

Bay Mills Indian Community: Priority Climate Action Plan

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1. Introduction

The Inter-Tribal Council of Michigan (ITCMI) received funding from the Environmental Protection Agency (EPA), to produce a Priority Climate Action Plan (PCAP) through the Climate Pollution Reduction Grant (CPRG) program, for Bay Mills Indian Community (BMIC or the “Tribe”). Bay Mills Indian Community is in Michigan’s Upper Peninsula, 15 miles west of Sault Ste. Marie, Michigan. BMIC has 2,258 members across three service counties; Chippewa, Mackinac and Luce counties. Bay Mills Indian Community has a total of 3,501.681 acres in trust land, in Northern Chippewa County. Bay Mills Indian Community has developed numerous programs/ projects to combat climate change. Projects include installation of electric vehicle charging stations at Bay Mills Resort and Casino, energy efficient buildings in new construction and assessments on how the Tribe can approve facilities and practices to combat climate change¹.

The Inter-Tribal Council of Michigan is a non-profit organization that represents twelve federally recognized tribes in Michigan. ITCMI is divided into several different divisions which includes Behavioral Health Services, Childhood and Family Services, Economic Development, Head Start, Health Education and Chronic Disease, Maternal and Early Childhood Services and Environmental Services. Each division is dedicated to act as a forum for member Tribes, to advocate in the development of programs and policies which will improve the economy, education, and quality of life for member Tribes, and to provide technical assistance to member Tribes in the development of Tribal regulations, ordinances and policies applicable to health and human services².

1.1 CPRG Overview

Participating in the CPRG program will produce two deliverables at the end of this program. The first deliverable is to create a PCAP by April 1st 2024. In the PCAP, ITCMI and BMIC will produce a generalized Green House Gas (GHG) inventory using existing national and state data. The PCAP will focus on implementation ready activities. In the PCAP a benefit analysis will be conducted to show benefits of GHG reduction measures. This PCAP will provide potential projects that BMIC can adapt to reduce GHG emissions. In development of this PCAP, ITCMI worked directly with the Bay Mills Biological Services Department to verify the Tribe’s goals in this program were met. The development of this PCAP, can open the door for the Tribe to apply for funding sources to help implement GHG reducing projects.

After the completion of the PCAP, ITCMI and BMIC will begin working on the Comprehensive Climate Action Plan (CCAP). The CCAP will consist of a complete GHG inventory for BMIC. This GHG inventory will be strictly for the entire Tribe. CCAP will provide GHG projections for near term (2030-2050) and long term (2050) projections. These projections will also include projections if no GHG reduction measures are taken. The CCAP will be published in fall 2026.

¹ [BMIC](#)

² [ITCMI](#)

1.2 PCAP Overview and Definitions

Below are the following components to Bay Mills Indian Community PCAP

- GHG Inventory: A generalized GHG inventory was created. This GHG inventory includes implementation ready sectors and some data will be collected from BMIC. ITCMI will use already published data from U.S Greenhouse Gas Emissions and Sinks by State and National Emissions Inventory (NEI). ITCMI used EPA's Tribal Greenhouse Gas Inventory tool.
- Quantified GHG reduction measures: A list of near term, high priority implementation ready measures are identified in this PCAP, for implementation activities suggested in this PCAP.
- Benefit Analysis: An analysis was conducted to assist benefits of GHG reduction measures. This analysis consisted of both base year estimates of co-pollutants and anticipated co-pollutant emission reductions. This assessment will include improved health outcomes, economic benefits, increased climate resilience, and improved air quality. This analysis also includes any dis-benefits resulting from implementation efforts listed in this PCAP
- A Review of Authority to Implement: A timeline was created to give BMIC key entities to implement projects listed in this PCAP.
- Identification of Other Funding Mechanisms: This section explores possible funding sources, the Tribe can seek to fund projects listed in this PCAP.

1.3 PCAP Development Approach

Below is ITCMI approach to the development of the PCAP.

- Stakeholder Engagement: Through the development of this PCAP, ITCMI worked directly with BMIC Biological Services and Administration. Quarterly meetings were held. Goals and objectives were given by the Tribe to ITCMI, to help develop this PCAP.
- Public Stakeholder Engagement: Public input was a major component in developing the PCAP. A public stakeholder meeting was held for Bay Mills Indian Community. In this meeting ITCMI and Bay Mills Biological Services presented the CPRG Program and how it would benefit the community. Public consensus from the stakeholder meeting was the following:
 - To update tribal homes and tribal facilities to be more energy efficient.
 - To introduce alternate sources of energy for the Tribe.

2. Organization and Considerations

2.1 PCAP Team

Table 1. Shows ITCMI PCAP team and roles that contributed to developing this PCAP.

Role	Reasonability
Project Manager- ITCMI	Manages operating project activities, host public stakeholder engagement meetings, complete reporting requirements to the EPA, develop GHG inventory and develop PCAP
Technical Support-ITCMI	Complete GHG inventory, data interpretation and assist with PCAP development.
Quality Assurance Manager-ITCMI	Provides quality assurance for PCAP development and GHG Inventory data
BMIC Biological Services	Develops BMIC goals and objectives for PCAP development. Assist in public stakeholder meetings, provide any previous data that BMIC has conducted.
Bay Mills Indian Community Executive Council	Provide final decision on implementation projects listed in this PCAP.
Environmental Protection Agency	Provide technical assistance in PCAP development.

2.2 Sector Specific Goals

In the development of this PCAP, ITCMI and BMIC have created the following goals for this to be delivered after the completion of this PCAP.

- Goal One: To create a new waste transfer station for BMIC and to establish a waste reduction program.
- Goal Two: To install combined heat and power at Bay Mills Resort and Casino and Health Care Center.
- Goal Three: To update tribal homes and tribal facilities with energy efficient retrofits and new green energy sources. Ex. heat pumps, solar panels and combine heat and power
- Goal Four: To install 12MW solar farm on BMIC trust land, to make BMIC 100% renewable

2.3 Existing GHG Assessments

In 2022, BMIC conducted a Green Assessment on facilities BMIC owns and operates. In this assessment the Tribe contracted Superior Watershed Partnership to conduct energy audits and a

waste characterization study for the Tribe. Over a six-week period 24-hour energy audits were conducted using the Department of Energy Asset Score Tool on all tribally owned facilities. This study's findings are referenced in section 3.2 of this PCAP.

3. PCAP Elements

3.1 Greenhouse Gas (GHG) Inventory

3.1.1 Scope

The scope of this GHG Inventory will focus on the following sectors:

- A. Electric Power Sector
- B. Solid Waste Sector
- C. Commercial and Residential Sector

The baseline year used for this inventory is 2020, this year was chosen for a baseline due to the volume of data available.

3.1.2 Data Collection Sources

Data in this GHG Inventory originated from the following sources:

- National Emissions Inventory (NEI): NEI is a comprehensive and detailed estimate of air emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emissions sources.
- State Inventory Tool (SIT): The SIT consists of eleven different GHG estimation models. These estimates are used in this PCAP using baseline year 2020.
- Green House Gas Inventory Data Explorer: Information obtained from this tool originated from the NEI data. This tool was used to decipher GHG emissions from different sections of the NEI.
- Tribal GHG Inventory Tool: This tool was used to generate the GHG Inventory for this project.
- State and Local Planning of Energy (SLOPE) Database: This tool was used to compare measures that can reduce GHG emissions to current conditions.
- BMIC Green Assessment: This assessment will be used to determine how much energy was consumed by BMIC facilities and how the Tribes facilities score on energy efficiency.

3.1.3 GHG Accounting Method and Global Warming Potential

In this GHG inventory, most of GHG's produced globally is Carbon Dioxide (CO₂). For this inventory CO₂ emissions are calculated in Million Metric Tons of CO₂ Equivalent (MMTCO_{2e}) or Metric Tons of CO₂ Equivalent (MTCO_{2e}).

Global Warming Potential

As GHG's are emitted to the atmosphere, these emitted gases act like a blanket that covers the Earth's atmosphere and cause warming. Each greenhouse gas emitted warms the Earth at different rates. Differences in rates are expressed in Global Warming Potential (GWP). GWP is the result of GHG's ability to absorb energy and how long it will stay in the atmosphere. The EPA primarily uses the 100-year GWPs from IPCC Fifth Assessment Report (AR5) per international reporting standards. 100-year GWP is based on energy absorbed by a gas over 100 years. Below is a summary of GWP to relevant GHG's listed in this inventory.

Table 2. GWP for greenhouse gases listed in this inventory in a 100 year period according to IPCC Fifth Assessment Report (AR5)³

Greenhouse Gases	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265

3.1.4 GHG Emissions by Sector

A. Electricity Generation and Consumption Sector

The following data is from the SIT⁴ using base year 2020.

Table's 3-6 shows residential, commercial and industrial electricity consumption data in 2020.

Table 3. 2020 Michigan Residential Electricity Consumption

Source	kWh	Total (MTCO ₂ e)
Space Heating	5,550,514,846	2,401,121
Air Conditioning	3,984,985,018	1,723,882
Water heating	4,269,620,805	1,847,014
Refrigeration	2,846,417,870	1,231,344
Other	19,213,320,622	8,311,573
Total	35,864,865,161	15,514,936

³ [Global Warming Potential](#)

⁴ [EPA State Inventory Tool](#)

Table 4. 2020 Michigan Commercial Electricity Consumption

Source	kWh	Total (MMTCO _{2e})
Space Heating	997,792,974	431,640
Cooling	3,991,171,869	1,726,558
Ventilation	5,864,215,990	2,536,826
Water Heating	142,541,883	61,663
Lighting	6,556,925,257	2,836,489
Cooking	997,792,974	431,640
Refrigeration	5,274,048,577	2,281,523
Office Equipment	1,625,418,534	703,147
Computers	3,278,462,629	1,418,244
Other	6,984,550,818	3,021,477
Total	35,492,921,502	15,354,036

Table 5. 2020 Michigan Industrial Electricity Consumption

Source	kWh	Total (MMTCO _{2e})
Conventional Boiler Use	393,796,870	170,354
Process Heating	2,879,793,900	1,245,782
Process Cooling and Refrigeration	2,108,908,085	912,302
Machine Drive	13,153,445,793	5,690,106
Electro-Chemical Process	1,739,799,795	752,627
Facility HVAC	621,255,853	268,752
Facility Lighting	2,095,694,010	906,585
Other Facility Support	1,687,907,767	730,179
Onsite Transportation	461,812,492	199,777
Other Non-Process Use	46,832,237	20,259
Other	306,061,291	132,400
Total	25,656,612,576	11,098,904

Table 6. Shows Michigan's total electricity consumption in MTCO_{2e}

Source	Total (MTCO _{2E})
Residential	15,514,936
Commercial	15,354,036
Industrial	11,098,904
Total	41,967,876

Electricity Consumption Emissions for BMIC Service Counties

Table 7. Electricity emissions in MMTCO₂e for BMIC service counties in 2020 using SLOPE Data.⁵

County	Residential	Commercial	Industrial	Transportation
Chippewa	73,378	98,151	17,419	6,488
Mackinac	73,378	21,886	10,394	5,258
Luce	73,378	21,335	20,904	1,687
Totals	220,134	141,372	48,717	13,433

B. Solid Waste Sector

The following information is from the State Inventory Tool (SIT) ⁶using base year 2020 in Michigan. This data was determined by 2020 Michigan population of 9,966,555 and estimated of 7,523,620 tons of waste produced.

Table 8. Shows waste combustion from Carbon Dioxide (Co₂), Nitrous Oxide (N₂O) and Methane (CH₄) in Million Metric Tons of Carbon Dioxide Equivalent (MMTCO₂e).

Source	MMTCO ₂ e
CO₂	541,542
Plastics	355,058
Synthetic Rubber	53,452
Synthetic Fibers	133,032
N₂O	8,723
CH₄	369
Total CO₂, N₂O CH₄	550,634

Table 9. Shows plastic combustion in 2020 in MMTCO₂e

Plastics	State MSW Combusted (short tons)	MMTCO ₂ e
PET	725.692	43,274
HDPE	725.692	70,678
PVC	725.692	4,222
LDPE/LLDPE	725.692	96,369
PP	725.692	91,433

⁵ [State and Local Planning for Energy](#)

⁶ [EPA State Inventory Tool](#)

PS	725.692	27,305
Other	725.692	35,843
Total Plastics	5,079.84	355,058

Table 10. Shows Methane (CH₄) emissions from landfills in MMTCO₂e

Potential CH ₄	MMTCO ₂ e
Potential CH₄	10,967,194
MSW Generation	10,249,714
Industrial Generation	717,480
Ch₄ Avoided	10,249,714
Flare	1,926,878
Landfill Gas-to-Energy	9,048,368
Oxidation at Industrial Landfills	71,748
Total Ch₄ Emissions	645,732

Table 11. Shows total emissions from landfills and waste combustion in MMTCO₂e

GHG	MMTCO ₂ e
Ch ₄	0.646
CO ₂	0.542
N ₂ O	0.009
Total	1.196

Table 12. Solid waste emissions for BMIC service counties, Michigan from the 2020 NEI⁷. Emissions are in tons.

County	Emissions (tons CO ₂)
Chippewa	343.89
Mackinac	194.82
Luce	42.93

⁷ [2020 NEI Data Set](#)

C. Commercial and Residential Sector

The following data is fuel combustion use in BMIC service counties. This data was obtained from the 2020 NEI ⁸in Michigan.

Table 13. Michigan Residential fuel combustion for natural gas, wood, oil and other types of combustion in emissions tons for BMIC service counties

County	Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)	Total Emissions (Tons)
Chippewa	56,657.60	2,785.92	3.59	32.26	59,477.85
Luce	8.07	604.06	.35	6.60	619.08
Mackinac	11.25	1,379.08	.96	16.92	1,168.21

Table 14. Michigan commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for BMIC service counties

County	Biomass	Natural Gas	Oil	Other Fuel Sources	Total Emissions
Chippewa	12.26	30.34	.92	1.94	45.46
Luce	1.94	4.81	.14	.30	7.19
Mackinac	3.07	7.60	.23	.48	11.38

Table 15. Emissions from commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for Michigan.

Biomass	Natural Gas	Oil	Other Fuel Sources	Total Emissions (tons)
4,937.38	12,215.68	373.90	782.66	18,309.62

Table 16. Emissions from natural gas, wood combustion, oil combustion and other fuel sources for Michigan.

Natural Gas (Tons)	Wood Combustion (Tons)	Oil (Tons)	Other Fuel Sources (Tons)
24,507.50	282,605.78	318.33	3,560.87

⁸ [2020 NEI Data Set](#)

3.2 GHG Reduction Measures

The following is Bay Mills Indian Community greenhouse gas reduction measures for this PCAP.

Greenhouse Gas Reduction Measure One: Build new a waste transfer station

Table 17. BMIC GHG reduction measure one overview

Measure 1: Build a Waste Transfer Station	Implementing Agency	Bay Mills Indian Community
	Applicable Sector	Solid Waste Sector
	Implementation Milestones	To build an adequate waste transfer station for Bay Mills Indian Community. This waste transfer station will offer a comprehensive waste collection and recycling program for BMIC.
	Location	Bay Mills Indian Community
	Cost	\$3,694,530.00
	Annual Estimated GHG Reduction and long-term reductions	10,501 MTCO_{2e} reduced every year. 2024 -2030: 63,006 MTCO_{2e} 2024 – 2050: 273,206 MTCO_{2e}

GHG Reduction One Summary: BMIC desires to build a new waste transfer station (WTS). This WTS will provide the Tribe’s members with one comprehensive location to dispose of household waste. The WTS will provide an adequate area for BMIC members to sort recycling. This recycling area will have areas for members to sort glass, plastic, cardboard and paper. This new WTS will provide one specific location for members to dispose of waste and recycle. This WTS will also provide members to dispose of tires, E-Waste and household hazardous waste. The creation of a new WTS will provide a location for outreach and education about the importance of recycling.

According to the 2020 BMIC Waste Transfer Station audit, on average BMIC annually produces an estimated 312 tons of waste a year. This estimation is a combination of waste from household membership, government buildings and from Bay Mills Resort and Casino (BMRC). An average of 15% of waste generated could be recycled. This measure will reduce GHG emissions by 10,501 MTCO_{2e} annually. GHG reduction calculation was determined by 2020 BMIC Waste Transfer Audit and EPA GHG Calculator⁹.

⁹ [EPA Greenhouse Gas Equivalencies Calculator](#)

GHG Reduction Measure Two: Retrofitting BMIC Facilities for Energy efficiency.

The following information and reduction measures is provided from the 2022 Bay Mills Indian Community Green Assessment. This assessment conducted energy audits on every facility owned by BMIC. This assessment provided recommendations for each building to become more energy efficient. GHG emission reductions for each building was determined from 2022 Bay Mills Indian Community Green Assessment and using EPA GHG Calculator¹⁰.

Tables 18-33. BMIC facility’s energy efficiency upgrades.

Table. 18. Administration Building

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Tribal Administration
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of LED lighting throughout the entirety of the building. Installation of energy efficient water heater.
	Location	12140 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG Reduction and	0.159 MTCO ₂ e.

Table 19. BMIC Conservation and Biological Services

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Conservation and Biological Services
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of LED lighting throughout the entirety of the building. Install air barrier improvements. Instillation of occupancy sensors throughout the facility.
	Location	11801 W Plantation Rd. Brimley, MI 49715

¹⁰ [EPA Greenhouse Gas Equivalencies Calculator](#)

	Annual Estimated GHG and criteria air pollutant emissions reductions	0.07 MTCO _{2e} .
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Table 20. Advance Office of Technologies

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Advance Office of Technologies
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of LED lighting throughout the entirety of the building. Improvements to the HVAC system. Instillation of occupancy sensors throughout the facility.
	Location	12061 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.003 MTCO _{2e}

Table 21. Boys and Girls Club of Bay Mills

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Boys and Girls Club
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of occupancy sensors throughout the facility. Installation of low flow water faucets to lower water usage.
	Location	12435 W Industrial Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	.003 MTCO _{2e}

Table 22. Justice Center

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Justice Center
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of occupancy sensors throughout the facility. Installation of LED lighting throughout the entire building. Improvements to the HVAC system.
	Location	12140 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.0203 MTCO ₂ e

Table 23. Bay Mills Child Development Center

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	BMIC Child Development Center
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of occupancy sensors throughout the facility. Installation of LED lighting throughout the entire building. Improvements to the building HVAC system which include demand control ventilation,
	Location	12471 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.0402 MTCO ₂ e

Table 24. Armella Parker Elder Center and History Department

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Armella Parker Elder Center and History Department
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of LED lighting throughout the entire building. Improvements to the building HVAC system
	Location	12485 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.002 MTCO _{2e}

Table 25. Cultural Department

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Cultural Department
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Installation of an air-side economizer to capture outside air for free cooler
	Location	12498 W Tower Rd, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.001 MTCO _{2e} .

Table 26. Bay Mills Housing Authority

Measure 2 : Retrofitting BMIC Facilities for	Building	BMIC Housing Authority
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Replacing current fixtures with LED lighting.

Energy Efficiency	Location	3095 S Towering Pines, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.003 MTCO _{2e}

Table 27. Bay Mills Resort and Casino

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Bay Mills Resort and Casino
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Replace 161 Wall Mounter Packaged Terminal Air Conditioners (PTAC) with Heat Pump PTAC. Installation of a CHP system. Convert the entire resort lighting to LED lighting.
	Location	11386 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.004 MTCO _{2e} .

Table 28. Wild Bluff Golf Course

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Wild Bluff Golf Course
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Update HVAC system to make system more energy efficient.
	Location	11335 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air	0.004 MTCO _{2e}

	pollutant emissions reductions	
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Table 29. Four Seasons Market and Deli

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Four Seasons Market and Deli
	Applicable Sectors	Commercial and Residential Sector and Electricity Generation and Consumption
	Summary	Assessing potential leaking points from doors, windows, walls, attics and basements.
	Location	9253 W 6 Mile Rd, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.0008 MTCO _{2e} .

Table 30. Waishkey Bay Farm

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Waishkey Bay Farm
	Applicable Sector	Commercial and Residential Sector
	Summary	Assessing potential leaking points from doors, windows, walls, attics and basements. Install occupancy sensors in the facility
	Location	10135 W Mills Rd, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.0002 MTCO _{2e}

Table 31. BMIC Maintenance Department

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	BMIC Maintenance Department
	Applicable Sector	Commercial and Residential Sector
	Summary	Assessing potential leaking points from doors, windows, walls, attics and basements. Update existing HVAC system.
	Location	5463 South Nbiish Road, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.004 MTCO _{2e}

Table 32. Bay Mills Community College

Measure 2 : Retrofitting BMIC Facilities for Energy Efficiency	Building	Bay Mills Community College
	Applicable Sector	Commercial and Residential Sector
	Summary	Assessing potential leaking points from doors, windows, walls, attics and basements. Update existing HVAC system. Installing occupancy sensors in the facility.
	Location	12214 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	0.0004 MTCO _{2e}

Table 33. Total GHG reductions for this measure annually and long term

Year	MTCO_{2e}
2024	0.3149 MTCO _{2e}
2024 - 2030	1.889 MTCO _{2e}
2024- 2050	8.1874 MTCO _{2e}

GHG Reduction Measure Three: Installation of 11 MW Solar Farm for Bay Mills Indian Community

Table 34. BMIC GHG reduction measure three overview.

Measure 3: Installation of 12MWac Solar Farm	Implementing Agency	Cloverland Electric Cooperative and Bay Mills Indian Community
	Applicable Sector	Electricity Generation and Consumption
	Overview	To develop and install 11 MW solar farm on BMIC trust land. This solar farm will produce enough energy for BMIC tribal facilities to be 100% renewable.
	Location	Bay Mills Indian Community
	Cost	\$28,000,000.00
	Annual Estimated GHG and criteria air pollutant emissions reductions	7,302 MTCO _{2e} reduced every year.
	Long Term GHG Reductions	2024 – 2030: 43,812 MTCO _{2e} 2024 – 2050: 189,852 MTCO _{2e}

GHG Reduction Measure Three Summary: The Tribe with partnership from Cloverland Electric Cooperative is in the process of planning to install an 11 MW solar farm for BMIC. This solar farm will supply BMIC with enough electricity to power the Tribal government buildings and Tribal enterprises. Unused generated electricity from the solar farm will be purchased from Cloverland Electric Cooperative to distribute across the Eastern Upper Peninsula of Michigan. This project will keep BMIC Tribal Government 100% renewable. An estimated 16,879,262 kWh will be generated annually for this project, reducing GHG by 7,302 MTCO_{2e} every year. GHG emission reduction was determined using Cloverland Electric Cooperative and BMIC electricity use and EPA GHG Calculator ¹¹

¹¹ [EPA Greenhouse Gas Equivalencies Calculator](#)

GHG Reduction Measure Four: Installation of Combine Heat and Power for Bay Mills Resort Casino.

Table 35. Overview of GHG reduction measure four.

Measure 4: Installation of Combine Heat and Power (CHP) for BMRC	Implementing Agency	Bay Mills Indian Community
	Applicable Sector	Commercial and Residential Sector
	Overview	To install and combine heat and power system for Bay Mills Resort and Casino.
	Location	11386 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	98.2 MTCO₂e reduced every year.
	Long Term GHG Reductions	2024 – 2030: 589.2 MTCO₂e 2024 – 2050: 2,553.2 MTCO₂e

GHG Reduction Measure Four Summary: The Tribe desires to install a CHP system for Bay Mills Resort and Casino (BMRC). This system will produce electricity and thermal energy in one location at the resort. This system would replace BMRC current systems. CHP systems produce significantly less GHG emissions. Average annual electricity consumption from BMRC is 4,503,340 kWh. With the installation of CHP, the total amount of kWh produced annually will be 4,730,400 kWh. Total GHG reduction from installation of a CHP is 98.2 MTCO₂e annually. GHG emissions reductions for this measure was determined by using EPA GHG Calculator¹² and data from bakertilly CHP Feasibility Study for BMIC.

¹² [EPA Greenhouse Gas Equivalencies Calculator](#)

GHG Reduction Measure Five: Installation of Combine Heat and Power at Bay Mills Health Center

Table 36. GHG reduction measure five overview.

Measure 5: Installation of Combine Heat and Power (CHP) for Bay Mills Health Center	Implementing Agency	Bay Mills Indian Community
	Applicable Sector	Commercial and Residential Sector
	Overview	To install and combine heat and power system for Bay Mills Health Care Center
	Location	12455 W Lakeshore Dr, Brimley, MI 49715
	Annual Estimated GHG and criteria air pollutant emissions reductions	67.5 MTCO ₂ e reduced every year.
	Long Term GHG Reductions	2024 – 2030: 405 MTCO ₂ e 2024 – 2050: 1,755 MTCO ₂ e

GHG Reduction Measure Five Summary: The Tribe desires to install a CHP system at BMIC Health Center. This system will produce electricity and thermal energy in one location at the Health Center. CHP systems produce significantly less GHG emissions. CHP will replace the Health Center current HVAC system. Total GHG reduction from installation of a CHP is 67.5 MTCO₂e annually. GHG emissions reductions for this measure was determined by using EPA GHG Calculator¹³ and data from bakertilly CHP Feasibility Study for BMIC.

¹³ [EPA Greenhouse Gas Equivalencies Calculator](#)

3.3 Benefit Analysis

The following is a benefit analysis for each GHG reduction measure listed in this PCAP. This benefit analysis will compare benefits and any potential drawbacks for each GHG reduction measure listed in section 3.2 of this PCAP.

GHG Reduction Measure One: Creation of a new waste transfer station for BMIC

- **Benefits**
 - 10,501 MTCO_{2e} reduced every year
 - 63,006 MTCO_{2e} GHG reduction between 2024-2030
 - 273,206 MTCO_{2e} GHG reduction between 2024-2050
 - Decrease of Methane (CH₄) and Nitrous Oxide (N₂O)
 - Lower cost for BMIC to manage waste
 - Creation of permeant jobs for the community
 - Total reduction in BMIC solid waste
 - Total increase of recyclable material for BMIC
 - Tribal Sovereignty

- **Drawbacks**
 - Large upfront cost
 - Land Degeneration
 - Habitat Loss

GHG Reduction Measure Two: Retrofitting BMIC Facilities for Energy efficiency.

- **Benefits**
 - A total 0.3149 MTCO_{2e} reduced every year
 - 1.889 MTCO_{2e} GHG reduced between 2024-2030
 - 8.1874 MTCO_{2e} GHG reduced between 2024-2050
 - BMIC facilities will become more energy efficient
 - Increase in jobs for the community working on upgrades
 - Lower energy cost for BMIC facilities

- **Drawbacks**
 - Large overall cost

GHG Reduction Measure Three: Installation of 11MW Solar Farm for Bay Mills Indian Community

- **Benefits**
 - 7,302 MTCO_{2e} reduced every year

- 43,812 MTCO₂e GHG reduced between 2024-2030
 - 189,852 MTCO₂e GHG reduced between 2024-2050
 - 100% renewable energy for Bay Mills Indian Community
 - Tribal sovereignty
 - Increase in jobs in the community
 - Overall revenue for BMIC
 - Unique partnership with Cloverland Electric Cooperative
- **Drawbacks**
 - Large startup cost
 - Land Degeneration
 - Habitat Loss

GHG Reduction Measure Four: Installation of Combine Heat and Power (CHP) for Bay Mills Resort Casino

- **Benefits**
 - 98.2 MTCO₂e reduced every year
 - 589.2 MTCO₂e GHG reduced between 2024-2030
 - 2,553.2 MTCO₂e GHG reduced between 2024-2050
 - Lower energy cost for and Bay Mills Resort and Casino
 - CHP will be 70% energy efficient compared to current systems that run at 50% efficiency
- **Drawbacks**
 - Large startup cost

GHG Reduction Measure Five: Installation of combine heat and power at BMIC Health Center

- **Benefits**
 - 67.5 MTCO₂e reduced annually
 - 405 MTCO₂e GHG reduced between 2024-2030
 - 1,755 MTCO₂e GHG reduced between 2024-2050.
 - Lower energy cost for the Tribe.
- **Drawbacks**
 - Large startup cost.

3.4 Review and Authority to Implement

Bay Mills Indian Community recognizes the importance of this PCAP and the GHG reduction measures that is included in this PCAP. With this importance the following miles stones will take place to make certain GHG reduction measures are implemented.

- Develop a PCAP that fits the needs and wants for BMIC: Through outreach meetings with tribal members and stakeholders, an adequate PCAP was developed.
- Presentation to BMIC Executive Council: After the completion of this PCAP members from BMIC Biological Services, BMIC Planning Department and ITCMI will present this PCAP to the Executive Council. Executive Council meets once a week. This presentation will clarify each section of this PCAP.
- Executive Council Vote: After the presentation from the PCAP team, Executive Council will vote on implementing measures in this PCAP

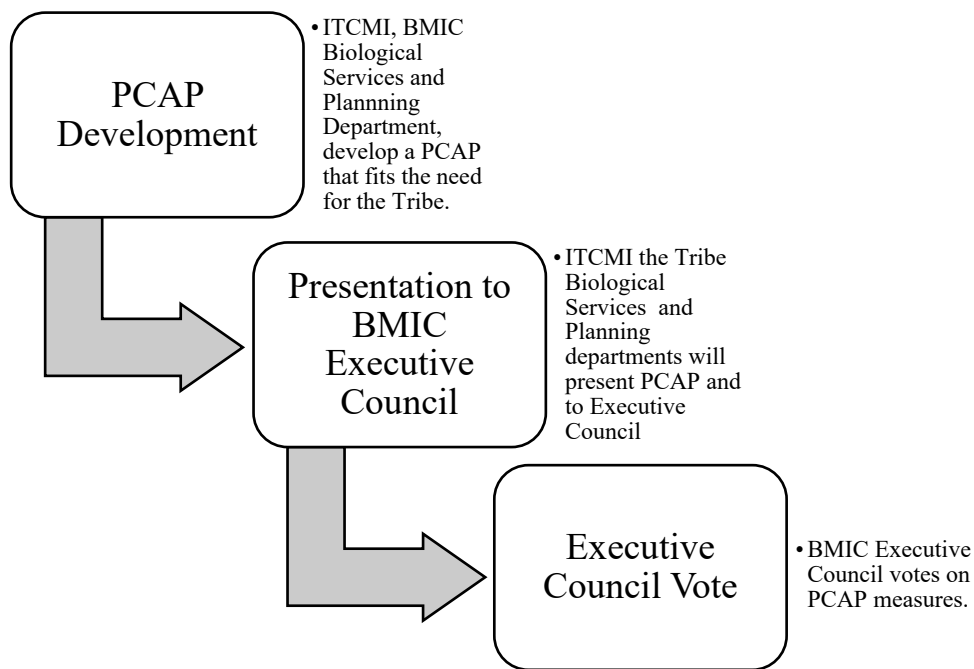


Figure 1. Flow chart for implementation of this PCAP

In the development of this PCAP, the Tribe has been transparent on the type of projects that will reduce GHG emissions. Through presentations to Executive Council, measures listed in this PCAP will be approved.

3.5 Identification of Other Funding Mechanisms

It is vital for Bay Mills Indian Community to have GHG reduction measures listed in the PCAP to be completed to help lower the Tribe's carbon footprint. To accomplish this goal, it is important for the Tribe to seek any funding sources available to possibly fund the Tribes GHG reduction measures.

The following are other sources of funding that the Tribe can apply for to help fund the Tribes GHG reduction measures.

Greenhouse Gas Reduction Fund (GGRF)¹⁴

Summary: \$27 billion investment to mobilize financing and private capital to combat the climate crisis and ensure American economic competitiveness. The GGRF will deliver lower energy costs and economic revitalization to communities, particularly those that have historically been left behind. Through the GGRF program, the EPA will allocate the fund through three competitions: Solar for All, National Clean Investment Fund (NCIF), and the Clean Communities Investment Accelerator (CCIA). Through these competitions, the fund aims to scale deployment of clean technologies nationally, build community clean financing capacity locally, and spur adoption of clean distributed solar energy in disadvantaged communities to achieve three broad objectives:

- Reduce greenhouse gas (GHG) emissions and other air pollutants.
- Deliver the benefits of greenhouse gas- and air pollution-reducing projects to American communities, particularly low-income and disadvantaged communities.
- Mobilize financing and private capital to stimulate additional deployment of greenhouse gas and air pollution reducing projects.

Community Change Grants¹⁵

Summary: The Inflation Reduction Act authorized the creation of the US Environmental Protection Agency's (EPA) new Environmental and Climate Justice Community Change Grants program. The program is designed to benefit disadvantaged communities through projects to reduce pollution, increase community climate resilience, and build community response capacity. The grants will be focused on community-driven initiatives to be responsive to community and stakeholder input.

¹⁴ [Greenhouse Reduction Fund](#)

¹⁵ [Community Change Grants](#)

Department of Energy Loan Programs Office State Energy Finance Institution Program

Summary: The Department of Energy's (DOE) Loan Programs Office (LPO¹⁶) finances large-scale energy infrastructure projects across the U.S. Through Title 17 Innovative Clean Energy Loan Guarantee Program (Title 17), DOE LPO provides loan guarantees for Innovative Clean Energy Projects, including through the designation of a State Energy Finance Institution (SEFI) to fund specific projects. A SEFI is a quasi-independent entity or an entity within a state agency or financing authority established by a state to satisfy two functions:

- Provide financial support or credit enhancements for clean energy projects, and
- Create liquid markets for eligible projects or take other steps to reduce financial barriers to the deployment of existing and new eligible projects.

4. Next Steps

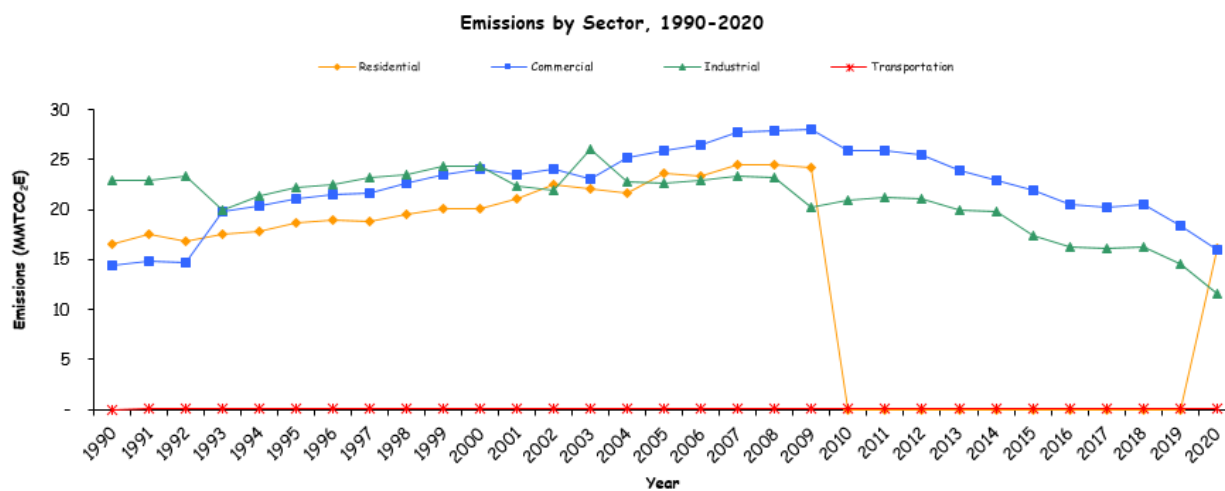
After the completion of this PCAP, work will begin on developing the CCAP for Bay Mills Indian Community. The CCAP will consist of developing a comprehensive GHG inventory for BMIC. This GHG inventory will consist of determining GHG emissions for the transportation sector, electricity power sector, the industrial sector, commercial and residential sector, land use and forestry sector, waste and materials management sector and agriculture sector. This GHG inventory will be unique for the Tribe. ITCMI will work directly with the Tribe to help determine GHG emissions for each sector of this inventory. A series of public stakeholder meetings will be held for tribal members. In the public stakeholder meetings, tribal members will have an opportunity to provide input on what type of GHG reduction measures should be included in the CCAP. During CCAP development, ITCMI will work with the Tribes Human Resources Department, to help develop positions to combat climate change. One of the main goals with the CCAP is to help create high quality jobs for the Tribe.

ITCMI will work directly with the Tribe, to develop additional and long-term GHG reduction measures. GHG reduction measures will address the main GHG emission sectors. After completion of GHG reduction measures for the CCAP, a complete benefit analysis will be conducted on each measure. This benefit analysis will look at benefits and drawbacks for each GHG reduction measure. At the end of the CCAP development, BMIC will have a comprehensive climate action plan that will help the Tribe combat climate change and meet the Tribes climate change goals.

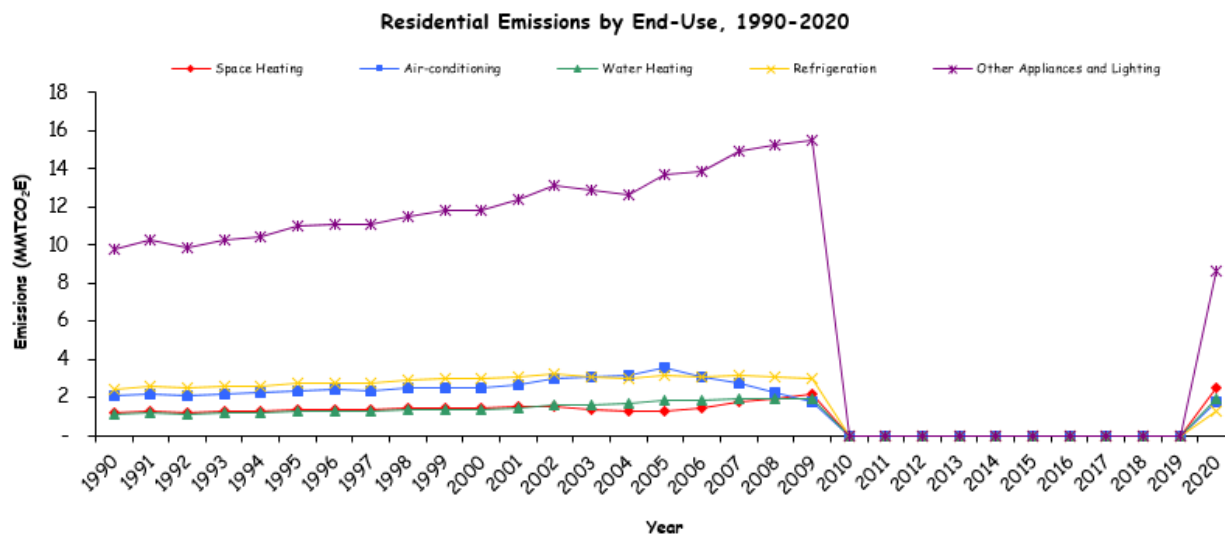
¹⁶ [DOE Loan Program](#)

Appendix A: Electricity Emissions for Michigan 1990-2020

Electricity emissions for the state of MI, using EPA State Inventory Tool¹⁷.

