West Michigan
Healthy Climate Plan

Priority Climate Action Plan

3/1/24

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Executive Summary

The West Michigan Priority Climate Action Plan is the result of a collaborative planning effort between the Grand Valley Metropolitan Council and the four counties that comprise the Grand Rapids-Kentwood Metropolitan Statistical Area. The plan's purpose is to present and analyze a list of high-priority, implementation-ready greenhouse gas reduction measures in the region.

A greenhouse gas inventory of the region was completed to lay the foundation for developing and analyzing reduction measures. Collectively the region is responsible for 38,102,961 metric tons of greenhouse gas emissions annually. This is equivalent to 210,070 railcars' worth of coal burned or 88,129,625 barrels of oil consumed. A majority of regional greenhouse gas emissions result from the stationary energy and transportation sectors.

Stationary Energy	Transportation	Waste
20,543,437 MT CO_2e	17,065,195 MT CO_2e	494,329 MT CO_2e
54%	45%	1%

To prevent the further exacerbation of climate change the Project Team (members of Grand Valley Metropolitan Council with support from KERAMIDA) has developed six reduction measures. Each reduction measure will reduce GHG emissions and provide benefits to low income and disadvantaged communities including the reduction of air pollution, job creation, and reduction in energy bill prices.

Reduce the carbon intensity of stationary energy	Improve building energy efficiency	Shift to electric vehicles	Reduce vehicle miles traveled	Reduced the production of waste	Sequester emissions
362,138*	36,499*	41,825*	156,018*	686,549*	1,121*

Collectively these measures can reduce GHG emissions by 1,242,325 metric tons by 2030 (*reduction potential of each measure shown above in MT CO_2e) – significantly less than needed to meet the goals outlined by the Michigan Healthy Climate Plan. This plan represents a snapshot of the region's potential. To close the GHG emissions reduction gap, the Project Team will be working with the community to expand on the six measures and develop new measures, which will be included in the Comprehensive Climate Action Plan.

Acknowledgments

The Grand Valley Metropolitan Council would like to express our gratitude to all those involved in helping to guide, shape, and/or otherwise develop this Priority Climate Action Plan. This includes, first and foremost, the seventy-seven combined members of our three climate advisory committees – the Jurisdictional Advisory Committee, Technical Advisory Committee, and Low Income & Disadvantaged Communities Advisory Committee - who contributed their time, data, and ideas over the past five months at multiple virtual and in-person meetings as well as numerous correspondences in between. Secondly, the over one hundred stakeholders of the MSA who attended one or more of the three community engagement events to share their valuable input.

The Priority Climate Action Plan was written by the Project Team which is comprised of members of the Grand Valley Metropolitan Council with support from KERAMIDA Inc.

Project Team

Grantee Organization	Advisory Firm
GVMC	KERAMIDA GLOBAL SUSTAINABILITY | CLIMATE | EHS

Engagement Support

West Michigan Sustainable Business Forum

Acronyms

AFV	Alternative Fuel Vehicles
BTU	British Thermal Unit
C4	Community Collaboration on Climate Change
CEJST	Climate and Economic Justice Screening Tool
CNG	Compressed Natural Gas
COG	Council of Governments
CPRG	Climate Pollution Reduction Grants
CWP	Clean Water Plant
eGRID	Emissions & Generation Resource Integrated Database
E.H.Zero	Equitable, Healthy & Zero Carbon
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EIA	Energy Information Administration
EJ	Environmental Justice
EPA	Environmental Protection Agency
EV	Electric Vehicles
FAWM	Feeding America West Michigan
FGRP	Friends of Grand Rapids Parks
GHG	Greenhouse Gas
GLREA	Great Lakes Renewable Energy Association
GPC	Global Protocol for Community-Scale Greenhouse Gas Inventories
GVMC	Grand Valley Metropolitan Council
HAN	Healthcare Anchor Network
ICE	Internal Combustion Engine
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
ITC	Solar Investment Tax Credit
JAC	Jurisdictional Advisory Committee
kWh	Kilowatt Hour
LAC	Low Income and Disadvantaged Communities Advisory Committee
LIDAC	Low Income and Disadvantaged Communities
LPG	Liquefied Petroleum Gas
LUST	Leaking Underground Storage Tank
MDOT	Michigan Department of Transportation
MiSBF	Michigan Sustainable Business Forum
MT	Metric Tons
MT CO2e	Metric Tons of Carbon Dioxide Equivalent

MSA	Grand Rapids-Kentwood Metropolitan Statistical Area
NPL	National Priorities List
NZ	Net Zero
PCAP	Priority Climate Action Plan
PPA	Power Purchase Agreement
PV	[Solar] Photovoltaic
QAPP	Quality Assurance Project Plan
RMP	Risk Management Plan
RSEI	Risk-Screening Environmental Indicator
RNG	Renewable Natural Gas
TAC	Technical Advisory Committee
TRI	Toxic Release Inventory
UST	Underground Storage Tank
WDS	Waste Data System
WRF	Water Reclamation Facility
WTE	Waste to Energy

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1 Introduction

The Inflation Reduction Act (IRA) provides grants to states, regions, and tribes through the Climate Pollution Reduction Grants (CPRG) program. The grants aim to help develop and implement plans that reduce GHG emissions with delivery of funding occurring in two rounds - Planning Grants and Implementation Grants. Planning Grant funding was allocated to each of the sixty-seven most populous metropolitan areas and forty-six states[1]. GVMC received Planning Grant funding for the Grand Rapids-Kentwood MSA. The West Michigan Healthy Climate Plan PCAP is the first deliverable of the CPRG Planning Grant funding.

1.1 Priority Climate Action Plan Overview

The purpose of the PCAP is to identify near-term, high-priority, implementation ready measures to reduce regional GHG emissions. The PCAP includes the following elements:

- GHG inventory
- Low income and disadvantaged communities (LIDAC) benefits analysis
- Quantified GHG reduction measures
- Review of authority to implement

The PCAP will be submitted to the Environmental Protection Agency (EPA) by March 1, 2024. A Comprehensive Climate Action Plan (CCAP) will be created following the submission of the PCAP. The CCAP will expand on the PCAP to establish additional near-term GHG reduction measures and long-term reduction measures. At the end of the funding cycle (mid-2027), GVMC will submit the third deliverable, a Status Report.

1.2 Priority Climate Action Plan Scope

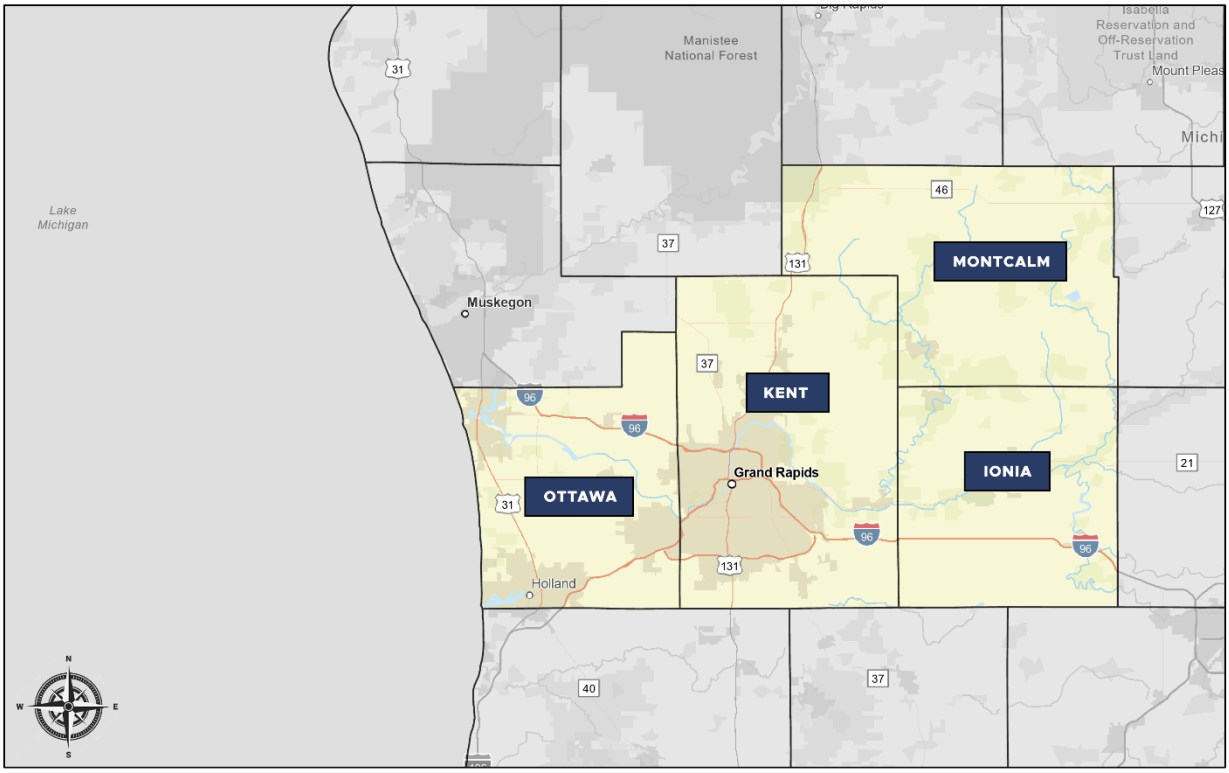
The scope of the West Michigan Healthy Climate Plan PCAP encompasses the four counties of the MSA: Ionia, Kent, Montcalm, and Ottawa. See Figure 1.

1.3 Priority Climate Action Plan Development Process

The West Michigan Healthy Climate Plan PCAP development began in early October 2023. Before any data could be collected, a Quality Assurance Project Plan (QAPP) was submitted and approved by the EPA.

[1] *All fifty states were offered CPRG funding, 4 declined.*

Figure 1: Geographic boundary of the PCAP



1.3.1 Engagement

While the QAPP was being reviewed, an engagement plan was created. The engagement plan outlined the following engagement strategies:

- Advisory committees
- Community engagement sessions
- Program website
- CPRG-specific email and mailing list
- Project idea form

1.3.1a Advisory Committees

Three advisory committees were formed to help create the West Michigan Healthy Climate Plan PCAP: the Jurisdictional Advisory Committee (JAC), the Technical Advisory Committee (TAC), and the Low Income and Disadvantaged Community Advisory Committee (LAC).

- The JAC was established to provide crucial feedback specific to the feasibility of implementing mitigation measures and determining authority to implement for reduction measures. The JAC is comprised of representatives from Kent, Ottawa, and Ionia counties,[2] as well as from municipalities and townships within the MSA.

[2] *GVMC attempted outreach multiple times with representatives of Montcalm County but received no interest in participating.*

- The TAC was formed with the objective of gathering a group of experts from the region who could provide valuable insights and recommendations on matters related to the GHG inventory, mitigation measures, and benefits analysis. Their expertise in region-specific topics related to the mitigation measures was crucial in developing strategies that could lead to practical actions that reduce GHG emissions in western Michigan.
- The LAC is composed of individuals from community-based organizations and non-profits representing LIDACs. The committee's primary role is to provide vital input and feedback for the LIDAC benefits analysis. Additionally, the committee acts as a liaison between GVMC and LIDACs.

