally owned fee lands do not have the same restrictions that trust lands have. Fee lands may be within or outside of the Reservation. Fee lands within the Reservation may be owned by non-Indians. State and local laws typically apply on fee land outside of Reservations and may apply on fee land within Reservations.

Trust land: The federal government holds title to the land. The use of trust land is governed by Tribes. The land is not subject to state laws but is subject to certain federal laws.

In terms of who is involved, almost all Reservations have third party utility companies providing services to the Tribe and to Tribal members, with the exception of a small number of Tribes in the Midwest with Tribally-owned utilities. Most of the utility companies operating on Reservations are under some type of state sanction and in many cases the utility's activities, rates, and service standards are governed or regulated by state public utility commissions. Because of this, there is a de facto application of state rules by the utilities to their Tribal customers on Indian lands. In most cases, the Tribal members and Tribes have not questioned utility policies and rate tariffs established under state rules and regulations and have paid the charges as an assumed condition of service. Utility policies generally apply to the whole utility service territory, and not just to the part outside of Indian Country. Generally, Indian Tribes and their members pay the utility rates published by the utility. However, Tribal sovereignty affords the Tribe the ability to push back on the situation where a state-regulated utility requires the Tribe to participate in state mandated programs, contribute to state energy policy goals, or pay the state approved rates. As Tribes aim to implement priority measures, they do not want to be limited by their utility's state-approved policies, or by a utility's full-requirements contracts (which were not approved by the Tribe) which limit customer generation options.

The following section provides a state-by-state overview of the relevant state and federal policies that impact Tribes' authority to implement renewable energy development and energy resilience measures. The Michigan, Minnesota, and Wisconsin state restrictions detailed in this section apply only to Tribes who have not exerted Tribal sovereignty through the formation of a Public Utilities Commission (PUC), a Tribal Utility Authority (TUA), and/or the development of Tribal energy codes. Several EPA Region 5 Tribes have already formed PUC or TUAs. A path to establishing full authority to implement through the formation of a PUC or a TUA is described at the end of this section, including a schedule of milestones for actions needed by key entities needed to obtain authority to implement such measures.

Table 13: Tribal Authority Renewables Measure Implementation

GOAL	STRATEGY	REDUCTION MEASURE	TRIBAL AUTHORITY TO IMPLEMENT *IF NOT EXERCISING SOVEREIGNTY THROUGH PUC OR TUA FORMATION		
			Michigan	Minnesota	Wisconsin
REDUCE EMISSIONS FROM ENERGY GENERATION	Renewable Energy Development	Install residential single-family renewables (PV, geothermal, wind)	Systems must be sized at 100% of average annual usage or 20 kW, whichever is smaller	Systems must be sized under 40 kW	System must be sized under 20 kW and serviced by an IOU or Municipal utility
		Install multifamily facility-scale renewables (PV, geothermal, wind)	Systems must be sized at 100% of average annual usage or 20 kW, whichever is smaller	Systems must be sized under 40 kW	System must be sized under 20 kW and serviced by an IOU or Municipal utility
		Install commercial facility-scale renewables (PV, geothermal, wind)	Systems must be sized at 100% of average annual usage or 150 kW, whichever is smaller	Systems must be sized under 40 kW	System must be sized under 20 kW and serviced by an IOU or Municipal utility
		Implement community-scale renewables.	Dependent on sponsorship by a utility with no Tribal ownership	Dependent on sponsorship by a utility with no Tribal ownership	Dependent on sponsorship by a utility with no Tribal ownership
		Implement utility-scale renewables	See Section 4.2.1	See Section 4.2.1	See Section 4.2.1
	Energy Resilience	Install building-level solar & storage	Systems must be sized at 100% of average annual usage or 20 kW, whichever is smaller	Systems must be sized under 40 kW	System must be sized under 20 kW and serviced by an IOU or Municipal utility
		Develop clean energy microgrids	See Section 4.2.1	See Section 4.2.1	See Section 4.2.1

4.2.1.1. Michigan

Michigan has replaced its net metering policies with a Distributed Generation Program in which residential distributed generation systems cannot be larger than what is needed to produce 100% of a facility's annual electricity usage, *or* 20 kW – whichever is smaller. A second category, typically for commercial or institutional customers, is available for systems between 20 kW and 150 kW with a similar system limitation of 100% of a facility's annual electricity usage or 150 kW, whichever is smaller. Tribes have full authority to implement battery storage with these distributed generation systems. Michigan state law allows utilities to cap participation in the Distributed Generation Program at 1% of their peak load, with suballocations of 0.5% for systems smaller than 20 kW, 0.25% for systems between 20 and 150 kW, and 0.25% exclusively for smaller anaerobic digestion systems. Several Investor-Owned Utility (IOUs) have already reached their program limits and are denying new Distributed Generation applicants. Municipal utilities and electric cooperatives are not required to participate in the Distributed Generation Program and may develop own programs and caps.

Tribes are not able to own community solar projects since only regulated utilities can sponsor community solar projects. Senate Bills 152 and 153 were introduced in early 2023 and would enable community solar to be owned by third-party developers such as Tribes, but these bills have not yet passed.