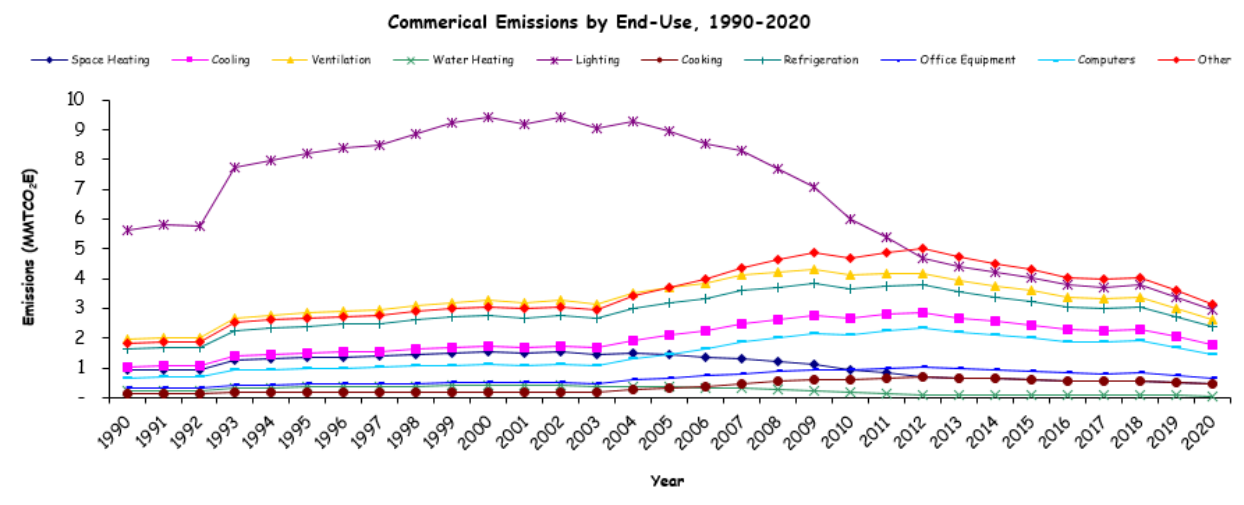


Appendix Figure 1. MI electricity emissions by sector. 1990-2020

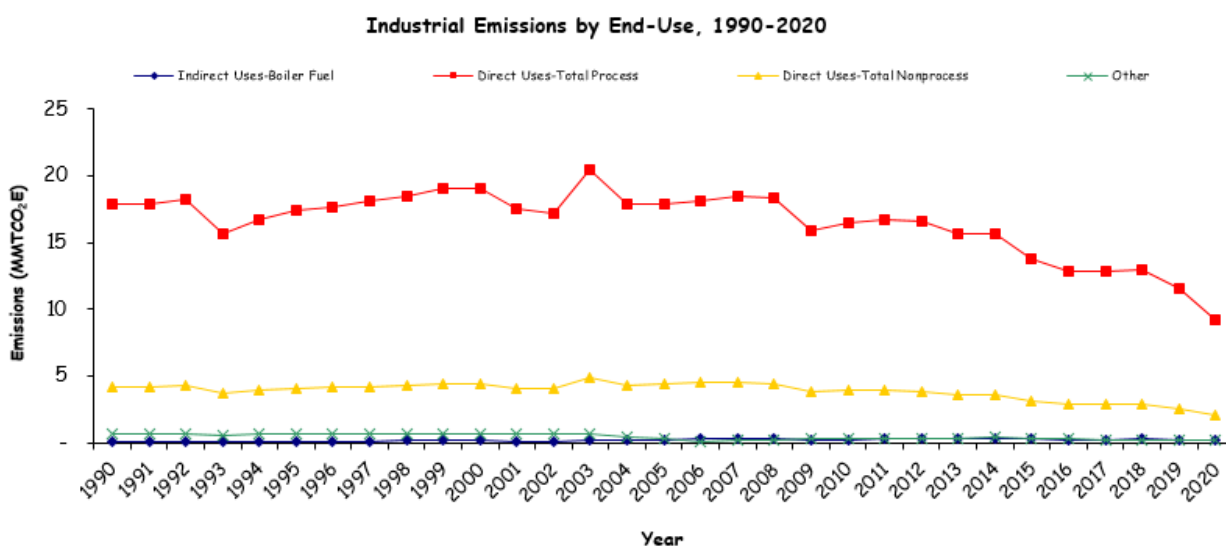


Appendix Figure 2. Residential emissions by end use, 1990-2020

¹⁷ [EPA State Inventory Tool](#)



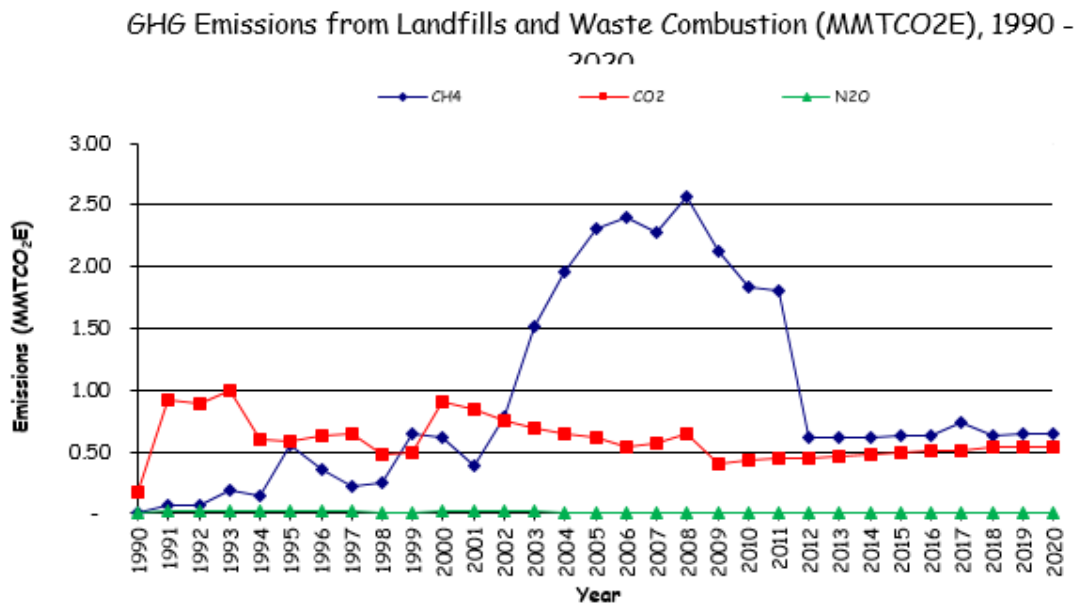
Appendix Figure 3. Commercial emissions by end-use, 1990-2020.



Appendix Figure 4. Industrial emissions by end-use, 1990-2020.

Appendix B. Solid Waste Emissions for the State of Michigan 1990-2020

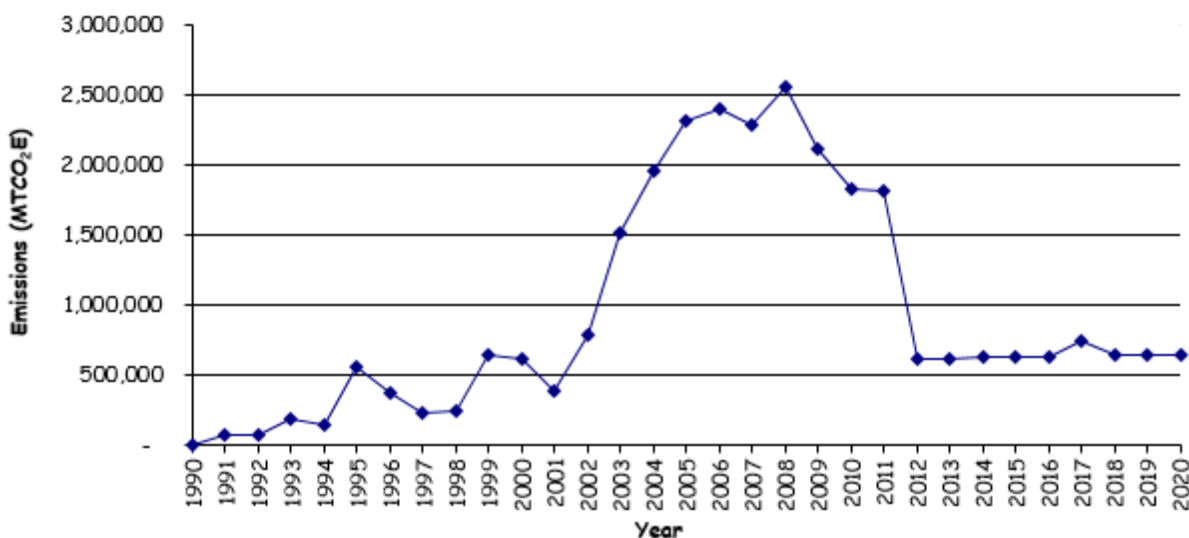
Solid waste emissions for the state of MI, using EPA State Inventory Tool¹⁸.



Appendix Figure 5. GHG emissions from landfills and waste combustion from 1990-2020

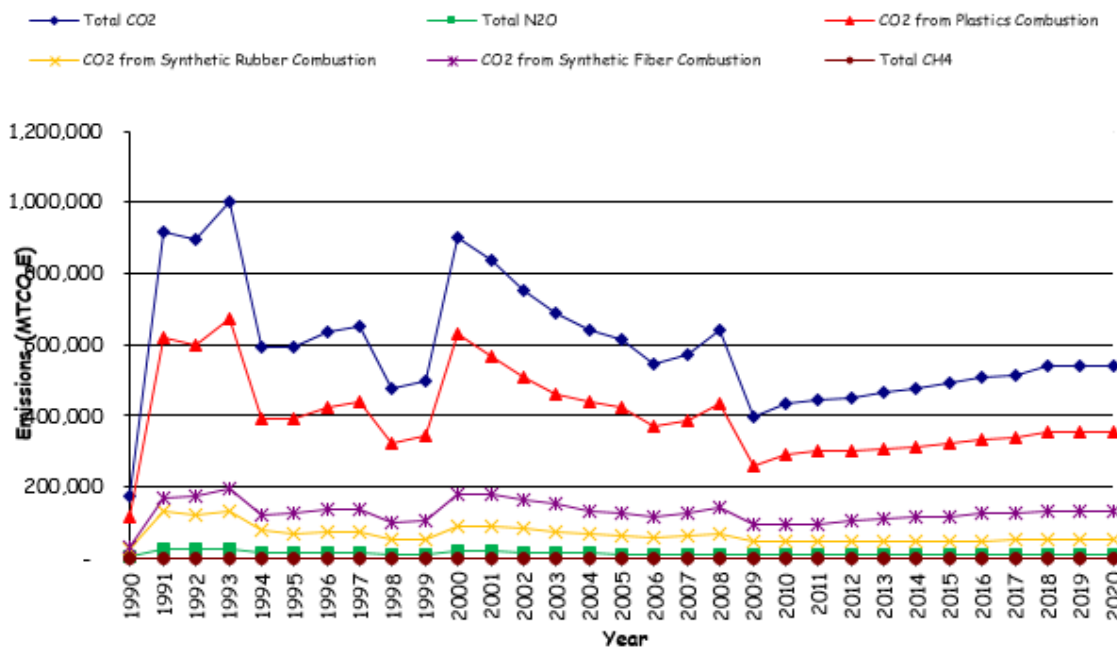
¹⁸ [EPA State Inventory Tool](#)

Methane Emissions from Landfills (MTCO₂E), 1990 - 2020



Appendix Figure 6. Methane Emissions from landfills, 1990-2020.

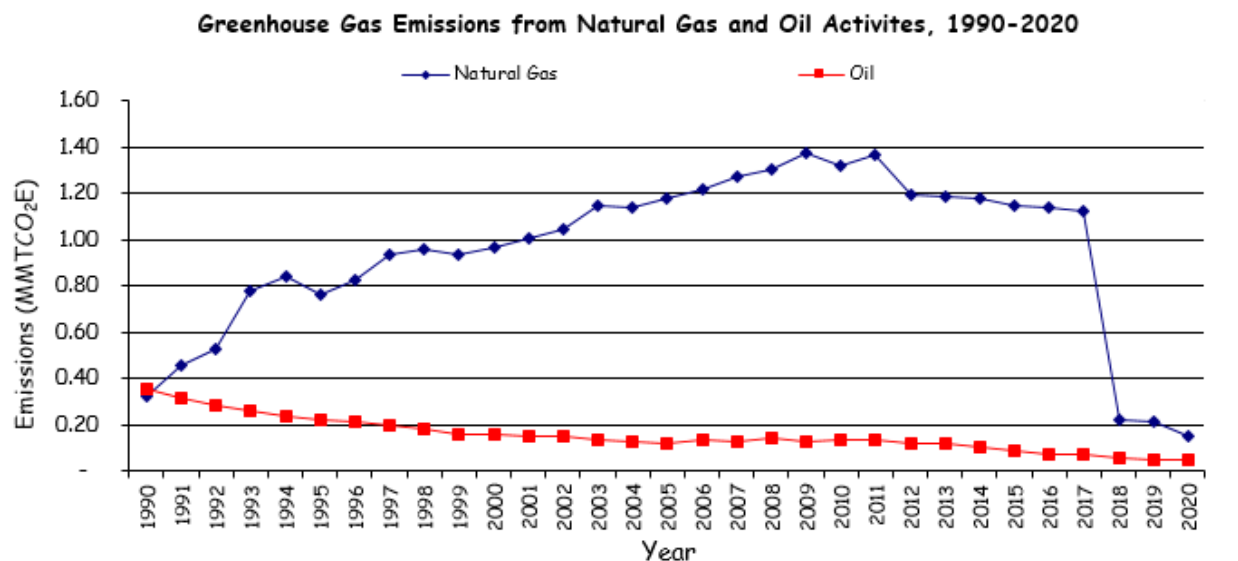
Emissions from Waste Combustion (MTCO₂E), 1990 - 2020



Appendix Figure 7. Emissions from waste combustion, 1990-2020.

Appendix C. Natural Gas and Oil Emissions for Michigan, 1990-2020.

Natural gas emissions for the state of MI, using EPA State Inventory Tool¹⁹.



Appendix Figure 10. Total greenhouse gas emissions from natural gas and oil activities for the state of Michigan in 1990-2020.

¹⁹ [EPA State Inventory Tool](#)

Grand Traverse Band of Ottawa and Chippewa Indians Priority Climate Action Plan

Prepared by: Inter Tribal Council of Michigan

October 2023



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1. Introduction

The Inter-Tribal Council of Michigan (ITCMI) received funding from the Environmental Protection Agency (EPA), to produce a Priority Climate Action Plan (PCAP) through the Climate Pollution Reduction Grant (CPRG) program, for Grand Traverse Band of Ottawa and Chippewa Indians (GTB or the “Tribe”). GTB is one of Michigan’s twelve federally recognized tribes located primary in Grand Traverse County, MI. As of 2024, tribal membership is 4,200. GTB has a six county service area located primary in the north-west portion of Michigan. . GTB service counties are Antrim, Benzie, Charlevoix, Grand Traverse, Leelanau, and Manistee an area of 2,562 square miles¹.

The Inter-Tribal Council of Michigan is a non-profit organization that represents twelve federally recognized tribes in Michigan. ITCMI is divided into several different divisions which includes Behavioral Health Services, Childhood and Family Services, Economic Development, Head Start, Health Education and Chronic Disease, Maternal and Early Childhood Services and Environmental Services. Each division is dedicated to act as a forum for member Tribes, to advocate in the development of programs and policies which will improve the economy, education, and quality of life for member Tribes, and to provide technical assistance to member Tribes in the development of Tribal regulations, ordinances and policies applicable to health and human services.

1.1 CPRG Overview

Participating in the CPRG program will produce two deliverables at the end of this program. The first deliverable is to create a PCAP by April 1st 2024. In the PCAP, ITCMI and GTB will produce a generalize Green House Gas (GHG) inventory using already existing national and state data. The PCAP will focus on implementation ready activities. This PCAP will provide potential projects that GTB can adapt to reduce GHG emissions. In development of this PCAP, ITCMI worked directly with GTB environmental department to verify GTB goals in this program were met. The development of this PCAP, will open the door for GTB to apply for funding sources to help implement GHG reducing projects.

After the completion of the PCAP, ITCMI and GTB will begin working on the Comprehensive Climate Action Plan (CCAP). The CCAP will consist of a complete GHG inventory for GTB. This GHG inventory will be strictly for the entire tribe. CCAP will provide GHG projections for near term (2030-2050) and long term (2050) projections. These projections will also include projections if no GHG reduction measures were taken. The CCAP preparation will consist of a series of public stakeholder meetings to provide a chance for tribal members to provide input on CCAP development.²

¹ [GTB](#)

² [ITCMI](#)

1.2 PCAP Overview and Definitions

Below are the following components to GTB PCAP

- GHG Inventory: A generalized GHG inventory will be created. This GHG inventory include implementation ready sectors and some data will be collected from GTB. ITCMI used already published data from U.S Greenhouse Gas Emissions and Sinks by State and National Emissions Inventory (NEI).
- Quantified GHG reduction measures: A list of near term, high priority implementation ready measures is identified in this PCAP. For implementation activities suggested in this PCAP.
- Benefit Analysis: An analysis was conducted to assist benefits of GHG reduction measures. This analysis consisted both base year estimates of co-pollutants and anticipated co-pollutant emission reductions. This assessment will include improved health outcomes, economic benefits, increased climate resilience, and improved air quality. This analysis also includes any dis-benefits resulting from implementation efforts listed in this PCAP
- A Review of Authority to Implement: A time line was created to give GTB key entities to implement projects listed in this PCAP.
- Identification of Other Funding Mechanisms: This section explores possible funding sources, the Tribe can seek to fund projects listed in this PCAP.

1.3 PCAP Development Approach

Below is ITCMI approach into the development of the PCAP.

- Stakeholder Engagement: Through the development of this PCAP, ITCMI worked directly with GTB Environmental Services and GTB Administration Office. Quarterly meetings were held. Goals and objectives were given to ITCMI, to help develop this PCAP.

2. Organization and Considerations

2.1 PCAP Team

Table 1. Shows ITCMI PCAP team and roles that contributed to developing this PCAP.

Role	Reasonability
Project Manager- ITCMI	Manages operating project activities, host public stakeholder engagement meetings, complete reporting requirements to the EPA, develop GHG inventory and develop PCAP
Technical Support-ITCMI	Complete GHG inventory, data interpretation and assist with PCAP development.
Quality Assurance Manager-ITCMI	Provides quality assurance for PCAP development and GHG Inventory data
GTB Environmental Services	Develops GTB goals and objectives for PCAP development. Assist in public stakeholder meetings, provide any previous data that the Tribe has conducted.
GTB Tribal Council	Provide final decision on implementation projects listed in this PCAP.
Environmental Protection Agency	Provide technical assistance in PCAP development.

2.2 Sector Specific Goals

In the development of this PCAP, ITCMI and BMIC have created the following goals for this to be delivered after the completion of this PCAP.

- Goal one: To install a Geothermal system for Turtle Creek Casino, Grand Traverse Resort and Spa and Leelanau Sands Casino & Lodge
- Goal Two: To introduce electric vehicles (EV's) to GTB.
- Goal Three: To reduce the Tribe's GHG emissions by 50% by 2030.
- Goal Four: To become completely net zero by 2050.

3. PCAP Elements

3.1 Greenhouse Gas (GHG) Inventory

3.1.1 Scope

The scope of this GHG Inventory will focus on the following sectors:

- A. Electricity Generation and Consumption Sector
- B. Commercial and Residential Sector
- C. Transportation Sector

The baseline year used for this inventory is 2020, this year was chosen for a baseline due to volume of data available.

3.1.2 Data Collection Sources

Data in this GHG Inventory originated from the following sources:

- National Emissions Inventory (NEI): NEI is a comprehensive and detailed estimate of air emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emissions sources.
- State Inventory Tool (SIT): The State Inventory Tool consists of eleven different GHG estimation models. These estimates are used in this PCAP using baseline year 2020.
- Green House Gas Inventory Data Explorer: Information obtained from this tool originally originated from the NEI data. This tool was used to decipher GHG emissions from different sections of the NEI.
- Tribal GHG Inventory Tool: This tool was used to generate the GHG Inventory for this project.
- State and Local Planning of Energy (SLOPE) Database: This tool was used to compare measures that can reduce GHG emissions to current conditions.

3.1.3 GHG Accounting Method and Global Warming Potential

In this GHG inventory, majority of GHG's is produced globally is Carbon Dioxide (CO₂). For this inventory CO₂ emissions is calculated in Million Metric Tons of CO₂ Equivalent (MMTCO₂e) or Metric Tons of CO₂ Equivalent (MTCO₂e).

Global Warming Potential

As GHG's are emitted in the atmosphere, these emitted gases act like a blanket that covers the Earth's atmosphere and cause warming. Each greenhouse gasses emitted warms the Earth at different rates. Differences in rates is expressed in Global Warming Potential (GWP). GWP is the result of GHG's ability to absorb energy and how long it will it stay in the atmosphere. The EPA primarily uses the 100-year GWPs from IPCC Fifth Assessment Report (AR5) per international

reporting standards. 100-year GWP is based on energy absorbed by a gas over 100 years. Below is a summary of GWP to relevant GHG's listed in this inventory.

Table 2. GWP for greenhouse gases listed in this inventory in a 100 year period according to IPCC Fifth Assessment Report (AR5)³

Greenhouse Gases	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265

3.1.4 GHG Inventory by Sector

A. Electricity Generation and Consumption

The following data is from the SIT⁴ using base year of 2020.

Tables 3-5. Shows residential, commercial and industrial electricity consumption data in 2020 in Michigan

Table 3. Michigan 2020 Residential Electricity Consumption

Source	kWh	Total (MTCO₂e)
Space Heating	5,550,514,846	2,401,121
Air Conditioning	3,984,985,018	1,723,882
Water heating	4,269,620,805	1,847,014
Refrigeration	2,846,417,870	1,231,344
Other	19,213,320,622	8,311,573
Total	35,864,865,161	15,514,936

Table 4. Michigan 2020 Commercial Electricity Consumption

Source	kWh	Total (MMTCO₂e)
Space Heating	997,792,974	431,640
Cooling	3,991,171,869	1,726,558
Ventilation	5,864,215,990	2,536,826
Water Heating	142,541,883	61,663
Lighting	6,556,925,257	2,836,489
Cooking	997,792,974	431,640
Refrigeration	5,274,048,577	2,281,523
Office Equipment	1,625,418,534	703,147

³ [Global Warming Potential](#)

⁴ [EPA State Inventory Tool](#)

Table 5. Michigan 2020 Industrial Electricity Consumption

Source	kWh	Total (MMTCO _{2e})
Conventional Boiler Use	393,796,870	170,354
Process Heating	2,879,793,900	1,245,782
Process Cooling and Refrigeration	2,108,908,085	912,302
Machine Drive	13,153,445,793	5,690,106
Electro-Chemical Process	1,739,799,795	752,627
Facility HVAC	621,255,853	268,752
Facility Lighting	2,095,694,010	906,585
Other Facility Support	1,687,907,767	730,179
Onsite Transportation	461,812,492	199,777
Other Non-Process Use	46,832,237	20,259
Other	306,061,291	132,400
Total	25,656,612,576	11,098,904

Table 6. Shows Michigan electricity consumption in Million Metric Tons Carbon Dioxide Equivalent (MMTCO_{2e})

Source	Total (MTCO _{2e})
Residential	15,514,936
Commercial	15,354,036
Industrial	11,098,904
Total	41,967,876

Electricity Consumption and Emissions for GTB Service Counties

Table 7-8 shows electricity consumption in kWh and emissions in Million Metric Tons CO₂ (MMTCO₂) across the Tribes six service counties Antrim, Benzie, Charlevoix, Grand Traverse, Leelanau, and Manistee. This data was obtained from SLOPE Tool⁵.

Table 7. Electricity Consumption in kWh for GTB Six Service counties

County	Residential	Commercial	Industrial	Transportation	Total
Antrim	125,287,882	26,074,533	39,623,208	4,554,324	195,537,018
Benzie	195,537,018	36,047,741	24,928,625	4,059,034	214,528,023
Charlevoix	125,287,882	35,432,292	174,611,743	6,136,908	341,427,796
Grand Traverse	149,495,552	350,219,928	277,860,681	11,374,088	788,947,320

⁵ [State and Local Planning for Energy](#)

Leelanau	149,495,552	32,032,667	48,327,419	5,975,719	235,804,983
Manistee	149,495,552	14,099,649	15,178,150	3,616,497	182,378,126

Table 8. Electricity Emissions in MMTCO_{2e} for each service county for GTB in 2020

County	Residential	Commercial	Industrial	Transportation
Antrim	54,199	11,280	17,141	1,970
Benzie	84,588	15,594	10,784	1,756
Charlevoix	54,199	15,594	10,784	2,655
Grand Traverse	64,671	151,503	120,201	4,920
Leelanau	64,671	13,857	20,906	2,585
Manistee	64,671	6,099	6,566	1,564
Totals	386,999	213,927	186382	15,450

B. Commercial and Residential Sector

The following data is fuel consumption for GTB service counties. The data was obtained from the 2020 NEI Database⁶.

Table 9. Michigan Residential fuel combustion for natural gas, wood, oil and other types of combustion in emissions tons for GTB service counties.

County	Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)
Antrim	32.38	2,324.10	1.16	32.80
Benzie	20.61	1,625.71	1.22	27.30
Charlevoix	48.59	1,802.62	1.47	28.81
Grand Traverse	222.73	4,529.23	3.77	44.58
Leelanau	222.73	4,529.23	3.77	44.58
Manistee	41.65	1,661.35	1.33	25.35
Totals	588.69	11,943.01	12.72	203.42

⁶ [2020 NEI Data Set](#)

Table 10. Michigan commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for GTB service counties.

County	Biomass (Tons)	Natural Gas (Tons)	Oil (Tons)	Other Fuel Sources (Tons)
Antrim	4.37	10.83	0.33	0.69
Benzie	4.36	10.79	0.32	0.69
Charlevoix	9.02	22.33	0.68	1.43
Grand Traverse	61.96	153.30	4.69	9.82
Leelanau	5.50	13.61	0.41	0.87
Manistee	7.43	18.39	0.56	1.17
Totals	92.64	229.25	6.99	14.67

Table 11. Emissions from residential fuel combustion for natural gas, wood, oil and other types of combustion for the state of MI.

Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)	Total Emissions (tons)
24,507.89	282,605.75	318.33	3,560.88	310,674.52

Table 12. Emissions from commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for the state of Michigan.

Biomass	Natural Gas	Oil	Other Fuel Sources	Total Emissions (tons)
4,937.38	12,215.68	373.90	782.66	18,309.62

C. Transportation Sector

The following transportation data is from the 2020 NEI dataset⁷. This data is calculating vehicle CO₂ emissions in tons.

Table 13. Combined CO₂ emissions from non-road equipment gasoline vehicles, diesel vehicle and other fuel type vehicles from GTB six service counties.

County	Non-Road Gasoline	Non-Road Diesel	Non-Road Other	Totals
Antrim	20,198.71	9,753.18	1,206.88	31,158.78
Benzie	20,689.62	5,851.83	332.70	26,874.16
Charlevoix	20,427.24	11,004.34	2,433.73	33,865.36
Grand Traverse	22,647.93	33,493.75	5,541.36	61,683.05

⁷ [2020 NEI Data Set](#)

Leelanau	27,148.78	14,362.64	254.10	41,765.52
Manistee	18,136.63	7,817.45	1,061.71	27,0153.80

Table 14. Combined CO₂ emissions from on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for GTB six service counties

County	On-road Diesel Heavy Duty Vehicles	On-road Diesel Light Duty Vehicles	On-road Non Diesel Heavy Duty Vehicles	On-road Non Diesel Light Duty Vehicles	Totals
Antrim	27,346.60	3,811.66	3,316.23	104,891.97	139,366.47
Benzie	19,606.85	2,719.13	2,313.92	74,683.95	99,103.87
Charlevoix	26,372.47	3,672.65	3,234.73	100,472.93	133,752.79
Grand Traverse	67,221.45	13,320.40	12,053.11	379,798.32	472,303.29
Leelanau	19,437.37	2,950.46	2,803.84	84,942.71	110,134.39
Manistee	20,430.88	4,842.97	2,612.43	96,291.98	124,178.29

Table 15. Combined CO₂ emissions from commercial marine vessels and locomotives for GTB six service counties.

County	Commercial Marine Vessels	Locomotives	Total's
Antrim	5.63	691.26	696.90
Benzie	4,690.85	0	4,690.85
Charlevoix	9,127.73	442.33	9,570.07
Grand Traverse	2,531.46	1,791.92	4,323.39
Leelanau	15,002.46	0	15,002.46
Manistee	5,570.16	404.13	5,974.30

Table 16. Combined CO₂ Emissions from gasoline vehicles, diesel vehicles and other fuel type vehicles, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for the state of Michigan in 2020.

Source	CO ₂ Emissions (Tons)
Gasoline vehicles, diesel vehicles, other fuel types.	6,464,377.05
On-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles	45,479,338.17
Commercial Marine and Locomotives	734,177.74
Total	52,677,892.96

3.2 GHG Reduction Measures

The following are GHG reduction measures for GTB.

GHG Reduction Measure One: To install combine heat and power (CHP) system in Turtle Creek Casino and Hotel.

Table 17. GHG reduction measure one overview.

Measure 1: To install a CHP system for Turtle Creek Casino and Hotel.	Implementing Agency	Grand Traverse Band of Ottawa and Chippewa Indians
	Applicable Sector:	Commercial and Residential Sector
	Implementation Milestones	To install a CHP system at Turtle Creek Hotel and Casino and replace current system used at the facility.
	Location	7741 M-72, Williamsburg, MI 49690
	Annual Estimated GHG and criteria air pollutant emissions reductions	7,077 MTCO _{2e} reduced every year.
	Long Term GHG Reduction	2024-2030: 42,642 MTCO _{2e} 2024-2050: 184,002 MTCO _{2E}

GHG Reduction Measure One Summary: GTB wishes to install a combine heat and power system for Turtle Creek Hotel and Casino. A CHP system combines heat and electricity to provide energy for the facility. CHP system will replace Turtle Creeks Casino and Hotel current systems which is boiler system for heat and electricity from Consumers Energy. In 2021, Turtle Creek used a total of 12,051,000 kWh. With the installation of CHP, Turtle Creek will use 2,064,600 kWh, this will be a total of 82% decrease in electricity use for Turtle Creek. Installation of CHP system will reduce GHG by 7,077 MTCO₂ a year. GHG emission reduction was determined by 2023 Turtle Creek Casino and Hotel CHP Microgrid Feasibility Study performed by DTE Energy.

GHG Reduction Measure Two: To install geothermal heating plants in Turtle Creek Casino, Grand Traverse Resort and Spa and Leelanau Sands Casino and Lodge

Table 18. GHG reduction measure two overview.

Measure 2: To install geothermal system at Turtle Creek Casino, Grand Traverse Resort and Spa and Leelanau Sands Casino and Lodge	Implementing Agency	Grand Traverse Band of Ottawa and Chippewa Indians
	Applicable Sector:	Commercial and Residential Sector
	Implementation Milestones	To replace current HVAC systems at Turtle Creek Casino, Leelanau Sands Casino and Lodge and Grand Traverse Resort and Casino with geothermal system.
	Location	Turtle Creek Casino: 7741 M-72, Williamsburg, MI 49690 Grand Traverse Resort and Spa: 100 Grand Traverse Village Blvd, Acme, MI 49610 Leelanau Sands Casino and Lodge: 2521 N West Bay Shore Dr, Peshawbestown, MI 49682
	Annual Estimated GHG and criteria air pollutant emissions reductions	23,236 MTCO ₂ e reduced every year.
	Long Term GHG Reduction	2024-2030: 139,416 MTCO ₂ e 2024-2050: 604,136 MTCO ₂ e

GHG Reduction Measure Two Summary: GTB wishes to install geothermal systems at Turtle Creek Casino, Leelanau Sands Casino and Lodge and Grand Traverse Resort and Spa. Currently both facilities use a boiler system for their HVAC system. Replacing both facilities with geothermal will reduce the Tribe’s energy consumption. This GHG reduction measure will take place in phases. With phase one being a complete energy assessment to determine what type of geothermal system is feasible. Phase two implementation and installation of the geothermal systems.

Table 19. Current carbon foot print for each facility and annual GHG reduction for each facility with geothermal upgrades

Facility	Current Carbon footprint (MTCO ₂ e)	Reduction (MTCO ₂ e)
Turtle Creek Casino and Hotel	20,981	9,736
Grand Traverse Resort and Spa	15,000	7,500
Leelanau Sands Casino	12,000	6,000
Totals	47,981	23,236

Total GHG reduction combined from installation of geothermal systems in Grand Traverse Resort and Spa, Turtle Creek Casino and Hotel and Leelanau Sands Casino and Lodge is 23,236 MTCO₂e. Emission reductions by adding geothermal was determined by The Nielsen Group⁸. The Nielsen Group is an outside energy consultant, which is currently conducting a geothermal feasibility study for GTB. The Nielsen Group compared current natural gas and GTB current HVAC systems with geothermal assumptions. Emission reduction numbers listed in the PCAP is a preliminary estimate, since the geothermal feasibility study is still ongoing for GTB.

⁸ [The Nielsen-Group](#)

GHG Reduction Measure Three: To replace 8 GTB vehicles with EV’s and to install 33 additional EV charging stations.

Table 20. GHG reduction measure three overview.

Measure 3: To replace 8 GTB vehicles with EV’s and install 33 additional EV charging stations.	Implementing Agency	Grand Traverse Band of Ottawa and Chippewa Indians
	Applicable Sector:	Transportation Sector
	Implementation Milestones	To replace 8 GTB vehicles with EV’s and install 33 additional EV charging stations.
	Location	Grand Traverse Resort and Spa: 100 Grand Traverse Village Blvd, Acme, MI 49610 Turtle Creek Hotel and Casino: 7741 M-72, Williamsburg, MI 49690 Leelanau Sands Casino and Lodge: 2521 N West Bay Shore Dr, Peshawbestown, MI 49682 GTB Government Offices
	Annual Estimated GHG and criteria air pollutant emissions reductions	33.6 MTCO_{2e} reduced every year.
	Long Term GHG Reduction	2024-2030: 201.6 MTCO_{2e} 2024-2050: 873.6 MTCO_{2e}

GHG Reduction Measure Three Summary: GTB wishes to replace 8 vehicles with EV’s throughout the Tribes entire vehicle fleet. The Tribe wishes to replace the following vehicles with EVs:

- Two, 14 passenger shuttle busses at Grand Traverse Resort and Spa
- One van at Turtle Creek Casino and Hotel
- Two EV shuttle busses at Turtle Creek Casino and hotel
- One 16 passenger shuttle bus at Leelanau Sands Casino and Lodge
- Two vans for GTB Maintenance Department.

In addition to the eight vehicles GTB wishes to replace with EV’s the Tribe would install an additional 29 EV charging stations. Charging stations will be attended to be used by GTB staff and the public. Charging stations will be located at the following locations:

- 11 EV charging stations at Grand Traverse Resort and Casino
- 8 EV charging stations at Turtle Creek Casino and Hotel

- 5 EV charging stations at Leelanau Sands Casino and Lodge
- 2 EV charging stations at GTB Administration Building
- 1 EV charging stations at GTB Economic Development Building
- 2 EV charging stations at Grand Traverse Band Family Health Center
- 1 EV charging station at GTB Natural Resources Department building
- 1 EV charging station at Benzie County Satellite Office
- 1 EV charging station at Charlevoix County Satellite Office
- 1 EV charging station at Grand Traverse County Satellite Office

This GHG reduction measure will lower GHG emissions by 33.6 MTCO_{2e} annually. GHG emissions reduction was determined by using EPA GHG Calculator ⁹

3.3 Benefit Analysis

The following is benefit analysis for each GHG reduction measure listed in this PCAP. This benefit analysis will compare benefits and any potential drawbacks for each GHG reduction measure listed in section 3.2 of the PCAP.

GHG Reduction Measure One: To install combine heat and power (CHP) system in Turtle Creek Casino and Hotel.

- **Benefits**
 - 7,077 MTCO_{2e} reduced every year
 - 46,642 MTCO_{2e} reduced between 2024-2030
 - 184,002 MTCO_{2e} reduced between 2024-2050
 - Reduce energy cost for GTB
 - Increase electricity supply readability
- **Drawbacks**
 - Initial installation cost for CHP systems is large
 - CHP systems are not 100% energy sustainable
 - System can be more expensive to repair and maintain

⁹ [EPA Greenhouse Gas Equivalencies Calculator](#)

GHG Reduction Measure Two: Install geothermal systems at Turtle Creek Hotel and Casino and Grand Traverse Resort and Spa

- **Benefits**
 - 23,236 MTCO₂e reduced annually
 - 139,416 MTCO₂e reduction reduced between 2024-2030
 - 604,136 MTCO₂e between 2024-2050
 - Lower energy cost for the Tribe

- **Drawbacks**
 - Initial installation cost is large
 - Location restricted source of energy
 - Generates minor amounts of carbon

GHG Reduction Measure Three: To replace 8 GTB vehicles with EV's and to install 33 additional EV charging stations

- **Benefits**
 - 33.6 MTCO₂e reduced every year
 - 201.6 MTCO₂e reduced between 2024-2030
 - 873.6 MTCO₂e reduced between 2024-2050
 - Will increase EV infrastructure for the Tribe

- **Drawbacks**
 - Large startup cost

3.4 Review and Authority to Implement

The Tribe recognizes the importance of this PCAP and the GHG reduction measures that is included. With this importance the following miles stones will take place to make certain GHG reduction measures will take place for the Tribe.