In addition to the responsibilities listed above, all advisory committees helped procure project ideas - from the communities and organizations its members represented - and reviewed the PCAP before submission. All three committees will continue as contributors to the West Michigan Healthy Climate Plan during the creation of the CCAP

Kent County engagement session

1.3.1b Community Engagement Sessions

In January 2024, the public engagement process was initiated by GVMC, which partnered with the Michigan Sustainable Business Forum (MiSBF) to organize three community engagement sessions across West Michigan. These sessions took place in Ottawa, Kent, and Ionia counties,[3] and aimed to collect public feedback on community interest and feasibility for each reduction category. Residents, community leaders, local officials, and other stakeholders participated in the

[3] *A session was planned for Montcalm County, but there were not enough registrations to host the event.*

Ottawa County engagement session

sessions to shape the PCAP. Qualitative and quantitative results from the community engagement sessions were compiled and shared with the three advisory committees. More information on the community engagement events can be seen in the YouTube short, 'GVMC 1014 West Michigan Sustainable Business Forum – Engagement Sessions'. For residents who were unable to attend the in-person engagement sessions, an online version of the engagement activity was made available on the GVMC CPRG website and sent to the project mailing list.

Ionia County engagement sessions

1.3.1c Project Idea Form

The project idea form was launched in December 2023 to gather information on projects that could help reduce GHG emissions in the MSA. All ideas submitted were filtered to ensure that projects had an associated GHG reduction. For projects that met this criterion, the Project Team reached out to the submission contact to gather further information and include the project, as an action, in the PCAP. The form was made available in fourteen languages, hosted on the GVMC website, sent out to the project mailing list, and advertised at community engagement events.

1.3.2 Greenhouse Gas Inventory

Once the EPA approved the QAPP, the Project Team began collecting data for the GHG inventory. See Section 2 for a detailed description of the GHG inventory development process and the results of the inventory.

1.3.3 Greenhouse Gas Reduction Measures

While GHG data was being collected for the inventory, the Project Team began soliciting GHG reduction project examples from the MSA. Project ideas were collected through each of the advisory committees, through the project idea form, and through the community engagement events. The purpose of collecting project ideas was to understand what implementation-ready reduction measures currently exist within the MSA.

As project ideas were received, they were logged in a spreadsheet and assessed based on relevance to the goal of the PCAP. Project ideas that had no correlation to the reduction of GHG emissions were not considered for the PCAP. All other project ideas were considered. The Project Team worked with each project submitter to collect the following information for each project:

- Project description
- Implementing agency
- GHG emission reduction estimate
- Milestones for obtaining implementing authority (if relevant)
- Implementation timeline
- Metrics for tracking progress

Once all the above data points had been identified, the project was included in the PCAP as an action. For details on how actions are associated with reduction measures, see Section 4.

GVMC recognizes that the actions and measures included in the PCAP are not sufficient to achieve the goals set out by the State of Michigan in the MI Healthy Climate Plan. However, the actions and measures included in the PCAP provide valuable insight into the status of climate action in West Michigan. During the CCAP phase, GVMC will use the information collected during the PCAP, continued community engagement, and the software platform ClimateView to fill in the emission reduction gaps present in the region.

1.4 Next Steps

Once the PCAP is submitted on March 1, 2024, the Project Team will work to finalize a grant submission through the CPRG Implementation Grant program. The grant submission is due on April 1, 2024. Work will continue with the advisory committees to ensure the strongest possible grant application is submitted.

The Project Team will begin working on the CCAP once the grant application is submitted. For details on the CCAP process, see Section 5.

2 Greenhouse Gas Inventory

A GHG inventory is a comprehensive record of all GHG emissions emitted within a defined boundary. The inventory provides a summary of both total and sector-specific GHG emissions, making it a necessary tool for climate action planning. GVMC will identify and prioritize reduction measures with the largest GHG emission reduction potential by creating a GHG inventory.

2.1 Geographic Boundary

The inventory boundary is the first step in completing a GHG inventory and includes the geographic area, time span, gases, and emission sources. The geographic boundary can be chosen to align with the administrative boundary of local government or metropolitan area. For this 2019 baseline inventory, the geographic boundary was chosen to span the four counties within the MSA: Ionia County, Kent County, Montcalm County, and Ottawa County, which can be seen above in Figure 1.

The geographic boundary becomes important when determining which category of GHG emissions the activities fall into: scope 1, scope 2, or scope 3. Activities occurring physically within the geographic boundary are considered scope 1, outside the geographic boundary are considered scope 3, and the use of electricity, steam, and/or heating/cooling are considered scope 2.

2.2 Methodology

There are several accepted standards for completing a GHG inventory; the Project Team followed the Global Protocol for Community-Scale GHG Inventories (GPC), BASIC level[4]. The GHG Inventory is organized into three sectors and corresponding subsectors, according to the GPC BASIC level (See Table 1).

Table 1: Greenhouse gas sectors and subsectors used in the priority climate action plan

Stationary Energy
Stationary energy GHG emissions result from the combustion of fuel in buildings, as well as power plants to supply energy.

[4] The GPC provides cities the option of selecting between two reporting levels: BASIC or BASIC+. The BASIC level covers scope 1 and scope 2 GHG emissions from stationary energy and transportation, as well as scope 1 and scope [3] GHG emissions from waste. GVMC will use BASIC+ for the CCAP.

Stationary Energy Subsectors	Residential Buildings Commercial & Institutional Buildings Manufacturing Industries & Construction Agriculture, Forestry & Fishing

Transportation

Transportation GHG emissions cover all regional trips, including road, rail, and air. Transportation GHG emissions result directly from the combustion of fuel or indirectly from the use of electricity.

Transportation Subsectors	On-road Railways Aviation

Waste

Waste GHG emissions include those produced during the disposal and treatment of solid waste and wastewater - generated within the municipal boundary - through various treatment types.

Waste Subsectors	Disposal of Solid Waste Biological Treatment of Waste Wastewater Management

2.2.1 Baseline Year

The GHG Inventory accounts for GHG emissions produced in the calendar year 2019, establishing 2019 as the baseline year for the PCAP. GVMC selected 2019 as the baseline for the following reasons:

- Regional data is more available for 2019 compared to prior years
- 2019 aligns with the baseline years of other Michigan CPRG plans
- 2019 data represents typical operations (data from 2020 and 2021 are skewed due to COVID-19 disruptions)

2.3 Process

After the geographic boundary was chosen for the GVMC 2019 baseline inventory, the next step was to determine which sectors and subsectors were applicable to the four counties within the region. Internal discussions occurred to combine KERAMIDA's technical expertise with GVMC's local knowledge. In addition to applicability, GVMC staff determined contacts at the city, county, regional and state level for KERAMIDA to request data.

Data requests were sent to 30+ contacts spanning a multitude of agencies to request information for the sectors and subsectors listed in Table 1 above. For any data that the region was not able to provide, national or state level data was scaled down from accredited sources. This methodology differed for each sector and is described below.

2.3.1 Stationary Energy

Following the breakdown in Table 1, the data for stationary energy was further broken down into five subsectors. Consumers Energy, the largest utility provider in the region, was able to provide data for natural gas and electricity consumption for both the Residential and Agriculture subsectors. Residential data was provided by the number of accounts in the entire region, which was then scaled up by the number of households in each county. Data provided for the Agricultural subsector was directly entered into the inventory, as data for each of the four counties was insufficient and insignificant.

Due to variations in data quality and quantity across the four counties, the US Energy Information Administration (EIA) was utilized for scope 1 fuel usage for the Commercial & Institutional Buildings and Manufacturing & Construction subsectors. For the Commercial and Manufacturing subsectors, national data was scaled using 2019 population values. To avoid double counting, GHG emissions from Energy Industries are not counted at the point of generation (Energy Industries), but rather at the point of consumption (Residential, Commercial, Manufacturing, Agriculture). Scope 2 electricity consumption data was scaled down from the EPA's 2019 Inventory Report. These consumption numbers were then multiplied by the EPA's 2019 Emissions & Generation Resource Integrated Database (eGRID) emission factors, to calculate the total scope 2 GHG emissions for each sector.

2.3.2 Transportation

Data for the majority of the Transportation sector was provided by the Michigan Department of Transportation (MDOT). On-road transportation data was provided in the form of vehicle miles traveled for each of the four counties within the GVMC region. To break down further by vehicle and fuel type, the EPA's 2019 Inventory Report was used to determine vehicle distribution percentages. This breakdown was then paired with the county-specific data to determine the miles traveled by each vehicle type (gas car, diesel car, electric vehicle (EV), liquefied petroleum gas (LPG) car, gas motorcycle, diesel bus, compressed natural gas (CNG) bus).

The EPA provided GHG emissions data from the National Rail Emissions Inventory at the county level that was directly entered into the inventory. This data accounted for both passenger and freight rail. In calculating aviation GHG emissions, only the Gerald R. Ford International Airport was counted towards total GHG emissions, due to the larger scale in comparison to smaller airports in the region. Gerald R. Ford International Airport releases passenger enplanement data on an annual basis. The EPA's 2019 Inventory Report contained national air fuel data, which was scaled down using airport-specific passenger enplanements.

2.3.3 Waste

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) 2019 Solid Waste Report provided the necessary data in the Solid Waste subsector. The NextCycle annual throughput data for the Council of Government (COG) in eight counties (Allegan, Ionia, Kent, Mecosta, Montcalm, Osceola, and Ottawa) was scaled down for accurate recycling data. Data for biologically treated waste (compost) was exported from the Michigan Waste Data System (WDS). Finally, wastewater treatment data was calculated using formulas provided in the GPC and Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, which relies on wastewater-specific attributes such as organic content, sludge removal, methane recovery, etc.

2.4 Greenhouse Gas Inventory Results

The total GHG emissions breakdown by sector for the 2019 calendar year can be seen below for the entire MSA and by county in Figures 2 and 3 respectively. Further, the GHG emissions breakdown by subsectors for the entire MSA and by county can be seen below in Figures 4-9.

2.4.1 Total Greenhouse Gas Emissions

The total annual GHG emissions assessed for the MSA for the baseline year of 2019 were 38,102,961 metric tons (MT) CO_2e. This is equivalent to roughly 35 MT CO_2e per capita for the MSA's population. This amount is the sum of GHG emissions from the stationary energy, transportation, and waste sectors, which are further explained in their respective sections. Table 2 presents the GHG emissions assessed for the baseline year 2019, by county and subsector.

