# Priority Climate Action Plan

April 1, 2024
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**Pokégnek Bodéwadmik**

PREPARED FOR:
POKAGON BAND OF POTAWATOMI
DOWAGIAC, MICHIGAN

Prepared By:


Environmental Consulting & Technology, Inc.
2001 Commonwealth Drive Suite 300
Ann Arbor, Michigan 48105

And

389nm, LLC
3313 North Seeley Avenue
Chicago, Illinois 60618

ECT
> ectinc.com

## Document Review

The dual signatory process is an integral part of Environmental Consulting & Technology, Inc.'s (ECT's) Document Review Policy. All ECT documents undergo technical/peer review prior to dispatching these documents to any outside entity.

This document has been authored and reviewed by the following employees:

Patrick Judd, P.L.A., ASLA, Senior Manager
Co- Author

Signature

29 March, 2024
Date

Adam George, P.E., Principal Engineer
Peer Review

Signature

30 March, 2024
Date

Kevin Dick, Principal , 389nm, LLC
Co-author

Signature

29 March, 2024
Date

## Acknowledgements

**Kowabdanawa odë kė Team Members**
Jennifer Kanine, PhD, CWB®, Director
Grant Poole, Water Quality Specialist
**Pokagon Band of Potawatomi Indians - Tribal Council**
**Pokagon Band of Potawatomi Indians - Land Use Board**
**Pokagon Band of Potawatomi Indians - CPRG Teams Group**

**Environmental Consulting and Technology, Inc.**
Patrick Judd, PLA, Project Manager
Tom Price, P.E, LEED AP, Project Director
Adam George, P.E., Project Engineer
Meghan Price, Scientist | Water Resources

**389nm, LLC**
Kevin Dick, Principal

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## Definitions

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

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

**Carbon Dioxide Equivalent (CO2e):** The GWP of a specific greenhouse gas expressed as a ratio of equivalent warming potential to CO2 over a period of time. E.g., methane has a GWP of 28 - 36 over 100 years (U.S. Environmental Protection Agency, 2021c).

**Carbon Sequestration:** Carbon capture and sequestration (CCS) is a set of technologies that can greatly reduce carbon dioxide emissions from new and existing coal- and gas-fired power plants, industrial processes, and other stationary sources of carbon dioxide.

**Clean Energy:** Energy that can be produced from renewable sources without emitting greenhouse gases. Transitioning to clean energy can help advance many of the Pokagon Band's environmental and economic goals by increasing further investment in alternative fuel vehicles and equipment, improving energy efficiency of their buildings, and reducing the tribe's carbon footprint.

**Fugitive Emissions:** Emissions which are released into the atmosphere accidentally.

**Global Warming Potential (GWP):** The potential of different greenhouse gases to produce the greenhouse effect as compared to carbon dioxide, which has a GWP of 1 (U.S. Environmental Protection Agency, 2021c). Equivalencies for relevant greenhouse gases are listed in Table 1.

**Greenhouse gas (GHG) Inventory**: A list of emission sources and sinks and the associated emissions quantified using standard methods. The PCAP must include a "simplified" inventory (see Section 3.1).

**MtCO$_2$e**: The Standard International System of Units (SI) unit of measurement of GHG. 1 MtCO2e is equal to 1 metric tonne of CO2, or 1,000 kilograms (kg) using the base SI unit of measurement.

**Organizational Boundaries:** These are set by an organization choosing an approach for consolidating GHG emissions and then consistently applies that approach to define the entities and assets included in scope 1 and scope 2.

**Scope 1 Emissions:** Direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles).

**Scope 2 Emissions**: Indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Although scope 2 emissions physically occur at the facility where they are generated, they are accounted for in an organization's GHG inventory because they are a result of the organization's energy use.

**Vehicle Miles Traveled (VMT):** Vehicle Miles Traveled, a unit of measurement helpful for calculating transportation-related emissions

# Executive Summary

This PCAP was developed with Kowabdanawa odë kė ("They watch over this land") team staff and the community from the Pokagon Band of Potawatomi (Pokagon Band, PBOPI). An inventory of the Pokagon Band's government facilities for Scope 1 and Scope 2 greenhouse gas emissions showed 1,961.2 tonnes of carbon dioxide equivalent (tCO2e) from electricity, natural gas, diesel fuel, propane, and gasoline consumption. The Pokagon Band has an opportunity over the next 10 to 15 years to expand its use of renewable energy, improve the energy efficiency of its buildings, and reduce its environmental impact to reduce its emissions by half, and reach net-zero emissions by 2050. Several strategies were reviewed to meet this objective.

*1. Solar Photovoltaic, Solar Thermal Systems and Storage*

Solar Photovoltaic (PV) Systems are still an opportunity for the Pokagon Band. Existing rooftop and ground mounted solar PV arrays already reduce energy costs and environmental impact. Additional rooftop and ground-mounted options, especially on low-quality land or over parking lots, offer further expansion potential. Coupled with battery storage, systems can be made to be grid independent at times and reduce peak load emissions. These projects must be analyzed for cost-effectiveness with upfront costs, savings, and maintenance in mind.

Solar Thermal systems are viable where hot water consumption is high, and can be considered alongside heat pump storage water heaters to eliminate natural gas and reduce electricity consumption for domestic hot water to almost zero.

*2. Beneficial Electrification*

Switching from natural gas involves replacing natural gas appliances with electric options (e.g., heat pumps, induction ranges) which increase efficiency and can lower long-term fuel costs as electricity becomes less expensive compared to natural gas. Careful financial analysis is needed to determine individual project feasibility.

*3. Electric Vehicle (EV) Fleet Conversion*

Investing in Level 2 (and potentially Level 3) charging stations is a prerequisite for transitioning to electric vehicles. As of 2024, electric vehicles have begun to break even against internal combustion engine vehicles when considering maintenance, and can reduce and eventually eliminate gasoline and diesel as motor vehicle fuels, drastically decreasing greenhouse gas and criteria pollutant emissions from vehicle fleets.

*4. Overall Considerations*

Project teams should continue to carefully analyze the costs and savings of renewable energy projects and electrification initiatives for informed decision-making, taking advantage of Inflation Reduction Act funding as well as existing and emerging utility incentives. The Pokagon Band should prioritize long-term savings and environmental sustainability when pursuing renewable energy and building improvements, as many of the improvements have a one-time up front cost for infrastructure that can be reused when appliances and systems reach the end of their useful life.
Call to Action

The Pokagon Band is well-positioned for further investments in solar energy, building electrification, and EV infrastructure. These measures will reduce environmental impact, improve energy efficiency, and may provide long-term cost savings on the eventual road to net zero emissions.

# 1.0 INTRODUCTION

## 1.1 CPRG Overview

The PBPOPI developed their Priority Climate Action Plans (PCAPs) under the U.S. Environmental Protection Agency's (EPA's) Climate Pollution Reduction Grant (CPRG) Planning Grant Program to gain better insight on their broader carbon emissions and sources to address climate change.

The United States Environmental Protection Agency (EPA) issued planning grants under Phase I of the Climate Pollution Reduction Grant (CPRG) program to support interested states, metropolitan statistical areas (MSAs), tribes, and territories to develop and implement plans for reducing greenhouse gas (GHG) emissions and other harmful air pollutants.

EPA's CPRG program is an opportunity for the Pokagon Band to identify near-term goals toward implementing GHG reduction strategies to improve tribal citizens and surrounding community lives through health and economic benefits.

Development of this PCAP allows the Pokagon Band to apply for CPRG Implementation Funds to implement the priority reduction measures found in this report with the main objective to reduce greenhouse gases through projects and programs that focus on near-term, high impact reductions and long-term integration of electrification.