Michigan summary: Within the constraints set by Michigan's Distributed generation program, Tribes have limited authority to implement facility-scale distributed generation under existing policy. More complex community-scale and microgrid projects that serve multiple facilities are likely to be restricted by the existing policy. If these restrictions are prohibitive to each Tribe's goals, **Tribes can ensure full authority to implement all measures** associated with renewable energy development and energy resilience by exercising their sovereignty and creating a Tribal PUC, TUA, or by enacting Tribal energy codes to reshape the regulatory and policy landscape on their respective Tribal lands. Utility-scale projects in all states will largely be driven by federal law and policy and the Midcontinent Independent System Operator (MISO) generator interconnection policies.

4.2.1.2. Minnesota

All utilities in Minnesota, including energy cooperatives, are required to offer a net metering tariff to residential customers with distributed generation systems up to 40 kW, and Tribes are ensured full authority to implement systems under 40 kW on single family, multifamily and commercial buildings. Tribes have full authority to implement battery storage with these distributed generation systems. Only regulated utilities can sponsor community solar projects and thus Tribes do not have full authority to implement community solar projects. Tribes have full authority to implement utility-scale renewable development including ownership and receiving Investment Tax Credit (ITC) benefits if the Tribe is granted the siting permits from either the State or Local Government.

Minnesota summary: Tribes have full authority to implement distributed generation with battery storage projects under 40 kW. More complex community-scale and microgrid projects that serve multiple facilities are likely to be restricted by the existing policy. If these restrictions are prohibitive to each Tribe's goals, **Tribes can ensure full authority to implement all measures** associated with renewable energy development and energy resilience by exercising their sovereignty and creating a Tribal PUC, TUA, or by enacting Tribal energy codes to reshape the regulatory and policy landscape on their respective Tribal lands. Utility-scale projects in all states will largely be driven by federal law and policy and the Midcontinent Independent System Operator (MISO) generator interconnection policies.

4.2.1.3. Wisconsin

All investor-owned and municipal utilities in Wisconsin, not including energy cooperatives, are required to offer a net metering tariff to residential customers with distributed generation systems up to 20 kW, and Tribes serviced by investor-owned and municipal utilities are ensured full authority to implement systems under 20 kW on single family, multifamily and commercial buildings. Tribes have full authority to implement battery storage with these distributed generation systems. Only regulated utilities can sponsor community solar projects and thus Tribes do not have full authority to implement community solar projects.

Wisconsin summary: Tribes have full authority to implement distributed generation with battery storage projects under 20 kW if serviced by investor-owned or municipal utilities. More complex community-scale and microgrid projects that serve multiple facilities are likely to be restricted by the existing policy. If these restrictions are prohibitive to each Tribe's goals, **Tribes can ensure full authority to implement all measures** associated with renewable energy development and energy resilience by exercising their sovereignty and creating a Tribal PUC, TUA, or by enacting Tribal energy codes to reshape the regulatory and policy landscape on their respective Tribal lands. Utility-scale projects in all states will largely be driven by federal law and policy and the Midcontinent Independent System Operator (MISO) generator interconnection policies.

4.2.2. Authority to Implement: Reduce Energy Consumption from Buildings

Table 14: Building Energy Consumption Reduction Measures

REDUCE ENERGY CONSUMPTION FROM BUILDINGS (COMMERCIAL & RESIDENTIAL).	Building Retrofits & Energy Conservation Measures	Electrify heating equipment.
		Install high-efficiency appliances, low-flow fixtures for homes & residences
		Install weatherization - insulation & weatherstripping
		Retrofit interior lighting to LEDs
		Install smart thermostats
	New Building Standards	Adopt green building standards for major renovations

Tribal governments have full authority to implement measures to reduce building energy consumption for Tribally-owned buildings and housing and have full authority to adopt new building standards for on-Reservation residential buildings. However, unless the Tribe chooses to enact changes to Reservation-wide housing policies, the Tribe must work with on-Reservation homeowners to encourage participation with implementing building retrofits and energy conservation measures, likely involving incentives to encourage participation in implementation. For all reduction measures covered under the goal of reducing energy consumption from buildings, progress will be tracked by quantifying emissions savings from the implementation of building efficiency measures. Implementation schedule of such measures will be identified and directed by individual Tribal CPRG Implementation Grant applicants.

4.2.3. Authority to Implement: Reduce Energy Emissions from Vehicles

Table 15: Vehicle Emission Reduction Measures

REDUCE EMISSIONS FROM VEHICLES	Mode-shift	Increase transit service
		Influence ride sharing
		Develop active transport network
	Zero Emissions Single-occupancy vehicles	Electrify SOV vehicles & provide charging infrastructure / hydrogen fuel cells
	Low or Zero Emissions Bus Fleet	Convert bus fleet to electricity, hydrogen, or lower-emission fuels

Tribal governments have full authority to implement measures to reduce emissions from Tribally-owned vehicles, although Tribes must ensure they have adequate power supply to support substantial EV fleet additions the Tribe may want to implement. The Tribe may have to develop new infrastructure to support larger electric loads associated with zero-emission vehicle uptake either through the installation of Tribally-owned infrastructure such as solar and storage, or they may have to work with their utility to ensure that increased load demand can be met.