Table 2: Grand Rapids-Kentwood metropolitan statistical area greenhouse gas emissions inventory, broken down into subsectors and counties

GHG Emissions Source	**GHG Total Emissions (MT CO_2e)**				
	Ionia	**Kent**	**Montcalm**	**Ottawa**	**Total**
Stationary Energy					
Residential Buildings	556,096	6,751,711	1,220,318	5,557,172	14,085,296
Commercial & Institutional Buildings	205,759	2,089,341	203,186	928,119	3,426,405
Manufacturing & Construction	171,950	1,746,042	169,800	775,620	2,863,412
Agriculture, Forestry & Fishing	40,165	67,493	11,569	49,097	168,324

SUB-TOTAL	**973,970**	**10,654,587**	**1,604,872**	**7,310,008**	**20,543,437**
Transportation					
On-road	1,342,653	10,022,810	1,067,996	4,153,258	16,586,717
Railways	641	4,636	0	2,971	8,249
Aviation	0	470,229	0	0	470,229
SUB-TOTAL	**1,343,294**	**10,497,675**	**1,067,996**	**4,156,229**	**17,065,195**
Waste					
Solid Waste	12,206	176,905	13,112	238,653	440,875
Biological Treatment	16	247	16	1,536	1,816
Wastewater	2,034	40,161	658	8,786	51,638
SUB-TOTAL	**14,255**	**217,313**	**13,786**	**248,976**	**494,329**
INVENTORY TOTAL	**2,331,519**	**21,369,574**	**2,686,654**	**11,715,213**	**38,102,961**

Figure 2: MSA GHG emissions by sector (MT CO_2e)

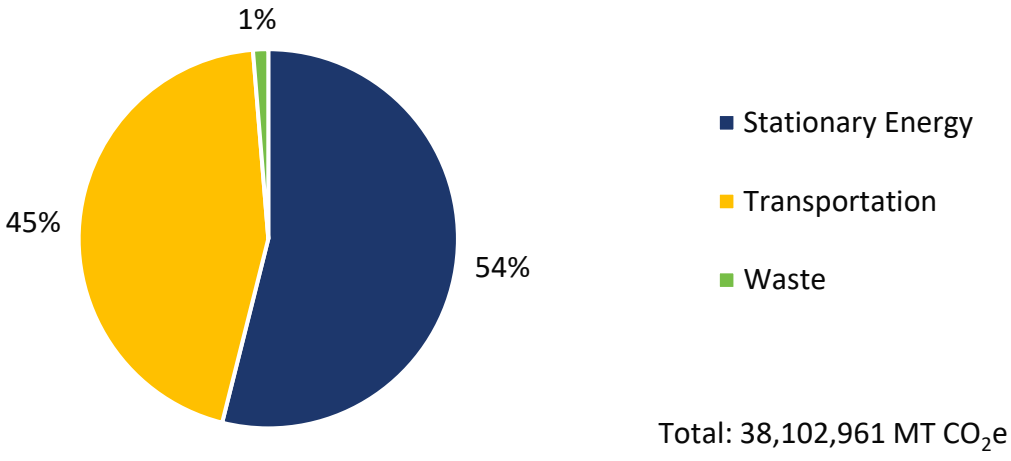
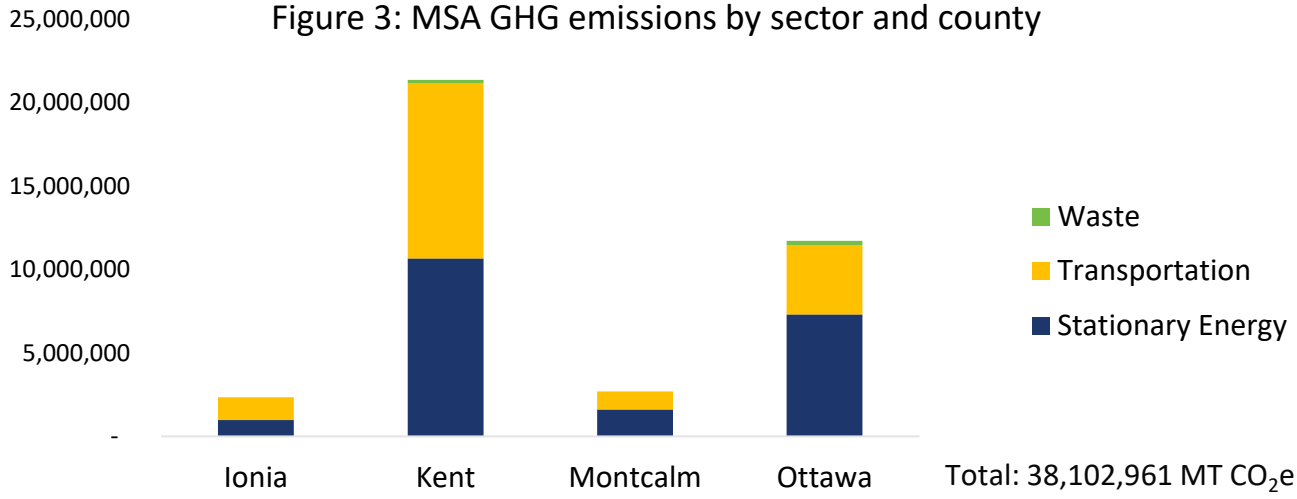


Figure 3: MSA GHG emissions by sector and county



2.4.2 Greenhouse Gas Emission Subsectors

2.4.2a Stationary Energy

The total annual GHG emissions from stationary energy for the MSA in 2019 were 20,543,437 MT CO_2e. This amount consists of GHG emissions from the residential, commercial, institutional, manufacturing, and agricultural sectors. The residential sector contributed 68% of overall stationary energy GHG emissions, making it the subsector that presents the most opportunity for GHG emissions reductions. Commercial and institutional followed at 17%, and manufacturing at 14%. Agriculture GHG emissions only comprised 1% of overall GHG emissions, but this subsector is likely underreported as there was insufficient data to capture all GHG emissions. Kent and Ottawa county had the first and second highest amount of GHG emissions in the stationary energy sector, due to their higher populations.

Figure 4: GHG Emissions from Stationary Energy (MT CO_2e)

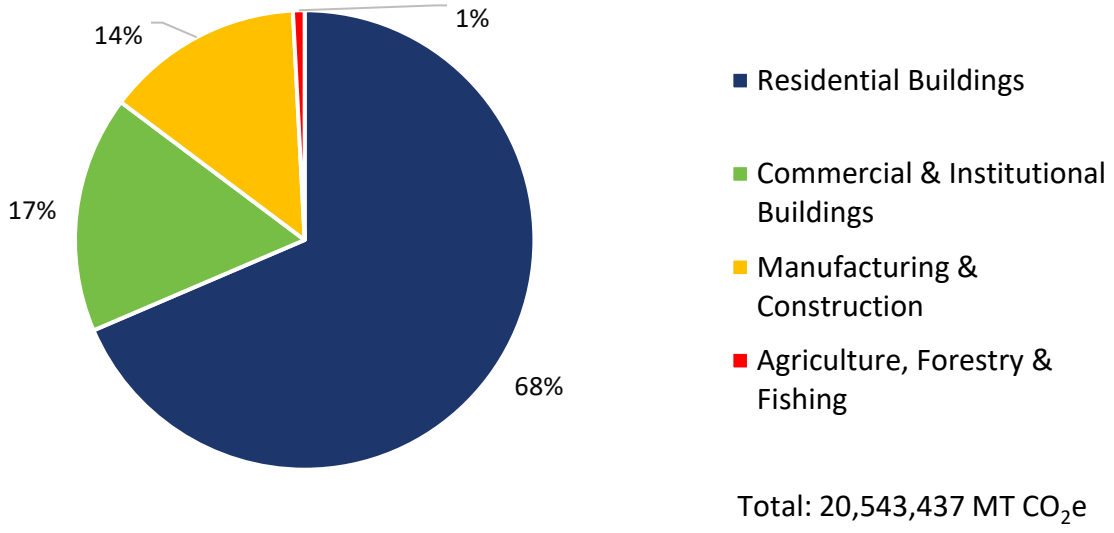
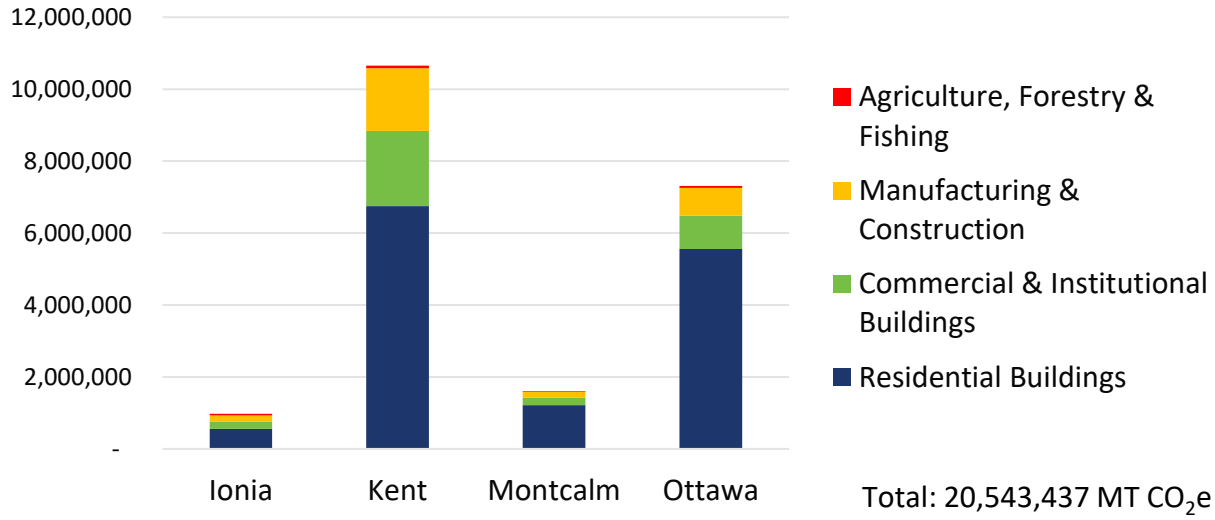


Figure 5: GHG Emissions from Stationary Energy by County (MT CO_2e)



2.4.2b Transportation

GHG Emissions from transportation in 2019 came largely from the on-road subsector, which made up 97% of the full sector. This subsector includes GHG emissions from any personal or freight vehicles driven on roads. The aviation subsector accounted for 3% of overall transportation GHG emissions, though this subsector is underreported due to only capturing GHG emissions from the Gerald R. Ford Airport. However, accounting for GHG emissions from smaller airports in the region would not have made a statistically significant difference. GHG emissions from rail made up less than 0.05% of GHG emissions, and therefore are not represented in the pie chart below, as it would not be visible. GHG emissions from water transportation may have constituted a significant percent of GHG emissions compared to rail and aviation, in large part due to Ottawa County being bordered by Lake Michigan, but these GHG emissions were not captured due to insufficient data. GHG emissions from off-road transportation were similarly not able to be captured but would have likely been as insignificant as the rail subsector.