Kowabdanawa odë kė was tasked with creating the PCAP and determining what next steps could be taken or pursued based on the outcomes of the analyses contained herein. This plan will be presented to the Pokagon Band Land Use Board, Tribal Council, and key decision makers that will be able to provide feedback and guidance as PBOPI moves forward with key initiatives to reduce GHG emissions.

## 1.2 PCAP Overview and Definitions

The Pokagon Band's PCAP covers all requirements as stipulated by the EPA in the following structure.

- *GHG inventory*
- *Quantified GHG reduction for priority measures*
- *A benefits analysis*
- *A review of authority to implement*
- *Identification of other funding mechanisms*
- *Workforce planning analysis*
- *Next Steps*

## 1.3 Approach to Developing the PCAP

The PCAP team's high-level approach to developing the PCAP include, but not limited to the following:

- *Identifying and engaging key stakeholders*
- *Understanding the GHG emissions inventory*

- *Establishing GHG reduction goals*
- *Identifying measures to reduce GHG emissions*
- *Prioritizing and selecting GHG reduction measures*
- *Estimating potential GHG reduction measure impacts*
- *Establishing an administrative process for measure implementation*

## 1.4 Scope of the PCAP

The PCAP scope includes a boundary that follows guidelines from the Global Protocol for Community-Scale Greenhouse Gas Inventories Version 1.1 (GHG Protocol) for Stationary Energy and Transportation Sectors only and is focused on Tribal administrative operations. Sub-Sectors reviewed for the purpose of this document are institutional buildings (Scope 1 Stationary Emissions and Scope 2 Electricity Generation Emissions) and on-road, off-road vehicle and maintenance equipment emissions from diesel and gasoline (Scope 1 Mobile Emissions). The inventory does not include Fugitive Emissions from Refrigeration, or any other Stationary Energy or Transportation sub-sectors, or other Sectors that may be included in municipal inventories such as residential emissions. Buildings included in the Inventory are listed below in Table 1.

**Table 1. List of Buildings Covered by Inventory**

| Building ID | Building Name | Energy Service Type |
|---|---|---|
| ADM1 | Rogers Lake Campus | Elec/Gas |
| ADM2 | Administration Bldg. | Gas |
| ADM3 | Community Center | Elec/Gas |
| ADM4 | Pavilion/Kitchen | Gas |
| ADM5 | Storm Shelter | Gas |
| ADM6 | South Bathhouse | Gas |
| ADM7 | North Bathhouse | Gas |
| CHC1 | Culture Bldg. | Gas |
| CHC2 | Multi-Purpose Bldg. | Gas |
| CTPD1 | Justice & Peacemaking Center | Gas |
| EB1 | Language Bldg. | Elec/Gas |
| F1 | Back Maintenance | Elec/Gas |
| F2 | Front Maintenance | Elec/Gas |
| F3 | Sewer Lift Station | Elec |
| F4 | Lift Station | Elec |
| F5 | Maintenance Bldg. | Elec/Gas |
| F6 | Fire Supp Generator | Gas |
| F7 | Generator | Gas |
| HCD1 | Temporary Housing | Elec/Prop |
| HCD1-2 | Temporary Housing | Elec |
| HCD2 | Gage Lake House | Elec/Prop |
| HCD3 | Urbanski Shop/Garage/Barn | Elec |
| HCD4 | Campus Pavilion | Elec |
| HCD5 | Dailey Road Village - Front Sign | Elec |

| Building ID | Building Name | Energy Service Type |
|---|---|---|
| HCD6 | Housing Office | Elec/Gas |
| PBKK1 | Kowadanawa odë kė Office | Elec/Prop |
| PBKK2 | Kowadanawa odë kė Maintenance Barn | Elec/Prop |
| PBKK3 | Kowadanawa odë kė Horse Barn | Elec |
| PBKK4 | North Liberty Office (electric) | Elec/Gas |
| PBKK4-2 | North Liberty Office | Elec |
| PF1 | Warehouse/MPB | Elec/Gas |
| PHS1 | PHS – Health and Wellness Center Generators | Gas |
| PHS2 | PHS – Small Meter | Gas |
| SB1 | South Bend Office | Elec/Gas |
| SB2 | Tribal Police Substation | Elec/Gas |
| SS1 | Elders Hall | Elec/Prop |
| SS2 | Social Services Bldg. | Gas |
| ZB1 | Head Start Bldg./ Zagbëgon | Gas |

# 2.0 TRIBAL ORGANIZATIONS AND CONSIDERATIONS

The PCAP team included the Pokagon Band's Kowabdanawa odë kė (Department of Natural Resources department), ECT, Inc., and 389NM. The Pokagon Band Tribal Council provides feedback and final approval of potential implementation recommendations set forth within this document. The Pokagon Band's Legal Counsel reviews the decision-making authority of the Band as it relates to specific projects, development of agreements, licensing, and permitting on an as needed and on-going basis.

## 2.1 The Kowabdanawa odë kė PCAP Management and Development Team

- **Tribal Council**: Provided support and guidance for the PCAP team. The Tribal Council also gave feedback during the process of data collections and reviews to prepare the PCAP document.
- **Kowabdanawa odë kė (Natural Resources)**: Lead the effort of the PCAP project on behalf of the tribe.
- **Pokagon Band CPRG Teams Group**: Responded to requests for data from individual departments and buildings that are included within the scope of the PCAP project.
- **Land Use Board**: The Land Use Board provided feedback during the process of data collections and reviews to prepare the PCAP.
- **Environmental Consulting and Technology, Inc.:** Provided project management and oversight of the PCAP planning process. ECT also prepared the QAPP.
- **389nm, LLC:** Collected GHG data

GHG efforts by others paralleling this PCAP

- ***Slipstream***

### 2.2 Special Considerations for Tribal Entities

The Pokagon Band has tribal properties that are somewhat scattered throughout the Service Area of the tribe. Among these tribal properties exists the buildings identified within the scope of the PCAP. Having tribal properties that are disjunct and tribal buildings on those properties, makes it more difficult to determine the best methods of moving forward to reduce the overall GHGs for the Pokagon Band. Considerations need to be made as there will likely be the need to implement projects at multiple locations to achieve net-zero. This PCAP development is the first effort to determine the energy use of multiple buildings at different locations across tribal properties and analyze their efficiency while also determining the best locations for enhancements, improvements, replacements, or re-development needs

- *Presence of sector-specific goals*
- *Existing GHG inventories or similar assessments*
- *Benefits quantifications*
- *Existing emissions reduction plans, programs, or strategies*

### 2.3 Collaborations

The Pokagon Band is also collaborating with Slipstream for implementation of the PSC-23-34-P Slipstream Low Carbon EIED Grant associated with Low-Carbon Energy Planning for Native Nations. The Pokagon Band, as lead are to co-create a net zero carbon plan that honors Pokagon's sovereignty and culture while driving economic diversity for the tribe as well as other Michigan stakeholders. The Slipstream project is focusing on economic facilities, locations off main campus, and tribal housing units. The collaboration is to complete three overall tasks that include:

- Organize a Stakeholder Engagement Processes
- Provide Technical Analysis of Energy System and Baseline Development
- Develop a Net Zero Project Plan

Following Pokagon Band Legal Counsel review and signature by the Government Manager, utility requests were made for all buildings and locations of interest to both projects. The PCAP Team and Slipstream shared utility data to eliminate redundancy and overlap of each team's effort.

## 3.0 PCAP ELEMENTS

This section discusses the results of:

- Greenhouse Gas (GHG) Inventory
    a) Scope of the inventory
    b) Data collection
    c) GHG accounting method
    d) GHG emission results by sector and gas
    e) GHG Emission Results
- GHG Reduction Measures

- Benefits Analysis
- Review of Authority to Implement
- Identification of Other Funding Mechanisms
- Workforce Planning Analysis

## 3.1 Greenhouse Gas (GHG) Inventory

The purpose of the simplified GHG inventory is to provide the Pokagon Band goals with a quantifiable baseline of comparison for emissions reductions for each reduction measure. The following include the following sections:

### 3.1.1 Scope

The Scope of the inventory, as mentioned in Section 1.3, is limited to administrative operations of the Pokagon Band and includes building stationary emissions from natural gas (natural gas includes underground service lines and above ground propane tanks) for heating and electricity and mobile emissions from fossil fuels due to on-road and off-road operations.