- Develop a PCAP that fits the needs and wants for GTB: Through outreach meetings with tribal stakeholders, an adequate PCAP was developed.
- Presentation to GTB Tribal Council: After the completion of this PCAP members from GTB Environmental Department, and ITCMI will present this PCAP to the Tribal Council. This presentation will clarify each section of this PCAP to Tribal Council.
- Tribal Council Vote: After the presentation from the PCAP team, Tribal Council will vote on implementing measures in this PCAP.

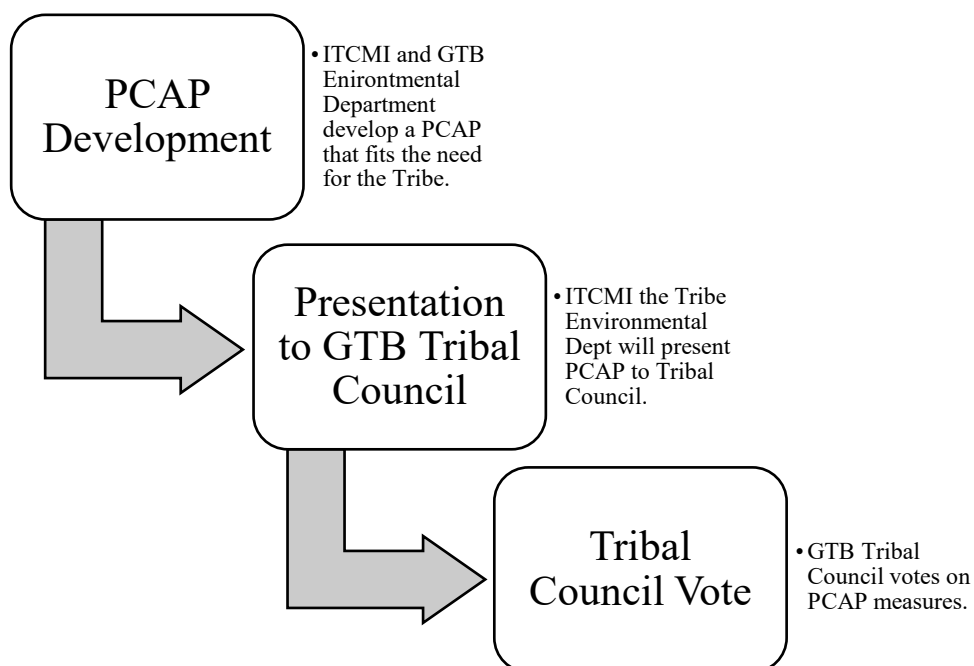


Figure 1. Flow chart for implementation of this PCAP.

In the development of the PCAP, the Tribe has been transparent on the type of projects that will reduce GHG emissions. Through presentations to the Tribal Council, measures listed in this PCAP will be approved.

3.5 Identification of Other Funding Mechanisms

It is vital for the Tribe to have GHG reduction measures listed in this PCAP to be completed to help lower the Tribes carbon footprint. To accomplish this goal it is important for the Tribe to seek any funding sources available to possibly fund the Tribes GHG reduction measures.

The following are sources of funding that the Tribe can apply for to help fund the Tribes GHG reduction measures:

Greenhouse Gas Reduction Fund (GGRF)¹⁰

Summary: \$27 billion investment to mobilize financing and private capital to combat the climate crisis and ensure American economic competitiveness. The GGRF will deliver lower energy costs and economic revitalization to communities, particularly those that have historically been left behind. Through the GGRF program, the EPA will allocate the fund through three competitions: Solar for All, National Clean Investment Fund (NCIF), and the Clean Communities Investment Accelerator (CCIA). Through these competitions, the fund aims to scale deployment of clean technologies nationally, build community clean financing capacity

¹⁰ [Greenhouse Reduction Fund](#)

locally, and spur adoption of clean distributed solar energy in disadvantaged communities in order to achieve three broad objectives:

- Reduce greenhouse gas (GHG) emissions and other air pollutants.
- Deliver the benefits of greenhouse gas- and air pollution-reducing projects to American communities, particularly low-income and disadvantaged communities.
- Mobilize financing and private capital to stimulate additional deployment of greenhouse gas and air pollution reducing projects.

Community Change Grants¹¹

Summary: The Inflation Reduction Act authorized the creation of the US Environmental Protection Agency’s (EPA) new Environmental and Climate Justice Community Change Grants program. The program is designed to benefit disadvantaged communities through projects to reduce pollution, increase community climate resilience, and build community response capacity. The grants will be focused on community-driven initiatives to be responsive to community and stakeholder input.

Department of Energy Loan Programs Office State Energy Finance Institution Program

Summary: The Department of Energy’s (DOE) Loan Programs Office (LPO¹²) finances large-scale energy infrastructure projects across the U.S. Through Title 17 Innovative Clean Energy Loan Guarantee Program (Title 17), DOE LPO provides loan guarantees for Innovative Clean Energy Projects, including through the designation of a State Energy Finance Institution (SEFI) to fund specific projects. A SEFI is a quasi-independent entity or an entity within a state agency or financing authority established by a state to satisfy two functions:

- Provide financing support or credit enhancements for clean energy projects, and
- Create liquid markets for eligible projects or take other steps to reduce financial barriers to the deployment of existing and new eligible projects.

4. Next Steps

After the completion of this PCAP, work will begin on developing the CCAP for the Tribe. The CCAP will consist of developing a comprehensive GHG inventory for GTB. This GHG inventory will consist determining GHG emissions for the transportation sector, electricity generation and consumption sector, the industrial sector, commercial and residential sector, land use and forestry sector, waste and materials management sector and agriculture sector. This GHG inventory will be unique for the Tribe. ITCMI will work directly with the Tribe to help determine GHG emissions for each sector of the inventory. A series of public stakeholder meetings will be held for tribal members. In the public stakeholder meetings, tribal members will

¹¹ [Community Change Grants](#)

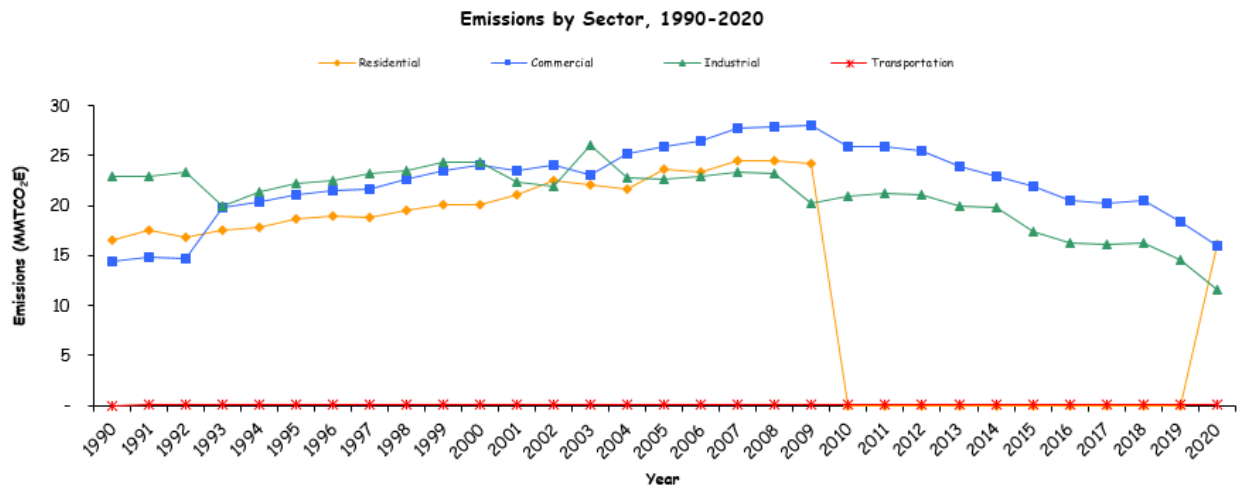
¹² [DOE Loan Program](#)

have an opportunity to provide input what type of GHG reduction measures should be included in the CCAP. During CCAP development, ITCMI will work the Tribes Human Resources Department, to help develop positions to help combat climate change. One of the main goals with the CCAP, is to help create high quality jobs for the Tribe.

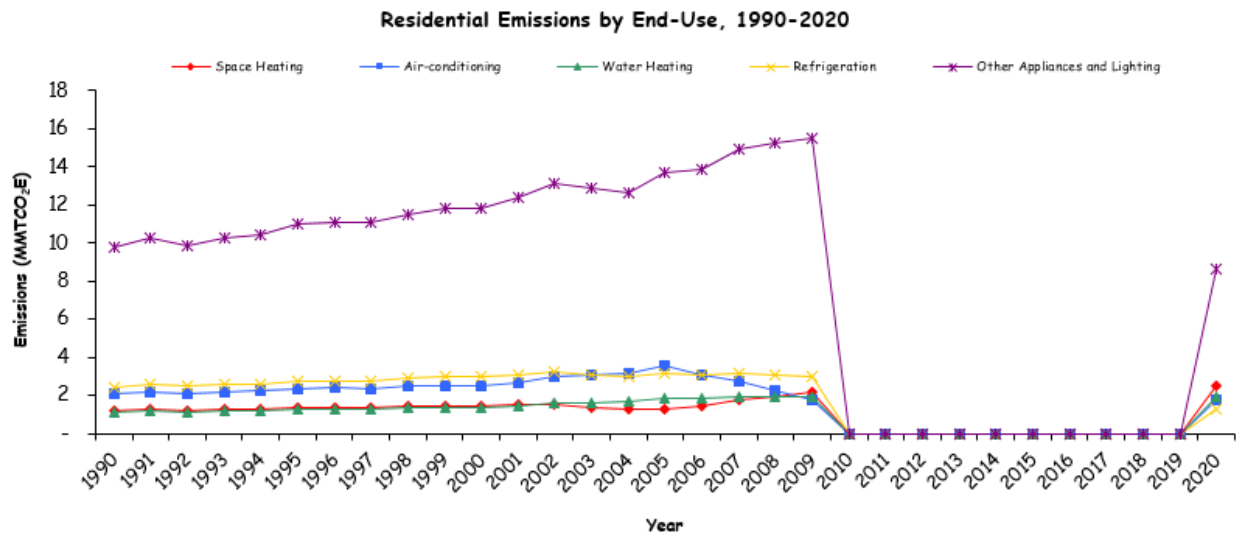
ITCMI will work directly with GTB, to develop additional and long term GHG reduction measures. GHG reduction measures will address the main GHG emission sectors. After completion of GHG reduction measures for the CCAP, a complete benefit analysis will be conducted on each measure. This benefit analysis will look at benefits and drawbacks for each GHG reduction measure. At the end of the CCAP development, GTB will have a comprehensive climate action plan that will help the Tribe combat climate change and meet the Tribes climate change goals.

Appendix A: Electricity Emissions for Michigan 1990-2020

Electricity emissions for the state of MI, using EPA State Inventory Tool.¹³

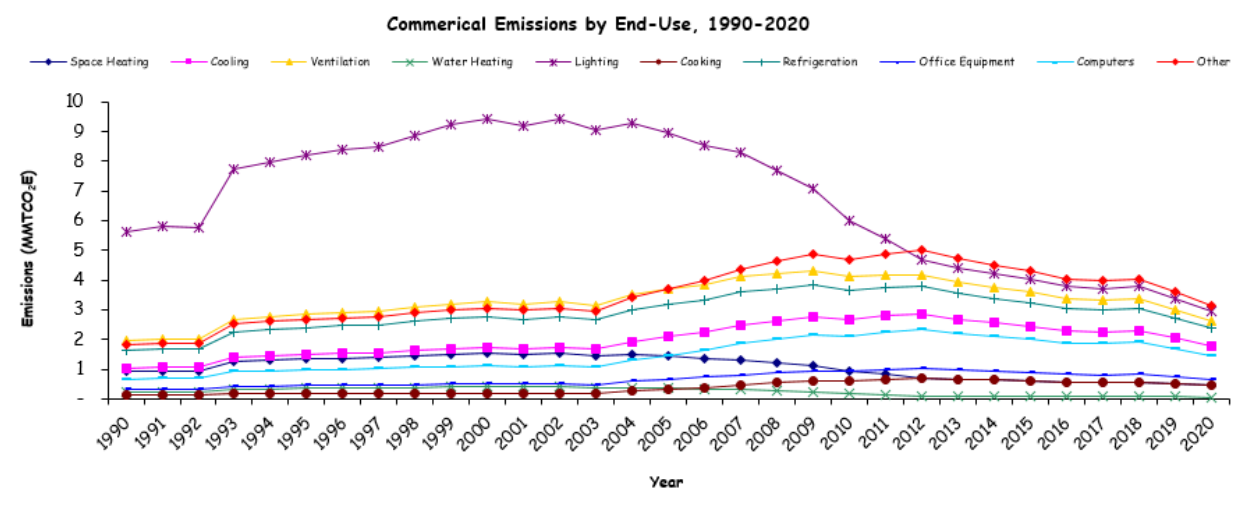


Appendix Figure 1. MI electricity emissions by sector. 1990-2020

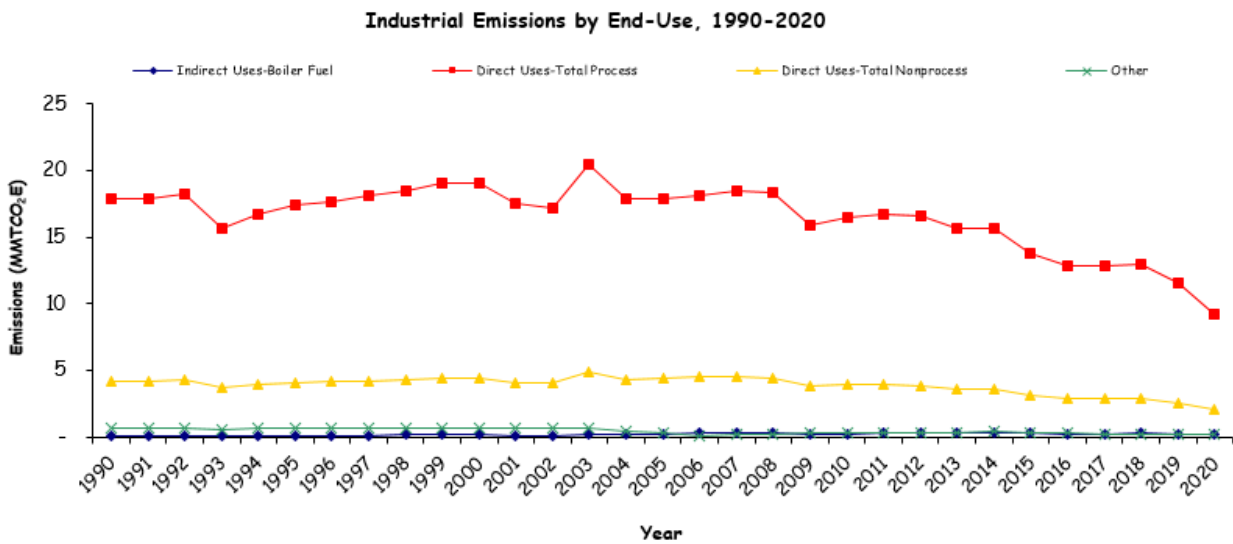


Appendix Figure 2. Residential emissions by end use, 1990-2020

¹³ [EPA State Inventory Tool](#)



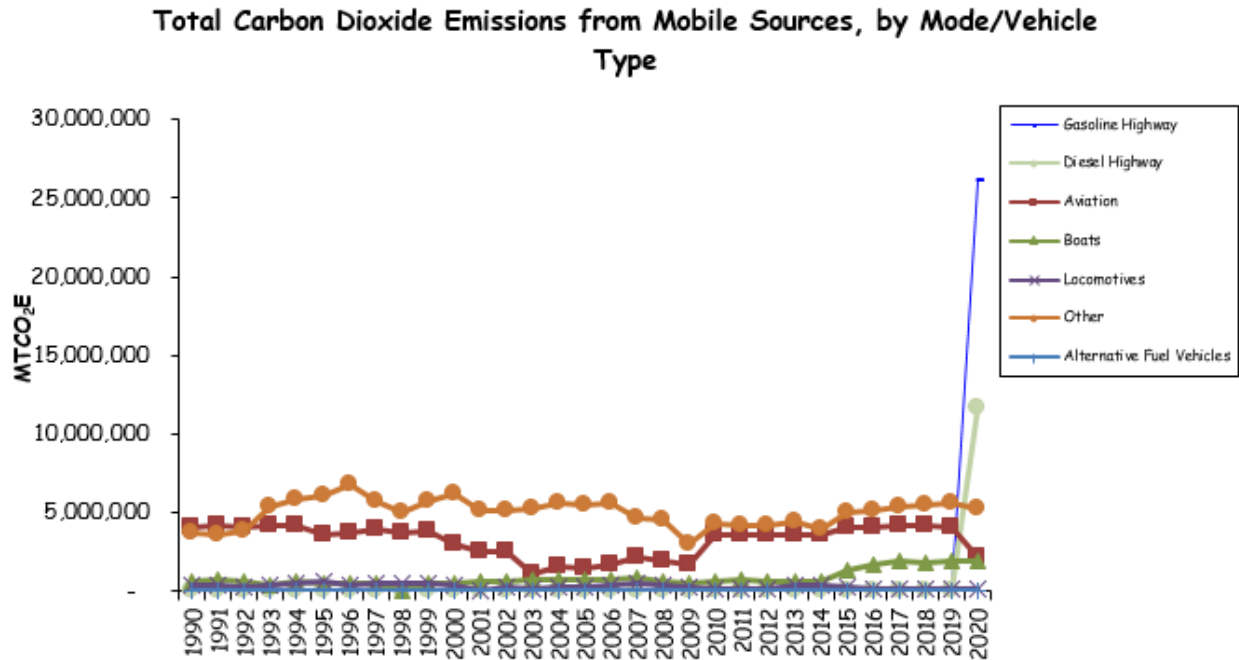
Appendix Figure 3. Commercial emissions by end-use, 1990-2020.



Appendix Figure 4. Industrial emissions by end-use, 1990-2020.

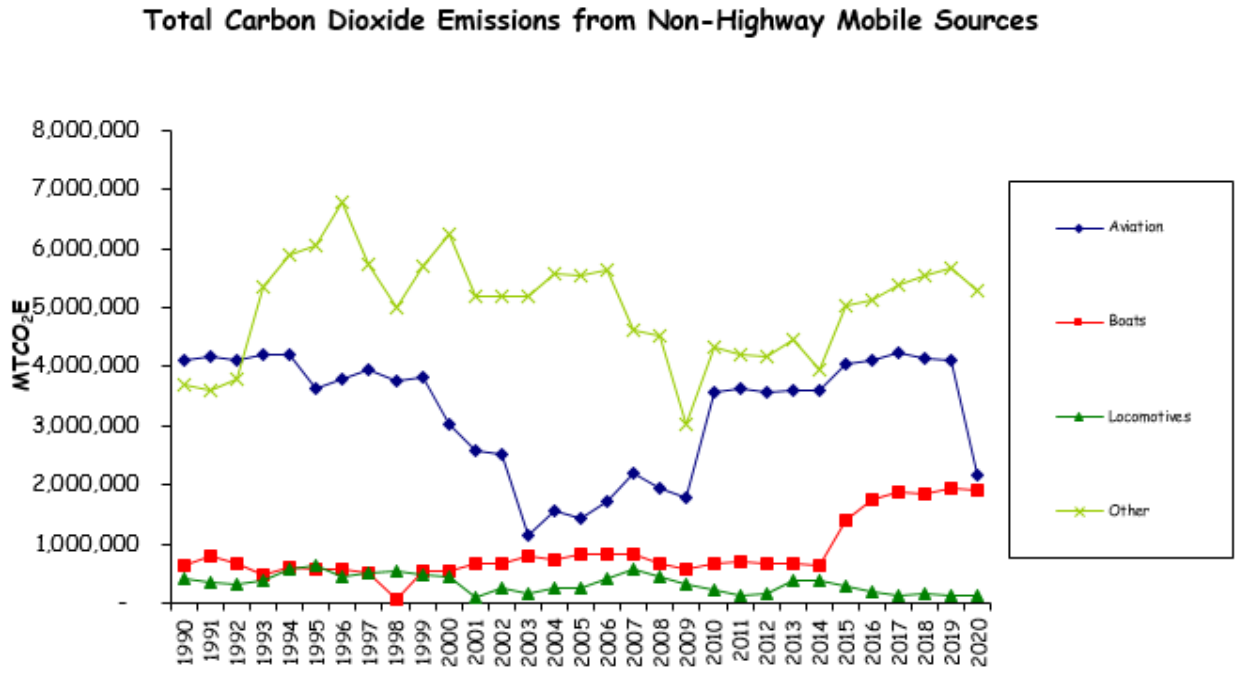
Appendix B. Mobile Combustion Emissions for Michigan 1990-2020

Mobile combustion emissions for the state of MI from 1990-2020 using EPA State Inventory Tool.¹⁴



Appendix Figure 5. CO₂ emissions from mobile sources, by mode/vehicle type.

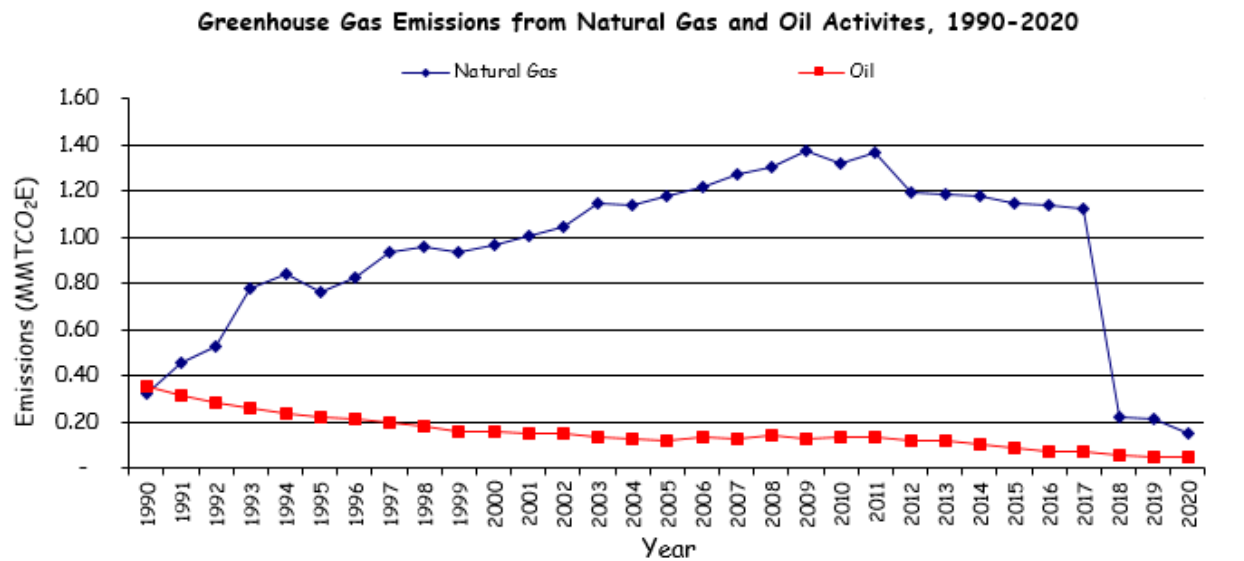
¹⁴ [EPA State Inventory Tool](#)



Appendix Figure 6. Total CO₂ emissions from non-highway sources in MI, 1990-2020.

Appendix C. Natural Gas and Oil Emissions for Michigan, 1990-2020.

Natural gas emissions for the state of MI, using EPA State Inventory Tool¹⁵.



Appendix Figure 7. Total greenhouse gas emissions from natural gas and oil activities for the state of Michigan in 1990-2020.

¹⁵ [EPA State Inventory Tool](#)

Little River Band of Ottawa Indians: Priority Climate Action Plan

Prepared by:
Inter-Tribal Council of Michigan
March 2024



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1. Introduction

The Inter-Tribal Council of Michigan (ITCMI) received funding from the Environmental Protection Agency (EPA), to produce a Priority Climate Action Plan (PCAP) through the Climate Pollution Reduction Grant (CPRG) program, for Little River Band of Ottawa Indians (LRBOI or the “Tribe”). Little River Band of Ottawa Indians is a Michigan federally recognize tribe located primarily in Manistee, Michigan. LRBOI membership is around 4,000 members across 9 service counties Manistee, Mason, Wexford, Lake, Oceana, Newaygo, Kent, Muskegon, and Ottawa. LRBOI has 28 different governmental departments including education, health services and environment and natural resources. ¹

The Inter-Tribal Council of Michigan is a non-profit organization that represents twelve federally recognized tribes in Michigan. ITCMI is divided into several different divisions which includes Behavioral Health Services, Childhood and Family Services, Economic Development, Head Start, Health Education and Chronic Disease, Maternal and Early Childhood Services and Environmental Services. Each division is dedicated to act as a forum for member Tribes, to advocate in the development of programs and policies which will improve the economy, education, and quality of life for member Tribes, and to provide technical assistance to member Tribes in the development of Tribal regulations, ordinances and policies applicable to health and human services².

1.1 CPRG Overview

Participating in the CPRG program will produce two deliverables at the end of this program. The first deliverable is to create a PCAP by April 1st 2024. In the PCAP, ITCMI and LRBOI will produce a generalized Green House Gas (GHG) inventory using already existing national and state data. The PCAP will focus on implementation ready activities. This PCAP will provide potential projects that LRBOI can adapt to reduce GHG emissions. In development of this PCAP, ITCMI worked directly with LRBOI environmental department to verify the Tribe goals in this program were met. The development of this PCAP will open the door for LRBOI to apply for funding sources to help implement GHG reducing projects.

After the PCAP is completed, ITCMI and the Tribe will begin working on the Comprehensive Climate Action Plan (CCAP). The CCAP will consist of a complete GHG inventory for LRBOI. This GHG inventory will be strictly for the entire tribe. CCAP will provide GHG projections for near term (2030-2050) and long term (2050) projections. These projections will also include projections if no GHG reduction measures are taken. CCAP preparation will consist of a series of public stakeholder meetings to provide a chance for tribal members to provide input on CCAP development. The CCAP will be published in spring 2026.

¹ [LRBOI](#)

² [ITCMI](#)

1.2 PCAP Overview and Definitions

Below are the following components to Little River Band of Ottawa Indians PCAP

- GHG Inventory: A generalized GHG inventory will be created. This GHG inventory includes implementation ready sectors, and some data will be collected from LRBOI. ITCMI will use already published data from U.S Greenhouse Gas Emissions and Sinks by State and National Emissions Inventory (NEI and SIT). ITCMI used EPA's Tribal Greenhouse Gas Inventory tool.
- Quantified GHG reduction measures: A list of near term, high priority implementation ready measures are identified in the PCAP. For implementation activities suggested in this PCAP.
- Benefit Analysis: An analysis was conducted to assist benefits of GHG reduction measures. This analysis consisted of both base year estimates of co-pollutants and anticipated co-pollutant emission reductions. This assessment will include improved health outcomes, economic benefits, increased climate resilience, and improved air quality. This analysis also includes any dis-benefits resulting from implementation efforts listed in this PCAP
- A Review of Authority to Implement: A timeline was created to give LRBOI key entities to implement projects listed in this PCAP.
- Identification of Other Funding Mechanisms: This section explores possible funding sources; the Tribe can seek to fund projects listed in this PCAP.

1.3 PCAP Development Approach

Below is ITCMI approach to the development of the PCAP.

- Stakeholder Engagement: Through the development of this PCAP, ITCMI worked directly with LRBOI Environmental Department and Administration Office. Quarterly meetings were held. Goals and objectives were given to ITCMI, to help develop this PCAP.
- Public Stakeholder Engagement: Public input was a major component in developing the PCAP. Flyers were created along with surveys being available for input from tribal members. ITCMI did not receive any input from tribal members on PCAP development. In development of the CCAP, two stakeholder meetings will be held for tribal members to provide input.

2. Organization and Considerations

2.1 PCAP Team

Table 1. Shows ITCMI PCAP team and roles that contributed to developing this PCAP.

Role	Reasonability
Project Manager- ITCMI	Manages operating project activities, host public stakeholder engagement meetings, complete reporting requirements to the EPA, develop GHG inventory and develop PCAP
Technical Support-ITCMI	Complete GHG inventory, data interpretation and assist with PCAP development.
Quality Assurance Manager-ITCMI	Provides quality assurance for PCAP development and GHG Inventory data
LRBOI Environmental Department	Develop LRBOI goals and objectives for PCAP development. Assist in public stakeholder meetings, provide any previous data that LRBOI has conducted.
Little River Band of Ottawa Indians Tribal Council	Provide final decision on implementation projects listed in this PCAP.
Environmental Protection Agency	Provide technical assistance in PCAP development.

2.1.1 Third Party Consultant

In the development of this PCAP, LRBOI partnered with Woven Energy LLC to develop a Renewable Energy and Microgrid Analysis Report. This report information is in 3.2 of the PCAP.

2.2. Sector Specific Goals

In developing this PCAP, LRBOI and ITCMI have created the following goals to be included in it.

- Goal One: To install solar panels near Little River Resorts and Casino.
- Goal Two: To reduce LRBO Carbon footprint by 50% by 2030.
- Goal three: To be completely net zero by 2050.

2.3 Existing GHG Assessments

In May 2023, LRBOI in partnership with Woven Energy conducted an analysis on renewable energy for the tribe. This report was funded by the Energy and Mineral Development Program (EMDP) Grant. This report created a baseline electric profile for LRBOI. This report describes alternate sources of energy LRBOI can use and their benefits.

3. PCAP Elements

3.1 Greenhouse Gas (GHG) Inventory

3.1.1 Scope

The scope of this GHG Inventory will focus on the following sectors:

- A. Electricity Generation and Consumption Sector
- B. Transportation Sector
- C. Commercial and Residential Sector

The baseline year used for this inventory is 2020, this year was chosen for a baseline due to volume of data available.

3.1.2 Data Collection

Data in this GHG Inventory originated from the following sources:

- National Emissions Inventory (NEI): NEI is a comprehensive and detailed estimate of air emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emissions sources.
- State Inventory Tool (SIT): The State Inventory Tool consists of eleven different GHG estimation models. These estimates are used in this PCAP using baseline year 2020.
- Green House Gas Inventory Data Explorer: Information obtained from this tool originally originated from the NEI data. This tool was used to decipher GHG emissions from different sections of the NEI.
- Tribal GHG Inventory Tool: This tool was used to generate the GHG Inventory for this project.
- State and Local Planning of Energy (SLOPE) Database: This tool was used to compare measures that can reduce GHG emissions to current conditions.
- Renewable Energy and Micro-grid Analysis Report for LRBOI: This report was referenced to determine the amount of electricity The Tribe has used annually.

3.1.3 GHG Accounting Method and Global Warming Potential

In this GHG inventory, most of GHG’s produced globally is Carbon Dioxide (CO₂). For this inventory CO₂ emissions are calculated in Million Metric Tons of CO₂ Equivalent (MMTCO_{2e}) or Metric Tons of CO₂ Equivalent (MTCO_{2e})

Global Warming Potential

As GHG’s are emitted in the atmosphere, these emitted gases act like a blanket that covers the Earth’s atmosphere and cause warming. Each greenhouse gas emitted warms the Earth at different rates. Differences in rates are expressed in Global Warming Potential (GWP). GWP is the result of GHG’s ability to absorb energy and how long it will stay in the atmosphere. The EPA primarily uses the 100-year GWPs from IPCC Fifth Assessment Report (AR5) per international reporting standards. 100-year GWP is based on energy absorbed by a gas over 100 years. Below is a summary of GWP to relevant GHG’s listed in this inventory.

Table 2. GWP for greenhouse gases listed in this inventory in a 100-year period according to IPCC Fifth Assessment Report (AR5)³

Greenhouse Gases	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265

3.1.4 GHG Inventory by Sector

A. Electricity Generation and Consumption Sector

The following data is from the SIT ⁴using base year of 2020.

Tables 2 -3 shows residential, commercial and industrial electricity consumption data in 2020 in Michigan

Table 3. 2020 Michigan Residential Electricity Consumption

Source	kWh	Total (MTCO _{2e})
Space Heating	5,550,514,846	2,401,121
Air Conditioning	3,984,985,018	1,723,882
Water heating	4,269,620,805	1,847,014

³ [Global Warming Potential](#)

⁴ [EPA State Inventory Tool](#)

Refrigeration	2,846,417,870	1,231,344
Other	19,213,320,622	8,311,573
Total	35,864,865,161	15,514,936

Table 4. 2020 Michigan Commercial Electricity Consumption

Source	kWh	Total (MMTCO ₂ e)
Space Heating	997,792,974	431,640
Cooling	3,991,171,869	1,726,558
Ventilation	5,864,215,990	2,536,826
Water Heating	142,541,883	61,663
Lighting	6,556,925,257	2,836,489
Cooking	997,792,974	431,640
Refrigeration	5,274,048,577	2,281,523
Office Equipment	1,625,418,534	703,147
Computers	3,278,462,629	1,418,244
Other	6,984,550,818	3,021,477
Total	35,492,921,502	15,354,036

Table 5. 2020 Michigan Industrial Electricity Consumption

Source	kWh	Total (MTCO ₂ e)
Conventional Boiler Use	393,796,870	170,354
Process Heating	2,879,793,900	1,245,782
Process Cooling and Refrigeration	2,108,908,085	912,302
Machine Drive	13,153,445,793	5,690,106
Electro-Chemical Process	1,739,799,795	752,627
Facility HVAC	621,255,853	268,752
Facility Lighting	2,095,694,010	906,585
Other Facility Support	1,687,907,767	730,179
Onsite Transportation	461,812,492	199,777
Other Non-Process Use	46,832,237	20,259
Other	306,061,291	132,400
Total	25,656,612,576	11,098,904

Table 6. Michigan total electricity consumption in Million Metric Tons Carbon Dioxide Equivalent (MTCO₂E)

Source	Total (MMTCO ₂ e)
Residential	15,514,936
Commercial	15,354,036

Industrial	11,098,904
Total	41,967,876

Electricity Consumption and Emissions for LRBOI Service Counties

Table 7. Electricity consumption kWh for LRBOI seven service counties using SLOPE Tool⁵

County	Residential	Commercial	Industrial	Transportation	Total
Manistee	150,433,3805	14,281,353.	15,559,143	8,478,546	188,737,769
Mason	122,298,557	168,340,022.	202,189,731	11,353,573	504,082,240
Oceana	122,298,557	11,608,545	128,130,671	15,644,133	277,655,531
Newaygo	122,298,557	62,951,665	138,710,537	30,450,084	354,322,923
Kent	2,021,897,313	3,241,366,036	2,082,563,024	205,794,505	7,552,441,478
Muskegon	536,613,129	481,222,697	653,255,415	34,728,921	1,705,966,699
Ottawa	724,471,685	667,908,968	1,691,313,145	117,111,199	3,200,336,086

Table 8. Electricity emissions in MMTCO_{2e} across LRBOI service counties in 2020

County	Residential	Commercial	Industrial	Transportation
Manistee	105,091	9,977	10,869	5,923
Mason	85,437	117,601	141,248	7,931
Oceana	85,437	8,110	89,511	10,929
Newaygo	85,437	43,977	96,902	21,272
Kent	874,661	1,402,196	900,905	89,060
Muskegon	232,136	208,174	282,595	15,204
Ottawa	313,402	288,934	731,652	50,622
Total	1,781,601	2,078,969	2,253,682	200,941

LRBOI Electricity Consumption Data

In 2020, Renewable Energy and Micro-Grid Analysis Report conducted by Wolven Energy LLC for LRBOI annual amount of electricity usage was 14.9 million kWh. This usage is dominated by the Little River Resort and Casino, which makes up 87.7% of the Tribe's facility electricity usage.

Table 9. LRBOI Electricity consumption in 2020 in MTCO_{2e} using EPA GHG Calculator⁶

kWh	MTCO _{2e}
14,900,000	6,446

⁵ [State and Local Planning for Energy](#)

⁶ [EPA Green House Gas Equivalencies Calculator](#)

B. Transportation Sector

The following transportation data is from the 2020 NEI dataset⁷. This data is calculating vehicle CO₂ emissions in tons.

Table 10. CO₂ emissions from gasoline vehicles, diesel vehicles, and other fuel type vehicles for each of the seven service counties for the Tribe 7 service counties.

County	CO ₂ Emissions (Tons)
Manistee	27,015.80
Mason	33,161.13
Oceana	33,971.12
Newaygo	30,741.12
Kent	40,252.18
Muskegon	79,289.55
Ottawa	213,305.62
Total CO₂	457,736.52

Table 11. Combined CO₂ emissions from commercial marine vessels, locomotives, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for the Tribe 7 service counties.

County	CO ₂ Emissions
Manistee	130,022.52
Mason	156,854.31
Oceana	170,080.94
Newaygo	189,068.38
Kent	2,714,361.76
Muskegon	697,850.99
Ottawa	1,219,441.77
Total Co₂	5,277,680.77

Table 12. Combined CO₂ Emissions from gasoline vehicles, diesel vehicles and other fuel type vehicles, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for the state of Michigan in 2020.

Source	CO ₂ Emissions (Tons)
Gasoline vehicles, diesel vehicles, other fuel types.	6,464,377.05
On-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles	45,479,338.17
Total	51,943,715.22

⁷ [2020 NEI Data Set](#)

The following information was obtained from the EPA Greenhouse Gas Inventory Data Explorer using base year of 2020. ⁸

Table 13. GHG for the Transportation Sector for Michigan in 2020 in MMTCO₂e.

Michigan Emissions	MMTCO₂E
Fossil Fuel Combustion Co ₂	42.426
Use of fluorinated gases	0.961
Fossil Fuel Combustion: Other GHG gases	0.332
Transportation Non-Energy Use	0.202
Gross Total	43.922

C. Commercial and Residential

The following data is fuel combustion use in the Tribe service counties. This data was obtained from the 2020 NEI in Michigan⁹.