Figure 6: GHG Emissions from Transportation[5] (MT CO_2e)

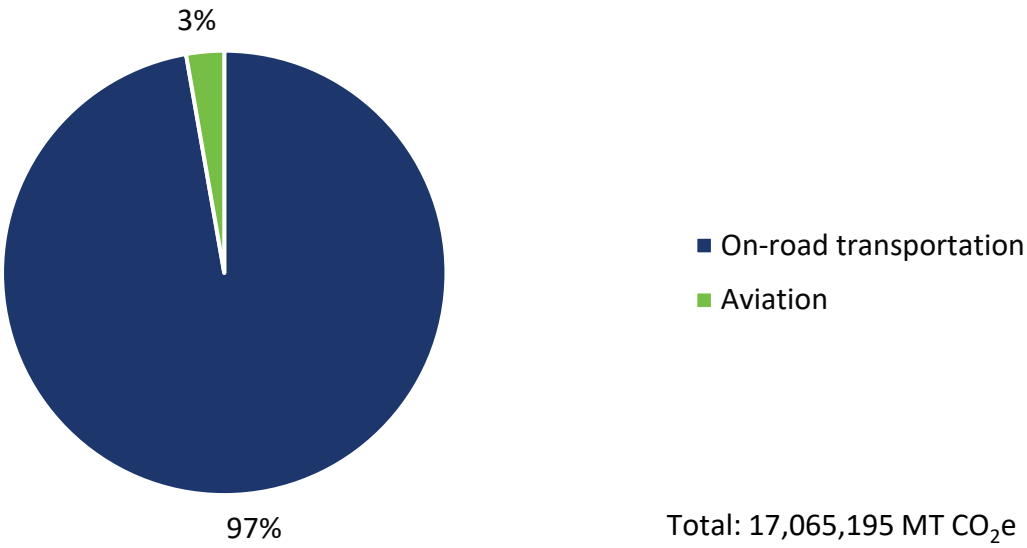
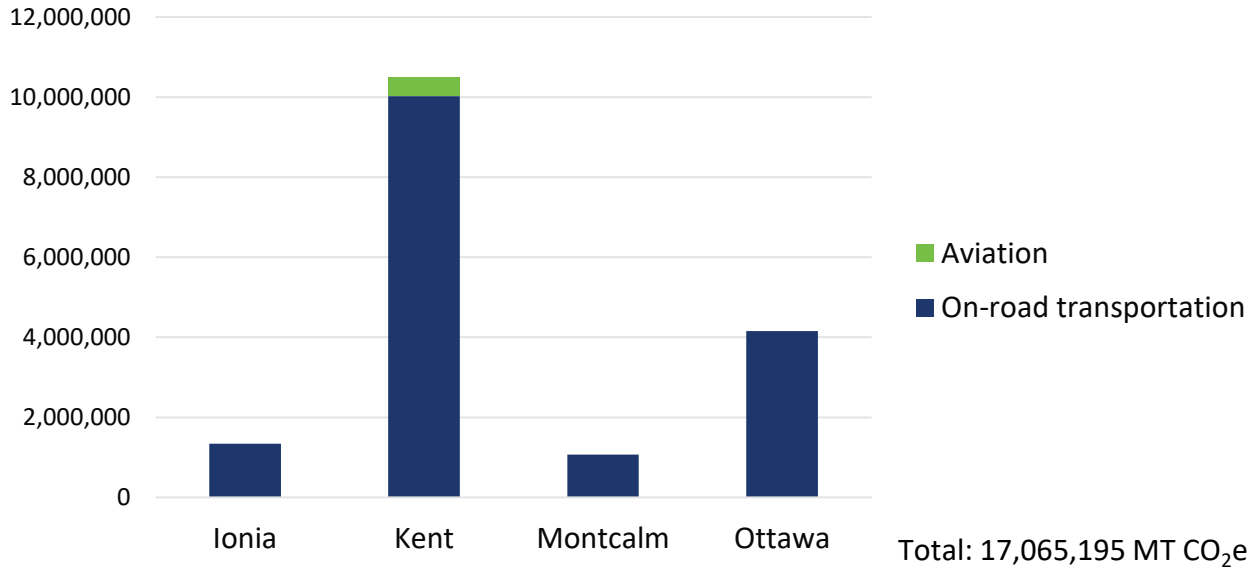


Figure 7: GHG Emissions from Transportation by County (MT CO_2e)



2.4.2c Waste

The total GHG emissions from the waste sector in 2019 were 494,329 MT CO_2e. GHG emissions from the waste sector can be mainly attributed to solid waste, which includes municipal solid waste, industrial waste, and construction waste, both landfilled and recycled. The second largest

[5] GHG emissions from rail made up less than 0.05% of GHG emissions, and therefore are not represented in the pie chart below, as it would not be visible.

subsector, which accounts for 11% of total sector GHG emissions, was wastewater treatment. The least-emitting subsector was biological treatment (0.37%). This subsector only includes composting, as there was no active anaerobic digestion within the four counties in 2019.

Figure 8: GHG Emissions from Waste (MT CO_2e)

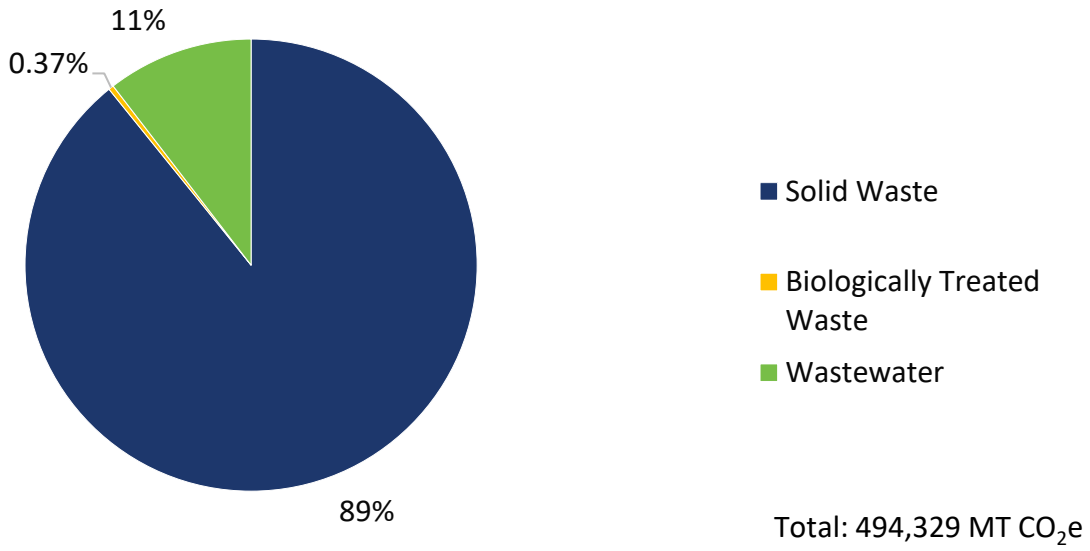
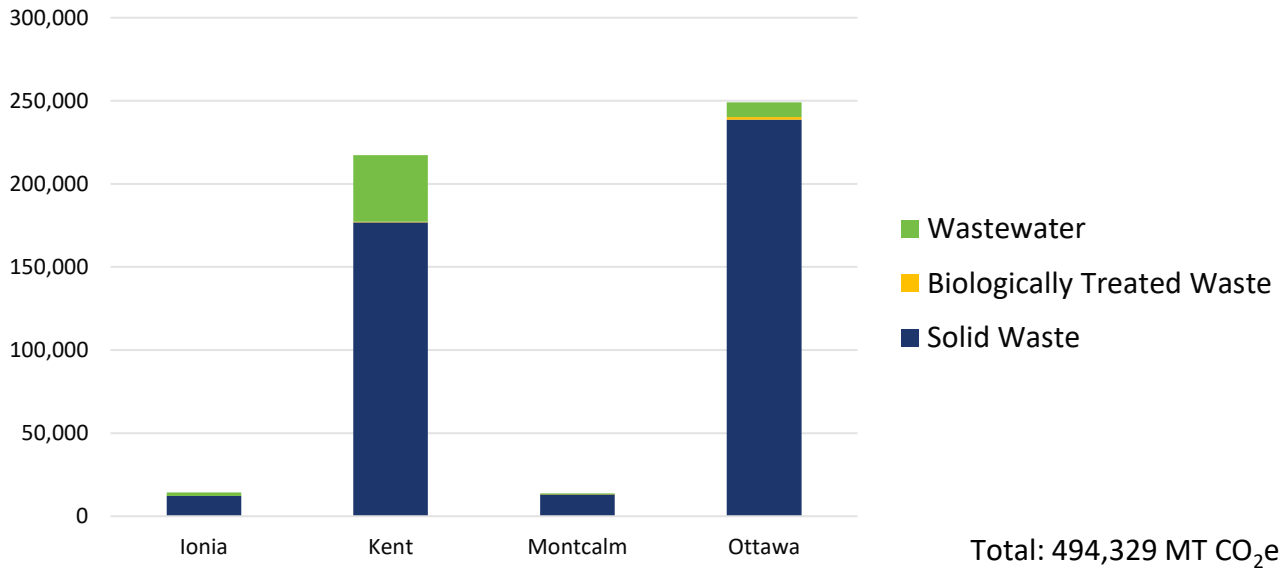


Figure 9: GHG Emissions from Waste by County (MT CO_2e)



3 Low Income and Disadvantaged Communities Analysis

CPRG pays special attention to LIDACs, due to the instrumental work of the Justice40 initiative that was passed in January 2021 through Executive Order 14008. This initiative mandated that at least 40% of the overall benefits of certain federal investments, including CPRG, be distributed to communities that are marginalized, underserved, and overburdened by pollution. As outlined by the EPA, the MSA was required to identify LIDACs (refer to Figures 10-13), engage with LIDACs in the planning process (see Section 3.3), list the census blocks/tracts impacted by each measure (see Appendix C) and identify and describe the benefits that each measure provides to these communities (see Section 4). The MSA achieved these requirements by utilizing the EPA's Environmental Justice (EJ) screening tool's EPA IRA Disadvantaged Communities Map layer, developing and convening a LIDAC Advisory Committee to provide input early in the planning process, identifying which census blocks would be impacted by each action, and determining the LIDAC benefits of each measure type.