Not all buildings included in the inventory have individual electric and natural gas meters, and they are often grouped together. However, we have identified all the administrative consumption from utility bills provided by utilities that serve the different locations administered by the Pokagon Band. Properties that are primarily concerned with multifamily residential housing have not been included in the inventory, as it focuses on institutional operations.

Additionally, maintenance and mobile emissions calculations do not include properties that primarily serve as multifamily housing. Mobile emissions are primarily from fleet vehicles in the citizen, support, and sovereign service departments of the Pokagon Band.

Emissions results are therefore limited to Scope 1 Stationary, Scope 1 Mobile, and Scope 2 Electricity Generation emissions.

### 3.1.2 Data Collection

Natural gas and electricity consumption data was requested and received from the following utilities. Northern Indiana Public Service Company (NIPSCO), Indiana Michigan Power (IM), Midwest Energy & Communications (MEC), , and SEMCO Energy Gas Company. All utilities provided at least one year of consumption data for both natural gases and electricity, if applicable. The most complete year is 2023.

Gasoline and diesel fuel consumption was collected and recorded in gallons where volume data existed or estimated from vehicle miles traveled using odometer readings proportional to a daily vehicle miles traveled estimate and aggregated to an annual consumption amount.

### 3.1.3 GHG Accounting Method

Natural gas emissions were estimated for Scope 1 Stationary Emissions using the GHG Protocol Emissions Tool for Stationary Combustion version 4.2. Gasoline and diesel emissions for Scope 1 Mobile Emissions were calculated using constants from the GHG Protocol Transport Tool version 2.6. Scope 2 Electricity Generation emissions were calculated using MEC's environmental disclosure and adjusted the assumptions since MEC provides market rate data and are the majority of the emissions. Only I&M and NIPSCO properties are in RFCW, which has a lower rate than MEC alone.

Primary greenhouse gas emissions reported are carbon dioxide ($CO_2$) and nitrous oxide ($N_2O$) from fossil fuel combustion in electricity generation and carbon dioxide ($CO_2$) from combustion of gasoline, diesel, liquid propane, and natural gas. Fugitive emissions are not included in the inventory.

The base year for this inventory is 2023 and is representative of general emissions patterns. Prior years would likely be reduced due to compounded effects for COVID-19 from 2020 through 2022.

### 3.1.4 GHG Emission Results

The following table shows GHG emissions results by sector and gas over time.

**Table 2. Pokagon Band Tribal GHG Emissions.**

| Scope | Sub-Scope | Year | tCO2e |
|---|---|---|---|
| 1 | Stationary | 2023 | 337.8 |
| 1 | Mobile | 2023 | 388.8 |
| 2 | Electricity Generation | 2023 | 1,234.6 |

## 3.2 GHG Reduction Measures

This section provides a set of priority GHG reduction measures for the Pokagon Band. These Priority GHG reduction measures are based on GHG emissions information and focused on achieving the most significant GHG reductions possible, while considering other relevant planning goals. GHG reduction measures include measures that reduce GHG emissions but no measures that enhance carbon sinks at this time. The following was considered:

- Policies, Codes, or goals that can be created, modified, or expanded to work towards emissions reduction.
- The Pokagon Band will measure or quantify anticipated GHG emission reductions from proposed priority measures specific to electrification.
- Pokagon Band has the authority to implement this measure.

The Pokagon Band included the following information for each GHG reduction measure:

- Implementing agency
- Implementation milestones and schedule
- Geographic location
- Funding sources
- Metrics for tracking progress
- Approximate Cost
- Annual estimated GHG and criteria air pollutant emission reductions
- Implementing authority milestones.

**Table 3. GHG Reduction Measures**

| | | |
|---|---|---|
| ***Measure 1: 250kW Distributed Photovoltaic*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | Headquarters (50kW); Health Services (100kW), Courts (90kW); Ancillary Buildings (10kW) |
| | **Funding sources** | Federal and State |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate cost** | $750,000 - $1M |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | -420 MWh (16%) electricity consumption; -280 lbs $SO_2$; -250 lbs $NO_x$; -290 tons/263 tonnes $CO_2$; -40 lbs $PM_{2.5}$; -10 lbs $NH_3$ |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements |
| | | |
| ***Measure 2: 1 MW Community Photovoltaic*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | Rodger's Lake Campus |
| | **Funding sources** | State, Federal, Private |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate cost** | $3M - $5M |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | -1,950 MWh generation; -1,300 lbs $SO_2$; -1,160 lbs $NO_x$; -1,360 tons/263 tonnes $CO_2$; -170 lbs $PM_{2.5}$; -40 lbs VOC; -16 lbs $NH_3$ |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements |

| | | |
|---|---|---|
| ***Measure 3: 1 MWh Storage/Peak Load Shift*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | Rodger's Lake Campus |
| | **Funding sources** | Federal |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate cost** | $500,000 - $600,000 |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | -1 MWh generation, -0.720 lbs SO2; -0.583 lbs NOx; 0.689 tons/0.625 tonnes CO2; -0.086 lbs PM2.5; -0.02 lbs VOC; -0.025 lbs NH3 |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements |
| | | |
| ***Measure 4: Air-Source Heat Pump Appliances*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | Roger's Lake Campus, South Bend, IN |
| | **Funding sources** | Federal, State, Utility Rebate |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate cost** | $100,000 for 25 locations |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | Remove 2,900 therms and add 85 MWh of generation for 22.06 lbs NOx and 37.23 tonnes CO2 due to fuel switching, but eventually reduces to zero with renewable energy generation |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements. |

| | | |
|---|---|---|
| ***Measure 5: Additional Air-Source Heat Pump Retrofits for Natural Gas Heating*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | Rodger's Lake Campus, South Bend, IN |
| | **Funding sources** | Federal, State, and Utility Programs |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate cost** | \$100,000 - \$300,000 |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | 176 tCO2e by 2035 |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements. |

| | | |
|---|---|---|
| ***Measure 6: Updated HVAC Controls*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | South Bend, IN |
| | **Funding sources** | Federal and State |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate cost** | \$25,000 - \$150,000 |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | -153 MWh generation; -0.110.2 lbs SO2; -0.89.2 lbs NOx; 105.4 tons/95.6 tonnes CO2; -13.2 lbs PM2.5; -3.1 lbs VOC; -3.8 lbs NH3 |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements. |