Table 14. Michigan Residential fuel combustion for natural gas, wood, oil and other types of combustion in emissions tons for LRBOI 7 service counties.

County	Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)
Manistee	41.65	1,661.33	1.33	25.35
Mason	48.18	1,609.07	1.31	35.84
Oceana	24.98	1,871.98	4.40	41.44
Newaygo	50.43	3,564.72	7.39	73.05
Kent	1,642.38	13,686.90	8.66	127.22
Muskegon	426.57	5,642.19	5.60	61.37
Ottawa	706.28	6,210.18	7.02	52.99
Totals	2,940.47	34,246.37	35.71	417.26

Table 15. Michigan commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for LRBOI 7 service counties.

County	Biomass (tons)	Natural Gas (tons)	Oil (tons)	Other Fuel Sources (tons)
Manistee	7.43	18.39	0.56	1.17
Mason	10.42	24.84	0.75	1.59

⁸ [EPA GHG Data Explorer](#)

⁹ [2020 NEI Data Set](#)

Oceana	4.79	11.87	0.36	0.76
Newaygo	12.26	30.34	0.92	1.94
Kent	471.98	1,167.73	35.74	74.81
Muskegon	59.58	147.41	4.51	9.44
Ottawa	113.16	279.97	8.56	17.93
Totals	679.58	1,680.55	51.40	107.64

Table 16. Emissions from fuel combustion for natural gas, wood, oil and other types of combustion for the state of Michigan

Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)	Total Emissions (tons)
24,507.89	282,605.75	318.33	3,560.88	310,674.52

Table 17. Emissions from commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emission tons for Michigan.

Biomass	Natural Gas	Oil	Other Fuel Sources	Total Emissions (tons)
4,937.38	12,215.68	373.90	782.66	18,309.62

3.2 GHG Reduction Measures

The following is LRBOI greenhouse gas reduction measures for this PCAP.

GHG Reduction Measure One: Install solar panels near Little River Resort and Casinos.

Table 18. GHG Reduction Measure One Overview

Measure 1: Install 4.5 MWdc solar PV and 4.5 MWh Battery's Near Little River Resort and Casino	Implementing Agency	Wolven Energy LLC
	Applicable Sector	Electricity Generation and Consumption Sector
	Implementation Milestones	To install 4.5 MW solar panels and 4.5 MWh battery bank on the property next to Little River Resort and Casino
	Location	Little River Resort and Casino 2700 Orchard Hwy, Manistee, MI 4966
	Cost	\$14,000,000.00 – \$16,000,000.00
	Annual Estimated GHG and criteria air pollutant emissions reductions	4,300 MTCO₂e reduced every year.
	Long Term GHG Reductions	2024 – 2030: 25,800 MTCO₂e 2024 – 2050: 111,800 MTCO₂e

GHG Reduction Measure One Summary: LRBOI with partnership with Wolven Energy LLC to install 4.5 MWdc solar panels and 4.5 MWh battery banks on the 150-acre property adjacent to Little River Resort and Casino. Little River Resort and Casino makes up to 80% of LRBOI energy use. This project could reduce LRBOI energy use by 22%. The 4.5 MWh battery can provide electricity to Little River Resort and Casino for 3 hours. This project will reduce GHG emissions by 4,300 MMTCO₂e reduced every year. Emissions reduction was determined from Woven Energy Renewable Energy and Micro Grid Analysis Report.

GHG Reduction Measure Two: Installing 2.3 MW Solar PV near Little River Resort and Casino

Table 19. GHG Reduction Measure Two Overview

Measure 2: Install 2.3 MWdc solar PV Near Little River Resort and Casino	Implementing Agency	Wolven Energy LLC
	Applicable Sector	Electricity Generation and Consumption Sector
	Implementation Milestones	To install 2.3 MW solar PV near the Little River Resort and Casino.
	Location	Little River Resort and Casino 2700 Orchard Hwy, Manistee, MI 4966
	Cost	\$6,000,000.00 – \$7,000,000.00
	Annual Estimated GHG and criteria air pollutant emissions reductions	2,500 MTCO₂e reduced every year.
	Long Term GHG Reductions	2024 – 2030: 15,000 MTCO₂e 2024 – 2050: 65,000 MTCO₂e

GHG Reduction Measure Two Summary: This reduction measure would take place on an 18-acre property adjacent to Little River Resort and Casino. This project will consist of installing 2.3 MWDC Solar PV on this property to help reduce Little River Resort and Casino energy use. This option does not include battery backup. This option would not be used if GHG reduction number one is utilized. Total GHG reduction is 2,500 MTCO₂E. Emissions reduction was determined from Woven Energy Renewable Energy and Micro Grid Analysis Report.

GHG Reduction Measure Three: Install 210 kWdc solar PV at the LRBOI Government Center.

Table 20. GHG Reduction Measure three overview.

Measure 3: Install 210 kWdc solar PV at LRBOI Government Center	Implementing Agency	Wolven Energy LLC
	Applicable Sector	Electricity Generation and Consumption Sector
	Implementation Milestones	To install 210 kWdc solar PV at Little River Band of Ottawa Indians Government Center.
	Location	2608 Government Center Drive, Manistee, MI 49660
	Cost	\$600,000.00- 700,000.00
	Annual Estimated GHG and criteria air pollutant emissions reductions	1,000 MTCO_{2e} reduced every year.
	Long Term GHG Reductions	2024 – 2030: 6,000 MTCO_{2e} 2024 – 2050: 26,000 MTCO_{2e}

GHG Reduction Measure Three Summary: This reduction measure will take place on a 1.5-acre site directly next to LRBOI Government Center. This project will consist of installing 210 kWdc solar PV to help power the Government Center day to day operations. The estimated GHG reduction will be 1000 MTCO_{2e} annually. Emissions reduction was determined from Woven Energy Renewable Energy and Micro Grid Analysis Report.

GHG Reduction Measure Four: Install solar panels on LRBOI tribal housing.

Table 21. GHG Reduction Measure Four Overview.

Measure 4: Installation of solar panels on 66 LRBOI tribal homes.	Implementing Agency	Wolven Energy LLC
	Applicable Sector	Electricity Generation and Consumption Sector
	Implementation Milestones	To install solar panels on 66 tribal homes on LRBOI reservation.
	Location	2953 Shaw Be Quo Ung, Manistee, MI 49660
	Annual Estimated GHG and criteria air pollutant emissions reductions	230 MTCO₂E reduced every year.
	Long Term GHG Reductions	2024 – 2030: 1,380 MTCO₂e 2024 – 2050: 5,980 MTCO₂e

GHG Reduction Measure Four Summary: This reduction measure will take place on LRBOI reservation where tribal housing is located. 66 homes are on this site. At the time of Wolven Energy LLC Renewable Energy and Micro-Grid Analysis Report, this project's total price is unknown. A GHG reduction estimated was calculated using MI Average yearly kWh of 8,040 multiplied by 66 homes. Estimated GHG reduction is 230 MTCO₂e. Emissions reduction was determined from Woven Energy Renewable Energy and Micro Grid Analysis Report.

3.3 Benefit Analysis

The following is a benefit analysis for each GHG reduction measure listed in this PCAP. This benefit analysis will compare benefits and any potential drawbacks for each GHG reduction measure.

GHG Reduction Measure One: Install solar panels near Little River Resort and Casinos.

- **Benefits**
 - 4,300 MTCO₂e reduced every year
 - 25,800 MTCO₂e reduced between 2024-2030
 - 111,800 MTCO₂e reduced between 2024-2050
 - Reduce strain on the Tribes current electricity system
 - Lower utility bills for the Tribe
 - Increase duration between power outages
 - Increase of quality jobs into the community
 - Stabilize the cost of power for the Tribe

- **Drawbacks:**
 - Land degeneration
 - Habitat loss for wildlife
 - Large upfront cost

GHG Reduction Measure Two: Installation 2.3 MWdc Solar PV near Little River Resort and Casino

- **Benefits**
 - 2,500 MTCO₂e reduced every year
 - 15,000 MTCO₂e reduced between 2024-2030
 - 65,000 MTCO₂e reduced between 2024-2050
 - Reduce strain on the Tribes current electricity system
 - Lower utility bills for the Tribe
 - Increase duration between power outages
 - Increase of quality jobs into the community
 - Stabilize the cost of power for the Tribe

- **Drawbacks:**
 - Land degeneration
 - Habitat loss for wildlife
 - Large upfront cost

GHG Reduction Measure Three: Installation 210 kWdc solar PV at the LRBOI Government Center.

- **Benefits**
 - 1000 MTCO_{2e} reduced every year.
 - 6,000 MTCO_{2e} reduced between 2024-2030
 - 26,000 MTCO_{2e} reduced between 2024-2050
 - Reduce strain on the Tribes current electricity system
 - Lower utility bills for the Tribe
 - Increase duration between power outages
 - Increase of quality jobs into the community
 - Stabilize the cost of power for the Tribe

- **Drawbacks:**
 - Land degeneration
 - Habitat loss for wildlife
 - Large upfront cost

GHG Reduction Measure Four: Install solar panels on LRBOI tribal housing.

- **Benefits**
 - 230 MTCO_{2e} reduced every year
 - 1,380 MTCO_{2e} reduced between 2024-2030
 - 5,980 MTCO_{2e} reduced between 2024-2050
 - Reduce strain on the Tribes current electricity system
 - Lower utility bills for the Tribe
 - Increase duration between power outages
 - Increase of quality jobs into the community
 - Stabilize the cost of power for the Tribe

- **Drawbacks:**
 - Land degeneration
 - Habitat loss for wildlife
 - Large upfront cost

3.4 Review and Authority to Implement

The Tribe recognizes the importance of the PCAP and the GHG reduction measures that is included in the PCAP. With this importance the following miles stones will take place to make certain GHG reduction measures will take place.

- Develop a PCAP that fits the needs and wants for LRBOI: Through outreach meetings with tribal members and stakeholders, an adequate PCAP was developed.
- Presentation to LRBOI Tribal Council: After completing this PCAP members from LRBOI Environmental Department, and ITCMI will present the PCAP to the Tribal Council. Tribal Council meets once a week. This presentation will clarify each section of this PCAP to Tribal Council.
- Tribal Council Vote: After the presentation from the PCAP team, Tribal Council will vote on implementing measures in this PCAP.

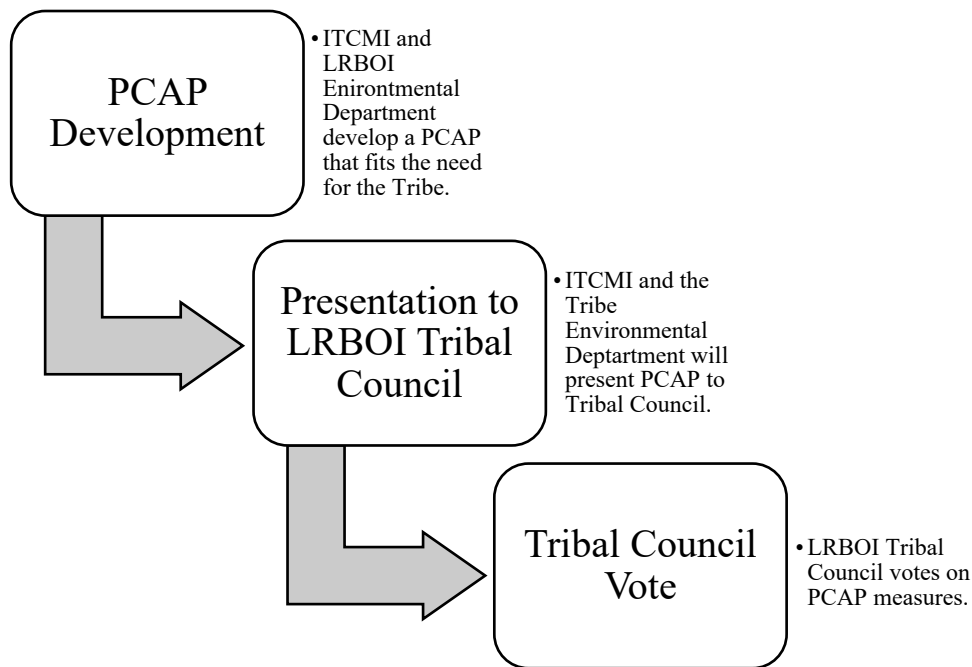


Figure 1. Flow chart for implementation of the PCAP.

In the development of this PCAP, the Tribe has been transparent on the type of projects that will reduce GHG emissions. Through presentations to the Tribal Council, measures listed in this PCAP will be approved.

3.5 Identification of Other Funding Mechanisms

It is vital for the Tribe to have GHG reduction measures listed in the PCAP to be completed to help lower the Tribe carbon footprint. To accomplish this goal, it is important for the Tribe to seek any funding sources available to possibly fund the Tribes GHG reduction measures.

The following are other sources of funding that the Tribe can apply for to help fund the Tribes GHG reduction measures.

Greenhouse Gas Reduction Fund (GGRF)¹⁰

Summary: \$27 billion investment to mobilize financing and private capital to combat the climate crisis and ensure American economic competitiveness. The GGRF will deliver lower energy costs and economic revitalization to communities, particularly those that have historically been left behind. Through the GGRF program, the EPA will allocate the fund through three competitions: Solar for All, National Clean Investment Fund (NCIF), and the Clean Communities Investment Accelerator (CCIA). Through these competitions, the fund aims to scale deployment of clean technologies nationally, build community clean financing capacity locally, and spur adoption of clean distributed solar energy in disadvantaged communities in order to achieve three broad objectives:

- Reduce greenhouse gas (GHG) emissions and other air pollutants.
- Deliver the benefits of greenhouse gas- and air pollution-reducing projects to American communities, particularly low-income and disadvantaged communities.
- Mobilize financing and private capital to stimulate additional deployment of greenhouse gas and air pollution reducing projects.

Community Change Grants¹¹

Summary: The Inflation Reduction Act authorized the creation of the US Environmental Protection Agency's (EPA) new Environmental and Climate Justice Community Change Grants program. The program is designed to benefit disadvantaged communities through projects to reduce pollution, increase community climate resilience, and build community response capacity. The grants will be focused on community-driven initiatives to be responsive to community and stakeholder input.

Department of Energy Loan Programs Office State Energy Finance Institution Program

Summary: The Department of Energy's (DOE) Loan Programs Office (LPO¹²) finances large-scale energy infrastructure projects across the U.S. Through Title 17 Innovative Clean Energy Loan Guarantee Program (Title 17), DOE LPO provides loan guarantees for Innovative Clean Energy Projects, including through the designation of a State Energy Finance Institution (SEFI)

¹⁰ [Greenhouse Reduction Fund](#)

¹¹ [Community Change Grants](#)

¹² [DOE Loan Program](#)

to fund specific projects. A SEFI is a quasi-independent entity or an entity within a state agency or financing authority established by a state to satisfy two functions:

1. Provide financing support or credit enhancements for clean energy projects, and
2. Create liquid markets for eligible projects or take other steps to reduce financial barriers to the deployment of existing and new eligible projects.

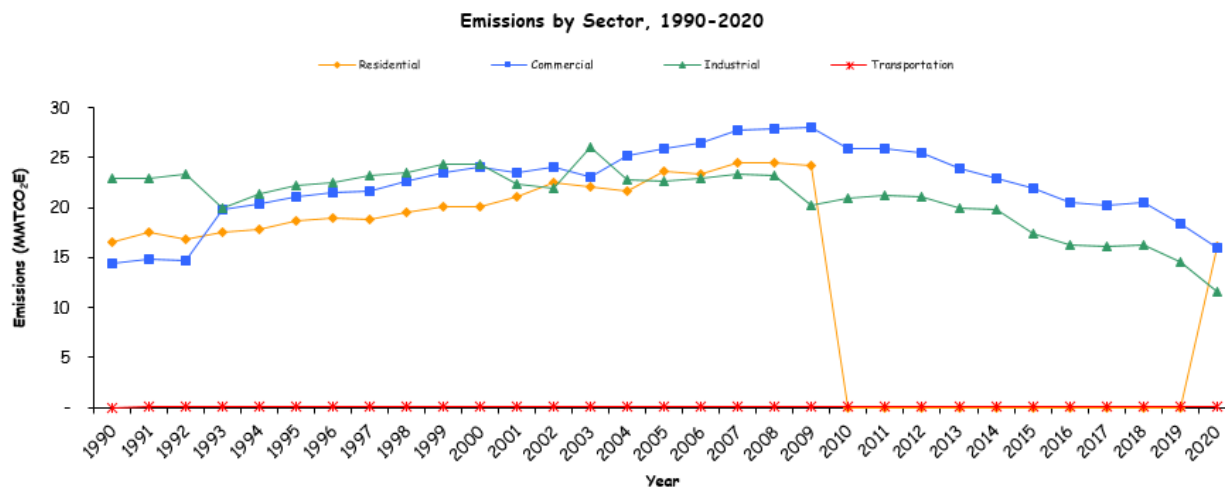
4. Next Steps

After the completion of the PCAP, work will begin on developing the CCAP for the Tribe. The CCAP will consist of developing a comprehensive GHG inventory for LRBOI. This GHG inventory will consist of determining GHG emissions for the transportation sector, electricity generation and consumption sector, the industrial sector, commercial and residential sector, land use and forestry sector, waste and materials management sector and agriculture sector. This GHG inventory will be unique for the Tribe. ITCMI will work directly with the Tribe to help determine GHG emissions for each sector of the inventory. A series of public stakeholder meetings will be held for tribal members. In the public stakeholder meetings, tribal members will have an opportunity to provide input on what type of GHG reduction measures should be included in the CCAP. During CCAP development, ITCMI will work with the Tribe's Human Resources Department, to help develop positions to help combat climate change. One of the main goals of the CCAP is to help create high quality jobs for the Tribe.

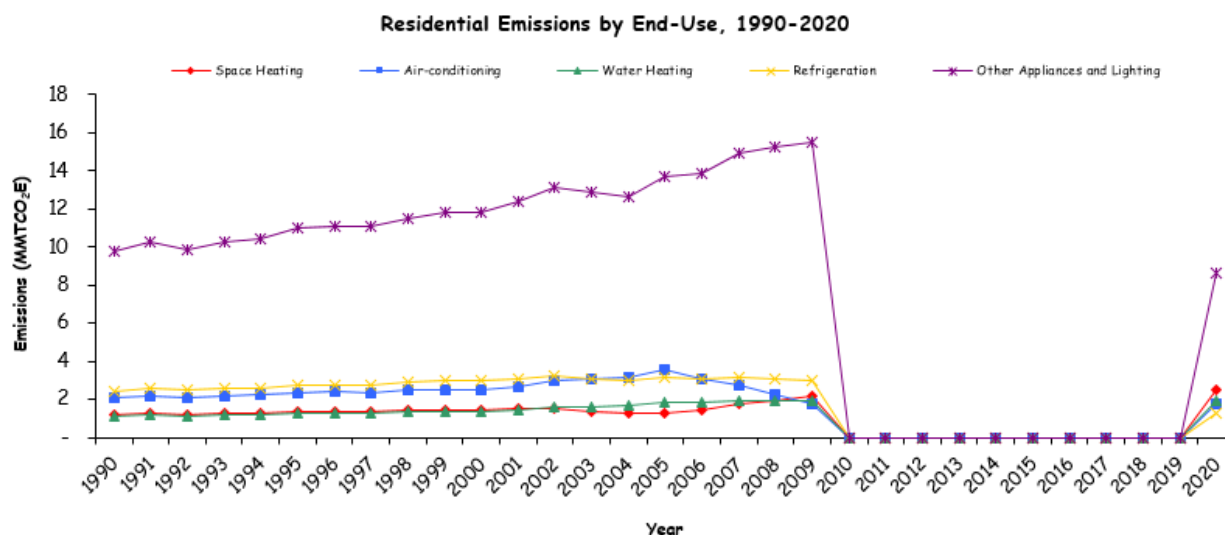
ITCMI will work directly with LRBOI, to develop additional and long term GHG reduction measures. GHG reduction measures will address the main GHG emission sectors. After completion of GHG reduction measures for the CCAP, a complete benefit analysis will be conducted on each measure. This benefit analysis will look at benefits and drawbacks for each GHG reduction measure. At the end of CCAP development, GTB will have a comprehensive climate action plan that will help the Tribe combat climate change and meet the Tribes climate change goals.

Appendix A: Electricity Emissions for Michigan 1990-2020

Electricity emissions for the state of MI, using EPA State Inventory Tool¹³.

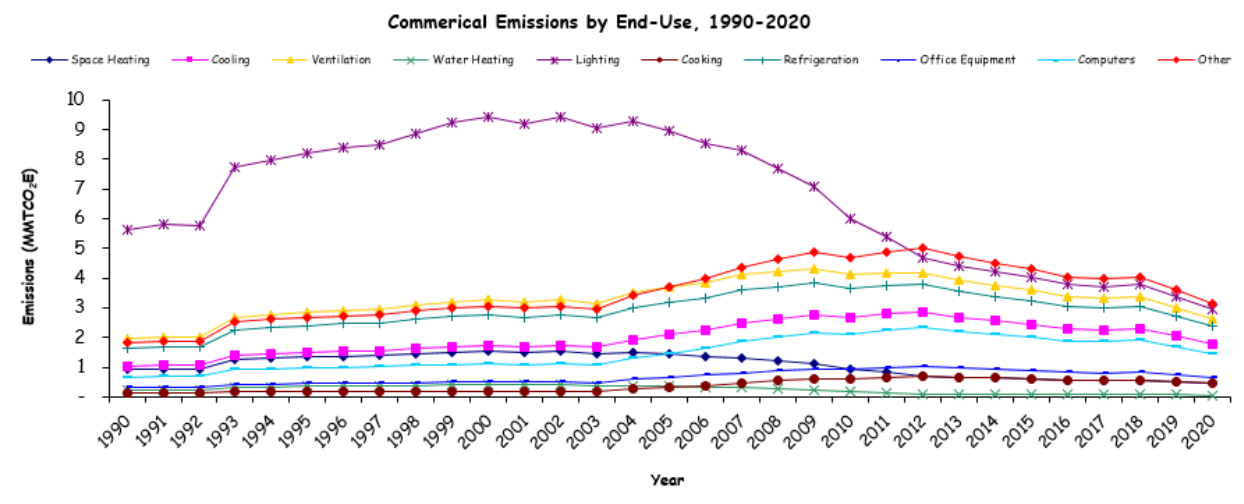


Appendix Figure 1. MI electricity emissions by sector. 1990-2020

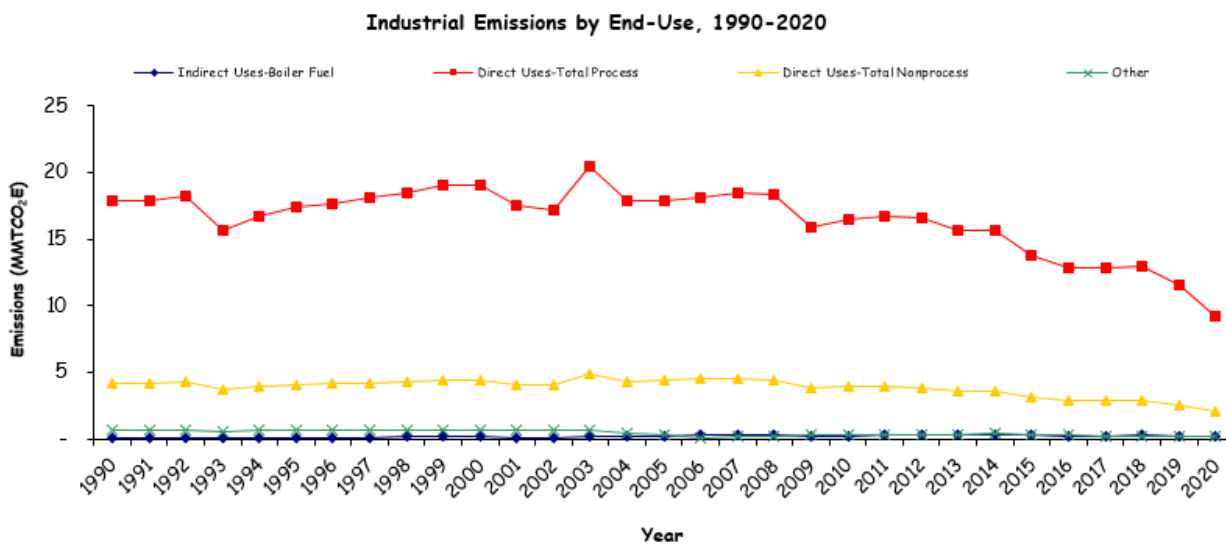


Appendix Figure 2. Residential emissions by end use, 1990-2020

¹³ [EPA State Inventory Tool](#)



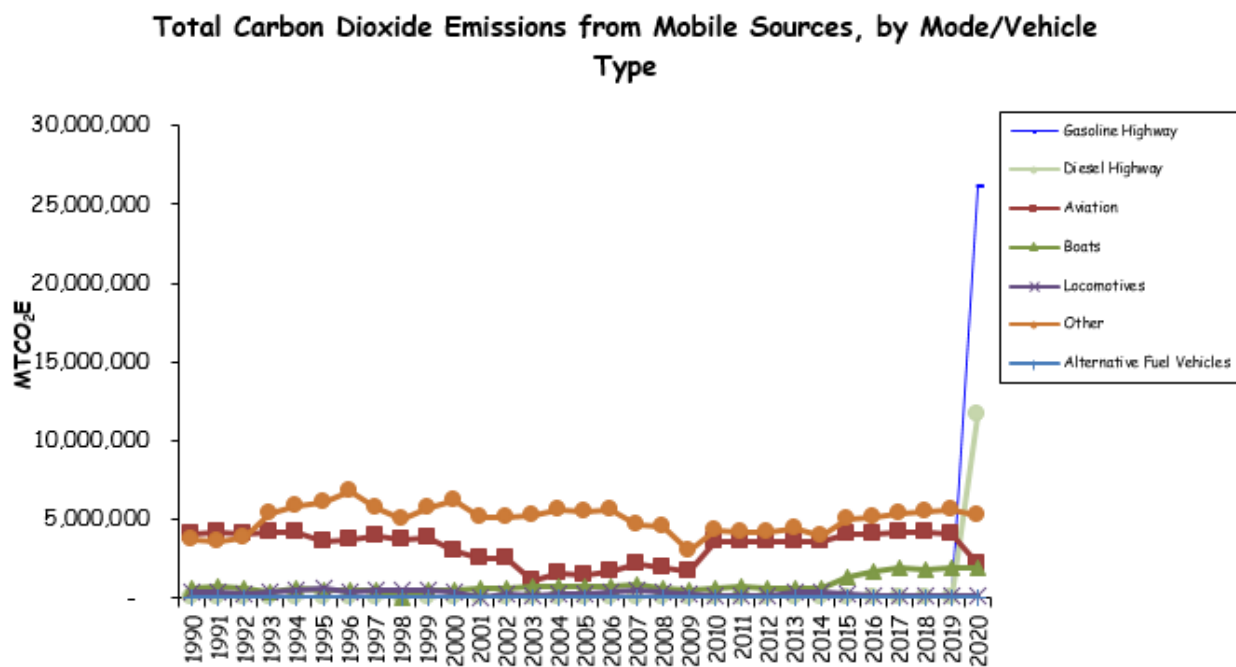
Appendix Figure 3. Commercial emissions by end-use, 1990-2020.



Appendix Figure 4. Industrial emissions by end-use, 1990-2020.

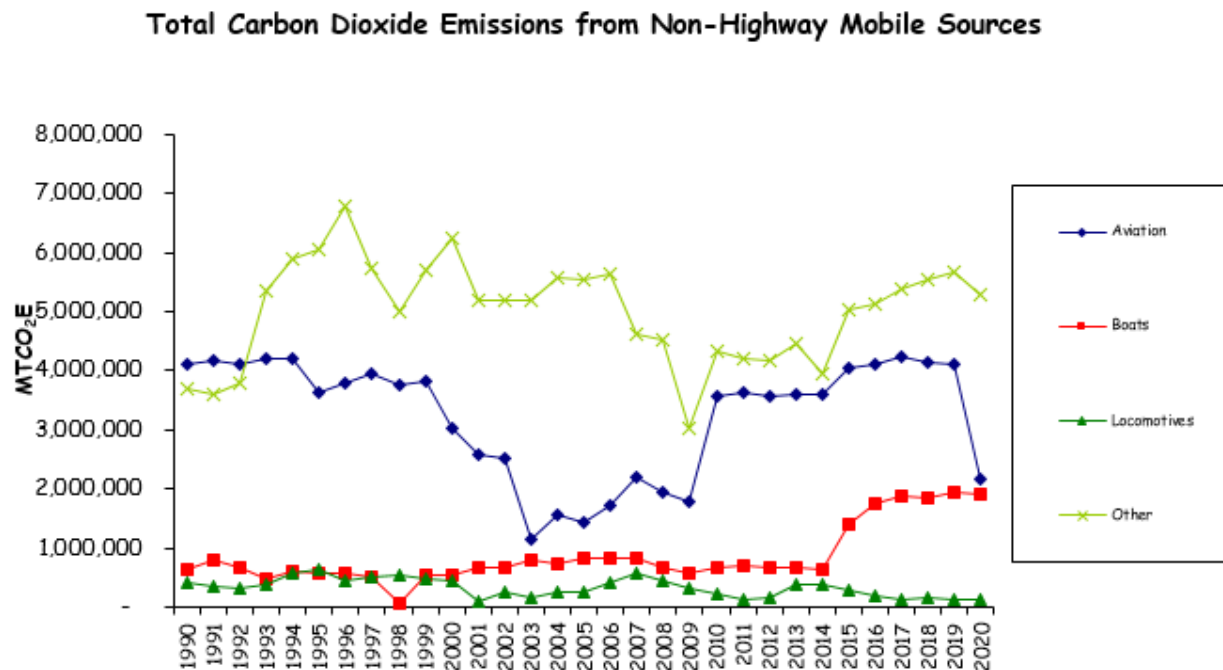
Appendix B. Mobile Combustion Emissions for Michigan 1990-2020

Mobile combustion emissions for the state of MI from 1990-2020 using EPA State Inventory Tool¹⁴.



Appendix Figure 5. CO₂ emissions from mobile sources, by mode/vehicle type.

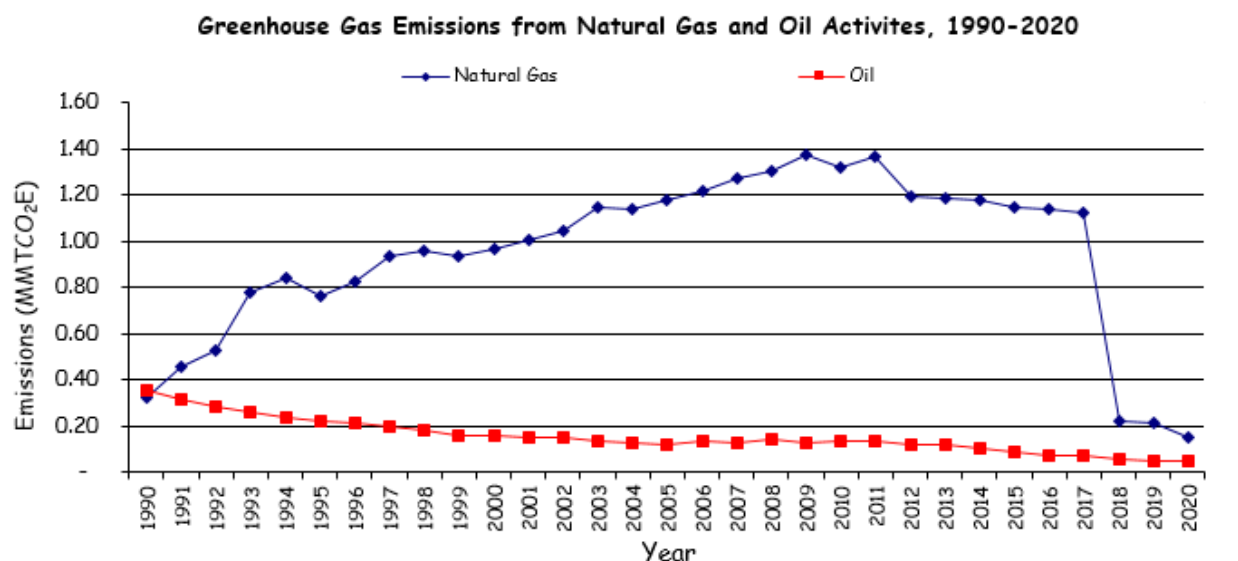
¹⁴ [EPA State Inventory Tool](#)



Appendix Figure 6. Total CO₂ emissions from non-highway sources in MI, 1990-2020.

Appendix C. Natural Gas and Oil Emissions for Michigan, 1990-2020.

Natural gas emissions for the state of MI, using EPA State Inventory Tool¹⁵.



Appendix Figure 7. Total greenhouse gas emissions from natural gas and oil activities for the state of Michigan in 1990-2020.

¹⁵ [EPA State Inventory Tool](#)

Nottawaseppi Huron Band of
the Potawatomi:
Priority Climate Action Plan

Prepared by:

Inter-Tribal Council of Michigan

March 2024

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1. Introduction

The Inter-Tribal Council of Michigan (ITCMI) received funding from Section 60114 of the Inflation Reduction Act, to produce a Priority Climate Action Plan (PCAP) through the Climate Pollution Reduction Grant (CPRG) program, for Nottawaseppi Huron Band of the Potawatomi (NHBP or the Tribe). NHBP is one of Michigan's twelve federally recognized tribes. NHBP currently has 1,400 members enrolled. NHBP members are primarily located in the Pine Creek Reservation which is near Athens, MI. NHBP has additional offices near Grand Rapids, MI. NHBP has a variety of departments which include; Planning, Public Works, Education, Environmental and Information Technology. NHPB owns and operates Firekeepers Casino and Hotel¹.

The Inter-Tribal Council of Michigan is a non-profit organization that represents twelve federally recognized tribes in Michigan. ITCMI is divided into several different divisions which includes Behavioral Health Services, Childhood and Family Services, Economic Development, Head Start, Health Education and Chronic Disease, Maternal and Early Childhood Services and Environmental Services. Each division is dedicated to act as a forum for member Tribes, to advocate in the development of programs and policies which will improve the economy, education, and quality of life for member Tribes, and to provide technical assistance to member Tribes in the development of Tribal regulations, ordinances and policies applicable to health and human services. ²

1.1 CPRG Overview

Participating in the CPRG program will produce two deliverables at the end of this program. The first deliverable is to create a PCAP by April 1st 2024. In the PCAP, ITCMI and NHBP will produce a generalize Green House Gas (GHG) inventory using already existing national and state data. This PCAP will focus on implementation ready activities. In the PCAP a benefit analysis will be conducted to show benefits of GHG reduction measures. This PCAP will provide potential projects that NHBP can adapt to reduce GHG emissions. In development of this PCAP, ITCMI worked directly with the Tribe environmental department to verify the Tribes goals in this program were met. The development of this PCAP, will open the door for NHBP to apply for funding sources to help implement GHG reducing projects.

After the completion of the PCAP, ITCMI and NHBP will begin working on the Comprehensive Climate Action Plan (CCAP). The CCAP will consist of a complete GHG inventory for the Tribe. This GHG inventory will be strictly for the entire tribe. CCAP will provide GHG projections for near term (2030-2050) and long term (2050) projections. These projections will also include projections if no GHG reduction measures were taken. CCAP preparation will consist of a series of public stakeholder meetings to provide a chance for tribal members to provide input on CCAP development. At the end of CCAP development, ITCMI will work the

¹ [NHBP](#)

² [ITCMI](#)

Tribe to determine the appropriate authority to implement the CCAP. The CCAP will be published in spring 2026.

1.2 PCAP Overview and Definitions

Below are the following components for NHBP PCAP

- GHG Inventory: A generalized GHG inventory will be created. This GHG inventory include implementation ready sectors. ITCMI will use already published data from U.S Greenhouse Gas Emissions and Sinks by State and National Emissions Inventory (NEI). ITCMI used EPA's Tribal Greenhouse Gas Inventory tool.
- Quantified GHG reduction measures: A list of near term, high priority implementation ready measures is identified in this PCAP. GHG emissions will be calculated in measures a long with total cost of measures if possible.
- Benefit Analysis: An analysis was conducted to assist benefits of GHG reduction measures. This analysis consisted both base year estimates of co-pollutants and anticipated co-pollutant emission reductions. This assessment will include improved health outcomes, economic benefits, increased climate resilience, and improved air quality. This analysis also includes any dis-benefits resulting from implementation efforts listed in this PCAP.
- A Review of Authority to Implement: A time line was created to give NHBP key entities to implement projects listed in this PCAP.
- Identification of Other Funding Mechanisms: This section explores possible funding sources, the Tribe can seek to fund projects listed in this PCAP.

1.3 PCAP Development Approach

Below is ITCMI approach into the development of the PCAP.

- Stakeholder Engagement: Through the development of this PCAP, ITCMI worked directly with NHBP Environmental Department and Administration Office. Quarterly meetings were held. Goals and objectives were given to ITCMI, to help develop this PCAP. Establishing GHG reduction goals:

2. Organization and Considerations

2.1 PCAP Team

Table 1. Shows PCAP team and roles that contributed to developing this PCAP.

Role	Reasonability
Project Manager- ITCMI	Manages operating project activities, host public stakeholder engagement meetings, complete reporting requirements to the EPA, develop GHG inventory and develop PCAP
Technical Support-ITCMI	Complete GHG inventory, data interpretation and assist with PCAP development.
Quality Assurance Manager-ITCMI	Provides quality assurance for PCAP development and GHG Inventory data
Nottawaseppi Huron Band of the Potawatomi	Develops NHBP goals and objectives for PCAP development. Provide any previous data that NHBP has conducted.
Nottawaseppi Huron Band of the Potawatomi Tribal Council	Provide final decision on implementation projects listed in this PCAP.
Environmental Protection Agency	Provide technical assistance in PCAP development.

2.2 Sector Specific Goals

In the development of this PCAP, ITCMI and the Tribe developed the following goals for this PCAP.