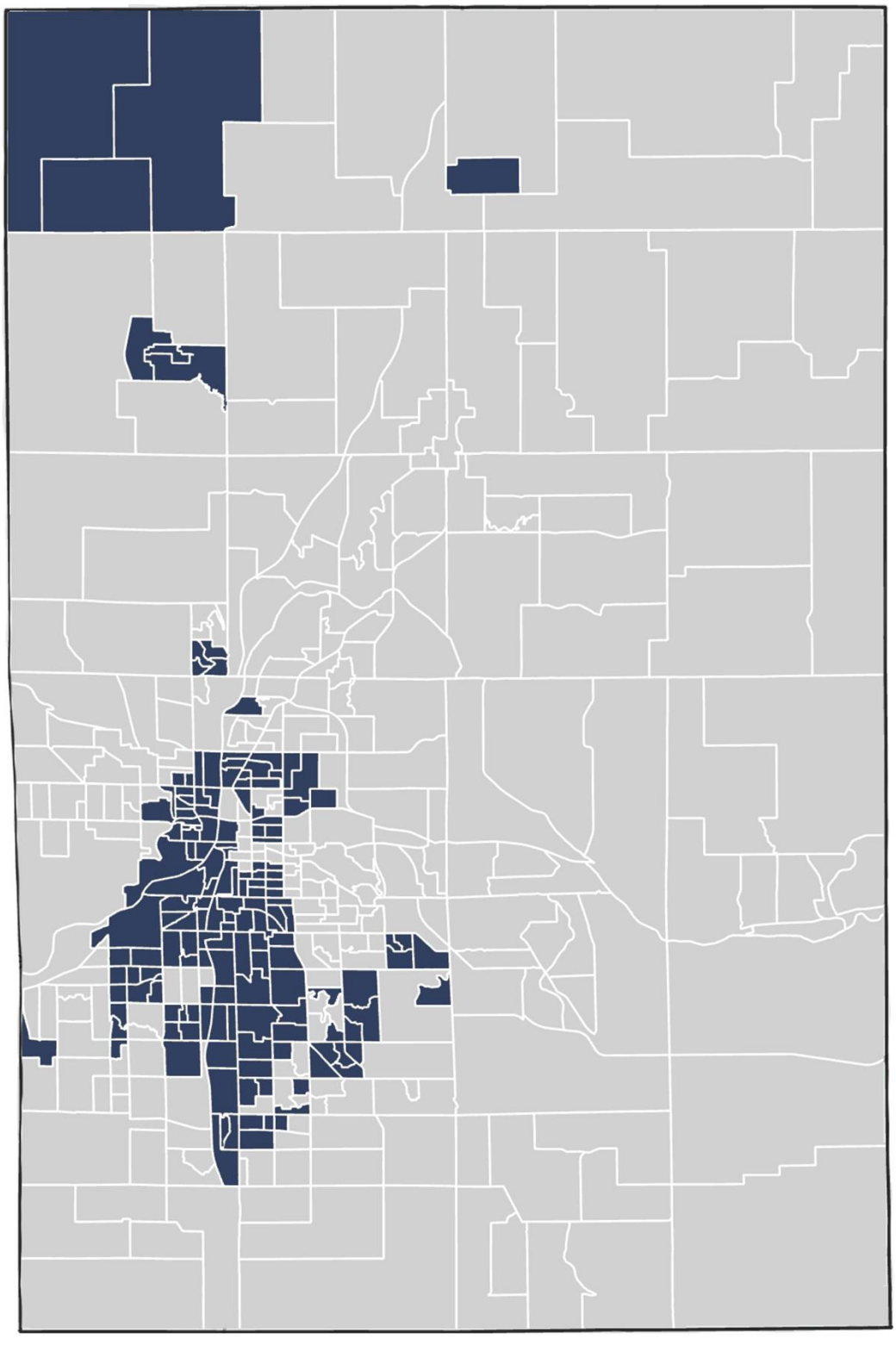
3.1 Identifying Low Income and Disadvantaged Communities

To align GVMC PCAP measures with Justice40 requirements, enhance equity, and improve resilience for communities, to identify LIDACs, GVMC used the EPA's EJ Screening and Mapping Tool, specifically the EPA IRA Disadvantaged Communities layer. The EJ Screening Tool combines several data sets that were used to determine whether a census block fits the LIDAC criteria. The EPA IRA Disadvantaged Communities Map combines block-level census data from the Climate and Economic Justice Screening Tool (CEJST) in addition to supplemental state and national environmental justice percentiles of environmental, health and economic data. The EPA IRA Disadvantaged Communities in West Michigan (see Figures 10-13) are indicated in dark blue on the maps below. The CEJST, alone, excludes numerous disadvantaged communities. For this reason, and in the interest of equitably pursuing the Justice40 initiative, GVMC relied on the EPA's IRA Disadvantaged Communities map to consider all highlighted areas on the maps below as LIDACs.

These tools effectively pinpoint areas facing disproportionate burdens, a detailed exploration of which is presented in this section. The utilization of these tools empowered GVMC to provide the EPA and regional governing bodies, including the LIDAC Advisory Committee, with comprehensive information for decision-making and the fulfillment of the Justice40 initiative. By utilizing the EPA IRA Disadvantaged Communities map, the PCAP of GVMC identified communities at the census block group level as disadvantaged if they exhibited a notably high concentration of low-income households coupled with heightened exposure to one or more environmental burdens.

In Figures 10-13 below, all areas highlighted in dark blue are considered LIDAC communities within the MSA for this PCAP.