<table>
<tr><td rowspan="8">Measure 7: International Energy Efficiency Code 2024 Adoption</td><td>Implementing agency</td><td>Pokagon Band of Potawatomi</td></tr>
<tr><td>Implementation milestones</td><td>Plan approval, construction start, construction end, interconnection agreement signed</td></tr>
<tr><td>Geographic location</td><td>Community-wide</td></tr>
<tr><td>Funding sources</td><td>Federal and State</td></tr>
<tr><td>Metrics tracking</td><td>Nominal Installation (AC), Gross Cost, Net Cost</td></tr>
<tr><td>Approximate cost</td><td>1 - 3% of built cost</td></tr>
<tr><td>Annual estimated GHG and criteria air pollutant emission reductions</td><td>75 - 125 tCO2e</td></tr>
<tr><td>Implementation authority milestones</td><td>Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements.</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td rowspan="8">Measure 8: 110 Low and Zero Emission Passenger Vehicles</td><td>Implementing agency</td><td>Pokagon Band of Potawatomi</td></tr>
<tr><td>Implementation milestones</td><td>Plan approval, construction start, construction end, interconnection agreement signed</td></tr>
<tr><td>Geographic location</td><td>All Pokagon Band Departments; Dowagiac, MI</td></tr>
<tr><td>Funding sources</td><td>Federal</td></tr>
<tr><td>Metrics tracking</td><td>Nominal Installation (AC), Gross Cost, Net Cost</td></tr>
<tr><td>Approximate cost</td><td>$3.85M - $6M for 110 vehicles</td></tr>
<tr><td>Annual estimated GHG and criteria air pollutant emission reductions</td><td>-310 MWh generation; -220 lbs SO2; -120 lbs NOx; 190 tons/172 tonnes CO2; -20 lbs PM2.5; 150 lbs VOC; 40 lbs NH3 due to increased electricity generation and decreased gasoline consumption. As the grid “greens”, SO2 and NOx are expected to decrease by up to half.</td></tr>
<tr><td>Implementation authority milestones</td><td>Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements.</td></tr>
</table>

| | | |
|---|---|---|
| ***Measure 9: 2 Low and Zero Emission Duty Vehicles*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | Administration |
| | **Funding sources** | Federal |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate cost** | $2M - $2.5M with charging infrastructure |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | -210 MWh generation, 160 lbs $SO_2$; 170 lbs $NO_x$; 10 tons/9 tonnes $CO_2$; -20 lbs $PM_{2.5}$; 70 lbs VOC; 10 lbs $NH_3$ due to increased electricity generation and decreased diesel consumption. As the grid "greens", $SO_2$ and $PM_{2.5}$ are expected to decrease by up to 50%. |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements. |

| | | |
|---|---|---|
| ***Measure 10: Low and Zero Emission Maintenance Equipment*** | **Implementing agency** | Pokagon Band of Potawatomi |
| | **Implementation milestones** | Plan approval, construction start, construction end, interconnection agreement signed |
| | **Geographic location** | Community-wide |
| | **Funding sources** | Federal and State |
| | **Metrics tracking** | Nominal Installation (AC), Gross Cost, Net Cost |
| | **Approximate Cost** | $100 to $500 / small tools, $1,000 - $2,500 for larger maintenance equipment |
| | **Annual estimated GHG and criteria air pollutant emission reductions** | -465 to -2,000 lbs $CO_2$ annually per equipment |
| | **Implementation authority milestones** | Pokagon Band Legal Counsel review of implementation requirements and development of necessary contracts and agreements. |

## 3.3 Benefits Analysis

This section provides a benefits assessment of the GHG reduction measures included in Table 3. The assessment includes estimated co-pollutant reductions of criteria air pollutants and/or precursors (e.g., particulate matter under 2.5 micrometers, nitrogen oxides, sulfur dioxides, volatile organic compounds), and air toxics or hazardous air pollutants (e.g., benzene, toluene, perchloroethylene) for each measure. The base year estimates of each co-pollutant, including criteria pollutants (and/or precursors), air toxics, or hazardous air pollutants are provided. Access to specific tribal data for co-pollutants wasn't available but identified minimum requirements were developed by using EPA's National Emissions Inventory to source data for counties that overlapped tribal jurisdictions.

### 3.3.1 Solar Photovoltaic and Thermal Systems

The Pokagon Band has three (3) active photovoltaic (PV) systems (20.4kW on the Administration Building, 15.21 kW on a ground mounted system at the Community Center, and 64kW on a ground mounted system at Pokagon Health Services) nominally producing an estimated 113 MWh per year. Where hot water consumption is high, solar thermal systems, which provide a heat exchanger and storage tank to preheat water from the heat of sunlight may be considered on additional buildings.

Photovoltaic power generation, also known as distributed generation, expansion is an opportunity for the Pokagon Band and has both financial and environmental advantages over the status quo where it is appropriate and feasible. There are also tradeoffs with using solar PV against other potential site uses, especially for ground mounted systems, that need to be considered and are discussed below.

Having online access, via dashboard portal, to monitor the production for the solar panels is essential for continuous observation of the efficiency of each array, and alert to any potential issues.

***Pros***

There are several advantages of PV systems over grid-sourced electricity:

- **Distributed generation eliminates system losses.** Grid-sourced electricity loses approximately 5% of the generated electricity to heat through resistance on lines and through transformers and other distribution equipment. Onsite generation does not have this loss.
- **There are other environmental benefits.** Solar photovoltaic systems, while only about 19% efficient at converting solar energy to electricity, do not require a non-renewable fuel source to do so. Fossil fuel generation loses about 50% of the embodied energy of the fuel to heat when generating electricity. The materials used are also less environmentally detrimental than fossil fuels and are largely recyclable.
- **Another is the cost of capacity.** Capacity charges are assessed to electricity customers on a $/kW basis. This changes every month and is dependent on the coincident peak demand for the meter. That is, if a customer has a high demand for electricity when the grid also has a high demand, they will be charged for that capacity. With an onsite solar array, that demand does not show up as the grid only provides the excess capacity needed. If a PV array provides more generation than the building requires at the coincident peak, the

capacity charge for that month will be zero. This is especially prevalent from April through September in this latitude.

- **Immediate onsite usage for the Pokagon Band.** As the Band pays per kWh, any generation is used onsite immediately and eliminates that potential charge.
- **Surplus renewable energy provides financial incentives.** In a metered application in Michigan and Indiana that is integrated with the utility, any excess generation not used onsite is sold at partial or retail rates to other customers and appears as a credit on the supply portion of the bill. A solar PV system will often generate more than is consumed onsite, especially in the spring and fall, if it is sized to meet up to 100% of the electricity demand for a building. Systems may generally be sized to meet up to 110% of total annual consumption in most utility service territories, and systems approximately 20 - 100kW are often exempt from additional integration requirements.
- **Reduced urban heat island effects.** Solar PV systems, especially those mounted over blacktop parking lots, reduce the urban heat island effect as they both shade and absorb solar radiation.

### *Cons*

There are some cons to distributed generation that should be considered:

- **Space.** Solar PV systems that are not building-mounted take up space that may be used for other purposes. Systems should be considered to be semi-permanent features and may significantly alter otherwise high quality land that could be restored to natural areas. This also reduces the ecosystem services of land used for solar PV installations. Ground-mounted systems often use gravel as a substrate to avoid tall grass growth and are less efficient at stormwater infiltration. Soil may be compacted or regraded to allow for systems to be installed, further degrading the stormwater benefit.
- **Installation costs.** Systems may be more expensive to install than efficiency projects that have similar reductions in demand and electricity consumption. If the goal is to reduce consumption, solar PV systems need to be considered on the same time frame as efficiency options.
- **Maintenance.** Distributed generation systems require maintenance just like any other building system. Solar panels generally last about 25 years before they are no longer generating the same output as when they were new (solar panels lose about 1% of their generating capacity annually to weather deterioration). Inverters often are replaced every 10 years. Generating systems must be monitored or they will not provide their prescribed benefit, and this adds to maintenance schedules and has staffing and expertise considerations.
- **Need to consider hazardous substances during solar panel production.** In addition to mining sand for silicon, solar photovoltaic panels use rare earth and other mined metals in their production, including hazardous materials such as lead and cadmium. Panels may be purchased to be Restriction of Hazardous Substances (RoHS) compliant for a premium.
- **Backup power.** Panels do not provide any backup power in the case of a power outage unless they are also integrated with a grid-tied battery backup system, as energized panels create a hazard for line personnel. Inverters are designed to shut down without grid electricity when they are grid-tied. This should be considered in installations and may

significantly add cost.

- **Aesthetics.** Though building-integrated panels are generally low-profile, ground mounted systems may interrupt the aesthetics of natural areas.