Tribes do not have direct authority to reduce emissions from vehicles owned by Tribal members but can encourage measure uptake by providing incentives to increase participation. If member uptake of zero emission vehicles is significant, Tribes may be required to take similar action as described above to support increased electric load, including developing Tribally-owned infrastructure or working with their utility to ensure load demand can be met. Tribes have full authority to expand Tribally-run transportation services to encourage mode shift but must rely on incentives and member buy-in to achieve increased public mode shift participation goals.

For all reduction measures covered under the goal of reducing emissions from vehicles, progress will be tracked by quantifying emissions savings from the implementation of mode-shifting and vehicle electrification. Implementation schedule of such measures will be identified and directed by individual Tribal CPRG Implementation Grant applicants.

4.2.4. Authority to Implement: Implement Low-Emissions Land-Use Planning Techniques

Table 16: Low-Emission Land-Use Planning Techniques

ENVIRONMENTAL MANAGEMENT & PLANNING TECHNIQUES	Land Use	Sequester carbon through plants
		Develop green infrastructure
		Implement responsible development & zoning policies

Tribes have full authority to implement environmental management and planning techniques on Tribally-owned land. To implement these measures on on-Reservation land owned by members or other non-Tribal entities, Tribes will have to work with landowners to incentivize participation. For all reduction measures covered under the goal of reducing emissions through environmental management and planning techniques, progress will be tracked by quantifying emissions savings from the implementation of such activities. Implementation schedule of such measures will be identified and directed by individual Tribal CPRG Implementation Grant applicants.

5. Intersection with Other Funding Availability

Many of the priority measures included in this PCAP expand upon or complement existing programs. The Midwest Tribal Energy Resources Association has explored federal and non-federal funding sources to determine whether these sources could fund each priority measure and whether such funding is sufficient to fully implement the measure. This section describes the results of this analysis for each priority measure.

Table 17: Additional Funding Opportunities

Funding Opportunity	Description	Timeline	Applicable Measure Goal
DOE Tribal Energy Efficiency Block Grant (EECBG)	Provides formula awards to Tribes for projects that reduce fossil fuel emissions or improve energy efficiency. Voucher award for Tribes is approximately 10-15k.	Full application due April 30, 2024	Reduce energy consumption from buildings (residential and commercial)
DOE Tribal Home Electrification and Appliance Rebates Program	Rebate program to support Tribal households to reduce energy bills, increase home comfort, improve indoor air quality, and reduce emissions by providing direct funding for energy efficiency and electrification home upgrades. $225 million available. Electrification and Appliance Rebates Program	Letter of Intent to apply by May 15, 2024. Applications accepted on a rolling basis until May 31, 2025	Reduce energy consumption from buildings (residential and commercial)
Environmental and Climate Justice Block Grants	$3B in Inflation Reduction Act (IRA) funding for financial and technical assistance to carry out environmental and climate justice activities to benefit underserved and overburdened communities.	Awards must be made by EPA by September 30, 2026.	Variable
Philanthropy funding	Various sources	Depends on foundation and specific opportunity	Variable
DOE SCEP - **Assistance for the Adoption of the Latest and Zero Building Energy Codes**	This opportunity assists eligible entities in further decarbonizing their buildings through the adoption of the latest national model building energy codes, zero energy codes, other codes that deliver equivalent or greater energy savings, including innovative approaches to decarbonize existing buildings through certain measurable and enforceable requirements.	Concept paper due February 9, 2024. Full application due April 30, 2024.	Reduce energy consumption from buildings (residential and commercial)

Funding Opportunity	Description	Timeline	Applicable Measure Goal
FEMA BRIC	$50M Tribal set aside for projects that respond to FEMA Hazard Mitigation Plan and reduce risks they face from disasters and natural hazards.	February 29, 2024	Variable
Community Change Grants	Partnership grant. $2B in IRA funding to benefit disadvantaged communities through projects that reduce pollution, increase climate resilience, and build community capacity to respond to environmental and climate justice challenges. $300 million reserved for Tribes.	Rolling with a deadline of November 21, 2024.	Variable
Energy and Mineral Development (EMDP) Program Grant	Offers Tribes financial support to assess the energy mineral resource potential of their lands.	Likely opens Q1 2024 and is an annual program	None
Tribal Energy Development Capacity (TEDC) Grant	Offers Tribes financial support to enhance a Tribe's internal capacity to manage energy resources through things like Tribal utility feasibility and formation	FY2024 due in January 2024 and is an annual program	Reduce emissions from energy generation
Production Tax Credit/Investment Tax Credit/Other Tax Credits	"Direct Pay" Tax Credits for non-profits, Tribes, consumers for clean energy, energy efficiency, EV and charging stations. 30-50% of project costs. Stackable with USDA/other funds.	Comment period has closed. Final rule to be issued soon.	Reduce emissions from energy generation