- Goal One: To introduce electric vehicle charging stations to the Tribe
- Goal Two: To improve the Tribes current recycling program
- Goal Three: To improve NHBP facilities with energy efficient upgrades
- Goal Four: To replace the entire of NHBP vehicle fleet with electric vehicles
- Goal Five: To plant wild grasses and native plants in land owned by NHBP.

3. PCAP Elements

3.1 Greenhouse Gas (GHG) Inventory

3.1.1 Scope

The scope of this GHG Inventory will focus on the following sectors:

- A. Transportation Sector
- B. Solid waste Sector
- C. Electricity Generation and Consumption Sector
- D. Agriculture Sector

The baseline year used for this inventory is 2020, this year was chosen for a baseline due to volume of data available.

3.1.2 Data Collection

Data in this GHG Inventory originated from the following sources:

- National Emissions Inventory (NEI): NEI is a comprehensive and detailed estimate of air emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emissions sources.
- State Inventory Tool (SIT): The State Inventory Tool consists of eleven different GHG estimation models. These estimates are used in this PCAP using baseline year 2020.
- Green House Gas Inventory Data Explorer: Information obtained from this tool originally originated from the NEI data. This tool was used to decipher GHG emissions from different sections of the NEI.
- Tribal GHG Inventory Tool: This tool was used to generate the GHG Inventory for this project.
- State and Local Planning of Energy (SLOPE) Database: This tool was used to compare measures that can reduce GHG emissions to current conditions.

3.1.3 GHG Accounting Method and Global Warming Potential

In this GHG inventory, majority of GHG's is produced globally is Carbon Dioxide (CO₂). For this inventory CO₂ emissions is calculated in Million Metric Tons of CO₂ Equivalent (MMTCO₂E) or Metric Tons of CO₂ Equivalent.

Global Warming Potential

As GHG's are emitted in the atmosphere, these emitted gases act like a blanket that covers the Earth's atmosphere and cause warming. Each greenhouse gasses emitted warms the Earth at different rates. Differences in rates is expressed in Global Warming Potential (GWP). GWP is the result of GHG's ability to absorb energy and how long it will it stay in the atmosphere. The EPA

primarily uses the 100-year GWPs from IPCC Fifth Assessment Report (AR5) per international reporting standards. 100-year GWP is based on energy absorbed by a gas over 100 years. Below is a summary of GWP to relevant GHG's listed in this inventory.

Table 2. GWP for greenhouse gases listed in this inventory in a 100 year period according to IPCC Fifth Assessment Report (AR5)³

Greenhouse Gases	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265

3.1.4 GHG Inventory by Sector

A. Transportation Sector

The following transportation data is from the 2020 NEI dataset⁴. This data is calculating vehicle CO₂ emissions in tons.

Table 3. Combined CO₂ emissions from non- road equipment gasoline vehicles, diesel vehicles, and other fuel type vehicles for Calhoun County, MI. Emissions in tons.

County	Non-Road Gasoline	Non-Road Diesel	Non-Road Other	Total
Calhoun	17,305.69	35,736.14	12,444.19	65,486.03

Table 4. Combined CO₂ emissions from on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for Calhoun County, MI. Emissions in tons.

County	On-road Diesel Heavy Duty Vehicles	On-road Diesel Light Duty Vehicles	On-road Non Diesel Heavy Duty Vehicles	On-road Non Diesel Light Duty Vehicles	Totals
Calhoun	196,975.05	17,663.61	18,355.13	544,847.03	777,841.55

³ [Global Warming Potential](#)

⁴ [2020 NEI Data Set](#)

Table 5. Combined CO₂ Emissions from gasoline vehicles, diesel vehicles and other fuel type vehicles, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for the state of Michigan in 2020.

Source	CO ₂ Emissions (Tons)
Gasoline vehicles, diesel vehicles, other fuel types.	6,464,377.05
On-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles	45,479,338.17
Total	51,943,715.22

The following information was obtained from the EPA Greenhouse Gas Inventory Data Explorer⁵ using base year of 2020.

Table 6. GHG for the Transportation Sector for Michigan in 2020 in MMTCO₂e.

Michigan Emissions	MMTCO ₂ e
Fossil Fuel Combustion CO ₂	42.426
Use of fluorinated gases	0.961
Fossil Fuel Combustion: Other GHG gases	0.332
Transportation Non-Energy Use	0.202
Gross Total	43.922

B. Solid Waste Sector

The following information is from the State Inventory Tool (SIT)⁶ using base year 2020 in the state of Michigan. This data was determined by 2020 Michigan population of 9,966,555 and estimated of 7,523,620 tons of waste produced.

Table 7. Shows MI solid waste combustion from landfills in Carbon Dioxide (CO₂), Nitrous Oxide (N₂O) and Methane (CH₄) in Million Metric Tons of Carbon Dioxide Equivalent (MMTCO₂e).

Source	MMTCO ₂ e
CO₂	541,542
Plastics	355,058
Synthetic Rubber	53,452
Synthetic Fibers	133,032
N₂O	8,723
CH₄	369
Total CO₂, N₂O CH₄	550,634

⁵ [EPA Greenhouse Data Explorer](#)

⁶ [EPA State Inventory Tool](#)

Table 8. Shows MI landfill plastic combustion in 2020 in MMTCO₂E

Plastics	State MSW Combusted (short tons)	MMTCO ₂ E
PET	725.692	43,274
HDPE	725.692	70,678
PVC	725.692	4,222
LDPE/LLDPE	725.692	96,369
PP	725.692	91,433
PS	725.692	27,305
Other	725.692	35,843
Total Plastics	5,079.84	355,058

Table 9. Shows Methane (CH₄) emissions from landfills in MMTCO₂E in MI

Potential CH ₄	MMTCO ₂ E
Potential CH₄	10,967,194
MSW Generation	10,249,714
Industrial Generation	717,480
Ch₄ Avoided	10,249,714
Flare	1,926,878
Landfill Gas-to-Energy	9,048,368
Oxidation at Industrial Landfills	71,748
Total Ch₄ Emissions	645,732

Table 10. Shows total emissions from landfills and waste combustion in MMTCO₂E in MI

GHG	MMTCO ₂ E
Ch ₄	0.646
CO ₂	0.542
N ₂ O	0.009
Total	1.196

Table 11. Solid waste emissions from 2020 NEI for Calhoun County, MI. Emissions in tons of CO₂.

County	Emissions (Tons)
Calhoun	660.37

C. Electricity Generation and Consumption Sector

The following data is from the SIT ⁷using base year of 2020.

Tables two and three shows residential, commercial and industrial electricity consumption data in 2020 in Michigan

Table 12. 2020 Michigan Residential Electricity Consumption

Source	kWh	Total (MTCO _{2e})
Space Heating	5,550,514,846	2,401,121
Air Conditioning	3,984,985,018	1,723,882
Water heating	4,269,620,805	1,847,014
Refrigeration	2,846,417,870	1,231,344
Other	19,213,320,622	8,311,573
Total	35,864,865,161	15,514,936

Table 13. 2020 Michigan Commercial Electricity Consumption

Source	kWh	Total (MMTCO _{2e})
Space Heating	997,792,974	431,640
Cooling	3,991,171,869	1,726,558
Ventilation	5,864,215,990	2,536,826
Water Heating	142,541,883	61,663
Lighting	6,556,925,257	2,836,489
Cooking	997,792,974	431,640
Refrigeration	5,274,048,577	2,281,523
Office Equipment	1,625,418,534	703,147
Computers	3,278,462,629	1,418,244
Other	6,984,550,818	3,021,477
Total	35,492,921,502	15,354,036

Table 14. 2020 Michigan Industrial Electricity Consumption

Source	kWh	Total (MTCO _{2e})
Conventional Boiler Use	393,796,870	170,354
Process Heating	2,879,793,900	1,245,782
Process Cooling and Refrigeration	2,108,908,085	912,302
Machine Drive	13,153,445,793	5,690,106
Electro-Chemical Process	1,739,799,795	752,627

⁷ [EPA State Inventory Tool](#)

Facility HVAC	621,255,853	268,752
Facility Lighting	2,095,694,010	906,585
Other Facility Support	1,687,907,767	730,179
Onsite Transportation	461,812,492	199,777
Other Non-Process Use	46,832,237	20,259
Other	306,061,291	132,400
Total	25,656,612,576	11,098,904

Table 15. Michigan total electricity consumption in Million Metric Tons Carbon Dioxide Equivalent (MTCO₂E)

Source	Total (MMTCO ₂ E)
Residential	15,514,936
Commercial	15,354,036
Industrial	11,098,904
Total	41,967,876

Service County Data

Table 16. Electricity use in Calhoun county MI. This data was obtained from the SLOPE⁸ tool.

County	kWh
Calhoun	2,136,781,172

Table 17. Calhoun County, MI electricity emissions.

County	MTCO ₂ e
Calhoun	924,359

D. Agriculture Sector

The following agriculture data is from the 2020 NEI database⁹.

Table 18. Crops and livestock emissions for Calhoun County MI.

County	Emissions (Tons)
Calhoun	924.39

⁸ [State and Local Planning for Energy](#)

⁹ [2020 NEI Data Set](#)

Table 19. Fertilizer application emissions for Calhoun County, MI.

County	Emissions (Tons)
Calhoun	564.58

Table 20. Livestock waste emissions for Calhoun County MI.

County	Emissions (Tons)
Calhoun	919.70

Table 21. Agriculture fires from field burning emissions in Calhoun County, MI.

County	Emissions (Tons)
Calhoun	26.80

3.2 Greenhouse Gas Reduction Measures

The following is the Tribe greenhouse gas reduction measures for this PCAP.

GHG Reduction Measure One: To replace NHBP GSA vehicle fleet with electric vehicles (EV’s) and the installation of solar electric vehicle charging stations.

Table 22. GHG Reduction Measure One Overview

Measure 1: Replacing NHBP GSA Vehicle Fleet with EV’s and Installation of Solar EV Charging Stations.	Implementing Agency	Nottawaseppi Huron Band of the Potawatomi
	Applicable Sector	Transportation Sector
	Implementation Milestones	To replace 23 NHBP GSA vehicle fleet with EVs. To install four solar EV charging stations
	Location	Pine Creek Reservation
	Annual Estimated GHG and criteria air pollutant emissions reductions	103 MTCO _{2e} reduced every year.
	Long Term GHG Reductions	2024 – 2030: 618 MTCO _{2e} 2024 – 2050: 2,678 MTCO _{2e}

GHG Reduction Measure One Summary: NHBP wishes to replace 23 General Service Administration (GSA) vehicles with electric vehicles. Currently the Tribe has one EV in their vehicle fleet. For the tribe to charge GSA vehicles the Tribe wishes to install four EV charging stations. Each charging station will use solar energy to charge vehicles. EV charging stations will have two locations. Four charging stations will be located on the Pine Creek Reservation, located near Athens, Michigan. Charging stations will be used by the Tribe commercial and residential use. The replacement of 23 vehicles to EV will reduce GHG's by 103 MTCO_{2e} annually. GHG emissions reduction for this measure was determined using EPA GHG Calculator.¹⁰

GHG Reduction Measure Two: Improvements to NHBP recycling program

Table 23. GHG reduction measure two overview.

Measure 2: To improve NHBP Recycling Program and Solid Waste Program	Implementing Agency	Nottawaseppi Huron Band of the Potawatomi
	Applicable Sector	Solid Waste Sector
	Implementation Milestones	To make improvements in NHBP recycling program
	Location	Pine Creek Reservation, Michigan
	Annual Estimated GHG and criteria air pollutant emissions reductions	40.4 MTCO_{2e} reduced every year.
	Long Term GHG Reductions	2024 – 2030: 242.4 MTCO_{2e} 2024 – 2050: 1,050.4 MTCO_{2e}

GHG Reduction Measure Two Summary: NHBP wishes to improve an already existing recycling program for the Tribe. These improvements will include purchasing an aluminum trailer to aid with curb side recycling for tribal members. The Tribe also wishes to purchase three recycling cans for each tribal housing unit. Cans will be separated by color; yellow cans will represent plastic packaging, and carton recyclables, blue cans will be for paper and cardboard and green will be for glass. Purchasing of EV will be part of improvements, to help aid with recycling pick up for tribal members. In 2023, NHBP collected an estimated 2,200 pounds of recycling from

¹⁰ [EPA Greenhouse Gas Equivalencies Calculator](#)

commercial buildings. An estimated 984 pounds of recycling was collected from NHBP tribal members. This reduction measure will reduce GHG's by 40.4 MTCO₂e. GHG emissions reduction for this measure was determined using EPA GHG Calculator¹¹.

GHG Reduction Measure Three: Restoring active row crop to historic grasslands

Table 24. GHG reduction measure three overview.

Measure 3: Restoration of Active Row Crop Back to Native Grasslands.	Implementing Agency	Nottawaseppi Huron Band of the Potawatomi
	Applicable Sector	Agriculture Sector
	Implementation Milestones	To restore 65.6 acres of established row crop to native grasslands.
	Location	1485 Mno-Bmadzewen Way Fulton, MI 49052
	Annual Estimated GHG and criteria air pollutant emissions reductions	212 MTCO ₂ e reduced every year.
	Long Term GHG Reductions	2024 – 2030: 1,272 MTCO ₂ e 2024 – 2050: 5,512 MTCO ₂ e

GHG Reduction Measure Three Summary: NHBP wishes to restore an estimated 65.6 acres of row crop back into native grassland. Currently this area is used for corn and soy bean crops. NHBP currently has an estimated 80 acres designated for grassland and oak savannah habitat. Proposed grasses that the Tribe wishes to plant are the following; Big Bluestem (*Andropogon gerardii*), Side-oats Gramma (*Bouteloua curtipendula*), Prairie Brome (*Bromus kalmii*) and Switchgrass (*Panicum virgatum*). The tribe will also plant a variety of Forbs and woody materials in the restoration area. In total the Tribe will plant 100 nut-bearing trees and 50 shrubs. This restoration project will take place over a series of phases. Restoring this area will not only lower the Tribes carbon foot print but will also decrease the amount of erosion that can take place due to climate change. This restoration project will lower GHG's by an estimated 212

¹¹ [EPA Greenhouse Gas Equivalencies Calculator](#)

MTCO_{2e} a year. GHG emission reductions for this measure was determined using Midwest Tribal Energy Resources Association (MTERA) Emissions Reduction Tool.¹²

GHG Reduction Measure Four: Replace the Tribe’s greenhouse with LED energy efficient lighting.

Table 25. GHG reduction measure four overview.

Measure 4: Installation of LED Lighting for NHBP Greenhouse	Implementing Agency	Nottawaseppi Huron Band of the Potawatomi
	Applicable Sector	Electricity Generation and Consumption
	Implementation Milestones	To replace current lighting in the greenhouse with energy efficient LED lighting.
	Location	11177 E Michigan Ave, Battle Creek, MI 49014
	Annual Estimated GHG and criteria air pollutant emissions reductions	10 MTCO_{2e} reduced every year.
	Long Term GHG Reductions	2024 – 2030: 60 MTCO_{2e} 2024 – 2050: 260 MTCO_{2e}

GHG Reduction Measure Four Summary: The Tribe wishes to replace 88 light fixtures in the greenhouse with energy efficient LED lighting in the Tribes greenhouse. The total square footage of the greenhouse is 6,957. This project will reduce GHG emissions by 10 MTCO_{2e} annually. GHG emission reductions for this measure was determined using MTERA Emissions Reduction Tool¹³.

¹² [MTERA Emissions Reduction Tool](#)

¹³ [MTERA Emissions Reduction Tool](#)

3.2 Benefit Analysis

The following is a benefit analysis for each greenhouse reduction measure included in the PCAP. This benefit analysis will include benefits and drawbacks for each reduction measure.

GHG Reduction Measure One: To replace NHBP GSA vehicle fleet with electric vehicles (EV's) and the installation of solar electric vehicle charging stations.

- **Benefits**
 - 103 MTCO₂e reduced every year
 - 618 MTCO₂e reduced between 2024-2030
 - 2,678 MTCO₂e reduced between 2024-2050
 - First charging station for the Tribe
- **Drawbacks**
 - Large startup cost
 - Land degeneration
 - Potential loss of habitat and wildlife

GHG Reduction Measure Two: Improvements to NHBP recycling program

- **Benefits**
 - 40.4 MTCO₂e reduced every year
 - 242.4 MTCO₂e reduced between 2024-2030
 - 1,050.4 MTCO₂e reduced between 2024-2050
 - Community engagement
 - Decrease of Methane (CH₄) and Nitrous Oxide (N₂O)
 - Creation of jobs for the Tribe
- **Drawbacks**
 - Large startup cost
 - Retention rates could be difficult to maintain

GHG Reduction Measure Three: Restoring active row crop to historic grasslands

- **Benefits**
 - 212 MTCO₂e reduced every year
 - 2,272 MTCO₂e reduced between 2024-2030
 - 5,512 MTCO₂e reduced between 2024-2050
 - Restoration to native habitat
 - Reduce carbon foot print
 - Decrease in erosion

- **Drawbacks**
 - Large startup cost

GHG Reduction Measure Four: Replace the Tribe’s greenhouse with LED energy efficient lighting

- **Benefits**
 - 10 MTCO₂e annual GHG reduction
 - 60 MTCO₂e 2024-2030 GHG reduction
 - 260 MTCO₂e 2024-2050 GHG reduction
 - Decrease in the Tribes energy bill
- **Drawbacks**
 - Large start up cost

3.4 Review and Authority to Implement

The Tribe recognizes the importance of this PCAP and the GHG reduction measures that is included. With this importance the following miles stones will take place to make certain GHG reduction measures will take place.

- Develop a PCAP that fits the needs and wants for NHBP: Through outreach meetings with stakeholders, an adequate PCAP was developed.
- Presentation to NHBP Tribal Council: After the completion of this PCAP members from NHBI Environmental Department, and ITCMI will present this PCAP to the Tribal Council. NHBP tribal Council meets twice a month. This presentation will clarify each section of this PCAP to the Tribal Council.
- Tribal Council Vote: After the presentation from the PCAP team, Tribal Council will vote on implementing measures in this PCAP.

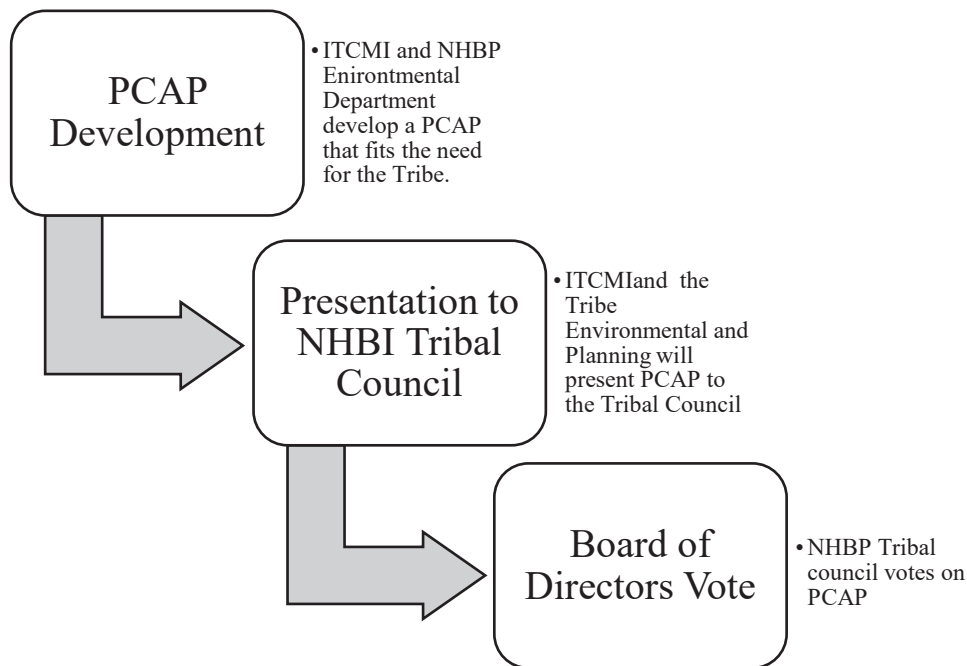


Figure 1. Flow chart for implementation of this PCAP.

In the development of this PCAP, the Tribe has been transparent on the type of projects that will reduce GHG emissions. Through presentations to the Tribal Council, measures listed in this PCAP will be approved.

3.5 Identification of Other Funding Mechanisms

It is vital for the Tribe to have GHG reduction measures listed in this PCAP to be completed to help lower the Tribe carbon footprint. To accomplish this goal it is important for the Tribe to seek any funding sources available to possibly fund the Tribes GHG reduction measures.

The following are other sources of funding that the Tribe can apply for to help fund the Tribes GHG reduction measures.

Greenhouse Gas Reduction Fund (GGRF)¹⁴

Summary: \$27 billion investment to mobilize financing and private capital to combat the climate crisis and ensure American economic competitiveness. The GGRF will deliver lower energy costs and economic revitalization to communities, particularly those that have historically been left behind. Through the GGRF program, the EPA will allocate the fund through three competitions: Solar for All, National Clean Investment Fund (NCIF), and the Clean Communities Investment Accelerator ¹⁵(CCIA). Through these competitions, the fund aims to

¹⁴ [Greenhouse Reduction Fund](#)

¹⁵ [Clean Communities Investment Accelerator](#)

scale deployment of clean technologies nationally, build community clean financing capacity locally, and spur adoption of clean distributed solar energy in disadvantaged communities in order to achieve three broad objectives:

- Reduce greenhouse gas (GHG) emissions and other air pollutants.
- Deliver the benefits of greenhouse gas- and air pollution-reducing projects to American communities, particularly low-income and disadvantaged communities.
- Mobilize financing and private capital to stimulate additional deployment of greenhouse gas and air pollution reducing projects.

Community Change Grants¹⁶

Summary: The Inflation Reduction Act authorized the creation of the US Environmental Protection Agency’s (EPA) new Environmental and Climate Justice Community Change Grants program. The program is designed to benefit disadvantaged communities through projects to reduce pollution, increase community climate resilience, and build community response capacity. The grants will be focused on community-driven initiatives to be responsive to community and stakeholder input.

Department of Energy Loan Programs Office State Energy Finance Institution Program¹⁷

Summary: The Department of Energy’s (DOE) Loan Programs Office (LPO) finances large-scale energy infrastructure projects across the U.S. Through Title 17 Innovative Clean Energy Loan Guarantee Program (Title 17), DOE LPO provides loan guarantees for Innovative Clean Energy Projects, including through the designation of a State Energy Finance Institution (SEFI) to fund specific projects. A SEFI is a quasi-independent entity or an entity within a state agency or financing authority established by a state to satisfy two functions:

- Provide financing support or credit enhancements for clean energy projects, and
- Create liquid markets for eligible projects or take other steps to reduce financial barriers to the deployment of existing and new eligible projects.

¹⁶ [Community Change Grants](#)

¹⁷ [DOE Loan Program](#)

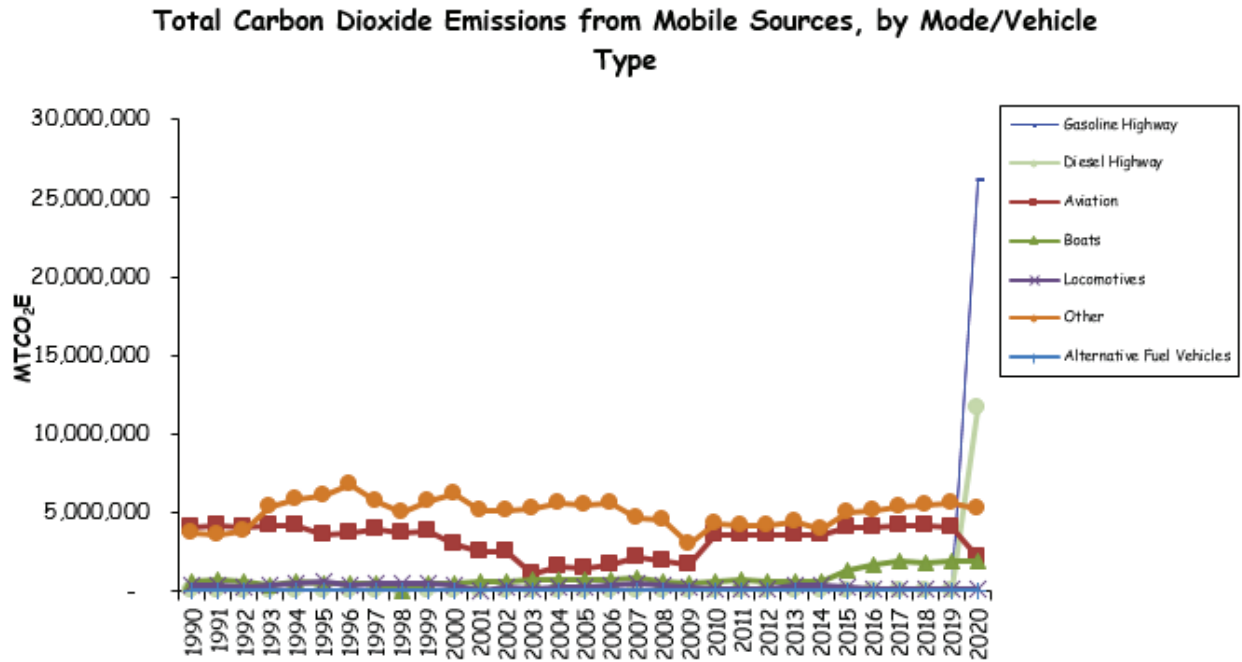
4. Next Steps

After the completion of this PCAP, work will begin on developing the CCAP for Nottawaseppi Huron Band of the Potawatomi. CCAP will consist of developing a comprehensive GHG inventory for NHBP. This GHG inventory will consist of determining GHG emissions for the transportation sector, electricity power sector, the industrial sector, commercial and residential sector, land use and forestry sector, waste and materials management sector and agriculture sector. This GHG inventory will be unique for the Tribe. ITCMI will work directly with the Tribe to help determine GHG emissions for each sector of the inventory. A series of public stakeholder meetings will be held for tribal members. In the public stakeholder meetings, tribal members will have an opportunity to provide input on what type of GHG reduction measures should be included in the CCAP. During CCAP development, ITCMI will work with the Tribes Human Resources Department, to help develop positions to help combat climate change. One of the main goals with the CCAP, is to help create high quality jobs for the Tribe.

ITCMI will work directly with the Tribe, to develop additional and long term GHG reduction measures. GHG reduction measures will address the main GHG emission sectors. After completion of GHG reduction measures for the CCAP, a complete benefit analysis will be conducted on each measure. This benefit analysis will look at benefits and drawbacks for each GHG reduction measure. At the end of CCAP development, NHBP will have a comprehensive climate action plan that will help the Tribe combat climate change and meet the Tribes climate change goals.

Appendix A. Mobile Combustion Emissions for Michigan 1990-2020

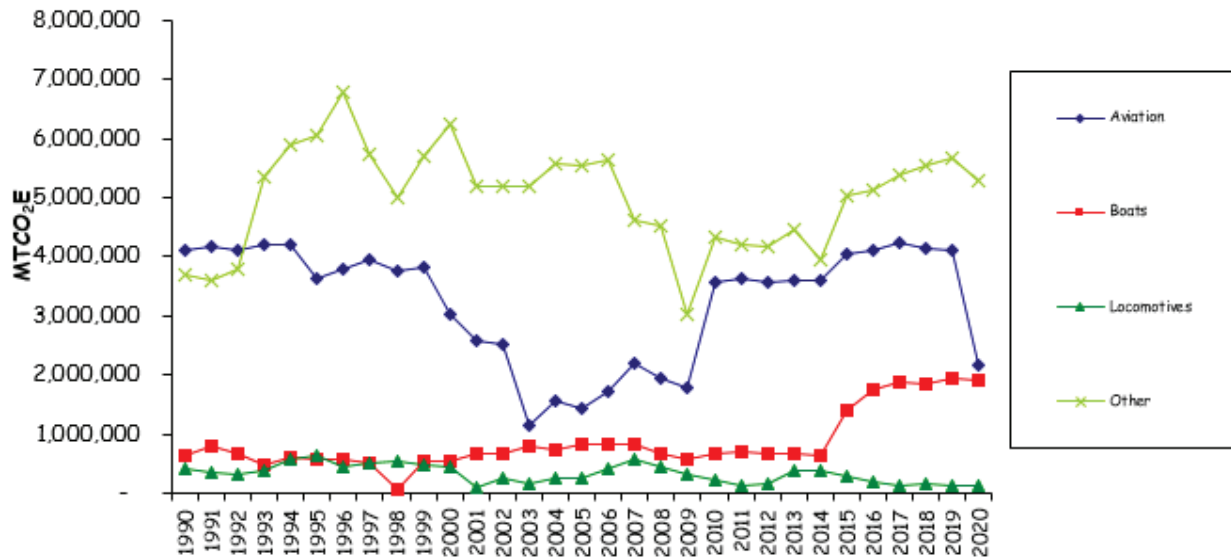
Mobile combustion emissions for the state of MI from 1990-2020 using EPA State Inventory ¹⁸Tool.



Appendix Figure 1. CO₂ emissions from mobile sources, by mode/vehicle type.

¹⁸ [EPA State Inventory Tool](#)

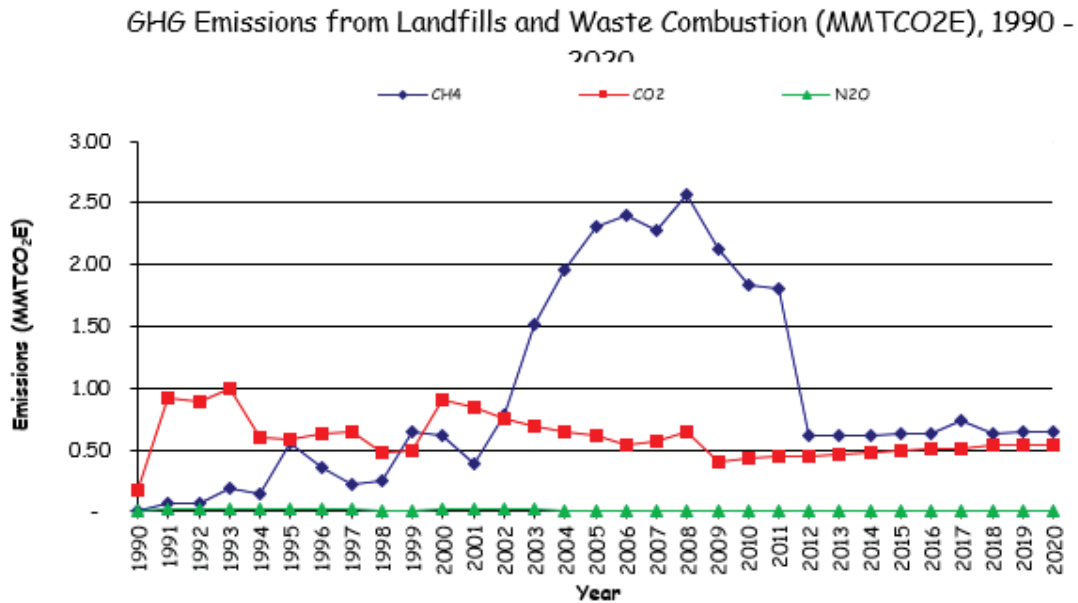
Total Carbon Dioxide Emissions from Non-Highway Mobile Sources



Appendix Figure 2. Total CO₂ emissions from non-highway sources in MI, 1990-2020.

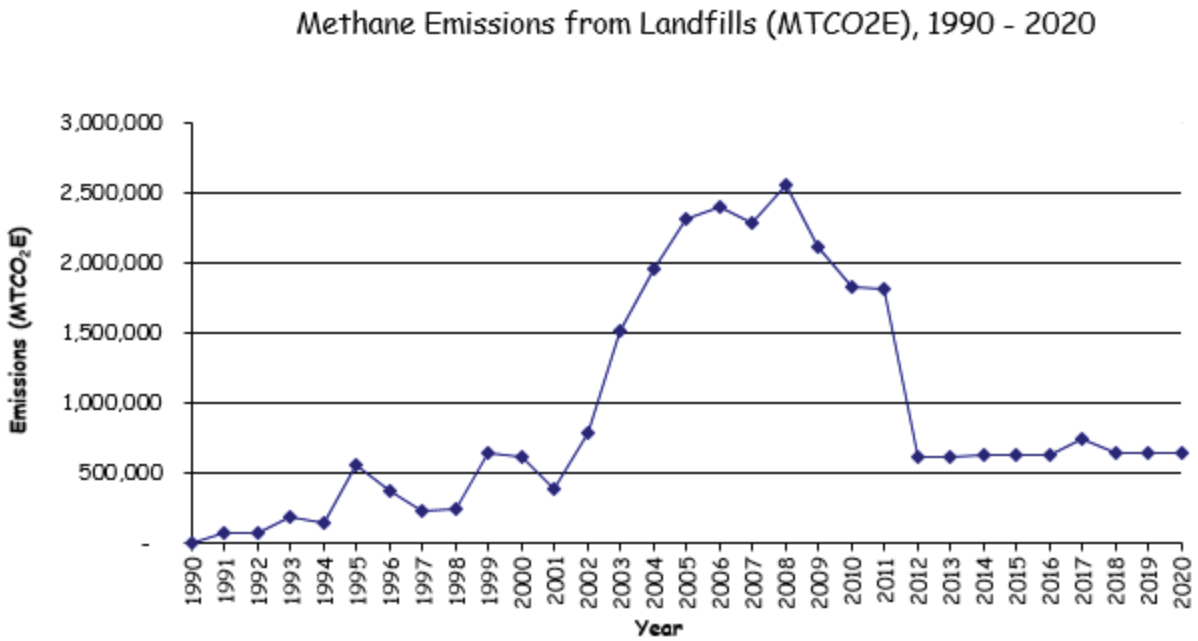
Appendix B. Solid Waste Emissions for the State of Michigan 1990-2020

Solid waste emissions for the state of MI, using EPA State Inventory Tool.¹⁹



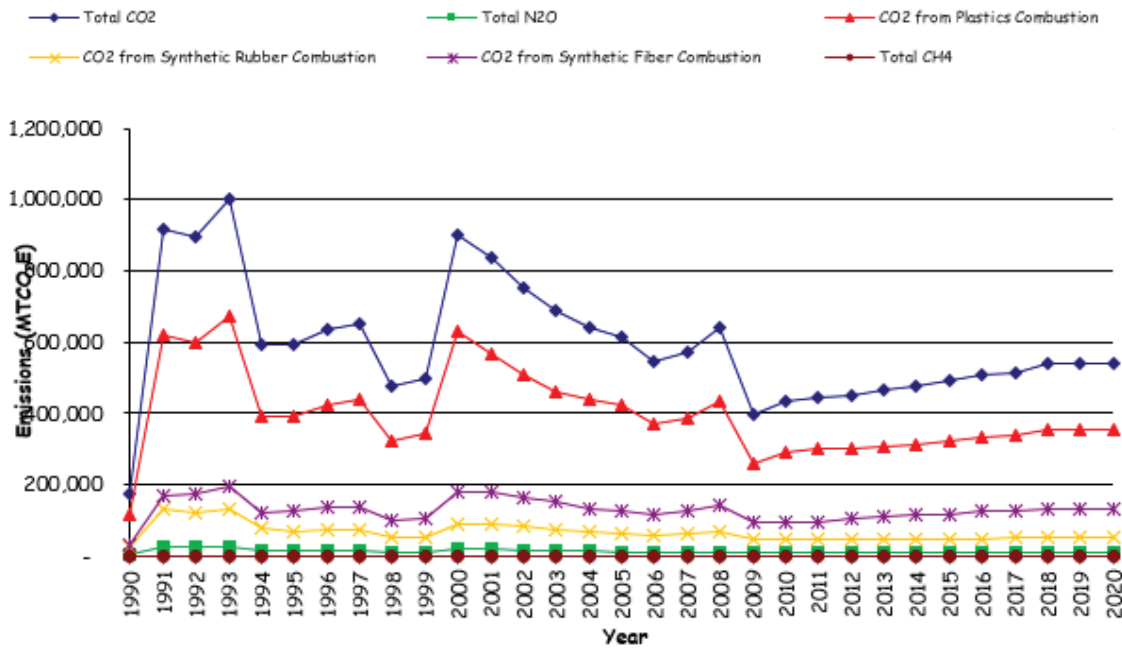
¹⁹ EPA State Inventory Tool

Appendix Figure 3. GHG emissions from landfills and waste combustion from 1990-2020



Appendix Figure 4. Methane Emissions from landfills, 1990-2020.

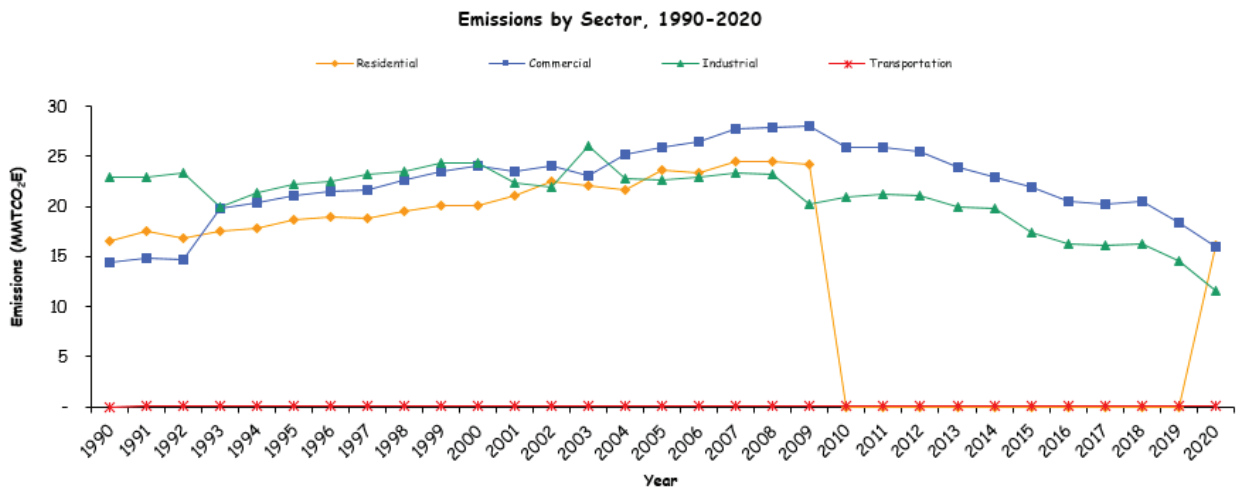
Emissions from Waste Combustion (MTCO₂E), 1990 - 2020



Appendix Figure 5. Emissions from waste combustion, 1990-2020.