As most Pokagon Band buildings are free of shading, opportunities for building integrated solar PV should be considered for buildings that are site suitable and then ground mounted systems may be considered. Areas with current or potential ecological value should be avoided. Areas with lower ecological quality should be evaluated for consideration.

### *Ground-Mounted System Considerations*

The Pokagon Band's greatest opportunity for integrating solar energy rests with ground-mounted systems, either over underutilized turf, degraded land, or parking lots, provided these locations are not prone to flooding.

Ground-mounted systems may be less expensive to install than building-mounted systems, even accounting for scaffolding, as the economy of scale and ease of installation for smaller systems reduces labor costs (National Renewable Energy Lab, 2020). Depending on the size of the system, the cost reduction can amount to 45% per watt of installed generation. However, there are site considerations that do not make this universally true. Service upgrades to the site, including conduit to the utility distribution as well as potentially onsite transformers can increase the initial cost. The internal rate of return (IRR) of a system should be considered on a 10-, 15-, and 20-year time frame to understand the cost-benefit of a system including up-front costs, electricity costs, and maintenance costs. These systems may be set up as Community Solar systems and provide renewable energy for all Pokagon Band buildings in a centralized area. Several calculators provide cost-benefit analysis[1] for community solar programs to evaluate the economics of individual projects which may be applicable in Indiana and Michigan. Renewable Energy Credit (REC) purchases in the OH SREC market, which often immediately reduce the upfront total installation cost to improve the economics of systems. An SREC is equivalent to 1MWh of solar generation, and may be sold in tranches of 5 years of generation. Ohio and Pennsylvania Tier 1 SRECs are available to Michigan projects and are currently available for $45/SREC. The Michigan REC system may provide a market in the future with changes to the Michigan Renewable Portfolio Standard enacted in 2023.

Ground-mounted systems are generally easier to maintain and can be outsourced to private contractors to monitor as part of a larger network of systems to replace inverters, clean panels for maximum generation, and replace damaged panels. Ground-mounted systems that are not tied to a building meter do not provide capacity reduction benefit. These systems will need third-party purchases of the generated electricity to be considered good investments and are often developed by a utility or partnership set up for this purpose. Ground-mounted systems over parking lots may also provide electric vehicle charging stations, which can provide 100% renewable charging to vehicles as a free benefit or nominal fee to improve the economics of the system.

Further inquiry on ground mount installations along with peak and average demand review of properties will provide more directive installation opportunities.

[1] See https://www.elevatenp.org/publications/community-solar-business-case-tool/.

### *Criteria Pollutant Reductions from Photovoltaics*

Photovoltaic generation reduces pollutants from generating assets owned and operated or purchased through supplier contracts from the distribution utility supplying the electricity (IM or MEC depending on the location). Reductions in kWh consumption and kW demand directly contribute to reduction in fossil fuel generation, especially at coincident peak times (times when both the demand for power from the Pokagon Band buildings and the demand for the rest of the grid is at its peak). During these times, "peaker" plants, which are typically natural gas fired generating assets that are small and can generate within 10 minutes of the requirement for generation, are most abundant as opposed to grid-renewable assets like wind power, which may be at their highest generating capacity off-peak at night. For this reason, photovoltaic generation can reduce fossil fuel consumption directly.

Reducing coal and natural gas consumption on the grid directly contributes to reductions in GHGs (primarily from carbon dioxide and nitrogen oxides) as well as other criteria pollutants. These include sulfur dioxide, volatile organic compounds (VOCs) that contribute to ground level ozone generation, ammonia, particulate matter (1.0 microns, 2.5 microns, and 10 microns) that may contribute to respiratory health issues, and polycyclic aromatic hydrocarbons (PAHs) such as toluene and benzene from diesel fuel generation.

Further reduction due to photovoltaic generation can come from reduced line and generation losses, which can be 55% of total demand. Individual greenhouse gas and criteria pollutant estimates are listed in corresponding greenhouse gas reduction measures (Measures 1 – 3; Table 3). Estimates were created using the AVoided Emissions and geneRation Tool (AVERT).

### 3.3.2 Storage

Electricity storage, in the form of hydropower or batteries, is typically used to provide electricity when the grid or renewable energy systems are unable to meet demand due to inadequate generation or outages. Increasingly, however, using storage to manage power demand can have immediate benefits to local air quality where fossil fuel generation occurs by eliminating the need to use peaker plants, generating assets that are primarily natural gas fired and can generate electricity in as little as 10 minutes.

Storage that is timed to be charged when renewable energy is plentiful as a generation asset (such as in the middle of the night or during peak insolation during the day) can be dispatched to avoid the use of peaker plants during peak demand periods - usually during hot summer months or cold winter months. At other times, it can be used as backup power or to offset evening consumption to reduce capacity charges.

### *Criteria Pollutant Reductions from Storage*

Though storage does not directly reduce gross criteria pollutant and greenhouse gas emissions, it can reduce criteria pollutant emissions by shifting the consumption away from periods of coincident peak demand that lead to use of fossil fuel generating assets on the grid. These include sulfur dioxide, volatile organic compounds (VOCs) that contribute to ground level ozone generation, ammonia, particulate matter (1.0 microns, 2.5 microns, and 10 microns) that may contribute to respiratory health issues, and polycyclic aromatic hydrocarbons (PAHs) such as toluene and benzene from diesel fuel generation. Individual greenhouse gas and criteria pollutant estimates are listed in corresponding greenhouse gas reduction measures (Measures 1 – 10; Table 3). Estimates were made using the AVoided Emissions and geneRation Tool (AVERT).

### 3.3.3 Beneficial Electrification

Electrification is a term used to describe the removal of natural gas-fueled equipment in place of analogous electrically fueled equipment. This is almost exclusively appliances used for space conditioning and domestic water heating. All appliances that use natural gas have an analogous electricity-fueled appliance. Natural gas is not a required fuel for buildings, and some municipalities around the country now prohibit new natural gas services. The Pokagon Band should consider doing the same. The reason natural gas remains in use for heating applications is because it is currently cheaper to consume per BTU of heat provided in most markets. However, as natural gas becomes scarcer and replaces other fossil fuels to reduce carbon emissions, it will become more expensive when compared to electricity. Over the same time frame, electricity will likely become less expensive as renewable energy, which is cheaper to procure than fossil fuel or nuclear electricity generation, becomes a larger part of the grid mix over the next decade. Therefore, as the Pokagon Band replaces equipment, electrification should be considered as part of the cost benefit analysis.

Natural gas consumption has extraction, transportation, and storage related emissions of GHG like losses in electricity consumption. These are estimated to be as high as 9% (Tollefson, 2013)[2]. However, Scope 1 emissions of natural gas only consider the onsite GHG footprint after it is delivered. Appliances that are fueled by natural gas have an efficiency rating that demonstrates the ratio of natural gas energy supplied to an appliance versus the energy delivered to perform the work of the appliance. For furnaces and boilers, this is annual fuel utilization efficiency (AFUE). For water heaters, this is denoted as energy factor or thermal efficiency. An example is an 80% AFUE hot water boiler. Of the natural gas burned on a correctly operating 80% AFUE boiler, 20% will not be used to deliver heat, but instead will pass the boiler's heat exchanger and be exhausted in the flue. A 90% AFUE boiler will condense the water in the flue gas and recapture some of this heat, returning it to the heat exchanger and allowing it to be used to heat the air or water.

Electric appliances, however, are 100% efficient at converting electricity to heat in resistance and heating applications (e.g., an electric unit heater) and more than 100% efficient in heat pump (both air sourced and geothermal) applications. Heat pumps can operate from 2.5 to 4 times more efficient than standard efficiency equipment. Energy delivered by electric grids, however, is less efficient in delivering heat to the site than natural gas when considering energy delivered, losing around 5% to resistance on power lines, and up to 50% from fossil fuel generation at the generation source. These losses are considered as part of the Scope 2 emissions of a facility.