Figure 10: Kent County LIDAC Census Blocks



LIDAC Census Block

Figure 11: Ottawa County LIDAC Census Blocks

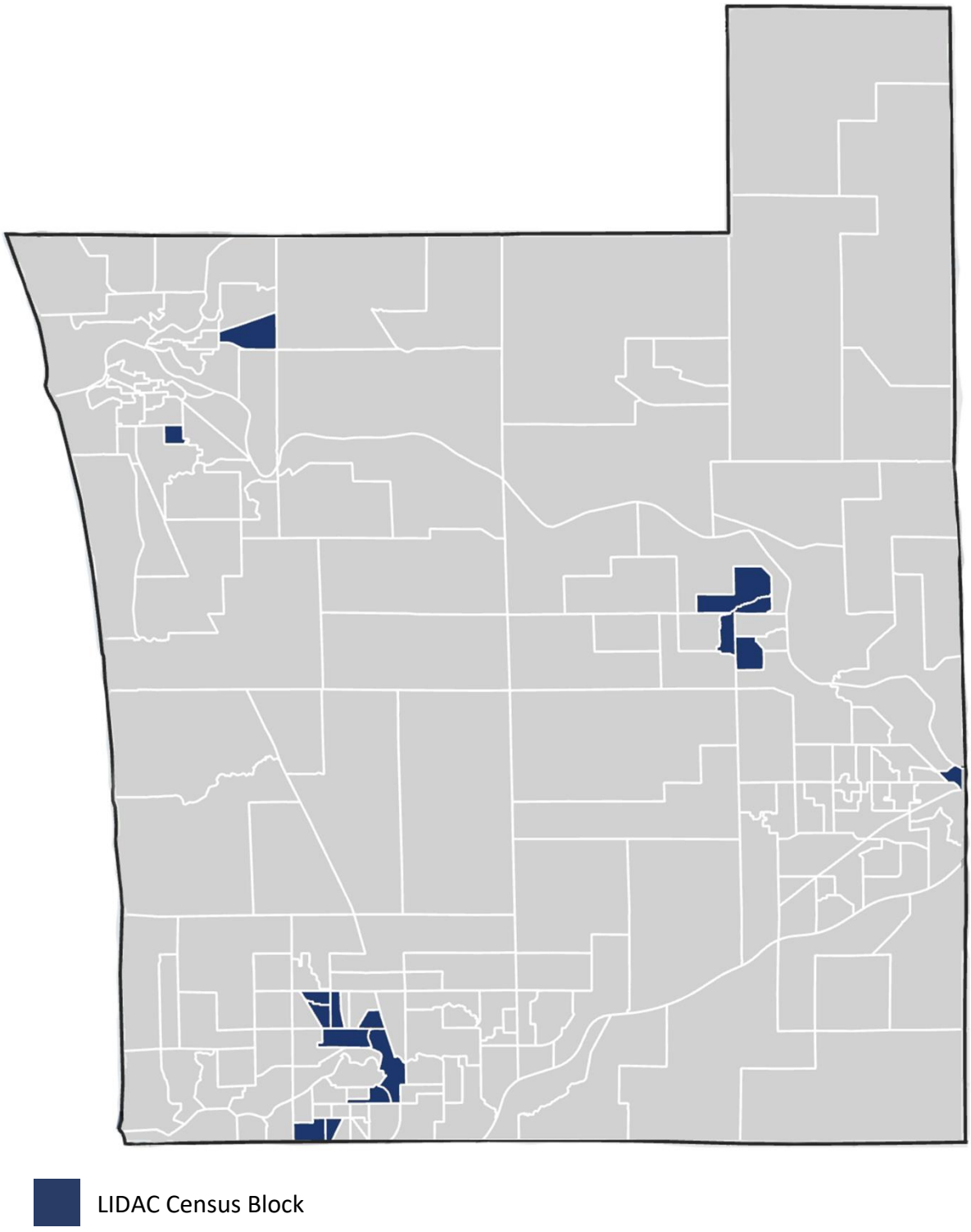


Figure 12: Ionia County LIDAC Census Blocks

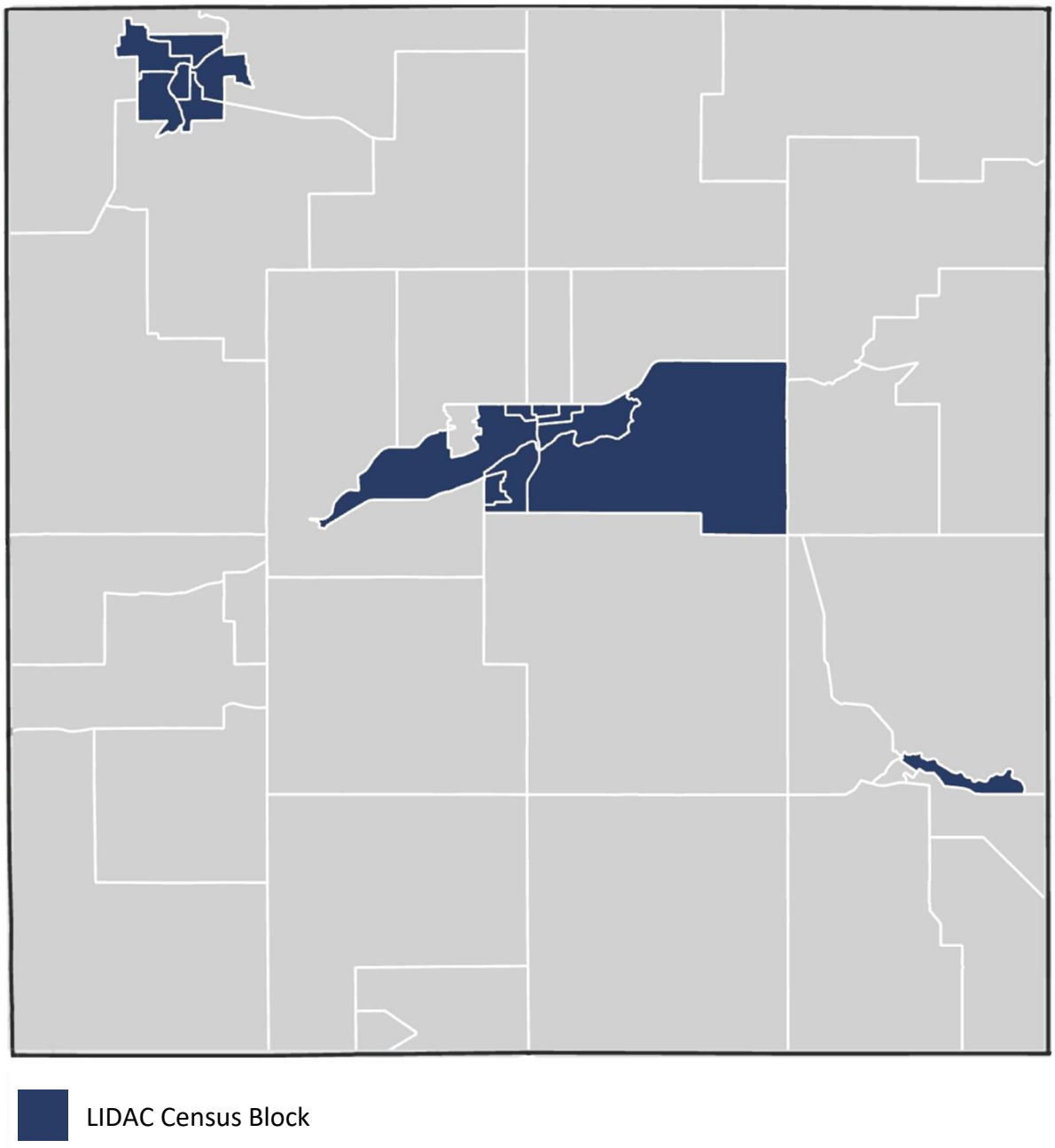
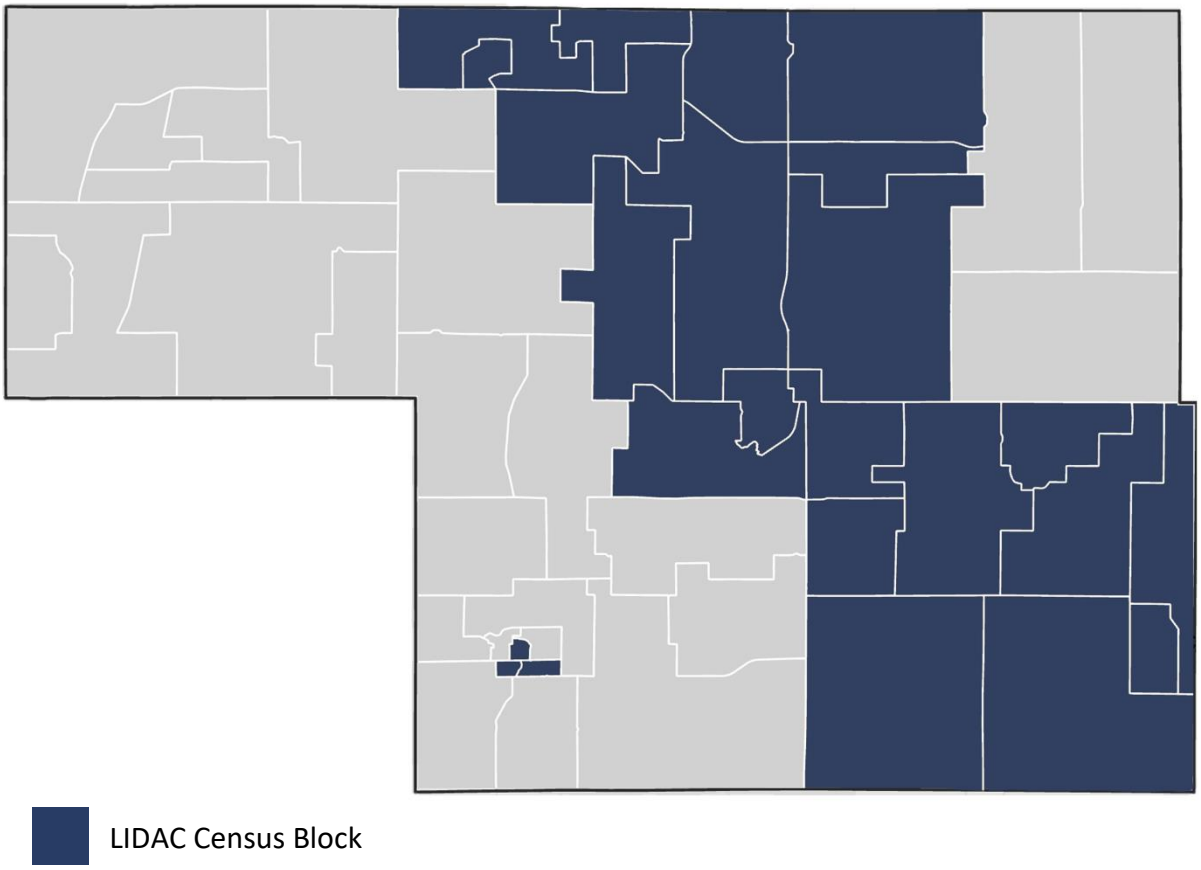


Figure 13: Montcalm County LIDAC Census Blocks



3.2 Impacts

A census tract is a permanent statistical subdivision of a county defined for the purposes of taking a census. These areas sometimes coincide with the limits of cities, towns, or other administrative areas, and several tracts exist within a county. A census block is the smallest geographic unit used by the US Census Bureau to collect and calculate data. The EPA IRA Disadvantaged Communities map assesses LIDACs at the block level and was analyzed as such for the PCAP LIDAC analysis. For a block to be considered as a LIDAC, it needs to be at or above the 90th percentile for any of the EJ Screen's Supplemental Indexes (see the following section) when compared to national or state data[6] OR have its center point ("centroid") in a tract considered disadvantaged by the CEJST (see Table 15 in Appendix B.).

3.2.1 EJScreen Supplemental Index

The EJ supplemental indexes include an analysis of thirteen environmental indicators, combined with socioeconomic data. The supplemental index highlights block groups with the highest intersection of five socioeconomic factors and a given environmental indicator. To calculate a single supplemental index[7] for one block group, the EJScreen multiplies the environmental indicator by socioeconomic information (see Table 16 in Appendix B). This socioeconomic information (collected at the census block level) includes the percentage of individuals who fall into the following categories: low income, linguistically isolated, less than high school education, unemployed, and low life expectancy. For a Census block to be deemed as a LIDAC it must be at or above the 90th percentile[8] when compared to national or state data.

3.3 Meaningful Low Income and Disadvantaged Communities Engagement

A Stakeholder Engagement Plan was developed early in the project to lay the groundwork for seeing the community as a partner, leveraging existing networks, determining what entities will be involved in the decision-making process, and establishing communication norms with project partners. The engagement plan identified how the key stakeholders for the LAC would be selected, provided a summary of the group, and outlined responsibilities. The plan also provides context on the various strategies that will be implemented to engage with the public throughout the project. GVMC designed the engagement plan to be iterative, allowing for the reassessment and improvement of the process, as seen through the engagement updates that have taken place.

The LAC includes individuals from community-based organizations and non-profits that represent LIDACs in the MSA. These individuals were selected in collaboration with GVMC and the MiSBF.

[6] Federally Recognized Tribal Lands are not included because there are none within the boundaries of the MSA.
[7] Supplemental Index = (Environmental Indicator Percentile for Block Group) X (Supplemental Demographic Index for Block Group)

[8] In other words, a census block that has a greater risk associated with an environmental indicator (such as PM2.5 or lead paint), in combination with certain socioecomonic factors, than 90% of other blocks in the U.S.

Those who serve on the committee provide valuable insight from their history of environmental justice-related work in the region. The role of the committee has been to provide feedback on which tool to use for the LIDAC map, submit project ideas for PCAP inclusion, provide feedback on the benefits to LIDAC areas on specific measure types, and help develop a broader engagement strategy for LIDAC areas during the CCAP.

During the PCAP phase, the LAC held three meetings. The first meeting introduced CPRG materials, defined responsibilities, and fostered collaborative group morale. The goal of the meeting was for the group to focus on these three priorities. At the first meeting, the LAC determined they wanted a collaborative space outside of the regular meetings; thus, a shared online platform was developed and communicated among committee members. The objective of the second meeting was to make the final determination of what tool to use to identify LIDAC areas within the MSA and provide qualitative feedback on the impacts of the measures. The final meeting involved presenting the draft of the PCAP and receiving feedback from the committee.

Stipends were offered to participants of the LAC to minimize any burdens for participating. The LAC provided unique engagement strategies for each county to minimize disbenefits for all LIDAC residents.

3.4 Reduction Measure Benefits

Many people living in LIDACs are impacted the most by environmental changes and are socially vulnerable to climate change trends. In 2021, the EPA conducted a "Climate Change and Social Vulnerability" study in the US,[9] which examined regional differences in six different climate risk categories on socially vulnerable groups, compared to reference populations, assuming 2°C of global warming or 50cm of global sea level rise. The three climate change impacts that will impact LIDACs in the Midwest most are:

- Air Quality and Health (due to combustion of fossil fuels) – New asthma diagnoses in children due to particulate air pollution.
- Extreme Temperature and Labor – Lost labor hours for weather-exposed workers.[10]
- Inland Flooding and Property – Property damage or loss due to inland flooding.

The EPA study found that a significant result for the Midwest region was that people with low income are 10% more likely to live in areas with the highest projected labor hour losses among weather-exposed workers due to extreme temperatures. Those who did not complete high school were 7% more likely to be in this group as well. In addition, those without a high school diploma are 10% more likely than those with a diploma to live in areas with the highest projected inland flooding damages. This is followed by minorities at 9%, and low-income earners at 3%.

[9] https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf
[10] Impacts not estimated for 65 and older.

3.4.1 Identifying and Describing Benefits

Section 4 of this report is devoted to GHG Reduction Measures. The GHG reduction benefits are provided at the action level. Additionally, the benefits to LIDAC communities of each measure are discussed in relation to each category level. The LIDAC benefits listed in this report were generated through a shared effort by individuals and organizations who submitted projects, the LAC, and GVMC Project Team.

4 Priority Greenhouse Gas Reduction Measures

GHG reduction measures ("reduction measures") are defined as a shift from a high-carbon activity to a low carbon activity while continuing to fulfill the need addressed by the high-carbon activity. This section is organized into three categories that correspond to sectors in the GHG inventory (Stationary Energy, Transportation, & Waste) and a fourth category to account for sequestration.

Stationary Energy

Measure 1.1 Reduce the carbon intensity of stationary energy

Measure 1.2 Improve building energy efficiency

Transportation

Measure 2.1 Shift to electric vehicles

Measure 2.2 Reduce miles traveled by vehicles powered by internal combustion engines

Waste

Measure 3.1 Reduce the production of landfill waste

Sequestration

Measure 4.1 Sequester greenhouse gas emissions

Each category contains one or more reduction measures, which can be thought of as a strategy to reduce GHG emissions within the broader category. Each reduction measure has one or more associated actions. An action is a specific project, policy, commitment, financial tool, or educational campaign that influences a shift from one activity to another.

The Project Team used a bottom-up approach to distinguish priority reduction measures. The Project Team started by identifying actions through several channels, including a web-based action idea form, in-person community engagement events, a CPRG email, and direct submissions to GVMC. For an action to be considered for inclusion in the PCAP, the following data was required:

- Action description
- Implementing agency
- GHG emission reduction estimate
- Milestones for obtaining implementing authority (if relevant)
- Implementation timeline

- Metrics for tracking progress

Once all the data above was available for an action, the action was added to the PCAP under the associated reduction measure(s). If the PCAP did not contain an applicable reduction measure, then a new reduction measure was created. This process allowed us to identify priority reduction measures by first identifying actions that will drive the reduction measure. Without an associated action, a reduction measure is just an idea, not a priority, and therefore was not included in the PCAP.