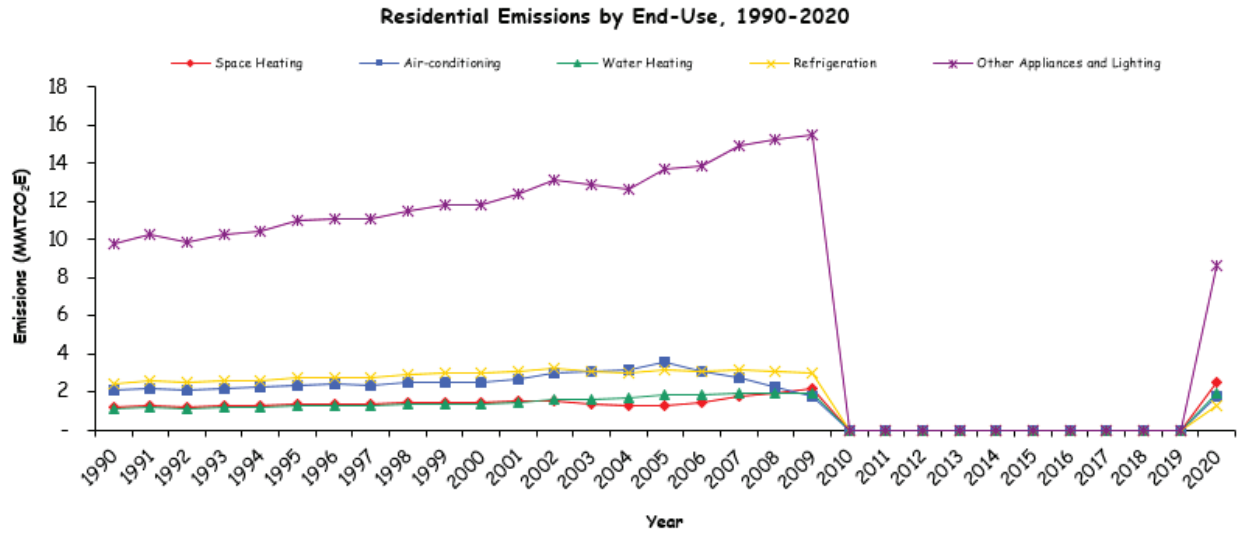
Appendix C. Electricity Emissions for Michigan 1990-2020

Electricity emissions for the state of MI, using EPA State Inventory Tool²⁰.

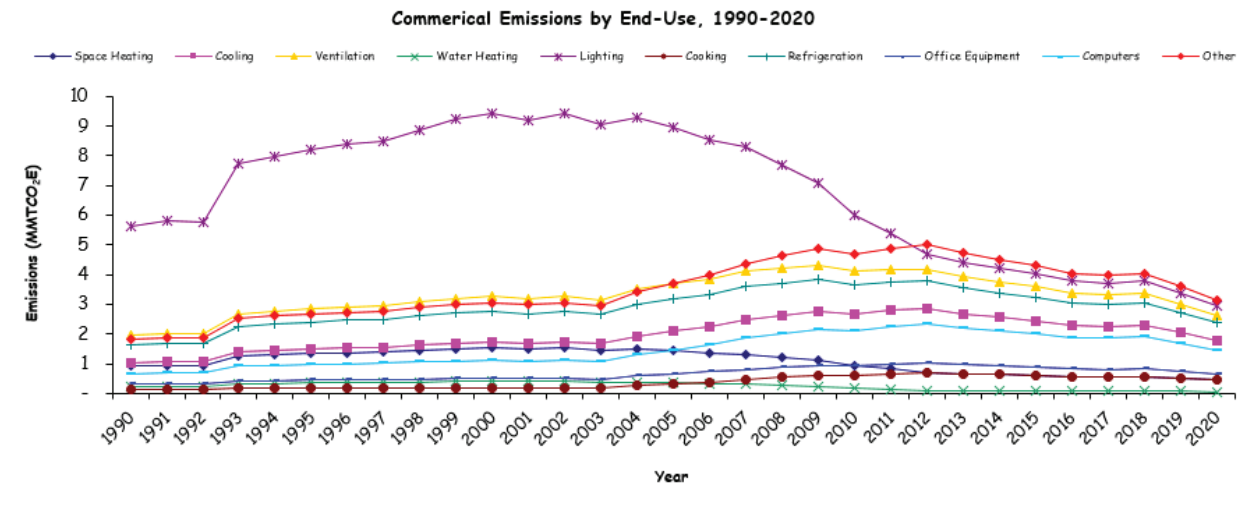


Appendix Figure 6. MI electricity emissions by sector. 1990-2020

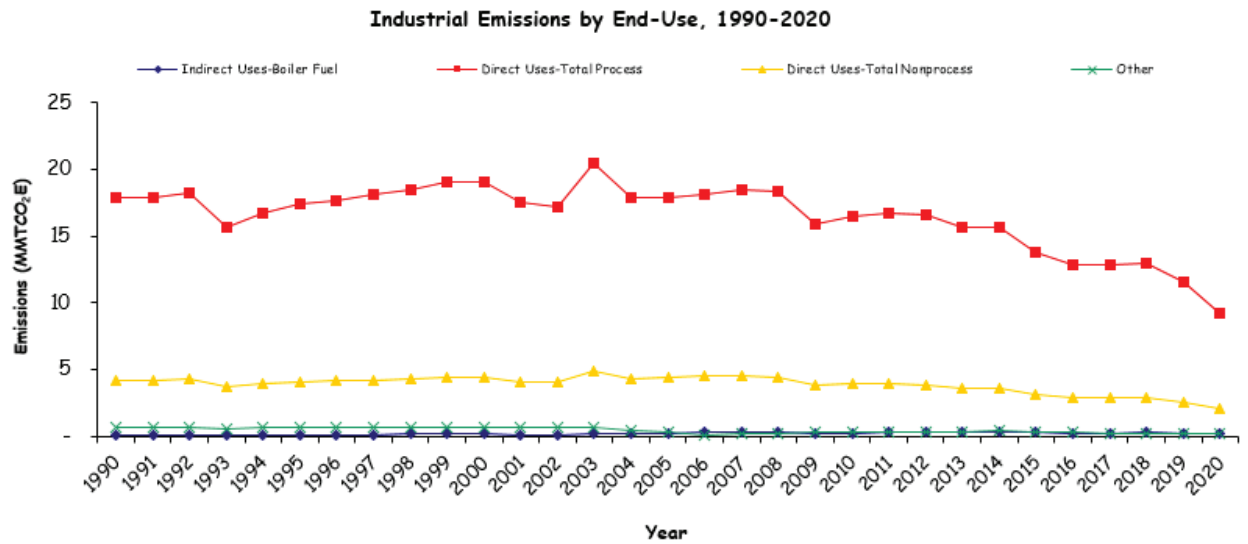
²⁰ EPA State Inventory Tool



Appendix Figure 7. Residential emissions by end use, 1990-2020



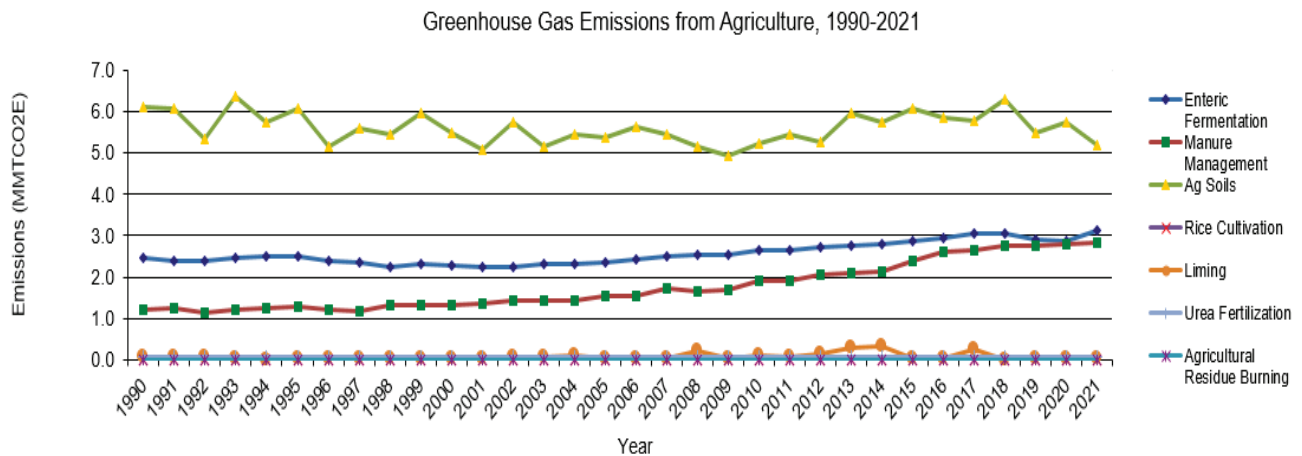
Appendix Figure 8. Commercial emissions by end-use, 1990-2020.



Appendix Figure 9. Industrial emissions by end-use, 1990-2020.

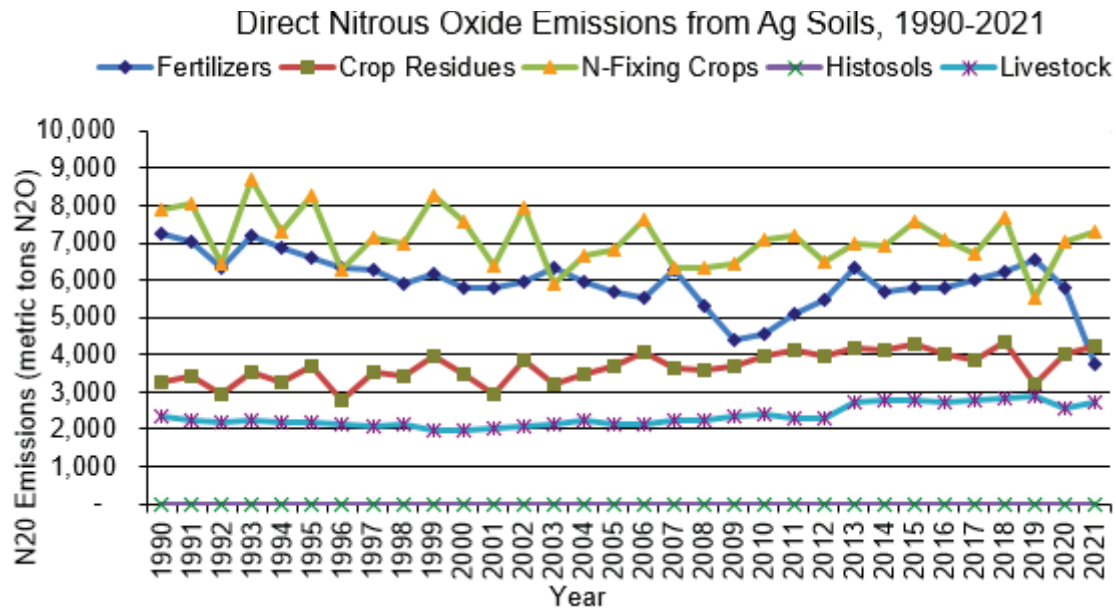
Appendix D. Agriculture Emissions in Michigan in 1990-2020

Agriculture emissions in Michigan in 1990-2020 using EPA State Inventory Tool²¹.

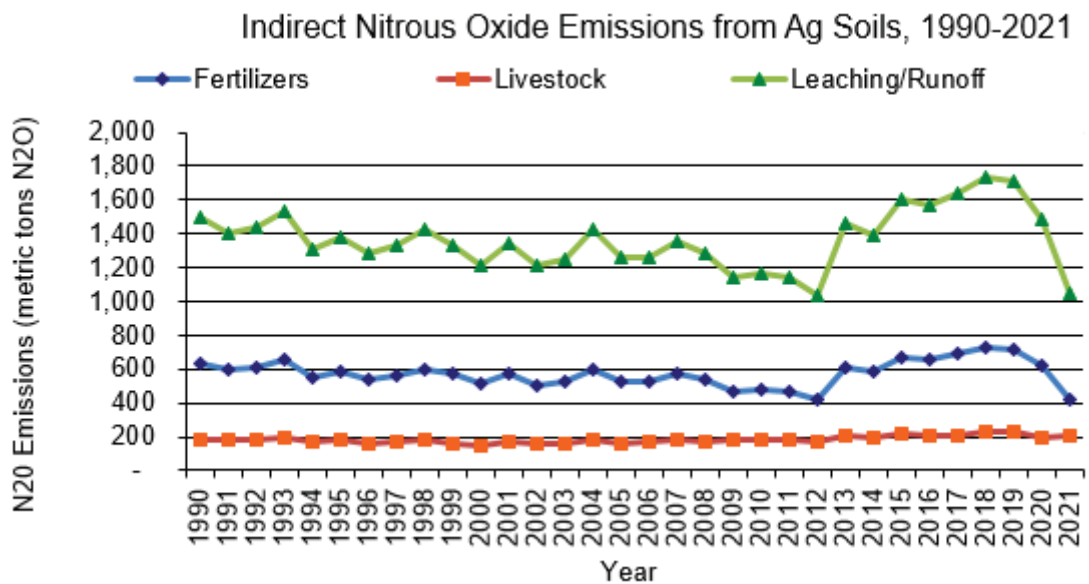


Appendix Figure 10. GHG emissions from agriculture in 1990-2020.

²¹ [EPA State Inventory Tool](#)



Appendix Figure 11. Direct Nitrous Oxide emissions from agriculture soils in 1990-2020.



Appendix Figure 11. Indirect Nitrous Oxide emissions from agriculture in 1990-2020.

Saginaw Chippewa Indian
Tribe:
Priority Climate Action Plan

Prepared by:
Inter-Tribal Council of Michigan
March 2024



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1. Introduction

The Inter-Tribal Council of Michigan (ITCMI) received funding from the Environmental Protection Agency (EPA), to produce a Priority Climate Action Plan (PCAP) through the Climate Pollution Reduction Grant (CPRG) program, for the Saginaw Chippewa Indian Tribe (SCIT or the Tribe). Saginaw Chippewa Indian Tribe is divided into three districts. District one Isabella district in which tribal members reside in Isabella County, Michigan. District Two, Saganing, in which tribal members reside in Arenac County, Michigan. District three is SCIT Members who reside across the United States. SCIT membership is around 3,000 members.

SCIT exterior boundaries are 138,240 acres with 2,682 acres in Trust status. SCIT major employers are Saginaw Indian Tribal Operations, Saginaw Chippewa Tribal College, Soaring Eagle Resorts and Casino, the Slot Place, Soaring Eagle Water Park, Saganing Eagles Landing Casino and Sagamok Gas Stations¹.

The Inter-Tribal Council of Michigan is a non-profit organization that represents twelve federally recognized tribes in Michigan. ITCMI is divided into several different divisions which includes Behavioral Health Services, Childhood and Family Services, Economic Development, Head Start, Health Education and Chronic Disease, Maternal and Early Childhood Services and Environmental Services. Each division is dedicated to act as a forum for member Tribes, to advocate in the development of programs and policies which will improve the economy, education, and quality of life for member Tribes, and to provide technical assistance to member Tribes in the development of Tribal regulations, ordinances and policies applicable to health and human services².

1.1 CPRG Overview

Participating in the CPRG program will produce two deliverables at the end of this program. The first delivery is to create a PCAP by April 1st, 2024. In the PCAP, ITCMI and the Tribe will produce a generalized Green House Gas (GHG) inventory using already existing national and state data. The PCAP will focus on implementation ready activities. In development of this PCAP, ITCMI worked directly with the Tribe's Environmental Department to verify the tribe goals in this program were met. The development of the PCAP will open the door for SCIT to apply for funding sources to help implement GHG reducing projects.

After the PCAP is completed, ITCMI and the Tribe will begin working on the Comprehensive Climate Action Plan (CCAP). The CCAP will consist of a complete GHG inventory for SCIT. This GHG inventory will be strictly for the entire Tribe. CCAP will provide GHG projections for near term (2030-2050) and long term (2050) projections. These projections will also include projections if no GHG reduction measures are taken. CCAP preparation will consist of a series of public stakeholder meetings to provide a chance for tribal members to provide input on CCAP development. The CCAP will be published in spring 2026.

¹ [SCIT](#)

² [ITCMI](#)

1.2 PCAP Overview and Definitions

Below are the following components to Saginaw Chippewa Indian Tribe PCAP

- GHG Inventory: A generalized GHG inventory will be created. This GHG inventory includes implementation ready sectors, and some data will be collected from SCIT. ITCMI will use already published data from U.S Greenhouse Gas Emissions and Sinks by State and National Emissions Inventory (NEI). ITCMI used EPA's Tribal Greenhouse Gas Inventory tool to develop this inventory.
- Quantified GHG reduction measures: A list of near term, high priority implementation ready measures are identified in this PCAP for implementation activities suggested in this PCAP.
- Benefit Analysis: An analysis was conducted to assist benefits of GHG reduction measures. This analysis consisted of both base year estimates of co-pollutants and anticipated co-pollutant emission reductions. This assessment will include improved health outcomes, economic benefits, increased climate resilience, and improved air quality. This analysis will include any drawbacks resulting from GHG reduction measures listed in this PCAP
- A Review of Authority to Implement: A timeline was created to give SCIT key entities to implement projects listed in this PCAP.
- Identification of Other Funding Mechanisms: This section explores possible funding sources; the Tribe can seek to fund projects listed in this PCAP.

1.3 PCAP Development Approach

Below is ITCMI approach to the development of the PCAP.

- Stakeholder Engagement: Through the development of this PCAP, ITCMI worked directly with the tribe Environmental Department and Administration Office. Quarterly meetings were held. Goals and objectives were given to ITCMI, to help develop this PCAP.
- Public Stakeholder Engagement: Public input was a major component in developing this PCAP. This public stakeholder meeting took place at Saginaw Chippewa Indian Tribe State of the Tribe Event. During this event surveys were handed out to tribal members. Surveys explained this program and tribal members were given the opportunity to provide input for PCAP development. Members of the Tribes Environmental Department explained the CPRG Program and the PCAP. The following are public consensus for this PCAP:
 - Include a solar energy project for tribally owned facilities and tribally owned homes
 - Provide an energy efficient form of public transportation for tribal members to use

2. Organization and Considerations

2.1 PCAP Team

Table 1. Shows the PCAP team and roles that contributed to developing this PCAP.

Role	Reasonability
Project Manager- ITCMI	Manages operating project activities, host public stakeholder engagement meetings, complete reporting requirements to the EPA, develop GHG inventory and develop PCAP
Technical Support-ITCMI	Complete GHG inventory, data interpretation and assist with PCAP development.
Quality Assurance Manager-ITCMI	Provides quality assurance for PCAP development and GHG Inventory data
SCIT Environmental Department	Develop SCIT goals and objectives for PCAP development. Assist in public stakeholder meetings, provide any previous data that SCIT has conducted.
Saginaw Chippewa Indian Tribe Tribal Council	Provide final decision on implementation projects listed in this PCAP.
Environmental Protection Agency	Provide technical assistance in PCAP development.

SCIT Tribal Agencies

The following are SCIT tribal agencies that helped contributed to the development of the PCAP.

- SCIT Environmental Department
- Migizi Economic Development
- SCIT Tribal Council

Third Party Consultant

- Environmental Resource Group: This consultant created a Solid Waste Management Plan for SCIT. This plan is referenced in 3.2 of the PCAP.

2.2 Special Considerations

2.2.1 Sector Specific Goals

In the development of this PCAP, ITCMI and SCIT created the following goals for the PCAP:

- Goal One: To have zero food, trash waste and be exemplary community by 2040.
- Goal Two: To create an electric vehicle program and charging stations for the Tribe
- Goal Three: To reduce the Tribes Carbon footprint by 50% by 2030.
- Goal Four: To be completely net zero by 2050.
- Goal Five: To maximize energy efficiency in facilities owned by the Tribe.

2.2.2 Existing Emissions Reduction Plans and Projects

- Solid Waste Management Plan: This plan was accepted by SCIT Tribal Council in November. This program will help reduce SCIT waste to zero by 2040.
- Special Environmental Projects: SCIT developed a list of projects that can help lower the tribe GHG emissions. List of proposed projects include using LED lighting in SCIT facilities, installing energy efficient furnaces in SCIT facilities and installing solar panels at SCIT facilities.

3. PCAP Elements

3.1 Greenhouse Gas (GHG) Inventory

3.1.1 Scope

The scope of this GHG Inventory will focus on the following sectors:

- A. Electricity Generation and Consumption
- B. Solid Waste Sector
- C. Transportation Sector
- D. Residential and Commercial

The baseline year used for this inventory is 2020, this year was chosen for a baseline due to volume of data available.

3.1.2 Data Collection

Data in this GHG Inventory originated from the following sources:

- National Emissions Inventory (NEI): NEI is a comprehensive and detailed estimate of air emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emissions sources.
- State Inventory Tool (SIT): The State Inventory Tool consists of eleven different GHG estimation models. These estimates are used in this PCAP using baseline year 2020.
- Green House Gas Inventory Data Explorer: Information obtained from this tool originally originated from the NEI data. This tool was used to decipher GHG emissions from different sections of the NEI.
- Tribal GHG Inventory Tool: This tool was used to generate the GHG Inventory for this project.
- State and Local Planning of Energy (SLOPE) Database: This tool was used to compare measures that can reduce GHG emissions to current conditions.
- Saginaw Chippewa Indians Solid Waste Plan: This plan will be referenced in the Solid Waste Sector of this GHG Inventory.

3.1.3 GHG Accounting Method and Global Warming Potential

In this GHG inventory, the majority of GHG's is produced globally is Carbon Dioxide (CO₂). For this inventory CO₂ emissions are calculated in Million Metric Tons of CO₂ Equivalent (MMT_{CO₂e}).

Global Warming Potential

As GHG's are emitted in the atmosphere, these emitted gases act like a blanket that covers the Earth's atmosphere and cause warming. Each greenhouse gas emitted warms the Earth at different

rates. Differences in rates are expressed in Global Warming Potential (GWP). GWP is the result of GHG’s ability to absorb energy and how long it will stay in the atmosphere. The EPA primarily uses the 100-year GWPs from IPCC Fifth Assessment Report (AR5) per international reporting standards. 100-year GWP is based on energy absorbed by a gas over 100 years. Below is a summary of GWP to relevant GHG’s listed in this inventory.

Table 2. GWP for greenhouse gases listed in this inventory in a 100-year period according to IPCC Fifth Assessment Report (AR5)³.

Greenhouse Gases	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265

3.1.4 GHG Inventory by Sector

A. Electricity Generation and Consumption

The following data is from the SIT⁴ using base year of 2020.

Tables 3 - 5. Shows residential, commercial and industrial electricity consumption data in 2020 in Michigan

Table 3. Michigan 2020 Residential Electricity Consumption

Source	kWh	Total (MTCO _{2e})
Space Heating	5,550,514,846	2,401,121
Air Conditioning	3,984,985,018	1,723,882
Water heating	4,269,620,805	1,847,014
Refrigeration	2,846,417,870	1,231,344
Other	19,213,320,622	8,311,573
Total	35,864,865,161	15,514,936

Table 4. Michigan 2020 Commercial Electricity Consumption

Source	kWh	Total (MMTCO _{2e})
Space Heating	997,792,974	431,640
Cooling	3,991,171,869	1,726,558
Ventilation	5,864,215,990	2,536,826
Water Heating	142,541,883	61,663
Lighting	6,556,925,257	2,836,489
Cooking	997,792,974	431,640
Refrigeration	5,274,048,577	2,281,523

³ [Global Warming Potential](#)

⁴ [EPA State Inventory Tool](#)

Office Equipment	1,625,418,534	703,147
Computers	3,278,462,629	1,418,244
Other	6,984,550,818	3,021,477
Total	35,492,921,502	15,354,036

Table 5. Michigan 2020 Industrial Electricity Consumption

Source	kWh	Total (MMTCO _{2e})
Conventional Boiler Use	393,796,870	170,354
Process Heating	2,879,793,900	1,245,782
Process Cooling and Refrigeration	2,108,908,085	912,302
Machine Drive	13,153,445,793	5,690,106
Electro-Chemical Process	1,739,799,795	752,627
Facility HVAC	621,255,853	268,752
Facility Lighting	2,095,694,010	906,585
Other Facility Support	1,687,907,767	730,179
Onsite Transportation	461,812,492	199,777
Other Non-Process Use	46,832,237	20,259
Other	306,061,291	132,400
Total	25,656,612,576	11,098,904

Table 6. Shows Michigan's total electricity consumption in MTCO_{2e}

Source	Total (MTCO _{2e})
Residential	15,514,936
Commercial	15,354,036
Industrial	11,098,904
Total	41,967,876

Electricity Consumption for SCIT Service Counties

Table 7- 8 shows electricity consumption in kWh and emissions in Co2 Million Metric Tons (MMT) across the Tribes two service counties Clare and Arenac. This information was obtained using the SLOPE⁵ tool

Table 7. Shows electricity consumption in kWh for SCIT two service counties in 2020.

County	Residential	Commercial	Industrial	Transportation	Total kWh
Clare	245,710,785	47,125,828	140,234,507	8,320,287	441,365,031
Arenac	114,825,245	17,458,243	49,148,018	3,595,982	185,045,073

⁵ [State and Local Planning for Energy](#)

Table 8. Shows electricity emissions in MMTCO_{2e} for SCIT two service counties in 2020

County	Residential	Commercial	Industrial	Transportation
Clare	106,293	20,386	60,665	3,599
Arenac	3,599	7,552	21,261	1,556
Total	109,982	27,938	81,926	5,155

B. Solid Waste Sector

The following information is from the State Inventory Tool (SIT) ⁶using base year 2020 in Michigan. This data was determined by 2020 Michigan population of 9,966,555 and estimated of 7,523,620 tons of waste produced.

Table 9. Shows waste combustion from Carbon Dioxide (Co₂), Nitrous Oxide (N₂O) and Methane (CH₄) in Million Metric Tons of Carbon Dioxide Equivalent (MMTCO_{2e}).

Source	MMTCO _{2e}
Co₂	541,542
Plastics	355,058
Synthetic Rubber	53,452
Synthetic Fibers	133,032
N₂O	8,723
CH₄	369
Total Co₂, N₂O CH₄	550,634

Table 10. Shows plastic combustion in 2020 in MMTCO_{2e}

Plastics	State MSW Combusted (short tons)	MMTCO _{2e}
PET	725.692	43,274
HDPE	725.692	70,678
PVC	725.692	4,222
LDPE/LLDPE	725.692	96,369
PP	725.692	91,433
PS	725.692	27,305
Other	725.692	35,843
Total Plastics	5,079.84	355,058

⁶ [EPA State Inventory Tool](#)

Table 11. Shows Methane (CH₄) emissions from landfills in MMTCO₂e

Potential CH ₄	MMTCO ₂ e
Potential CH₄	10,967,194
MSW Generation	10,249,714
Industrial Generation	717,480
Ch₄ Avoided	10,249,714
Flare	1,926,878
Landfill Gas-to-Energy	9,048,368
Oxidation at Industrial Landfills	71,748
Total Ch₄ Emissions	645,732

Table 12. Shows total emissions from landfills and waste combustion in MMTCO₂e

GHG	MMTCO ₂ e
CH ₄	0.646
CO ₂	0.542
N ₂ O	0.009
Total	1.196

Table 13. Solid waste emissions from the 2020 NEI ⁷for SCIT service counties.

County	Emissions (tons)
Clare	647.81
Arenac	190.84
Totals	838.65

C. Transportation Sector

The following transportation data is from the 2020 NEI dataset⁸. This data is calculating vehicle CO₂ emissions in tons.

Table 14. CO₂ emissions from gasoline vehicles, diesel vehicles, and other fuel type vehicles for each of the seven service counties for SCIT service counties.

County	CO ₂ Emissions (Tons)
Clare	18,317.17
Arenac	27,396.48
Total CO₂ Emissions	45,713.65

⁷ [2020 NEI Data Set](#)

⁸ [2020 NEI Data Set](#)

Table 15. Combined CO₂ emissions from commercial marine vessels, locomotives, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for SCIT service counties.

County	CO ₂ Emissions (Tons)
Clare	196,387.96
Arenac	373,215.96
Total Co₂ Emissions	569,603.96

Table 16. Combined CO₂ Emissions from gasoline vehicles, diesel vehicles and other fuel type vehicles, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for the state of Michigan in 2020.

Source	CO ₂ Emissions (Tons)
Gasoline vehicles, diesel vehicles, other fuel types.	6,464,377.05
On-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles	45,479,338.17
Total	51,943,715.22

D. Residential and Commercial

The following data is fuel combustion use in SSMTCI service counties. This data was obtained from the 2020 NEI ⁹in Michigan.

Table 17. Michigan Residential fuel combustion for natural gas, wood, oil and other types of combustion in emissions tons for SCIT service counties.

County	Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)
Clare	38.92	2,121.15	1.16	45.73
Arenac	22.28	1,101.22	.86	22.82
Totals	61.20	3,22.37	2.02	68.55

⁹ [2020 NEI Data Set](#)

Table 18. Michigan commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for SCIT service counties.

County	Biomass	Natural Gas	Oil	Other Fuel Sources
Clare	7.47	18.49	.56	1.18
Arenac	3.89	9.63	0.29	0.61
Totals	11.36	28.12	0.85	1.79

Table 19. Emissions from fuel combustion for natural gas, wood, oil and other types of combustion for Michigan.

Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)	Total Emissions (tons)
24,507.89	282,605.75	318.33	3,560.88	310,674.52

Table 20. Emissions from commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for Michigan.

Biomass	Natural Gas	Oil	Other Fuel Sources	Total Emissions (tons)
4,937.38	12,215.68	373.90	782.66	18,309.62

3.2 GHG Reduction Measures

The following are SCIT greenhouse gas reduction measures for this PCAP.

GHG Reduction Measure One: Implement a recycling program for SCIT members.

Table 21. GHG reduction measure one overview

Measure 1: Implementation of a recycling program for SCIT members.	Implementing Agency	Saginaw Chippewa Indian Tribe
	Applicable Sector	Solid Waste Sector
	Overview	To provide SCIT members with two recycling bins per household, to encourage recycling.
	Location	Saginaw Chippewa Indian Tribe: Isabela and Arenac Counties
	Annual Estimated GHG and Long Term GHG Reductions	821 MTCO_{2e} Annually 2024 – 2030: 4,926 MTCO_{2e} 2024 – 2050: 21,346 MTCO_{2e}

GHG Reduction Measure One Summary: In coordination with 2023 SCIT Solid Waste Management Plan a recycling program will be established for SCIT. This program will provide SCIT members who live in Isabela and Arenac counties reservations with two recycling bins per household (774 recycling bins). This program will provide outreach for members to learn the importance of recycling. A total of 821 MTCO_{2e} GHG will be reduced every year with this program. GHG emissions reduction for this measure was determined by 2023 SCIT Solid Waste Management Plan, conducted by Environmental Resource Group.

GHG Reduction Measure Two: Creation of food and composting program for SCIT Members.

Table 22. GHG reduction measure two overview.

Measure 2: Food and composting program for SCIT members.	Implementing Agency	Saginaw Chippewa Indian Tribe
	Applicable Sector	Solid Waste Sector
	Overview	To provide tribal members with composting bins for food and solid waste.
	Location	Saginaw Chippewa Indian Tribe: Isabela and Arenac Counties
	Annual Estimated GHG and Long Term GHG Reductions	704 MTCO ₂ e Annually 2024 – 2030: 4,224 MTCO₂e 2024 – 2050: 18,304 MTCO₂e

GHG Reduction Measure Two Summary: In coordination with SCIT 2023 Solid Waste Management Plan, SCIT will create a food composting program. This program will provide members who live in Isabela and Arenac Counties Reservations with bins for food waste storage and composting. A total of 387 bins will be distributed for SCIT members. Composting bins will be placed at tribal schools to help divert food waste. This program will encourage businesses on the reservation to establish food waste collection systems. This program will encourage businesses on the reservation to provide food to organizations that serve people in need rather than discarding it as waste. With the establishment of this program, a total of 704 MTCO₂ will be reduced annually. GHG emissions reduction for this measure was determined by 2023 SCIT Solid Waste Management Plan, conducted by Environmental Resource Group.

GHG Reduction Measure Three: Reduce Solid Waste by 90% by 2040

Table 23. GHG reduction measure three overviews.

Measure 3: To cut SCIT solid waste by 90% by 2040.	Implementing Agency	Saginaw Chippewa Indian Tribe
	Applicable Sector	Solid Waste Sector
	Overview	To cut SCIT solid waste by 90% by 2040
	Location	Saginaw Chippewa Indian Tribe: Isabela and Arenac Counties
	Annual Estimated GHG and Long Term GHG Reductions	2,641 MTCO_{2e} Annually 2024 – 2030: 15,846 MTCO_{2E} 2024 – 2050: 68,666 MTCO_{2e}

GHG Reduction Measure Three Summary: In coordination with SCIT 2023 Solid Waste Management Plan, SCIT wishes to cut SCIT solid waste by 90% by 2040. SCIT will accomplish this goal by introducing composting and recycling programs for SCIT membership. SCIT will introduce a composting program to Soaring Eagle Resort and Casinos and Saganing Eagles Landing Casino. Community gardens will be established using compost generated from this program. Food waste prevention and reduction campaigns will be established for SCIT members and businesses to learn the importance of food waste and reduction. According to the SCIT 2023 Solid Waste Management Plan, in 2022 SCIT produced an estimated 3,060 tons of waste. With this reduction measure the total GHG’s that will be reduced would be 2,641 MTCO_{2e} a year. GHG emissions reduction for this measure was determined by 2023 SCIT Solid Waste Management Plan, conducted by Environmental Resource Group.

GHG Reduction Measure Four: Installation of 40 Level Two Electric Vehicles (EVs) Charging Stations for SCIT.

Table 24: GHG Reduction Measure Four Overview.

Measure: Installation of 40 level two EV charging stations for SCIT.	Implementing Agency	Saginaw Chippewa Indian Tribe
	Applicable Sector	Transportation Sector
	Overview	To install EV charging stations for tribal members, public and tribal departments to use.
	Location	5447, Sturman Rd, Standish MI, 48658
	Annual Estimated GHG and Long Term GHG Reductions	308 MTCO₂e annually 2024 – 2030: 1,848 MTCO₂e 2024 – 2050: 8,008 MTCO₂e

GHG Reduction Measure 4 Summary: SCIT wants to install 40 level two EV charging stations on trust land owned by SCIT. This will be a large EV charging station to hold a variety of charging stations. 15 Tesla Fast Charging Stations will be offered at this charging station along with 15 charging stations to charge medium/ heavy trucks and 10 level two charging stations for other vehicles. At this time, SCIT does not have any EV charging stations. With the completion of this charging station tribal members, members of the public and commercial vehicles can charge their vehicles. This charging station could potentially bring the option of electric school buses to SCIT, with a designated area planned to accommodate school buses. A total of 308 MTCO₂e will be reduced annually. GHG emissions reduction from this measure was determined using EPA GHG calculator¹⁰.

¹⁰ [EPA Greenhouse Gas Equivalencies Calculator](#)

3.3 Benefit Analysis

The following is a benefitting analysis for each GHG reduction measure listed in this PCAP. This benefit analysis will compare benefits and any potential drawbacks for each GHG reduction measure.

GHG Reduction Measure One: Implementation of a Recycling Program for SCIT Members

- **Benefits**
 - 821 MTCO_{2e} reduced every year
 - 4,926 MTCO_{2e} reduced between 2024-2030
 - 21,346 MTCO_{2e} reduced between 2024-2050
 - Reduced levels of waste entering landfills
 - Decrease of Methane (CH₄) and Nitrous Oxide (N₂O)
 - Lowering cost of waste removal for SCIT
- **Drawbacks**
 - Large upfront cost
 - Recycling retention rates could be difficult to maintain
 - Some recycling practices can have negative impact on the environment

GHG Reduction Measure Two: Creation of food composting program for SCIT Members

- **Benefits**
 - 704 MTCO₂ reduced annually
 - 4,224 MTCO_{2e} reduced between 2024-2030
 - 18,304 MTCO_{2e} reduced between 2024-2050
 - Decrease of Methane (CH₄) and Nitrous Oxide (N₂O)
 - Lower food waste for the Tribe
 - Creation of new jobs for the Tribe
 - Lowering the cost of waste removal for the Tribe
 - An adequate composting program can provide tribal members quality soil for planting
- **Drawbacks**
 - Large upfront cost
 - Recycling retention rates could be difficult to maintain

GHG Reduction Measure Three: Reduce solid waste by 90% by 2040 for SCIT

- **Benefits**
 - 2,641 MTCO₂ reduced annually
 - 15,846 MTCO_{2e} reduced between 2024-2030
 - 68,666 MTCO_{2e} reduced between 20224-2050
 - Decrease of Methane (CH₄) and Nitrous Oxide (N₂O)

- Creation of new jobs for the Tribe
- Total reduction of solid waste for the Tribe
- Greener community

- **Drawbacks**
 - Large upfront cost
 - Retention rates for this program could be difficult to maintain

GHG Reduction Measure Four: Installation of 40 Level Two Electric Vehicles (EVs) Charging Stations for SCIT

- **Benefits**
 - 308 MTCO_{2e} reduced every year
 - 1,848 MTCO_{2e} reduced between 2024-2030
 - 8,008 MTCO_{2e} reduced between 2024-2050
 - First charging station for the Tribe
 - Could potentially increase more E.V use for the Tribe. Ex. E.V School Busses
 - Increase tourism for the Tribe

- **Drawbacks**
 - Increase threat for vandalism and theft
 - Loss of habitat for wildlife
 - Land degeneration
 - Increase overall energy use

3.4 Review and Authority to Implement

Saginaw Chippewa Indian Tribe recognizes the importance of this PCAP and the GHG reduction measures that is included. With this importance the following miles stones will take place to make certain GHG reduction measures will take place.