Without considering system losses, a therm of natural gas is equivalent to the energy provided by 29 kWh. When system losses are applied, using electricity creates 2.7 times more GHG for the same amount of heat under standard conditions. However, because of the efficiency of heat pumps and the inefficiency of standard efficiency natural gas fueled equipment, the GHG equation flips to 1 to 2 times fewer GHG emissions when natural gas is replaced with electric heat pump applications. This will increase as the grid becomes "greener" and GHG emissions from sources

[2] Tollefson, J. (2013, January 2). Methane leaks erode green credentials of natural gas. *Nature*. *493*(12). Retrieved from https://doi.org/10.1038/493012a.

further reduce, making natural gas as a fuel both financially and environmentally untenable in the mid to long term.

### 3.3.4 Financial Rationale

From a financial standpoint, electrical applications that are more than 100% efficient at converting electrical energy to heat energy, or applications that are covered by an onsite renewable energy system, can make financial sense in a few ways. First, for a building that eliminates natural gas as a fuel, this also eliminates the fixed charges associated with carrying a redundant utility. Second, while natural gas is increasingly a component of electricity generation and its supply is becoming more expensive, it is also being outcompeted in electricity generation by lower-cost renewable solar and wind energy. Many natural gas appliances have boasted lower operating expenses in the past but may not be able to provide the same claim in the mid and long term. Finally, electrical appliances may require less maintenance and generally have a lower first-cost to install. They don't require draft venting and regular burner cleaning and have fewer building safety considerations. Natural gas-fired appliances off-gas criteria pollutants that reduce indoor air quality for occupants that are not present in electrical appliances. There are many appliances now on the market that are commercially viable to replace natural gas appliances, and their lifetime savings beats the lifetime cost difference from a similar gas appliance, even accounting for the increased upfront cost.

### 3.3.5 Heat Pump Storage Water Heaters

Storage water heaters are a mainstay of domestic hot water heating, and the majority in this market have natural gas burners. Electric resistance storage water heaters also exist, which convert electricity to heat by running a high current through a high resistance conductor. A heat pump or hybrid water heater operates with the same technology, but adds a heat pump to take ambient heat in the space and transfer it to the water. A heat pump operates the same as a dehumidifier or air conditioner. It runs a compressor and a blower that compresses a refrigerant and passes it across a heat exchanger. The heat exchanger transfers heat from the phase change of the refrigerant from a gas to a liquid and heats the water in the tank. The cold, dry air exhaust from the blower is then expelled to another area. Heat Pump water heaters use less energy running a compressor than they would heating through resistance heating. A 50-gallon tank will typically use 600 kWh or the equivalent of 20 therms per year heating water as opposed to 4,000 kWh or 130 therms for a standard electric or natural gas water heater, being 4 – 6 times more efficient than standard equipment. As above, the cost of operation is also lower when capacity charges are considered.

Heat pump water heaters require at least a 240V 30A service to power the backup resistance coil, which are normally not standard for gas water heaters and should be considered in cost considerations. As the heat pump delivers heat much more slowly than a resistance heater, they typically have an operating procedure that starts in heat pump mode, and, if it doesn't meet setpoint in a reasonable time, will switch to electric resistance. Therefore, the Pokagon Band should review the use case when estimating savings. High use applications may better suit other approaches like tankless applications or smaller point of use electric resistance water heaters.

### 3.3.6 Heat Pump Clothes Dryers

Using similar technology to heat pump water heaters, heat pump clothes dryers use heat pumps to move heat from the room to the clothes in the dryer while removing moisture through condensation. They operate more efficiently and will dry clothes with less heat as they circulate dry air from the heat pump and remove moisture through a condensate line. Heat pump clothes dryers also require a 240V service connection to run a backup electric heater, which is not required for gas dryers.

### 3.3.7 Air-Source and Ground-Source Heat Pump HVAC

Air-Source Heat Pump HVAC systems can best be described as an air conditioner that operates in both directions, providing both heating and cooling. A standard air conditioner can take heat inside a building, pass it over a heat exchanger that evaporates a refrigerant in a closed loop. The evaporation process takes heat and sends it outside through the refrigerant gas, where it is compressed back to a liquid and recirculated. The compression removes heat from the refrigerant, and it is expelled through a heat exchanger outside the building.

An air-source heat pump can operate in reverse, taking heat from outside and passing it inside. This is efficient down to below zero degrees, making heat pumps up to four times more efficient than equivalent resistance heating systems. This process is continuous, unlike a staged process for natural gas furnaces, making heat pumps optimally efficient from down to –4°F for some designs. For very cold days, heat pumps switch to a resistance heating coil automatically. Air-source heat pumps are rated by heating seasonal performance factor (HSPF). A resistance heater may have an HSPF of about 3.41. A high performing heat pump in this climate would operate at 11.7. This makes heat pumps about 350% more efficient than electric resistance heaters or having a coefficient of performance (COP) of 3.5.

Ground-source (geothermal) heat pumps operate on the same principle, and the Pokagon Band currently employs systems at its Administration and Health Services buildings (see Figure 2), as well as its Community Center. As the ground is always 55°F under 18", geothermal heat pumps can have a COP of up to 4.4, surpassing air-source heat pumps. Geothermal pumps require underground liquid piping to provide a heat exchanger and may be easy or difficult to install depending on their location and land availability. There are also incentives available to install geothermal, making them a cost-effective option for large installations. Multiple sites have sufficient landscape to provide a horizontal exchange loop. Individual installations must be considered, as there are significant capital improvements required to convert a natural gas heating system to geothermal, and there is a requirement for backup heating in this climate zone. For this reason, ground-source heat pumps are primarily used in new construction applications where these costs can be mitigated.