Below is the list of all priority reduction measures and associated actions, organized by category. Each reduction measure includes estimated near- and long-term GHG emission reductions, calculated using data provided to the Project Team by regional stakeholders. The Project Team reviewed calculations at a high-level but acknowledge that each estimate needs to be reviewed more closely during the CCAP phase, therefore estimates can change before the CCAP is submitted.

The Project Team, with support from the LAC, developed a qualitative description of how each reduction measure will impact LIDACs. The descriptions will be improved and quantified during the CCAP phase. In addition to emission reduction estimates and LIDACs benefit descriptions the following data is organized into two tables for each reduction measure and action:

- Implementing agencies
- Milestones for obtaining implanting authority
- Implementation schedules

4.1 Stationary Energy

Measures within this category specifically address GHG emissions within the stationary energy sector. Regionally, 54% of GHG emissions result from stationary energy. Collectively, the measures below have the potential to annually reduce regional stationary energy GHG emissions by 119,774 MT CO_2e.

Measure 1.1 Reduce the carbon intensity of stationary energy

Carbon intensity refers to the amount of GHG emissions emitted per kilowatt hour (kWh) of electricity produced. Decreasing the carbon intensity of stationary energy will decrease GHG emissions in addition to other benefits like a reduction in air pollutant GHG emissions. There are several ways to decrease the carbon intensity of stationary energy including the installation of rooftop solar photovoltaic (PV) systems, shifting from burning carbon intensive fuels (e.g., coal) to less carbon intensive fuels (e.g., natural gas), and other renewable energy projects. The actions presented in Table 3 are examples of implementation-ready projects in the MSA. Table 3 is not an exhaustive list of actions associated with Measure 1.1; during the CCAP phase, additional implementation-ready projects will be added, and new actions will be developed to achieve the region and state's goal of climate neutrality by 2050.

Estimate of the greenhouse gas emissions reductions

To estimate the GHG emissions reductions below, the Project Team used the annual GHG emission reductions for each action in Table 3 and the projected timelines from Table 4. The Project Team collaborated with the submitter of each action to calculate the emission reduction assumptions or conducted a high-level quality check for each calculation. The estimation assumes that each action will be implemented. More precise emission reduction projections and data verification will be performed during the CCAP Phase.

Estimate of total quantifiable GHG emissions reductions through 2030 (MT CO_2e)	362,138
Estimate of total quantifiable GHG emissions reductions through 2050 (MT CO_2e)	2,563,078

Low Income and Disadvantaged Communities Benefits

Reducing the carbon intensity of stationary energy, as outlined in Measure 1.1, can produce numerous benefits to LIDACs in West Michigan, including, renewable energy access and affordability, job creation and economic empowerment, and environmental justice and health impacts. Renewable energy access and affordability create more possibilities for community members and organizations to obtain solar and reduce their energy costs. This will offer communities that have faced disproportionate environmental benefits, reduced energy costs,

and improved energy equity for low-income families. Green job creation and economic opportunities open the door for the development of new green jobs, available for people in LIDACs seeking jobs, particularly those who have been historically burdened by environmental challenges. Environmental justice and health addresses historic injustices by reducing environmental hazards, improving air quality, and revitalizing neighborhoods. This will ultimately lead to cleaner air, healthier communities, and fewer hospitalizations for conditions such as asthma and chronic obstructive pulmonary disease. These initiatives underscore a commitment to greening the grid while creating new green job opportunities and improving environmental health outcomes.

Geographic Location and Impacted Low Income and Disadvantaged Communities

This measure will impact all four counties within the MSA: Ionia, Kent, Montcalm, and Ottawa. See Appendix C for associated LIDAC Census Block Identification Numbers for each county.

Metrics for Tracking Progress

The following metrics will be used to track the progress of Measure 1.1. Additional metrics may be added during the CCAP phase as existing actions are refined and new actions are added.

- Amount of electricity produced (kWh)
- Amount of GHG emissions reduced
- Amount of new renewable energy installed (kWh)
- Amount of money saved

Table 3: Measure 1.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction (MT CO_2e)
1.1.1	City of Grand Rapids Solar on Municipal Property (landfill)	Solar installation at Butterworth Landfill site.	25,710
1.1.2	Electrification of the Grand Rapids Steam District	Electrification of the downtown GR Steam District using the proposed solar at the Butterworth Landfill.	18,330

Table 3: Measure 1.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction ($MT CO_2e$)
1.1.3	Waste to Energy (WTE) Steam Interconnect Replacement	Export steam from the Kent County Waste to Energy facility to the downtown Grand Rapids heating district, partially displacing natural gas use in their boilers.	16,600
1.1.4	Kent County Landfill Solar	Solar installation at Sparta Landfill, North Kent Landfill, and Kentwood Landfill.	15,123
1.1.5	Solar Park on Brownfields	An inventory and feasibility study on Brownfield opportunities on public properties in GVMC's region.	13,640
1.1.6	City of Wyoming Anaerobic Digester	Biodigester constructed at City of Wyoming's Clean Water Plant. The biodigester would produce methane which will be used to generate electricity.	7,300
1.1.7	City of Grand Rapids Community Solarize Program	Solarize residential homes in Grand Rapids.	4,242
1.1.8	Harbor Island Community Solar	Redevelopment of old SIMS Brownfield site for community solar park.	2,498
1.1.9	Finance LIDAC-serving nonprofit solar	Provide qualified nonprofit applicants with grants to fully cover the financial cost of solar installation on their owned buildings.	2,339
1.1.10	Solar For All	Create jobs for LIDAC communities living within EPA's CEJST-defined areas to become active participants in the design of community-owned solar projects.	1,585
1.1.11	E.H. Zero Solar on Multi-Family Housing Properties	Solar on 5 and Solar + Storage on 3 Affordable Housing Multifamily Properties (8 total properties; 320 total units)	1,076

Table 3: Measure 1.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction ($MT CO_2e$)
1.1.12	City of Grand Rapids Solar on 8 Municipal Buildings	Solar installation on the rooftops of 8 different municipal buildings.	987
1.1.13	Kent County Anaerobic Digester	Biodigester constructed in Kent County for increase in energy recovery, replacing natural gas with renewable natural gas (RNG).	383
1.1.14	East Grand Rapids Community Facilities Solar Arrays	Roof mounted solar arrays on various municipal buildings in East Grand Rapids. GHG reductions would persist for 25 years.	234
1.1.15	JustAir – Expansion of AQ Network	Expand current air quality network to include the four GVMC counties.	-

Table 4: Measure 1.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
1.1.1	City of Grand Rapids	RFP release by City of GR, contract finalizing with developer, EPA approval, Butterworth Site Group approval, other permits required (land-use, electrical/solar, interconnection)	The proposed timeline ranges from 12-30 months depending on the size of the project. The average from all proposals was 23 months, with construction starting in the first half of 2025 and

			commissioning occurring Summer 2026.
1.1.2	Vicinity Energy	Vicinity steam Rates are approved by the City of Grand Rapids; traditional plan and permit approvals.	Fully implemented twelve months from funding approval.
1.1.3	Kent County DPW and Vicinity Energy	City of Grand Rapids Approval, easements for new steam line, county authorization of steam to district	• Q4 2024 - Decision to proceed; 18 months to flowing steam • Q1 2025 - Design engineering, permitting and procurement • Q3 2025 – Construction • Q1 2026 - Startup and commissioning
1.1.4	Kent County Department of Public Works	Approval to proceed from the Kent County Board of Public Works	• Q4 2024 – Issue Request for Proposal by Kent County Fiscal Services – Purchasing Division • Q1 2025 – Review proposals • Q2 2025 – Kent County Board of Public Works Approval • Q3 2025 – Contracts; notice to proceed • Q1 2026 – Commence site engineering and public engagement • Q4 2026 – EGLE due diligence and due care complete • Q1 2027 - Interconnection Agreements • Q4 2027 – Construction underway

			• Q3 2028 – Commercial operation date
1.1.5	Contractor on the behalf of the State of Michigan[11]	• RFP from State of Michigan for a contractor to proceed with the project. • Policy coordination and best practices shared between State and other brownfield authorities (county) for solar development. • Contractor creates inventory, which ranks high probability sites in tiers (1,2,3) based upon various criteria: type and size of brownfield; proximity to existing utility infrastructure; legal clarity on ownership, risk; community support. • Contractor creates a public-facing protocol to codify solar development on brownfields that includes de-risking and de-costing so this kind of development is more cost effective ultimately than greenfield development.	Start as soon as the grant becomes available. Three years total with projects in queue for development as early as year two.
1.1.6	City of Wyoming	• City of Wyoming City Council – Currently working with the Council and other City Staff to gain their support for the project. This will be an ongoing process	• Project Development and Design – Ongoing and expected to conclude early 2026 • Project Construction – Anticipated to begin Q3

		but is not anticipated to delay construction. • EGLE – All process related improvements at the Clean Water Plant will need to be reviewed and approved by EGLE before construction. This requires application and approval of a Part 41 Wastewater Construction Permit. Based on previous experience with a similar project, the approval process will run parallel with the design and should take no more than three months from time of application to permit approval.	2026 and conclude by the mid-2028
1.1.7	City of Grand Rapids, Great Lakes Renewable Energy Association (GLREA), Solar Developers	Authority obtained	Dependent on how long the program will be funded. Intent is for a 5-year program (2025-2030).
1.1.8	City of Grand Haven	• Pre-feasibility study = Project review & analysis, site selection, site visit(s), consultations, financial analysis, feasibility report • HDR & City of Grand Haven = Background env. analysis (start 2022), remediation identification and implementation, community engagement, redevelopment planning followed by selection of project	• January 2024 – December 2026 • 3-year timeline from start to finish

		• Prep & Enabling Works = Land survey, env. assessment, conceptual design, civil engineering, permitting, RFP. • Procurement/Construction = RFP, contract, final design and permitting, construction	
1.1.9	The Community Action House[12]	Upon funding award, the implementation agency would hire a program coordinator to administer the program's application and reporting requirements.	• The hiring of a program coordinator would be accomplished within an estimated three months of notice. • Then, a target minimum of 10 solar array installations per year would be anticipated - though there would be potential to conclude in a shorter timeframe to reach targets well prior to the grant period's ending. • All funded partners would report to the program coordinator on relevant metrics for the grant.
1.1.10	Healthy Planet Strategies[13]	• March - CT36/150 • April - CT28/115 • May - CT26/235 • June - CT39/200 • July - CT40/245 • August - CT135/315 • September - CT140/465.	• May 2024 – Passage of Michigan House and Senate bills for financing community solar, notice sent to Healthy Planet Strategies asking for commitment, initial planning meeting to