- Develop a PCAP that fits the needs and wants for SCIT: Through outreach meetings with tribal members and stakeholders, an adequate PCAP was developed.
- Presentation to SCIT Tribal Council: After completing this PCAP members from SCIT Environmental Department, and ITCMI will present this PCAP to the Tribal Council. The Tribal Council meets once a month. This presentation will clarify each section of this PCAP to Tribal Council.
- Tribal Council Vote: After the presentation from the PCAP team, Tribal Council will vote on implementing measures in this PCAP.

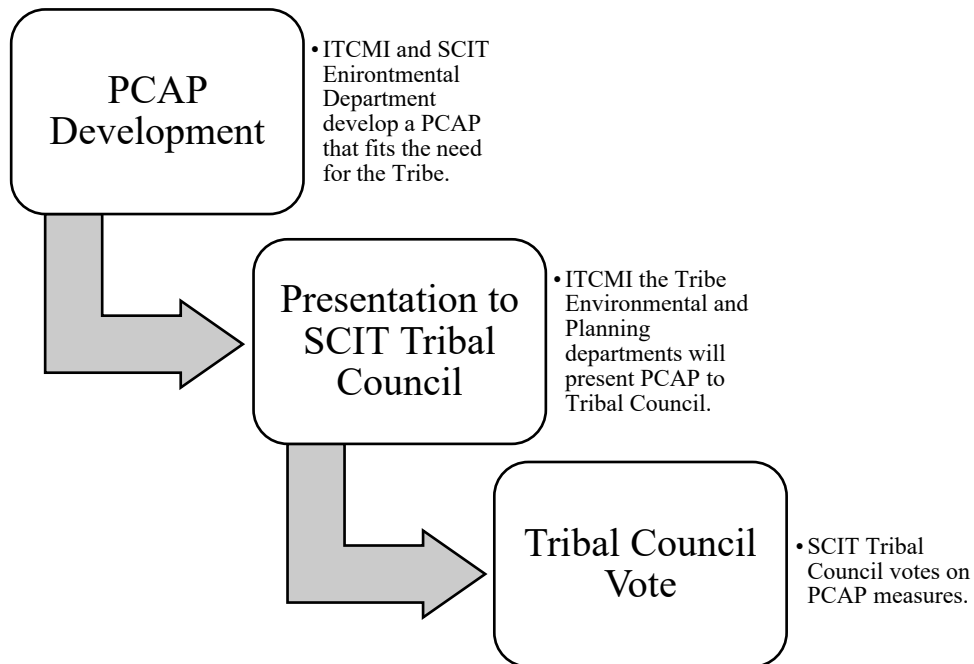


Figure 1. Flow chart for implementation of this PCAP.

In the development of the PCAP, the Tribe has been transparent on the type of projects that will reduce GHG emissions. Through presentations to the Tribal Council, measures listed in this PCAP will be approved.

3.5 Identification of Other Funding Mechanisms

It is vital for SCIT to have GHG reduction measures listed in this PCAP to be completed to help lower the Tribe carbon footprint. To accomplish this goal, it is important for the Tribe to seek any funding sources available to possibly fund the Tribes GHG reduction measures.

The following are other sources of funding that the Tribe can apply for to help fund the Tribes GHG reduction measures.

Greenhouse Gas Reduction Fund (GGRF)¹¹

Summary: \$27 billion investment to mobilize financing and private capital to combat the climate crisis and ensure American economic competitiveness. The GGRF will deliver lower energy costs and economic revitalization to communities, particularly those that have historically been

¹¹ [Greenhouse Reduction Fund](#)

left behind. Through the GGRF program, the EPA will allocate the fund through three competitions: Solar for All, National Clean Investment Fund (NCIF), and the Clean Communities Investment Accelerator (CCIA). Through these competitions, the fund aims to scale deployment of clean technologies nationally, build community clean financing capacity locally, and spur adoption of clean distributed solar energy in disadvantaged communities to achieve three broad objectives:

- Reduce greenhouse gas (GHG) emissions and other air pollutants.
- Deliver the benefits of greenhouse gas- and air pollution-reducing projects to American communities, particularly low-income and disadvantaged communities.
- Mobilize financing and private capital to stimulate additional deployment of greenhouse gas and air pollution reducing projects.

Community Change Grants¹²

Summary: The Inflation Reduction Act authorized the creation of the US Environmental Protection Agency's (EPA) new Environmental and Climate Justice Community Change Grants program. The program is designed to benefit disadvantaged communities through projects to reduce pollution, increase community climate resilience, and build community response capacity. The grants will be focused on community-driven initiatives to be responsive to community and stakeholder input.

Department of Energy Loan Programs Office State Energy Finance Institution Program

Summary: The Department of Energy's (DOE) Loan Programs Office¹³(LPO) finances large-scale energy infrastructure projects across the U.S. Through Title 17 Innovative Clean Energy Loan Guarantee Program (Title 17), DOE LPO provides loan guarantees for Innovative Clean Energy Projects, including through the designation of a State Energy Finance Institution (SEFI) to fund specific projects. A SEFI is a quasi-independent entity or an entity within a state agency or financing authority established by a state to satisfy two functions:

- Provide financing support or credit enhancements for clean energy projects, and
- Create liquid markets for eligible projects or take other steps to reduce financial barriers to the deployment of existing and new eligible projects.

¹² [Community Change Grants](#)

¹³ [DOE Loan Program](#)

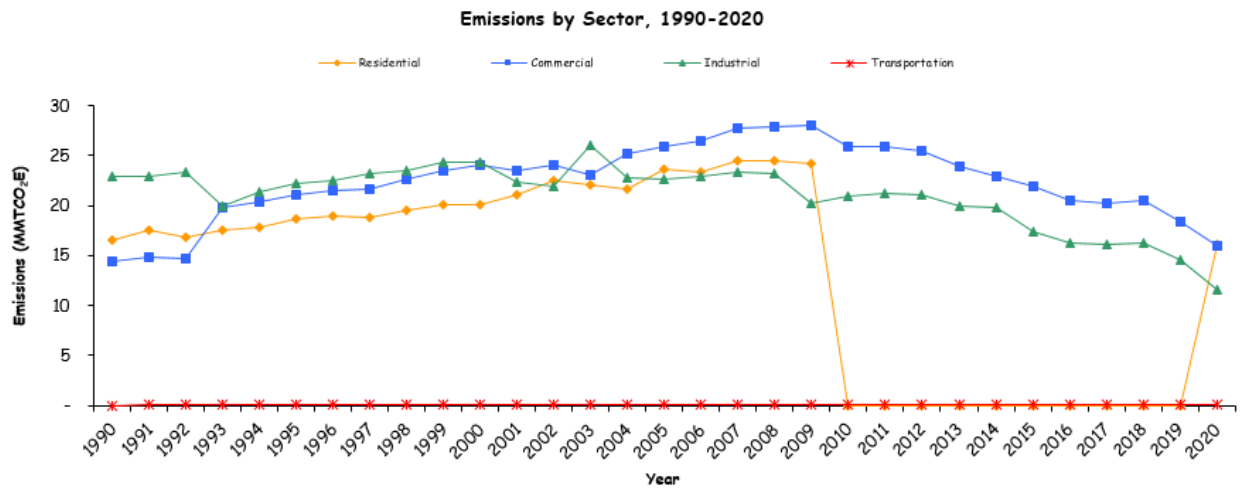
4. Next Steps

After the completion of this PCAP, work will begin on developing the CCAP for Saginaw Chippewa Indian Tribe. The CCAP will consist of developing a comprehensive GHG inventory for SCIT. This GHG inventory will consist of determining GHG emissions for the transportation sector, electricity generation and consumption sector, the industrial sector, commercial and residential sector, land use and forestry sector, waste and materials management sector and agriculture sector. This GHG inventory will be unique for the Tribe. ITCMI will work directly with the Tribe to help determine GHG emissions for each sector of the inventory. A series of public stakeholder meetings will be held for tribal members. In the public stakeholder meetings, tribal members will have an opportunity to provide input on what type of GHG reduction measures should be included in the CCAP. During CCAP development, ITCMI will work with the Tribes Human Resources Department, to help develop positions to help combat climate change. One of the main goals with the CCAP is to help create high quality jobs for the Tribe.

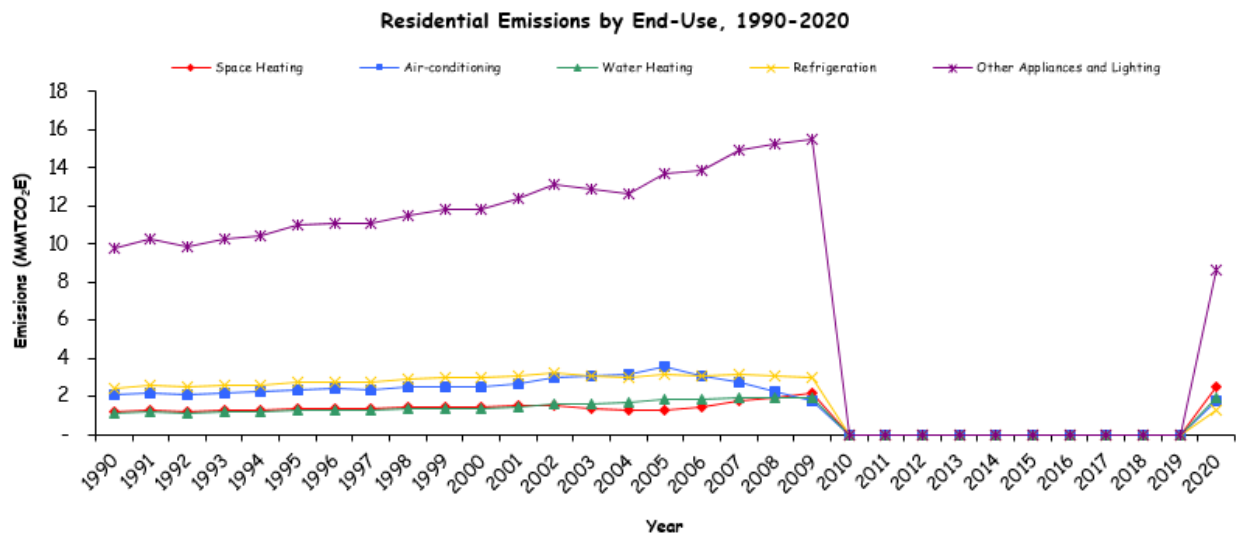
ITCMI will work directly with SCIT to develop additional and long-term GHG reduction measures. GHG reduction measures will address the main GHG emission sectors. After completion of GHG reduction measures for the CCAP, a complete benefit analysis will be conducted on each measure. This benefit analysis will look at benefits and drawbacks for each GHG reduction measure. At the end of the CCAP development, SCIT will have a comprehensive climate action plan that will help the Tribe combat climate change and meet the Tribes climate change goals.

Appendix A: Electricity Emissions for Michigan 1990-2020

Electricity emissions for the state of MI, using EPA State Inventory Tool¹⁴.

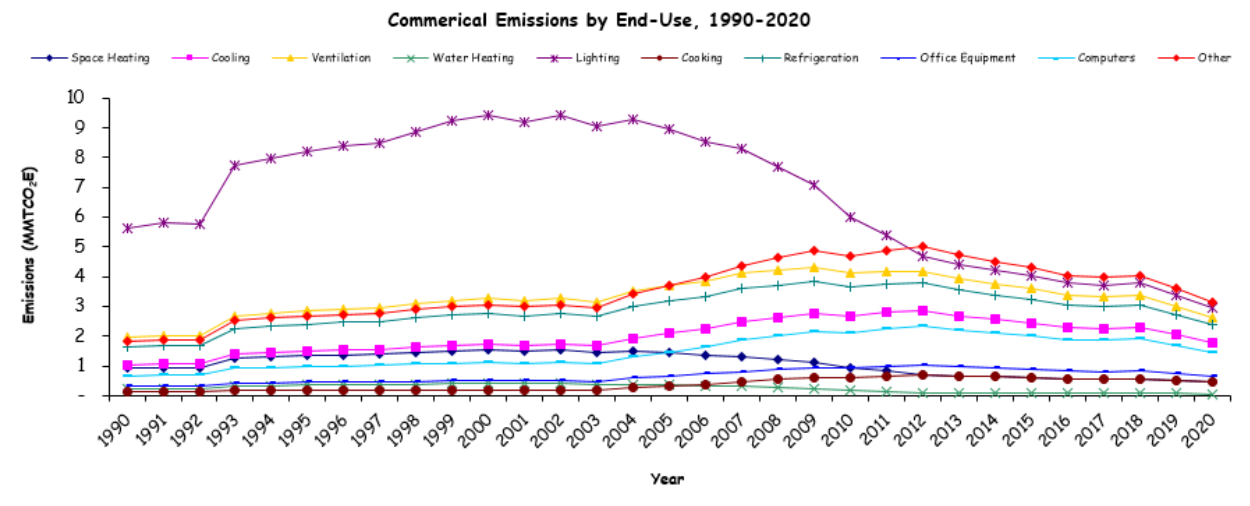


Appendix Figure 1. MI electricity emissions by sector. 1990-2020

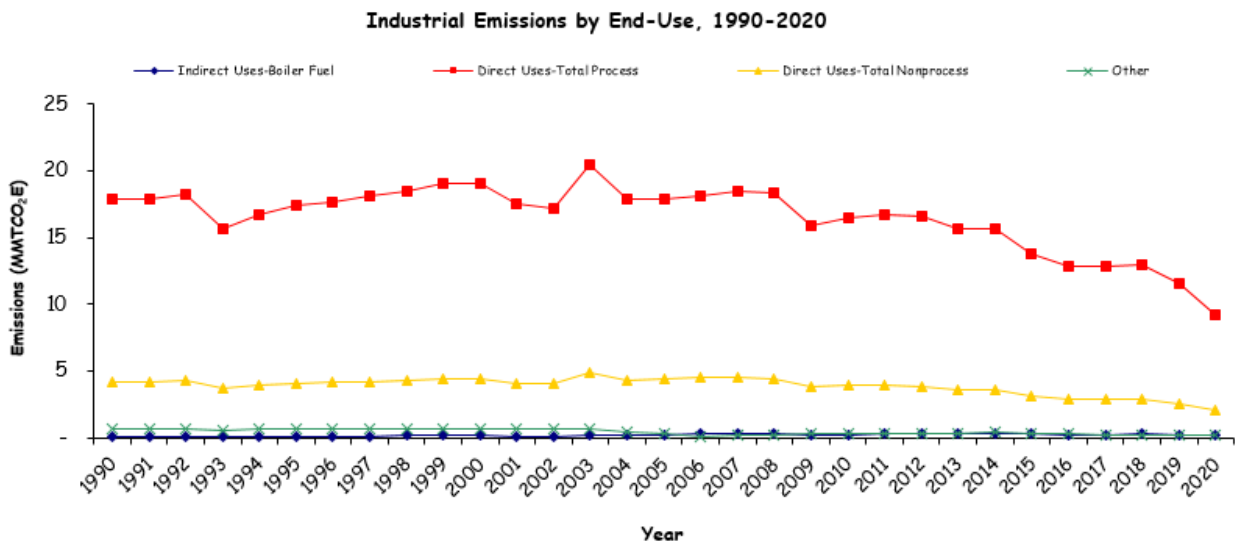


Appendix Figure 2. Residential emissions by end use, 1990-2020

¹⁴ [EPA State Inventory Tool](#)



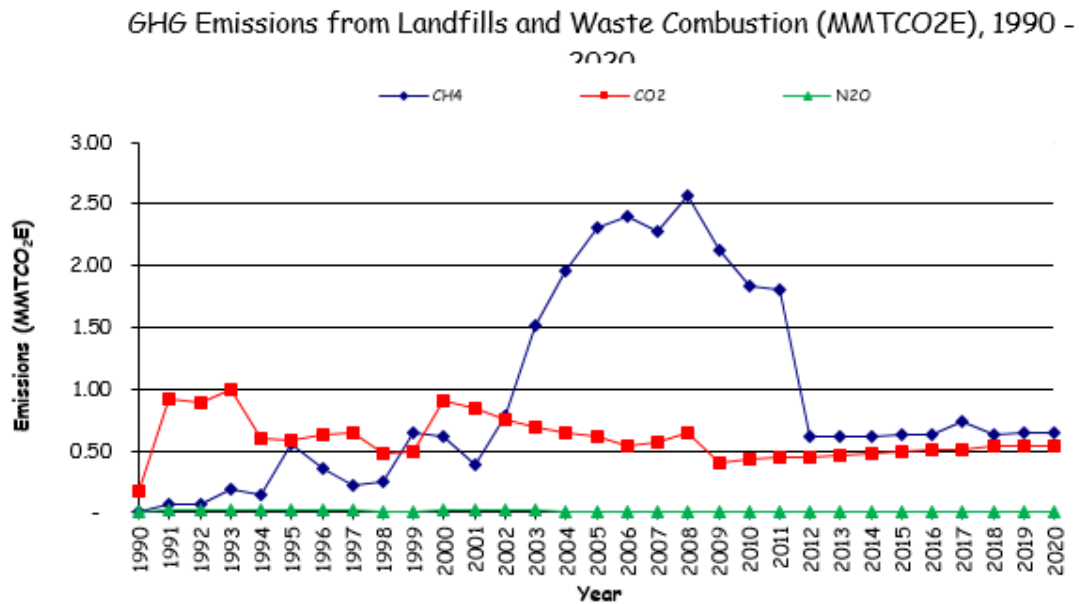
Appendix Figure 3. Commercial emissions by end-use, 1990-2020.



Appendix Figure 4. Industrial emissions by end-use, 1990-2020.

Appendix B. Solid Waste Emissions for the State of Michigan 1990-2020

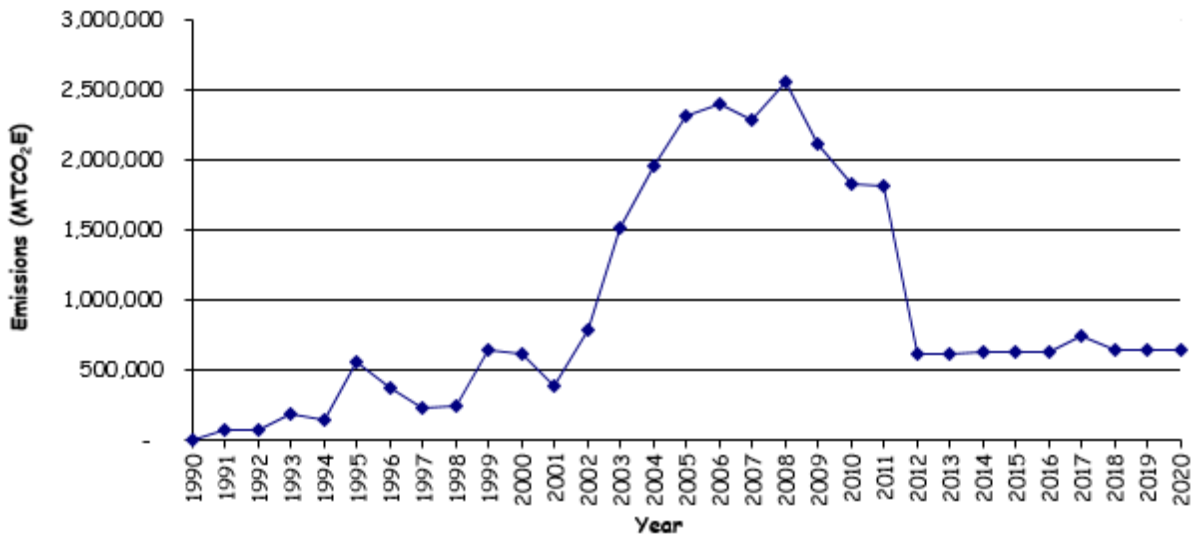
Solid waste emissions for the state of MI, using EPA State Inventory Tool¹⁵.



Appendix Figure 5. GHG emissions from landfills and waste combustion from 1990-2020

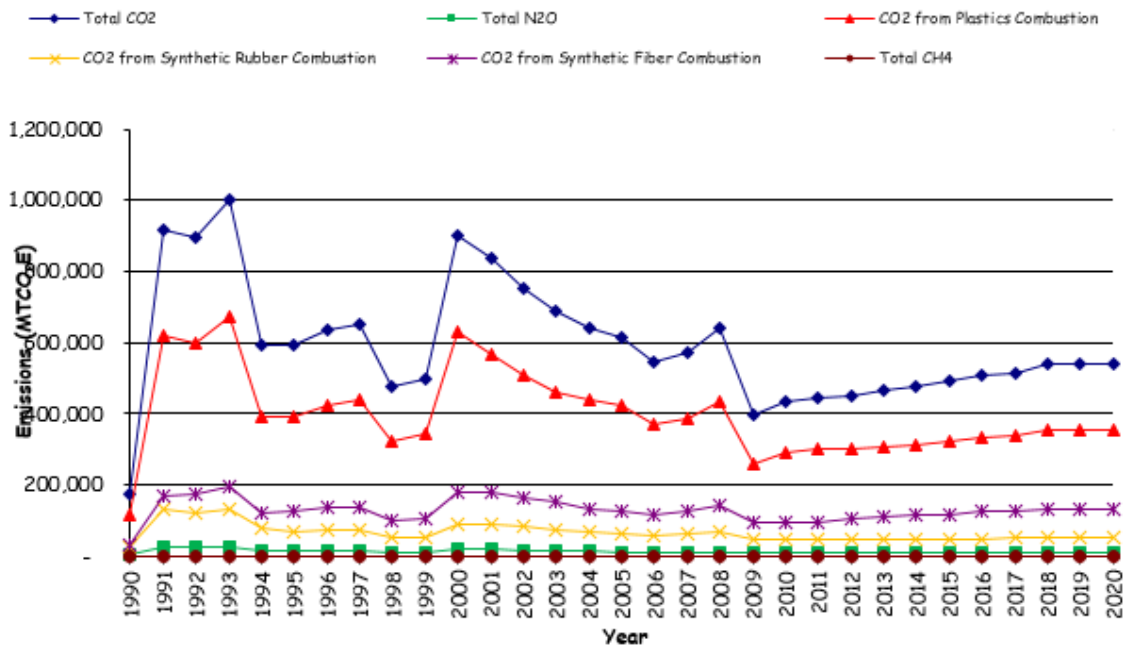
¹⁵ [EPA State Inventory Tool](#)

Methane Emissions from Landfills (MTCO₂E), 1990 - 2020



Appendix Figure 6. Methane Emissions from landfills, 1990-2020.

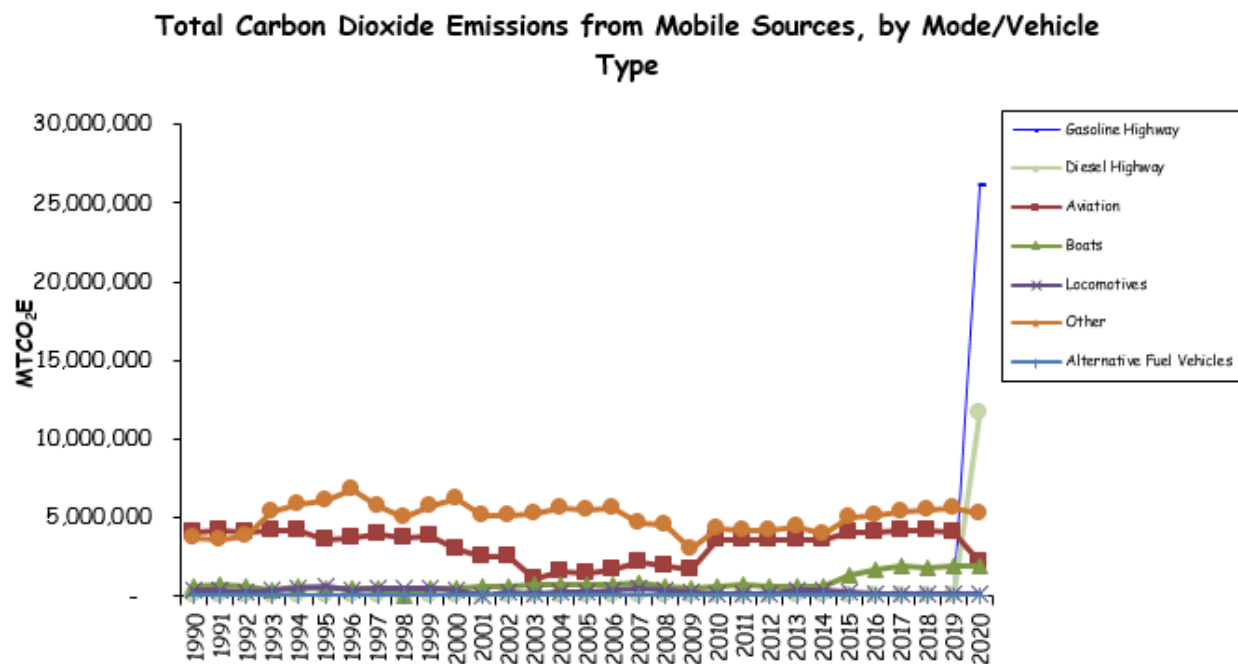
Emissions from Waste Combustion (MTCO₂E), 1990 - 2020



Appendix Figure 7. Emissions from waste combustion, 1990-2020.

Appendix C. Mobile Combustion Emissions for Michigan 1990-2020

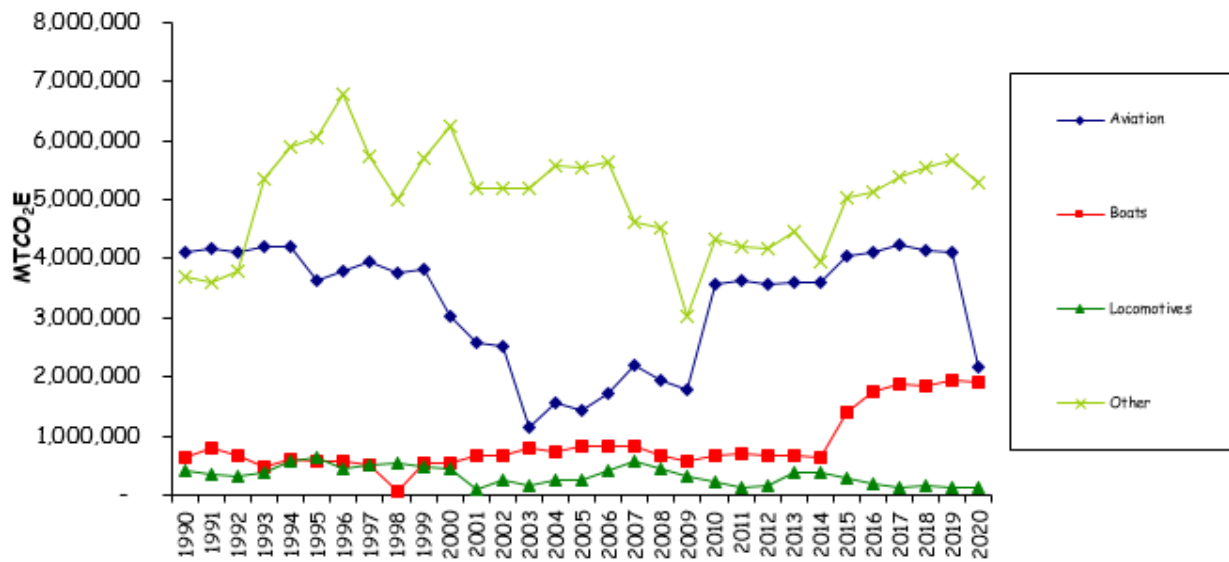
Mobile combustion emissions for the state of MI form 1990-2020 using EPA State Inventory Tool.¹⁶



Appendix Figure 8. CO₂ emissions from mobile sources, by mode/vehicle type.

¹⁶ [EPA State Inventory Tool](#)

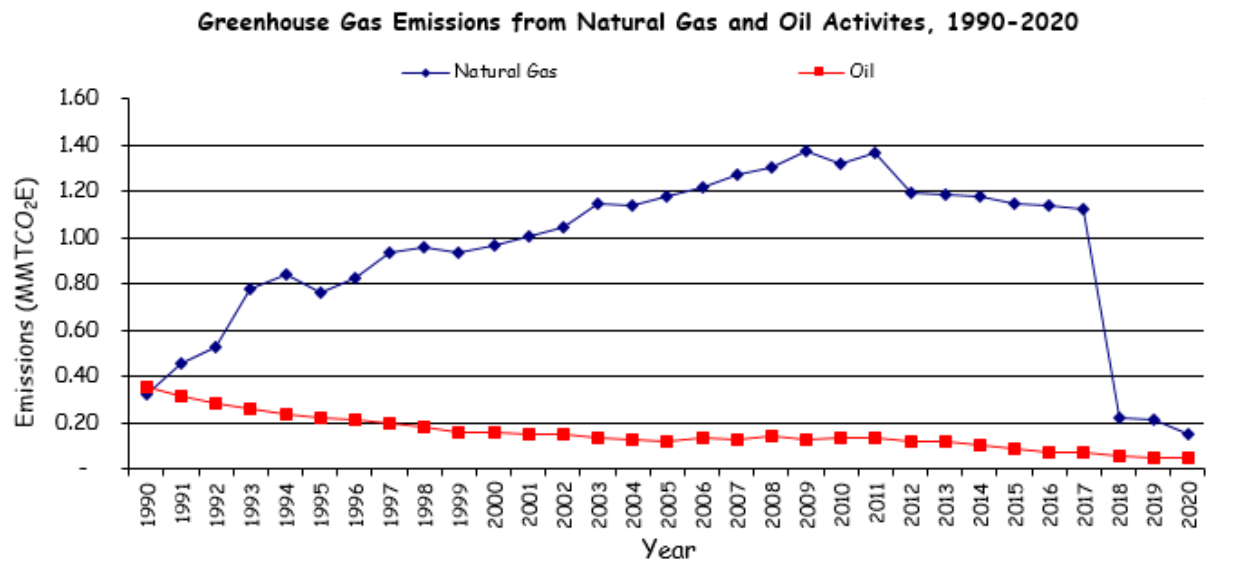
Total Carbon Dioxide Emissions from Non-Highway Mobile Sources



Appendix Figure 9. Total CO₂ emissions from non-highway sources in MI, 1990-2020.

Appendix D. Natural Gas and Oil Emissions for Michigan, 1990-2020.

Natural gas emissions for the state of MI, using EPA State Inventory Tool.



Appendix Figure 10. Total greenhouse gas emissions from natural gas and oil activities for the state of Michigan in 1990-2020.

Sault Ste. Marie Tribe of Chippewa Indians: Priority Climate Action Plan

Prepared by:

Inter-Tribal Council of Michigan

March 2024



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1. Introduction

The Inter-Tribal Council of Michigan (ITCMI) received funding from Section 60114 of the Inflation Reduction Act, to produce a Priority Climate Action Plan (PCAP) through the Climate Pollution Reduction Grant (CPRG) program, for the Sault Ste. Marie Tribe of Chippewa Indians (SSMTCI or the “Tribe”). SSMTCI has a seven-county service area across Michigan which includes Chippewa, Mackinac, Delta, Alger, Luce and Marquette counties. SSMTCI is the largest federally recognized Tribe in Michigan with membership being 49,393 members strong as of January 1st 2023. The Tribe owns 2,850 acres held in trust and 270 acres of reservation land¹.

The Inter-Tribal Council of Michigan is a non-profit organization that represents twelve federally recognized tribes in Michigan. ITCMI is divided into several different divisions which includes Behavioral Health Services, Childhood and Family Services, Economic Development, Head Start, Health Education and Chronic Disease, Maternal and Early Childhood Services and Environmental Services. Each division is dedicated to act as a forum for member Tribes, to advocate in the development of programs and policies which will improve the economy, education, and quality of life for member Tribes, and to provide technical assistance to member Tribes in the development of Tribal regulations, ordinances and policies applicable to health and human services².

1.1 CPRG Overview

Participating in the CPRG program will produce two deliverables at the end of this program. The first deliverable is to create a PCAP by April 1st, 2024. In the PCAP, ITCMI and SSMTCI will produce a generalized Green House Gas (GHG) inventory using already existing national and state data. The PCAP will focus on implementation ready activities. This PCAP will provide potential projects that SSMTCI can adapt to reduce GHG emissions. In development of this PCAP, ITCMI worked directly with SSMTCI Environmental Department to verify SSMTCI goals in this program were met. The development of the PCAP will open the door for the Tribe to apply for funding sources to help implement GHG reducing projects.

After the PCAP is completed, ITCMI and the Tribe will begin working on the Comprehensive Climate Action Plan (CCAP). The CCAP will consist of a complete GHG inventory for SSMTCI. This GHG inventory will be strictly for the entire tribe. CCAP will provide GHG projections for near term (2030-2050) and long term (2050) projections. These projections will also include projections if no GHG reduction measures are taken. CCAP preparation will consist of a series of public stakeholder meetings to provide a chance for tribal members to provide input on CCAP development. At the end of CCAP development, ITCMI will work SSMTCI to determine the appropriate authority to implement the CCAP. The CCAP will be published in spring 2026.

¹ [SSMTCI](#)

² [ITCMI](#)

1.2 PCAP Overview and Definitions

Below are the following components to the SSMTCI's PCAP:

- GHG Inventory: A generalized GHG inventory will be created. This GHG inventory includes implementation ready sectors and some data will be collected from SSMTCI. ITCMI will use already published data from U.S Greenhouse Gas Emissions and Sinks by State and National Emissions Inventory (NEI). ITCMI used EPA's Tribal Greenhouse Gas Inventory tool.
- Quantified GHG reduction measures: A list of near term, high priority implementation ready measures is identified in the PCAP.
- Benefit Analysis: An analysis was conducted to assist benefits of GHG reduction measures. This analysis consisted of both base year estimates of co-pollutants and anticipated co-pollutant emission reductions. This assessment will include improved health outcomes, economic benefits, increased climate resilience, and improved air quality. This analysis also includes any dis-benefits resulting from implementation efforts listed in this PCAP
- A Review of Authority to Implement: A timeline was created to give SSMTCI key entities to implement projects listed in this PCAP.
- Identification of Other Funding Mechanisms: This section explores possible funding sources; the Tribe can seek to fund projects listed in the PCAP

1.3 PCAP Development Approach

Below is the ITCMI approach to the development of the PCAP.

- Stakeholder Engagement: Through the development of this PCAP, ITCMI worked directly with SSMTCI Environmental Department and Administration Office. Quarterly meetings were held. Goals and objectives were given to ITCMI, to help develop this PCAP.
- Public Stakeholder Engagement: Public input was a major component in developing the PCAP. A series of public stakeholder meetings were held. One for the Tribe Elders and one for tribal members. The meeting for tribal members was held at Kewadin Casino, in Sault Ste. Marie, Michigan. ITCMI explained the CPRG program and components included in the PCAP.

Public consensus from the stakeholder meetings were the following:

- To introduce more alternate sources of energy for the Tribe.

2. Organization and Considerations

2.1 PCAP Team

Table 1. Shows ITCMI PCAP team and roles that contributed to developing this PCAP.

Role	Reasonability
Project Manager- ITCMI	Manages operating project activities, host public stakeholder engagement meetings, complete reporting requirements to the EPA, develop GHG inventory and develop PCAP
Technical Support-ITCMI	Complete GHG inventory, data interpretation and assist with PCAP development.
Quality Assurance Manager-ITCMI	Provides quality assurance for PCAP development and GHG Inventory data
Sault Tribe Environmental Department and Planning Department	Develops Sault Tribe goals and objectives for PCAP development. Assist in public stakeholder meetings, provide any previous data that Sault Tribe has conducted.
Sault Ste. Marie Tribe of Chippewa Indians Tribal Council	Provide final decision on implementation projects listed in this PCAP.
Environmental Protection Agency	Provide technical assistance in PCAP development.

2.2 Sector Specific Goals

In developing this PCAP, ITCMI and SSMTCI developed the following goals:

- Goal One: To introduce solar power to the Tribe.
- Goal Two: To replace current HVAC systems in SSMTCI tribal facilities and tribal housing.

2.3 Existing GHG Assessments

The tribe is currently working on an energy feasibility study with Slipstream who is a renewable energy consultant. Slipstream³ is currently conducting energy audits for facilities owned by the Tribe.

³ [Slipstream](#)

3. PCAP Elements

3.1 Greenhouse Gas (GHG) Inventory

3.1.1 Scope

The scope of this GHG Inventory will focus on the following sectors:

- A. Electricity Generation and Consumption Sector
- B. Transportation Sector
- C. Residential and Commercial Sector

The baseline year used for this inventory is 2020, this year was chosen for a baseline due to volume of data available.

3.1.2 Data Collection

Data in this GHG Inventory originated from the following sources:

- National Emissions Inventory (NEI): NEI is a comprehensive and detailed estimate of air emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emissions sources.
- State Inventory Tool (SIT): The State Inventory Tool consists of eleven different GHG estimation models. These estimates are used in this PCAP using baseline year 2020.
- Green House Gas Inventory Data Explorer: Information obtained from this tool originally originated from the NEI data. This tool was used to decipher GHG emissions from different sections of the NEI.
- Tribal GHG Inventory Tool: This tool was used to generate the GHG Inventory for this project.
- State and Local Planning of Energy (SLOPE) Database: This tool was used to compare measures that can reduce GHG emissions to current conditions.

3.1.3 GHG Accounting Method and Global Warming Potential

In this GHG inventory, the majority of GHG's are produced globally is Carbon Dioxide (CO₂). For this inventory CO₂ emissions are calculated in Metric Tons of CO₂ Equivalent (MTCO_{2e}).

Global Warming Potential

As GHG's are emitted in the atmosphere, these emitted gases act like a blanket that covers the Earth's atmosphere and cause warming. Each greenhouse gas emitted warms the Earth at different rates. Differences in rates are expressed in Global Warming Potential (GWP). GWP is the result of GHG's ability to absorb energy and how long it will stay in the atmosphere. The EPA primarily uses the 100-year GWPs from IPCC Fifth Assessment Report (AR5) per international reporting standards. 100-year GWP is based on energy absorbed by a gas over 100 years. Below is a summary of GWP to relevant GHG's listed in this inventory.

Table 2. GWP for greenhouse gases listed in this inventory in a 100-year period according to IPCC Fifth Assessment Report (AR5)⁴

Greenhouse Gases	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265

3.1.4 GHG Emissions by Sector

A. Electricity Generation and Combustion Sector

The following data is from the SIT ⁵using base year of 2020.