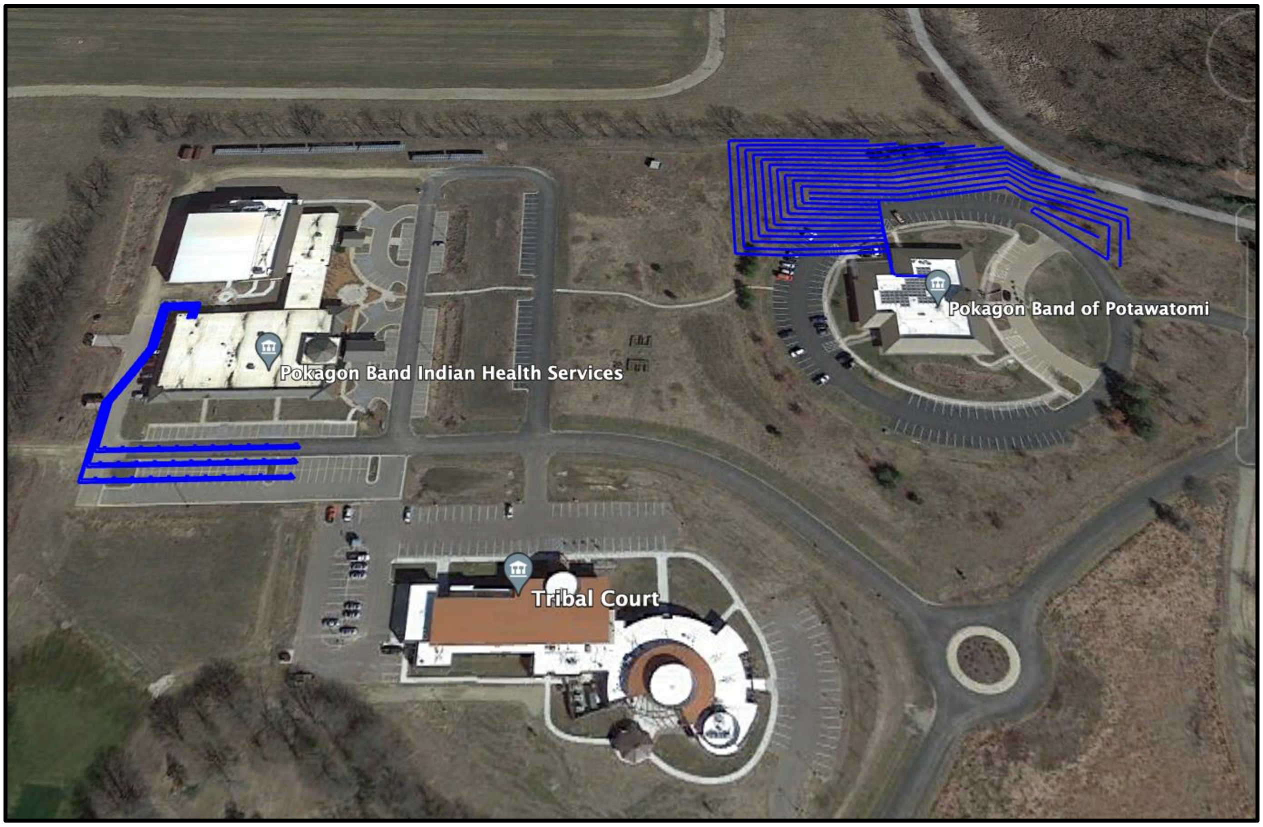


**Figure 1**. Pokagon Band geothermal grids servicing the Administration and Pokagon Health Services buildings.

### 3.3.8 Induction Ranges

Many people prefer gas ranges to electric resistance ranges because they can control the flame and heat directly. Turning the gas off on a gas range provides almost immediate removal of heat, while a resistance electric cooktop stays hot for a longer time when the appliance is turned off. This can make professional cooking more difficult. Induction ranges offer a more efficient electric appliance while providing the same control as a gas range. They work by inducing an electric field in a ferrous metal (cast-iron or steel). Instead of heating a resistance coil under the cooktop, the resistance occurs in the cookware and the cooktop never gets hot. The induction field is more efficient at delivering heat where it is needed, and as such can be controlled more effectively. This has the added benefit of allowing spills to be immediately cleaned. Commercial induction ranges with higher BTU outputs are available and take up less space than natural gas ranges. These appliances require a 240V service, which is not required by a natural gas appliance, and must be considered in the cost to retrofit.

### 3.3.9 Cost Benefit of Total Natural Gas Conversion to All Electric

At current rates, for every 100,000 BTUs (about the equivalent of a standard sized furnace or water heater capacity), though natural gas is less expensive per BTU delivered, the cost for fuel is approximately break-even when accounting for the elimination of a natural gas customer charge. Running heat pump appliances instead of resistance heating appliances reduces this amount by approximately 66%, making electricity the more cost effective fuel. This is because while a resistance electric heater has a high-capacity charge (an electric water heater of this size uses about 9kW when operating and that amount is recorded by the meter), a heat pump only uses a few hundred watts to run a compressor. This reduces the capacity charges associated with electricity consumption, and capacity charges can be some of the most expensive portions of an electricity bill. In a building with solar photovoltaic, the capacity charges drop further as the building does not "show up" for that generation when the meter records the specific capacity needs of the building.

Converting the total therms to BTUs delivered provides an accurate comparison for determining cost effectiveness versus electricity used for heat. The Pokagon Band consumed 14,930,404 kBTU of heat in 2023. Converting to electric resistance would consume 542,449 kWh for the same heating end use assuming a mix of standard efficiency and high efficiency applications. This would eliminate 176 tCO2e of the Pokagon Band's total GHG emissions by 2035. Further review is needed to address the cost-benefit on an individual building level.

### *Criteria Pollutant Reductions from Beneficial Electrification*

Beneficial electrification would increase certain criteria pollutants in the short and medium term due to fuel switching. They would shift the location of emissions from the buildings themselves to the generating assets on the grid, and because of line losses, would increase consumption accordingly. Criteria pollutants affected include sulfur dioxide, volatile organic compounds (VOCs) that contribute to ground level ozone generation, ammonia, particulate matter (1.0 microns, 2.5 microns, and 10 microns) that may contribute to respiratory health issues, and polycyclic aromatic hydrocarbons (PAHs) such as toluene and benzene from diesel fuel generation.

In the near term, emissions may increase until coal-fired assets are fully retire, and roughly break even when natural gas has replaced coal assets. However, in the long term, these emissions would decrease to zero as the grid becomes "greener", with renewable generation taking precedence over fossil fuel generation entirely.

Individual greenhouse gas and criteria pollutant estimates are listed in corresponding greenhouse gas reduction measures (Measures 1 – 10; Table 3).

### 3.3.10 Electric Vehicle Fleet Conversion

The Pokagon Band has the available connection infrastructure to begin converting their fleet from internal combustion engine (ICE) vehicles to electric or plug-in hybrid vehicles beginning in 2024. Before it can begin to replace its vehicles on a schedule as they retire them, the Band must provide the charging infrastructure.

There are three levels of charging infrastructure currently available, as described below.

### *Level I Charging*

Level I chargers can be plugged into any 15A or 20A wall outlet and deliver 1 to 1.2 kW of electricity. A typical electric car battery has a capacity of 30 - 75 kWh. A 1 kW charger will deliver 1 kWh per hour. Therefore, a Level I charger will fill a car from zero charge in one to two days, with 4 to 8 hours adding about 4 miles of driving per hour, depending on the outside air temperature. Every location with electricity has this ability, and electric vehicles are sold with this connection, which provides a standard wall outlet cable connected to an industry standard SAE

J1772 connection that can also be used with 120V and 240V applications. However, these connections are not suitable for fleet applications.

### *Level II Charging*

A Level II charger requires a National Electrical Manufacturers Association (NEMA) 30A or 50A 240V connection and can deliver 8kW. This infrastructure can be installed in buildings that operate on two legs of a single phase (e.g., residential and small commercial/institutional buildings) and operates on single phase alternating current. The cost may be under $1,000 per charging location for non-metered applications. The 8kW delivery will charge a vehicle from zero in 4 to 12 hours depending on the battery capacity, delivering about 30 miles of travel per charge depending on the outside air temperature. A typical metropolitan area may have several hundred of these charging stations, often at public works buildings and private businesses like convenience stores and supermarkets. The Pokagon Band can encourage fleet and residential vehicle conversion by adding Level II charging infrastructure to its buildings to support fleet and visitor vehicle charging.

### *Level III Charging*

Level III infrastructure requires three phase power at 480V and uses transformers to convert alternating current (AC) to direct current (DC). These DC fast chargers deliver 150kW to 500kW and can charge a large capacity battery in as little as 15 minutes, or several hundred miles in an hour of charging. This infrastructure is most like a typical gas station but is also the least common and most expensive to install. DC fast chargers are found at various locations in metropolitan areas, and approximately every 125 miles along highways. The charging plug depends on the brand of vehicle. Most vehicles starting in 2024 will come with the North American Charging Standard (NACS) connector pioneered by Tesla. SAE J1772 and Combined Charging Standard (CCS) adapters are available for purchase. The Pokagon Band should explore Level III charging infrastructure for its fleet of vehicles.

From an emissions standpoint, electric vehicles (EVs) have an enormous positive benefit. Passenger vehicles, light duty trucks, and maintenance equipment already have analogous electric alternatives that would reduce Scope 1 emissions to zero for their use cases. Eliminating a gallon of gasoline used by a passenger vehicle with a 21.46 miles per gallon (mpg) fuel efficiency rating and replacing it with a standard electric vehicle fuel efficiency rating of 4 miles per kWh (mpk) or 125 miles per gallon equivalent would reduce emissions by 5.4 times for every mile driven under current emissions conditions for the (Pennsylvania-New Jersey-Maryland Interconnection Independent system operators (PJM ISO), the ISO covering most of the Pokagon Band's tribal lands. Additionally, covering Scope 2 emissions with 100% renewable energy would eliminate mobile emissions from vehicles and maintenance equipment.

### *Criteria Pollutant Reductions from Fleet Conversion*

Switching from gasoline and diesel fuel consumption to electric vehicles would shift greenhouse gas and criteria pollution from the non-point source mobile emissions to point source electricity generating assets. Primarily this would remove certain pollutants entirely, and decrease other pollutants. Criteria pollutants affected include sulfur dioxide, volatile organic compounds (VOCs) that contribute to ground level ozone generation, ammonia, particulate matter (1.0 microns, 2.5 microns, and 10 microns) that may contribute to respiratory health issues, and polycyclic aromatic hydrocarbons (PAHs) such as toluene and benzene from diesel fuel generation. Primarily particulate matter and PAHs would be most reduced as gasoline and diesel are replaced by natural gas and renewable energy generation on the grid.

Individual greenhouse gas and criteria pollutant estimates are listed in corresponding greenhouse gas reduction measures (Measures 1-10; Table 3). Estimates were made using the AVoided Emissions and geneRation Tool (AVERT).

## 3.4 Review of Authority to Implement

As each measure is implemented, the Pokagon Band Legal Counsel will review the needs of the measure and determine what requirements may be needed in order to move forward. Most times, this would be developing necessary contracts and agreements to support the work being completed in the measure. Agreements, funding applications, and contracts are moved up the chain of command to the level needed for the defined work within the agreement, likely to the Government Manager or Tribal Council level.

## 3.5 Identification of Other Funding Mechanisms

Below is a current list of state and federal alternative funding mechanisms which will allow the Pokagon Band to fund a broader range of priority projects. An additional list of potential funding opportunities can be found on EPA's website under Priority Climate Action Plan: Helpful Resources for Tribes and Territories.

1. **Comprehensive Climate Action Plan (CCAP)**
   Once a PCAP plan is completed and submitted to EPA, Pokagon Band can apply for a CPRG grant to implement the GHG emissions reduction recommendations from that plan.
   CPRG Planning Program Guidance

2. **The Bureau of Indian Affairs' Branch of Tribal Climate Resilience (TCR)** – These grants fund habitat restoration, carbon management, riparian planting, relocation, and site expansion efforts, to fulfill Tribal goals, promote the health and wellness of Tribal peoples and ecosystems on trust lands, and meet Tribal communities' most pressing needs in the face of a changing climate.
   BIA Tribal Climate Resilience Grants

3. **Community Energy Management Program (EGLE)**
   The Michigan Department of Environment, Great Lakes, and Energy (EGLE) Energy Unit has an open RFP for the Community Energy Management Program. The purpose of this program is to help communities improve energy management and accelerate the implementation of energy efficiency and renewable energy.
   MIEGLE Community Energy Management Program

4. **Clean vehicle tax credits - Credits for new clean vehicles purchased in 2023 or after**
   Buyers of EVs qualify for a credit up to $7,500 under Internal Revenue Code Section 30D if you buy a new, qualified plug-in EV or fuel cell electric vehicle (FCV). The Inflation Reduction Act of 2022 changed the rules for this credit for vehicles purchased from 2023 to 2032.
   Clean Vehicle Tax Credits
5. **Technical Assistance for the Adoption of Building Energy Codes**

Codes and innovative approaches such as building performance standards supported under this opportunity are cross-cutting and will create more inclusive programs that align with the Administration's Justice40 priorities and will build capacity at the state and local level, including encouraging strong community and Tribal engagement. The potential impact from these innovations in building energy codes presents a nearly unprecedented opportunity to benefit all Americans through utility bill savings, more resilient and efficient buildings, support for the workforce, and reduce our contributions to the changing climate.
Technical Assistance for the Adoption of Building Energy Codes
*Partnerships with Tribes are encouraged since Tribes are not eligible to be direct grant recipients.*

6. **Preventing Outages and Enhancing the Resilience of Electric Grid Grants (EGLE - Grid Resiliency)**
   The Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (IIJA), Section 40101(d) - Preventing Outages and Enhancing the Resiliency of the Electric Grid Formula Grants to States and Indian Tribes will provide funding to States and Indian Tribes to improve resilience and to enhance the reliability to their electric grids.

   Michigan will receive a total of roughly $38 million in Preventing Outages and Enhancing the Resilience of the of the Electric Grid Formula Grants to States and Indian Tribes funding through 5 years. The Grid Resiliency Program aligns with the MI Healthy Climate Plan to clean the Grid**.**
   Preventing Outages and Enhancing the Resilience of Electric Grid Grants

7. **Tribal Home Electrification and Appliance Rebates Program**
   The U.S. Department of Energy's (DOE) Office of State and Community Energy Programs (SCEP) has up to $225 million to grant to Tribal governments and Alaska Native entities for Home Electrification and Appliance Rebates. This program will provide up to $14,000 per eligible household for energy efficiency and electrification home upgrades.
   Tribal Home Electrification and Appliance Rebates Program

8. **Elective pay and transferability**
   Elective pay makes certain clean energy tax credits and the Creating Helpful Incentives to Produce Semiconductors (CHIPs) manufacturing credit effectively refundable (see Elective Pay and Transferability Frequently Asked Questions). The entity can receive the full value of the credit because the IRS treats the elective payment amount as a tax payment. We then count it as overpayment on the return and refund it to the entity.
   IRS Elective Pay Tax Credits

Additional funding sources, program information and updates can be found on the United States Environmental Protection Agency's or State of Michigan's BIL and IRA Funding websites. These websites should be checked regularly on status of state and federal applications submitted and upcoming sustainability-related funding opportunities.
EPA BIL and IRA Funding Opportunities
MIEGLE BIL and IRA Funding Opportunities

## 3.6 Workforce Planning Analysis

In 2022, over 60 percent of the state's clean energy workforce, or 75,085 workers, represented the energy efficiency sector of the clean energy industry. This sector comprises of manufacturing of ENERGY STAR-rated appliances, installation of efficient lighting, high-efficiency heating, ventilation, and air conditioning (HVAC) systems, and installation of high-performance building materials in homes and commercial buildings[3]. However, continued growth of the industry requires a trained workforce as over 88 percent of employers in Michigan report at least some difficulty hiring workers.

Labor statics in 2022 found clean energy jobs in Cass County were between 100 – 499 and 500 – 1,999 in Van Buren County. As the clean energy continues to steadily grow, job opportunities include electricians, construction and inspection of solar array, wind turbine and geothermal installation, and "green" building inspectors and auditors.

Pokagon Band currently has a job posting for a new full-time Climate Resilience Specialist position within the Pokagon Band to join the Kowabdanawa odë kė ("They watch over this land") team.

The State of Michigan has submitted to the Federal Government's State and Community Energy Program for Technical Assistance for the Adoption of Building Energy Codes. That program encourages partnerships since Tribes are not eligible to be direct grant recipients. However, future opportunities may allow the Pokagon Band to hire external labor to inform them of innovative building energy codes and to take approaches to efficiency and emissions reductions for their new and renovated buildings. Additionally, the Pokagon Band can provide opportunities for tribal members to go through state or local municipal training on the adoption of the latest model energy codes, zero energy codes, or other standards with equivalent energy savings, like a building performance standard.

# 4.0 Next Steps

The PCAP has provided a baseline of emissions and a high level overview of potential projects to pursue over the next five to ten years, particularly with respect to increased solar photovoltaic generation and electrification of buildings and fleet vehicles. Next steps include:

1) Individual project prioritization
2) Work plan development
3) Cost refinement
4) Funding identification and allocation
5) Project management
6) Project implementation
7) Maintenance and metrics tracking

These major project phases each provide opportunities for local workforce development and training, as many of the technologies to be pursued require electrical and mechanical expertise and Federal, State, or professional certifications.

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