Tables 3-5. Shows residential, commercial and industrial electricity consumption data in 2020 in Michigan

Table 3. 2020 Residential Electricity Consumption

Source	kWh	Total (MTCO ₂ e)
Space Heating	5,550,514,846	2,401,121
Air Conditioning	3,984,985,018	1,723,882
Water heating	4,269,620,805	1,847,014
Refrigeration	2,846,417,870	1,231,344
Other	19,213,320,622	8,311,573
Total	35,864,865,161	15,514,936

Table 4. 2020 Commercial Electricity Consumption

Source	kWh	Total (MTCO ₂ e)
Space Heating	997,792,974	431,640
Cooling	3,991,171,869	1,726,558

⁴ [Global Warming Potential](#)

⁵ [EPA State Inventory Tool](#)

Ventilation	5,864,215,990	2,536,826
Water Heating	142,541,883	61,663
Lighting	6,556,925,257	2,836,489
Cooking	997,792,974	431,640
Refrigeration	5,274,048,577	2,281,523
Office Equipment	1,625,418,534	703,147

Table 5. 2020 Industrial Electricity Consumption

Source	kWh	Total (MTCO _{2e})
Conventional Boiler Use	393,796,870	170,354
Process Heating	2,879,793,900	1,245,782
Process Cooling and Refrigeration	2,108,908,085	912,302
Machine Drive	13,153,445,793	5,690,106
Electro-Chemical Process	1,739,799,795	752,627
Facility HVAC	621,255,853	268,752
Facility Lighting	2,095,694,010	906,585
Other Facility Support	1,687,907,767	730,179
Onsite Transportation	461,812,492	199,777
Other Non-Process Use	46,832,237	20,259
Other	306,061,291	132,400
Total	25,656,612,576	11,098,904

Table 6. Shows Michigan electricity consumption in Million Metric Tons Carbon Dioxide Equivalent (MMTCO_{2e})

Source	Total (MMTCO _{2E})
Residential	15,514,936
Commercial	15,354,036
Industrial	11,098,904
Total	41,967,876

Electricity Consumption and Emissions for SSMTCI Service Counties

Table six and seven shows electricity consumption in kWh and emissions in Million Metric Tons Co2 (MMT) across the Tribes seven service counties Chippewa, Mackinac, Luce, Alger, Delta, Marquette and Schoolcraft counties. This information was obtained using the SLOPE ⁶Tool.

Table 7. Electricity consumption in MMTCO₂ for each service county for the Tribe in 2020.

County	Residential	Commercial	Industrial	Transportation
Chippewa	105,036,671	140,498,271	24,934,486	9,287,422
Mackinac	105,036,671	31,329,297	14,879,218	7,526,065
Luce	105,036,671	0.000	29,922,556	2,414,319
Alger	105,036,671	27,715,731	5,946,412	4,407,788
Delta	105,036,671	102,428,339	51,697,736	13,314,218
Marquette	108,494,910	106,062,420	97,446,130	10,433,330
Schoolcraft	105,036,671	13,293,703	56,621,330	3,282,395

Table 8. Electricity emissions across the Tribe service counties in 2020 in MTCO_{2e}

County	Residential	Commercial	Industrial	Transportation
Chippewa	45,438	60,779	10,787	4,018
Mackinac	45,438	13,553	6,437	3,256
Luce	45,438	0.00	12,944	1,044
Alger	45,438	11,990	2,572	1,907
Delta	45,438	44,310	22,364	5,760
Marquette	49,934	45,882	42,155	4,513
Schoolcraft	45,438	5,751	24,494	1,420
Total	322,306	182,285	121,753	21,918

B. Transportation Sector

The following transportation data is from the 2020 NEI dataset⁷. This data is calculating vehicle Co₂ emissions in tons.

Table 9. Combined Co₂ emissions from gasoline vehicles, diesel vehicles, and other fuel type vehicles for each of the seven service counties for SSMTCI

County	Co ₂ Emissions (Tons)
Chippewa	56,337.50
Luce	36,095.49
Mackinac	52,686.16

⁶ [State and Local Planning for Energy](#)

⁷ [2020 NEI Data Set](#)

Alger	40,059.60
Delta	45,388.13
Marquette	41,456.71
Schoolcraft	39,273.69
Total CO₂	311,297.28

Table 10. Combined CO₂ emissions from commercial marine vessels, locomotives, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for the Tribe's 7 service counties.

County	CO ₂ Emissions
Chippewa	246,003.50
Luce	60,302.17
Mackinac	162,006.21
Alger	112,634.12
Delta	209,526.44
Marquette	283,496.18
Schoolcraft	88,313.35
Total	1,060,911.26

Table 11. Combined CO₂ Emissions from gasoline vehicles, diesel vehicles and other fuel type vehicles, on-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles for the state of Michigan in 2020.

Source	CO ₂ Emissions (Tons)
Gasoline vehicles, diesel vehicles, other fuel types.	6,464,377.05
On-road diesel heavy duty vehicles, on-road diesel light duty vehicles, on-road non diesel heavy duty vehicles and on-road non diesel light duty vehicles	45,479,338.17
Total	51,943,715.22

The following information was obtained from the EPA Greenhouse Gas Inventory Data Explorer using base year of 2020.

Table 12. GHG for the Transportation Sector for Michigan in 2020 in MMTCO₂e.

Michigan Emissions	MMTCO ₂ E
Fossil Fuel Combustion CO ₂	42.426
Use of fluorinated gases	0.961
Fossil Fuel Combustion: Other GHG gases	0.332

Transportation Non-Energy Use	0.202
Gross Total	43.922

C. Residential and Commercial Sector

The following data is fuel combustion for SSMTCI service counties. This data was obtained from the 2020 NEI ⁸in Michigan.

Table 13. Michigan Residential fuel combustion for natural gas, wood, oil and other types of combustion in emissions tons for SSSMTCI 7 service counties.

County	Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)
Chippewa	56,657.60	2,785.92	3.59	32.26
Luce	8.07	604.06	.35	6.60
Mackinac	11.25	1,139.08	.96	16.92
Alger	11.80	1,016.32	.72	10.37
Delta	77.30	2,681.87	2.41	33.88
Marquette	140.11	5,254.89	5.64	48.20
Schoolcraft	12.33	837.28	.50	10.44
Totals	56,918.46	14,319.52	14.17	158.67

Table 14. Michigan commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for SSMTCI 7 service counties.

County	Biomass (Tons)	Natural Gas (Tons)	Oil (Tons)	Other Fuel Sources (Tons)
Chippewa	12.26	30.34	.92	1.94
Luce	1.94	4.81	.14	.30
Mackinac	3.07	7.60	.23	.48
Alger	1.82	4.52	.13	.28
Delta	14.50	35.88	1.09	2.29
Marquette	29.47	72.93	2.23	4.67
Schoolcraft	2.32	5.75	.17	.36
Totals	65.38	161.83	4.91	10.32

⁸ [2020 NEI Data Set](#)

Table 15. Emissions from fuel combustion for natural gas, wood, oil and other types of combustion for Michigan.

Natural Gas Emissions (tons)	Wood Combustion Emissions (tons)	Oil Combustion (tons)	Other fuel source (Tons)	Total Emissions (tons)
24,507.89	282,605.75	318.33	3,560.88	310,674.52

Table 16. Emissions from commercial and institutional fuel combustion for biomass, natural gas, oil and other fuel sources in emissions tons for Michigan.

Biomass	Natural Gas	Oil	Other Fuel Sources	Total Emissions (tons)
4,937.38	12,215.68	373.90	782.66	18,309.62

3.2 GHG Reduction Measures

The following are the Tribe GHG reduction measures for the PCAP.

GHG Reduction Measure One: Installation solar panels and battery banks for the Tribe

Table 17: GHG reduction measure one overview.

Measure 1: Install Solar System for Sault Ste. Marie Tribe of Chippewa Indians	Implementing Agency	Sault Ste. Marie Tribe of Chippewa Indians and Cloverland Electric Cooperative
	Applicable Sector	Electricity Generation and Combustion Sector
	Implementation Milestones	To build an array of 6.9 MW solar panels and battery banks in up three locations on the Tribes fee and trust land.
	Location	Chippewa and Mackinac Counties, MI.
	Funding Sources	National Energy Technology Laboratory
	Tracking	Quarterly reports every quarter for four years. End of project final report.
	Cost	\$38,824,574.00
	Annual Estimated GHG and criteria air pollutant emissions reductions	9,829 MTCO₂e reduced every year.
	Long Term GHG Reduction:	2024 - 2030: 58,974 MTCO₂e 2024 – 2050: 255,554 MTCO₂e

GHG Reduction Measure One Summary: SSMTCI is partnering with Cloverland Electric Cooperative to install 6.5 MW solar panels in a maximum of three locations across Mackinac and Chippewa counties in Michigan. The proposed locations are fee and trust land owned by the Tribe. This project is anticipated to last 4 years. Once installation of panels and battery banks is completed an estimated 14,070 MWh - 16,680 MWh will be provided by this project. An estimated 9,829 MTCO₂e will be reduced every year. Unused electricity generated from proposed solar panels, will be used by Cloverland to provide electric power to the surrounding

areas. GHG emissions reduction from this measure was determined by Sault Ste. Marie Tribe of Chippewa Indians Solar Energy Storage Project proposal and using EPA GHG Calculator⁹.

GHG Reduction Measure Two: Installation of geothermal plant in SSMTCI Facilities and Tribal housing.

Table 18. Overview of GHG reduction measure two.

Measure 2: Installation of Geo-thermal for SSMTCI Facilities and Tribal housing.	Implementing Agency	Sault Ste. Marie Tribe of Chippewa Indians
	Applicable Sector:	Commercial and Residential Sector
	Overview	To replace existing HVAC systems in 17 Tribal facilities and 126 Tribal homes with a geothermal heat plant.
	Location	Sault Ste. Marie, MI 49783
	Annual Estimated GHG Reductions and Long Term Reductions	390 MTCO_{2e} reduced every year 2024-2030: 2,340 MTCO_{2e} 2024-2050: 10,140 MTCO_{2e}

GHG Reduction Measure Summary: The Tribe wishes to replace current HVAC systems with geothermal plant for the following facilities:

- ACFS Mary Murray Building/Bonnie McKerchie Building, 2218 Shunk Rd, Sault Ste. Marie, MI 49783
- Big Bear Arena (Chi Mukawa), 2 Ice Circle, Sault Ste. Marie, MI 49783
- Trades Building, 2293 Shunk Rd, Sault Ste. Marie, MI 49783
- Ceremonial Building (Niigaanagizhik) 11 Ice Circle, Sault Ste. Marie, MI 49783
- Church (DeMawating), 2318 Shunk Rd, Sault Ste. Marie, MI 49783
- Early Childhood Education Center (Anne Suggitt), 4 Ice Circle, Sault Ste. Marie, MI 49783
- Elderly Center Building (Nokomis/Mishomis Building), 2076 Shunk Rd, Sault Ste. Marie, MI 4978
- SSSMTCI Enrollment Building, 2428 Shunk Rd, Sault Ste. Marie, MI 4978
- SSMTCI Facilities Building, 2280 Shunk Rd, Sault Ste. Marie, MI 4978

⁹ [EPA Greenhouse Gas Equivalencies Calculator](#)

- Joseph K. Lumsden Bahweting Anishnabe PSA, 1301 Marquette Ave, Sault Ste. Marie, MI 4978
- JKL Bahweting Bus Garage, 1808 Dakota Ave, Sault Ste. Marie, MI 4978
- Judicial Building (George K. Nolan Judicial Building), 2175 Shunk Rd, Sault Ste. Marie, MI 4978
- Kewadin Casino- Sault Ste. Marie, 2186 Shunk Rd, Sault Ste. Marie, MI 4978
- Midjim Convenience Store- Sault Ste. Marie, 2205 Shunk Rd, Sault Ste. Marie, MI 4978
- Powwow Showers Facility, 12 Ice Circle, Sault Ste. Marie, MI 4978
- SSMTCI Natural Resources Department and Wildlife Department , 2428 Shunk Rd, Sault Ste. Marie, MI 4978
- Shedawin, 2154 Shunk Rd, Sault Ste. Marie, MI 4978

In addition to the 17 facilities, this geothermal plant will provide efficient heating to an estimated 126 Tribal homes near the geothermal plant. An estimated 638,171 sq. Ft will be heated with this geothermal plant. The geothermal plant will be located on the west end of Kewadin Casino- Sault Ste. Marie property. Facilities and Tribal homes are within two miles of the proposed geothermal plant. Annual estimated GHG emission reduction from this measure is 390 MTCO_{2e}. This estimate is part of the Tribe ongoing energy feasibility study performed by Slipstream. This estimate was created by creating quick energy models on existing Tribal facilities and applied emission factors from the Tribe electricity provider, Cloverland Electric Cooperative and the Tribe natural gas provider Detroit Edison (DTE). Slipstream used assumptions about ground source heat pumps efficiency for Co-efficient of performance (COP) and Energy Efficient Rating (EER) to convert modeled energy consumption values. Slip stream took the difference between existing and this proposed project.

3.3 Benefit Analysis

The following is a benefit analysis for each GHG reduction measure listed in this PCAP. This benefit analysis will compare benefits and any potential drawbacks for each GHG reduction measure.

GHG Reduction Measure One: Installation of Solar Panels and Battery Backups for the Tribe.

- **Benefits:**
 - 9,829 MTCO_{2e} reduced annually
 - 58,974 MTCO_{2e} reduced between 2024-2030
 - 255,554 MTCO_{2e} reduced between 2024-2050
 - Reduce strain on the Tribes current electricity system
 - Lower utility bills for the Tribe
 - Increase duration between power outages
 - Increase of quality jobs into the community
 - Stabilize the cost of power for the Tribe
- **Drawbacks**
 - Land degeneration
 - Habitat loss for wildlife
 - High upfront cost

GHG Reduction Measure Two: Installation of Geothermal in SSMTCI Facilities

- **Benefits**
 - 390 MTCO_{2e} annually reduction
 - 2,340 MTCO_{2e} reduced between 2024-2030
 - 10,140 MTCO_{2e} reduced between 2024-2050
 - Overall savings on heating for the Tribe
 - Stable form of energy for the Tribe
 - Geothermal releases 99% less CO₂ than other types of heating systems
- **Drawbacks**
 - Large upfront cost
 - Location specific source of energy

3.4 Review and Authority to Implement

The tribe recognizes the importance of this PCAP and the GHG reduction measures that are included. With this importance the following miles stones will take place to make certain GHG reduction measures will take place.

- Develop a PCAP that fits the needs and wants of the Tribe: Through outreach meetings with tribal members and stakeholders, an adequate PCAP was developed.
- Presentation to SSMTCI Board of Directors: After the completion of the PCAP members from SSMTCI Environmental Department, the Tribe Planning Department and ITCMI will present this PCAP to the Board of Directors. SSMTCI Board of Directors meets twice a month. This presentation will clarify each section of the PCAP for the Board of Directors.
- Board of Directors Vote: After the presentation from the PCAP team, the Board of Directors will vote on implementing measures in this PCAP.

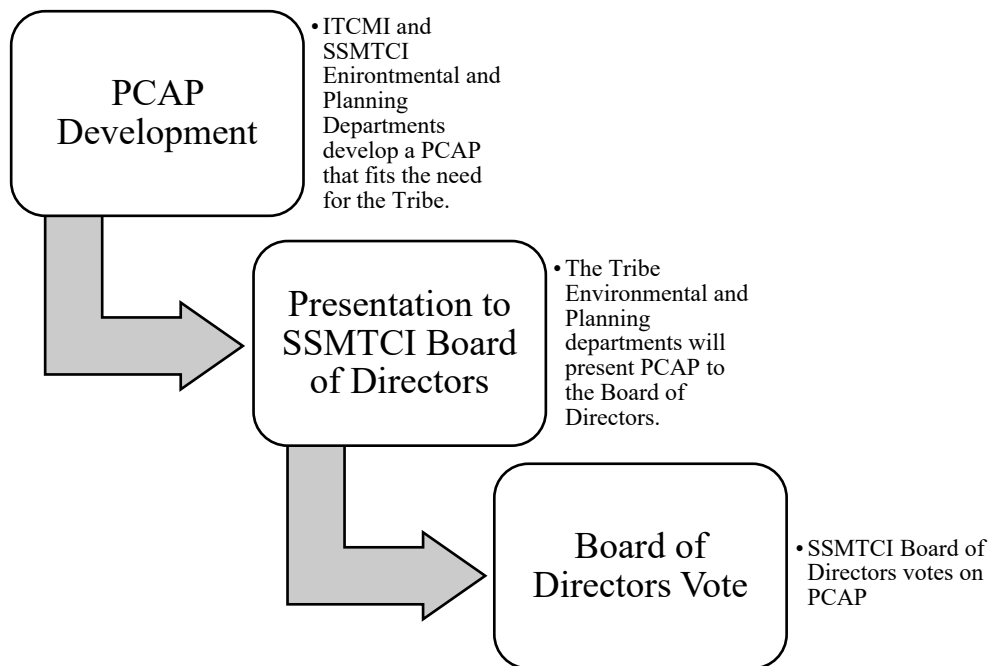


Figure 1. Flow chart for implementation of this PCAP.

In the development of this PCAP, the Tribe has been transparent on the type of projects that will reduce GHG emissions. Through presentations to the Board of Directors, measures listed in this PCAP will be approved.

3.5 Identification of Other Funding Mechanisms

It is vital for the Tribe to have GHG reduction measures listed in this PCAP to be completed to help lower the Tribe carbon footprint. To accomplish this goal, it is important for the Tribe to seek any funding sources available to possibly fund the Tribes GHG reduction measures.

The following are other sources of funding that the Tribe can apply for to help fund the Tribes GHG reduction measures.

Greenhouse Gas Reduction Fund (GGRF)¹⁰

Summary: \$27 billion investment to mobilize financing and private capital to combat the climate crisis and ensure American economic competitiveness. The GGRF will deliver lower energy costs and economic revitalization to communities, particularly those that have historically been left behind. Through the GGRF program, the EPA will allocate the fund through three competitions: Solar for All, National Clean Investment Fund (NCIF), and the Clean Communities Investment Accelerator (CCIA). Through these competitions, the fund aims to scale deployment of clean technologies nationally, build community clean financing capacity locally, and spur adoption of clean distributed solar energy in disadvantaged communities in order to achieve three broad objectives:

- Reduce greenhouse gas (GHG) emissions and other air pollutants.
- Deliver the benefits of greenhouse gas- and air pollution-reducing projects to American communities, particularly low-income and disadvantaged communities.
- Mobilize financing and private capital to stimulate additional deployment of greenhouse gas and air pollution reducing projects.

Community Change Grants¹¹

Summary: The Inflation Reduction Act authorized the creation of the US Environmental Protection Agency's (EPA) new Environmental and Climate Justice Community Change Grants program. The program is designed to benefit disadvantaged communities through projects to reduce pollution, increase community climate resilience, and build community response capacity. The grants will be focused on community-driven initiatives to be responsive to community and stakeholder input.

Department of Energy Loan Programs Office State Energy Finance Institution Program

¹⁰ [Greenhouse Reduction Fund](#)

¹¹ [Community Change Grants](#)

Summary: The Department of Energy’s (DOE) Loan Programs Office (LPO) ¹²finances large-scale energy infrastructure projects across the U.S. Through Title 17 Innovative Clean Energy Loan Guarantee Program (Title 17), DOE LPO provides loan guarantees for Innovative Clean Energy Projects, including through the designation of a State Energy Finance Institution (SEFI) to fund specific projects. A SEFI is a quasi-independent entity or an entity within a state agency or financing authority established by a state to satisfy two functions:

1. Provide financing support or credit enhancements for clean energy projects, and
2. Create liquid markets for eligible projects or take other steps to reduce financial barriers to the deployment of existing and new eligible projects.

4. Next Steps

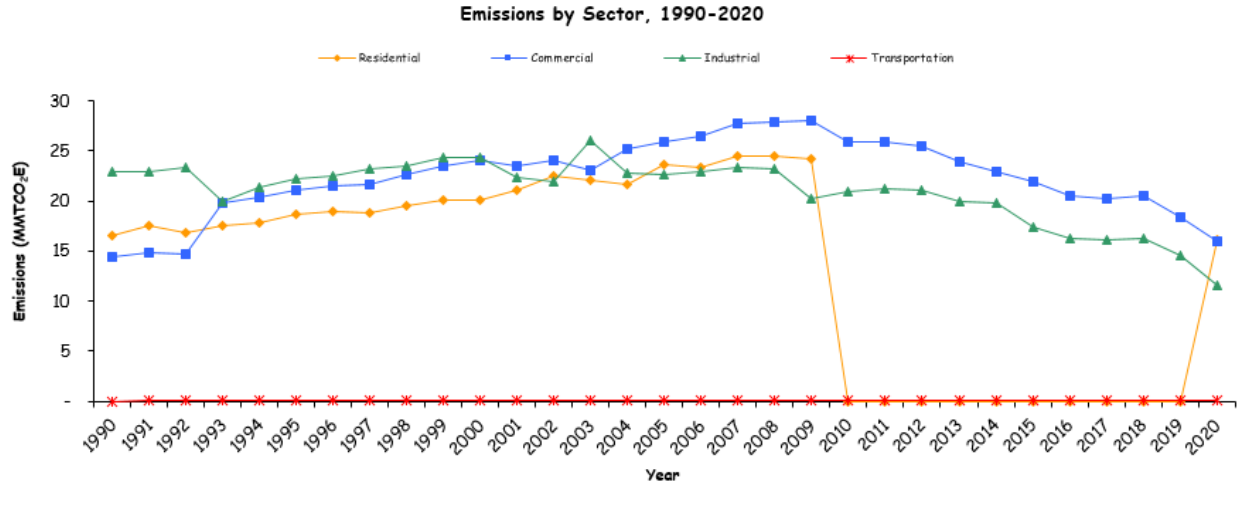
After the completion of this PCAP, work will begin on developing the CCAP for the Tribe. The CCAP will consist of developing a comprehensive GHG inventory for SSMTCI. This GHG inventory will consist of determining GHG emissions for the transportation sector, electricity generation and consumption sector, the industrial sector, commercial and residential sector, land use and forestry sector, waste and materials management sector and agriculture sector. This GHG inventory will be unique for the Tribe. ITCMI will work directly with the Tribe to help determine GHG emissions for each sector of the inventory. A series of public stakeholder meetings will be held for tribal members. In the public stakeholder meetings, tribal members will have an opportunity to provide input on what type of GHG reduction measures should be included in the CCAP. During CCAP development, ITCMI will work with the Tribes Human Resources Department, to help develop positions to help combat climate change. One of the main goals with the CCAP is to help create high quality jobs for the Tribe.

ITCMI will work directly with the Tribe, to develop additional and long-term GHG reduction measures. GHG reduction measures will address the main GHG emission sectors. After completion of GHG reduction measures for the CCAP, a complete benefit analysis will be conducted on each measure. This benefit analysis will look at benefits and drawbacks for each GHG reduction measure. At the end of the CCAP development, SSMTCI will have a comprehensive climate action plan that will help the Tribe combat climate change and meet the Tribes climate change goals.

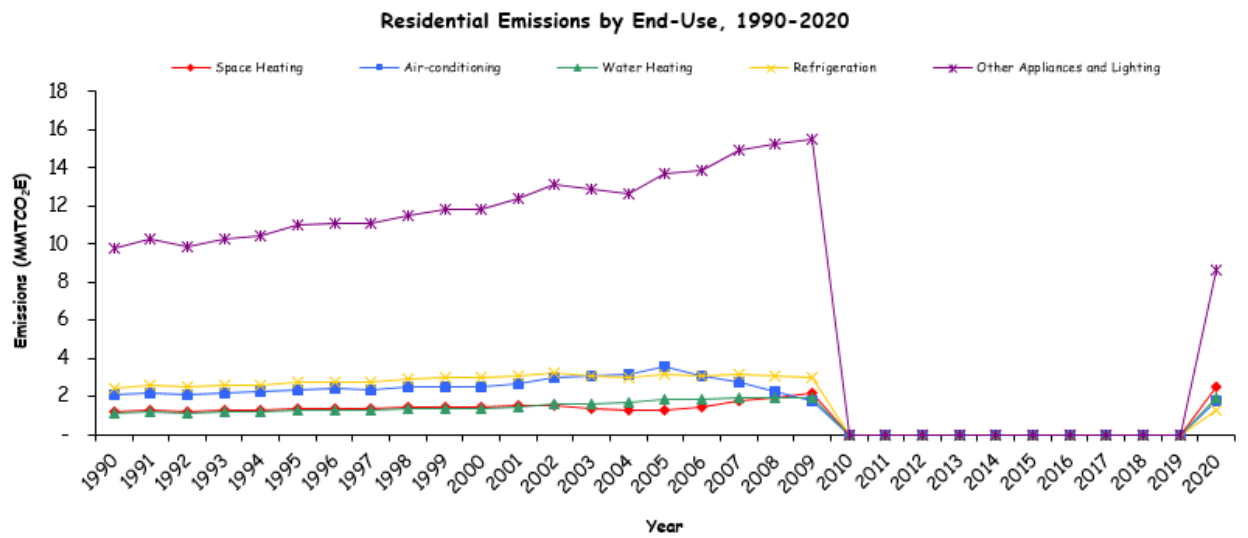
¹² [DOE Loan Program](#)

Appendix A: Electricity Emissions for Michigan 1990-2020

Electricity emissions for the state of MI, using EPA State Inventory Tool¹³.

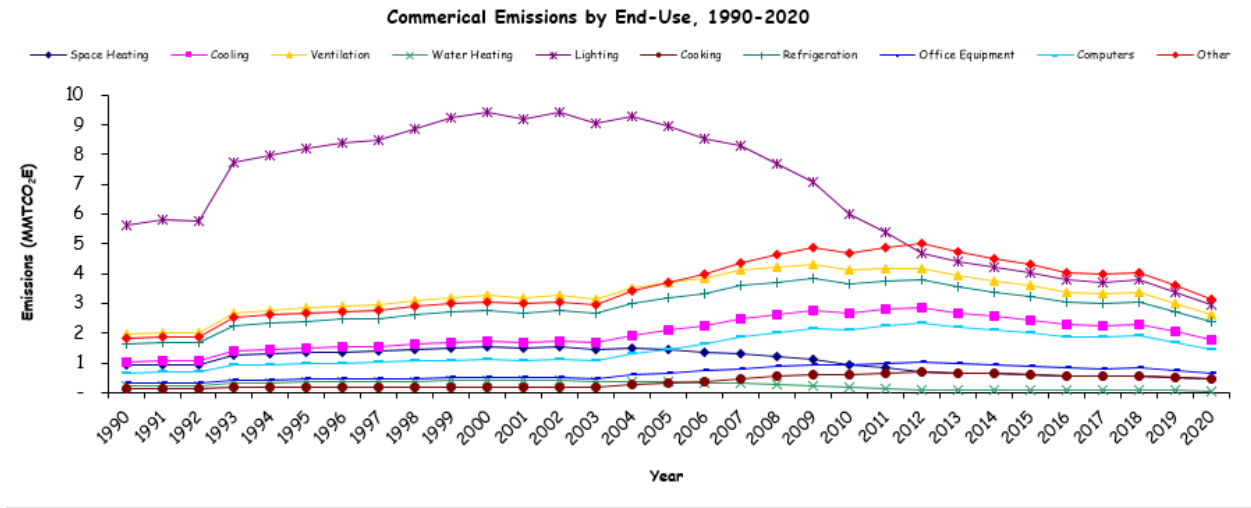


Appendix Figure 1. MI electricity emissions by sector. 1990-2020

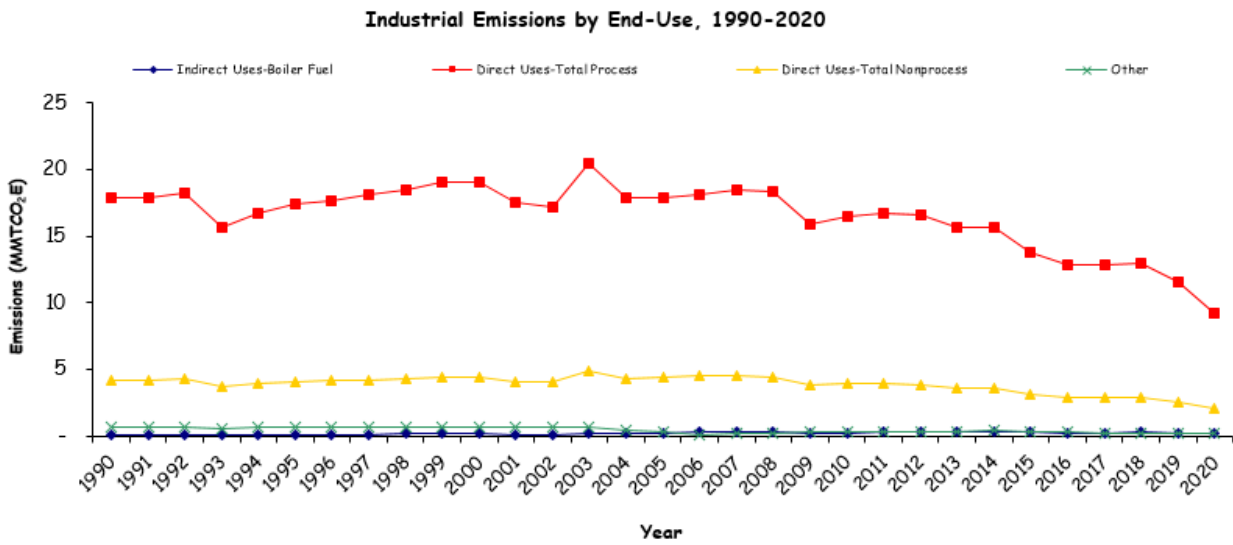


Appendix Figure 2. Residential emissions by end use, 1990-2020

¹³ [EPA State Inventory Tool](#)



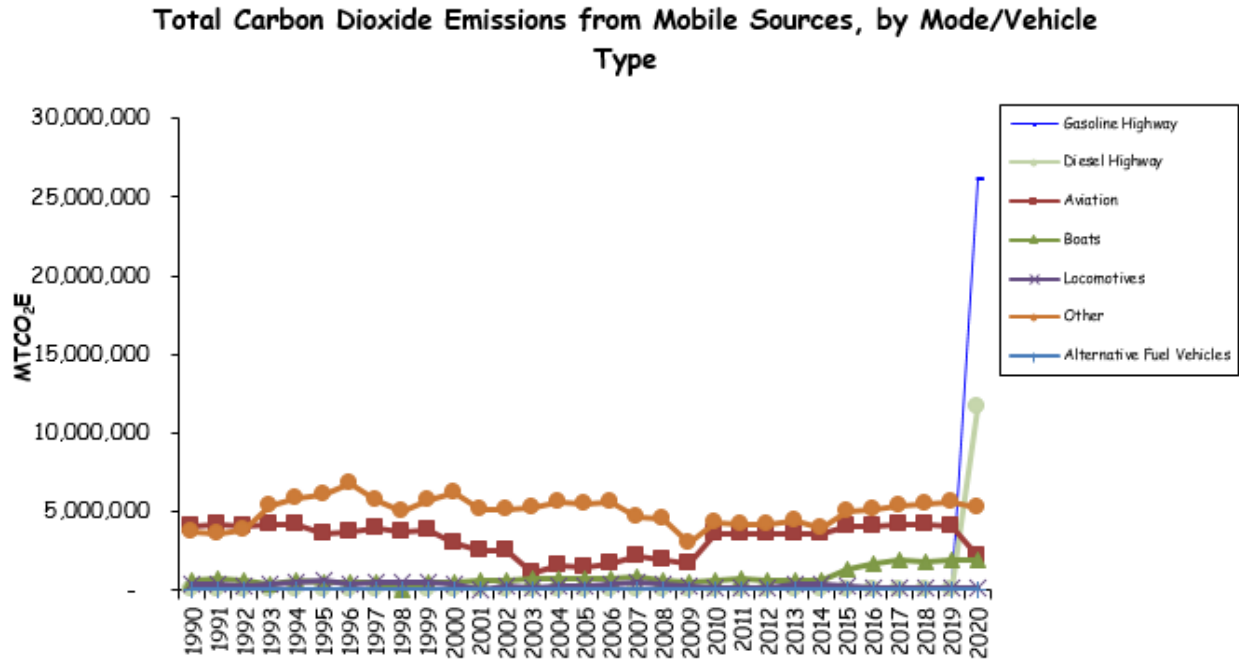
Appendix Figure 3. Commercial emissions by end-use, 1990-2020.



Appendix Figure 4. Industrial emissions by end-use, 1990-2020.

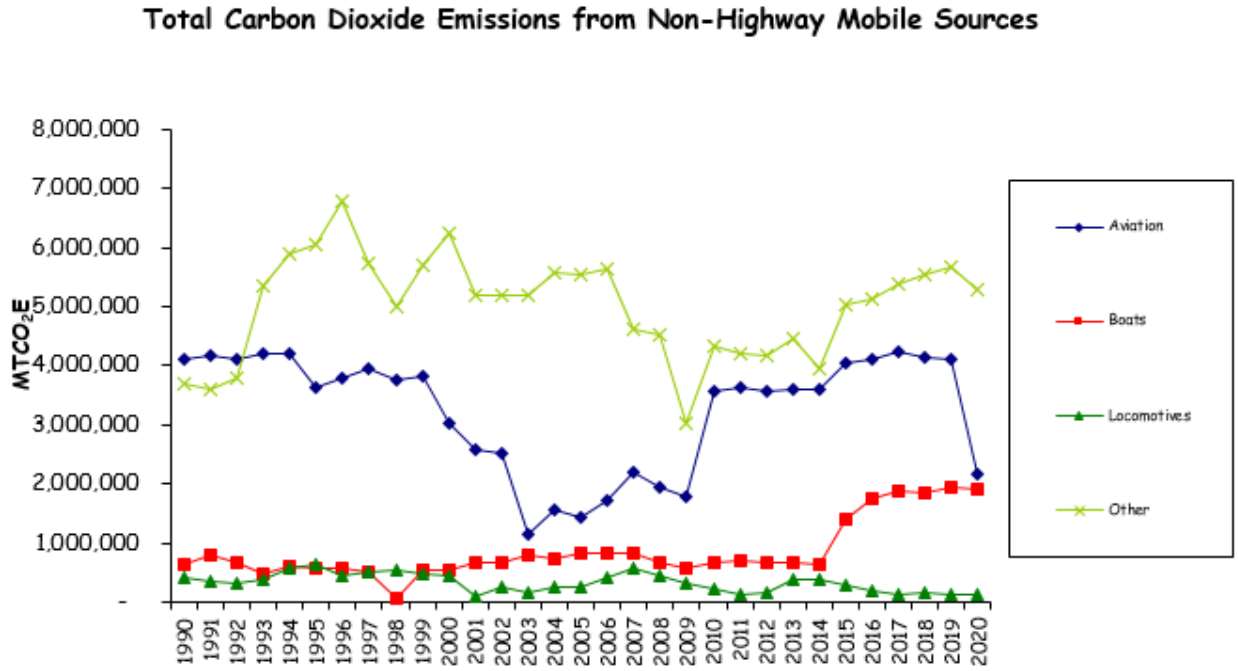
Appendix B. Mobile Combustion Emissions for Michigan 1990-2020

Mobile combustion emissions for the state of MI form 1990-2020 using EPA State Inventory Tool.¹⁴



Appendix Figure 5. CO₂ emissions from mobile sources, by mode/vehicle type.

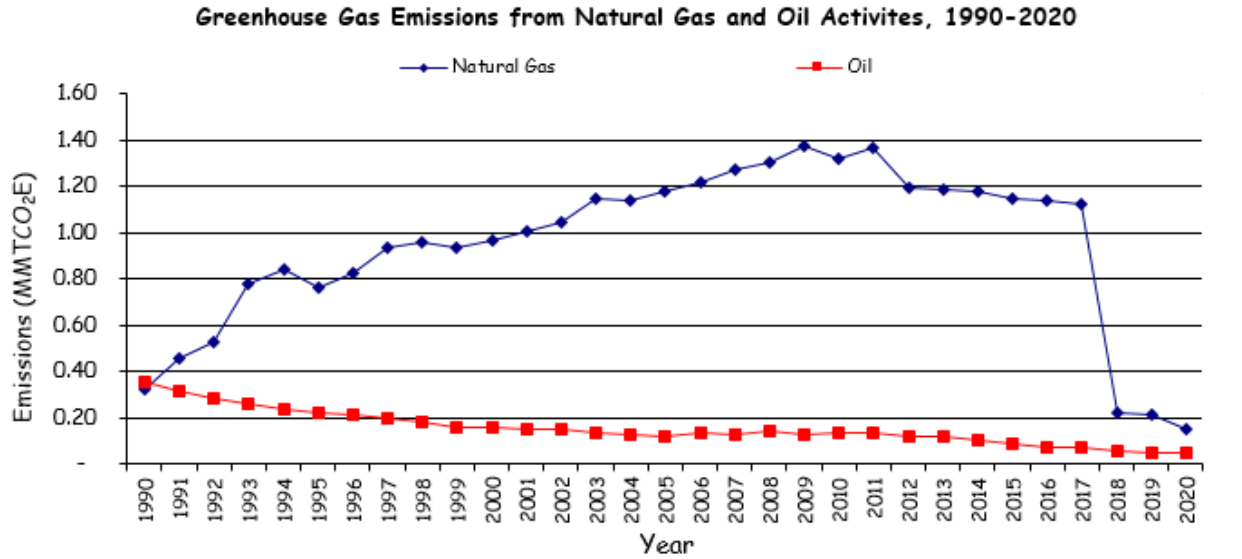
¹⁴ [EPA State Inventory Tool](#)



Appendix Figure 6. Total CO₂ emissions from non-highway sources in MI, 1990-2020.

Appendix C. Natural Gas and Oil Emissions for Michigan, 1990-2020.

Natural gas emissions for the state of MI, using EPA State Inventory Tool¹⁵.



Appendix Figure 7. Total greenhouse gas emissions from natural gas and oil activities for the state of Michigan in 1990-2020.

¹⁵ [EPA State Inventory Tool](#)