		• The goal is to sign up over 2,025 subscribers by the end of 2025. Publish schedule.	determine committees, engage Grand Valley State University in baseline process. • June 2024 – Establish organizational structure, short-term action steps, high profile spaces within community and committees. • July 2024 – Hold job fair to fill positions (over 350), secure major sponsors (Meijer, Corewell, Grand Valley State University, Amazon, etc.) • August 2024 – Submit funding requests, identify financial institutions with CEJST areas. • September 2024 – Conduct market research survey, create subscriber system. • January 2025 – Begin trainings, pilot in Census Tract 38 to determine best practices.
1.1.11	City of Grand Rapids	City of Grand Rapids plan review, permit approvals and inspection.	Nine months to identify and enter into contracts with properties; 9 months to purchase equipment and install
1.1.12	City of Grand Rapids	Lease agreement with State of Michigan for portion of police department roof rented by	Nine months to purchase equipment and install, additional six months for Police Department to

		State; Traditional plan review and permit approvals.	finalize contract with State of MI regarding leased portion of building.
1.1.13	Kent County DPW and Kent County[14]	Kent County Board of Commissioners approval	• Q4 2024 – Approval by the Kent County Board of Commissioners • Q1 2025 – Finalize design and permits • Q2 2025 – Contracts and notice to proceed • Q2 2027 – Facility construction complete • Q3 2027 – Facility startup and shakedown.
1.1.14	City of East Grand Rapids	Implementation ready	Spring 2024
1.1.15	JustAir Solutions and Kennedy Collective	Authority obtained	• May-July 2024 – Project development • August 2024-April 2025 - Implementation • May 2025 – Evaluation & adjustment

[11] Including stakeholders such as the State Land Bank Authority, Dept. of Environment, Great Lakes and Energy, local units of government, EPA's Re-powering America program.

[12] They have confirmed interest in this role but would need to know more about this before a formal commitment and would need some degree of administrative funding to support the administration of this effort.

[13] Potential Fiduciary Partners: Grand Valley Metro Council, Kent County, West Michigan Environmental Action Council, West Grand Neighborhood Association, or the Grand Rapids Community Foundation

Potential Participating Organizations include: Kent County, City of Grand Rapids - Sustainability and Environmental Justice Departments, Grand Rapids Community Collaboration on Climate Change (C4), Grand Rapids Climate Coalition, Citizens Climate Lobby, Grand Valley State University, Grand Valley Metro Council, JustAir Solutions, Urban Core Collective, Urban League of West MI, Hispanic Center of West MI, West MI Hispanic Chamber of Commerce, NAACP, Sierra Club-West Michigan, Kent County Democratic Party, LINC UP, Seeds of Promise, Grand Rapids Neighborhood

[14] The Kent County Anaerobic Digester is repeated below in Measure 3.1 Action 3.1.2 as there are dual benefits of reducing the carbon intensity of stationary energy and reducing the production of landfill waste.

Potential Funding Sources

The following actions have identified potential funding sources. The funding sources listed below are not confirmed and do not represent a commitment for the associated agency. Additional funding sources will be assessed during the CCAP phase.

	Action	Funding Source
1.1.6	City of Wyoming Anaerobic Digester	Open market bonds
1.1.8	Harbor Island Community Solar	Direct pay for development and/or the Solar Investment Tax Credit (ITC)
1.1.14	East Grand Rapids Solar	PPA

Measure 1.2 Improve building energy efficiency

Improving the energy efficiency of buildings can significantly decrease the amount of energy required to operate them (i.e., electricity and fuel consumption), reducing stationary energy GHG emissions. There are several ways to improve building energy efficiency, but the primary methods involve weatherization to minimize heat loss in the winter and cooling loss in the summer. Retrofitting commercial, institutional, municipal, and residential spaces with newer technologies, better insulation, and/or improved ventilation can help reduce the total energy consumption of a building, thereby reducing overall GHG and co-pollutant emissions. The actions presented in Table 5 are examples of implementation-ready projects in the MSA. Table 5 is not an exhaustive list of actions associated with Measure 1.2; during the CCAP phase, additional implementation-ready projects will be added, and new actions will be developed to achieve the region and state's goal of climate neutrality by 2050.

Estimate of the quantifiable GHG emissions reductions

To estimate the GHG emissions reductions below, the Project Team used the annual GHG emission reductions for each action in Table 5 and the projected timelines from Table 6. The Project Team collaborated with the submitter of each action to calculate the emission reduction assumptions or conducted a high-level quality check for each calculation. The estimation assumes that each action will be implemented. More precise emission reduction projections and data verification will be performed during the CCAP Phase.

Estimate of total quantifiable GHG emissions reductions through 2030 (MT CO_2e)	36,499
Estimate of total quantifiable GHG emissions reductions through 2050 (MT CO_2e)	231,039

Low Income and Disadvantaged Communities Benefits

Improving building energy efficiency through Measure 1.2 yields numerous benefits for LIDACs including improving air quality, reducing costs, and improving community well-being. Improving energy efficiency ultimately leads to less energy needed to be produced. This will not only enhance energy efficiency but also reduce GHG emissions by significant margins, leading to cleaner air and healthier environments for LIDACs. Reducing costs for LIDAC residents means that the energy burden faced by these communities will be significantly decreased. It will allow residents to spend less money on energy costs and allocate their resources to other areas that will improve their lives and financial well-being. Transitioning to Net Zero development can also reduce operating costs and promote community vibrance by creating sustainable infrastructure that residents can be proud of and enjoy. Improving building energy efficiency demonstrates a

commitment to enhancing the quality of life and advancing equitable access to clean energy solutions for LIDAC communities.

Geographic Location and Impacted Low Income and Disadvantaged Communities

This measure will impact all four counties within the MSA: Ionia, Kent, Montcalm, and Ottawa. See Appendix C for associated LIDAC Census Block Identification Numbers for each county.

Metrics for Tracking Progress

The following metrics will be used to track the progress of Measure 1.2. Additional metrics may be added during the CCAP phase as existing actions are refined and new actions are added.

- Amount of electricity (kWh) and gas (Btu) reduced per household
- Amount of GHG emissions reduced (MT CO_2e)
- Amount of savings from energy cost reductions

Table 5: Measure 1.2 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		**Action Description**	**Estimated Annual GHG Emission Reduction** (MT CO_2e)
1.2.1	Corewell Health Energy Efficiency	Energy efficiency projects and upgrading aging energy related infrastructure at the Lemmon Holton Cancer Pavilion, Grand Rapids Medical Center, and Blodget Hospital.	4,178
1.2.2	City of Grand Rapids – Water Utility Efficiency	Energy efficiency improvement opportunities at the Water Filtration Plant and Water Resource Recovery Facility.	2,430
1.2.3	Holland Home Energy Education	Holland's home energy education program educates and provides financial assistance for energy improvements to resident's homes.	1,800
1.2.4	NZ Kent County Admin Building	Construct the first NZ county administration building in MI, allowing for partial electrification of the county's fleet.	924

Table 5: Measure 1.2 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction ($MT CO_2e$)
1.2.5	E.H. Zero Home Repair Program	Retrofitting older homes to be carbon neutral and all-electric ready and leverage existing resources such as weatherization and utility programs that streamlines the application processes for residents.	395

Table 6: Measure 1.2 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
1.2.1	Corewell Health	Authority obtained.	• July 2025 - Lemmon Holton Cancer Pavilion • January 2026 - Grand Rapids Medical Center & Blodget Hospital
1.2.2	City of Grand Rapids	City releases RFP for energy audits.	• 2 months – RFP process • 12 months – completion of work

Table 6: Measure 1.2 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
1.2.3	Holland Board of Public Works and Holland Energy Fund	Authority obtained	• Q4 2024 – Approval by the Kent County Board of Commissioners • Q1 2025 – Finalize design and permits • Q2 2025 – Contracts and notice to proceed • Q2 2027 – Facility construction complete • Q3 2027 – Facility startup and shakedown
1.2.4	Kent County	Approval from the Kent County Board of Commissioners	• 2024 – Design • 2025 – Start construction (18-month process) • 2027 – Completion/move in
1.2.5	City of Grand Rapids	City of Grand Rapids plan review, permit approvals and inspection	9 months to identify and enter into contracts with properties; 9 months to purchase equipment and install

Potential Funding Sources

No potential funding sources have been identified for this measure.

4.2 Transportation

Measures within this category specifically address GHG emissions within the transportation sector. The focus of the PCAP was to collect and present implementation-ready reduction measures. The Project Team did not collect or receive any implementation-ready measures related to public transportation. This is a gap in the PCAP that will be addressed in the CCAP, as public transportation can play a significant role in reducing emissions from the transportation sector. Regionally, 45% of GHG emissions result from transportation. Collectively the measures below have the potential to annually reduce regional transportation GHG emissions by 83,054 MT CO2e.

Measure 2.1 Shift to electric vehicles

EVs do not emit any tailpipe emissions (i.e. CO_2),[15] which means that switching from internal combustion engines (ICEs) to EVs reduces GHG emissions while operating an EV relative to an ICE. EVs are also much more energy-efficient and produce less noise than fossil-fueled vehicles. However, for the shift to EVs to be truly effective, grid decarbonization is necessary to eliminate all GHG emissions associated with driving. The actions presented in Table 7 are examples of implementation-ready projects in the MSA. Table 7 is not an exhaustive list of actions associated with Measure 2.1; during the CCAP phase, additional implementation-ready projects will be added, and new actions will be developed to achieve the region and state's goal of climate neutrality by 2050.

Estimate of the quantifiable greenhouse gas emissions reductions

To estimate the GHG emissions reductions below, the Project Team used the annual GHG emission reductions for each action in Table 7 and the projected timelines from Table 8. The Project Team collaborated with the submitter of each action to calculate the emission reduction assumptions or conducted a high-level quality check for each calculation. The estimation assumes that each action will be implemented. More precise emission reduction projections and data verification will be performed during the CCAP Phase.

Estimate of total quantifiable GHG emissions reductions through 2030 (MT CO_2e)	41,825
Estimate of total quantifiable GHG emissions reductions through 2050 (MT CO_2e)	208,185

[15] *EV usage can, however, increase stationary energy emissions if the electricity used to charge EVs is not produced from renewable sources.*

Low Income and Disadvantaged Communities Benefits

Shifting to EVs through Measure 2.1 brings several benefits to LIDACs including improving air quality, reducing fuel and maintenance costs, accessibility to clean transportation options, and promoting equity. Firstly, transitioning to EVs helps improve air quality by reducing harmful GHG emissions associated with traditional fossil fuel vehicles, thereby mitigating respiratory illnesses and other health issues prevalent in LIDACs. Secondly, EVs offer significant fuel savings compared to gasoline or diesel-powered vehicles, resulting in lower transportation costs for individuals and families in LIDACs who often have limited financial resources. Additionally, the adoption of EVs can lead to substantial cost savings over time due to reduced maintenance requirements and the lower cost of electricity compared to gasoline or diesel. Moreover, supplying EV charging stations to the public in LIDACs enhances accessibility to clean transportation options, promoting equity and inclusivity in sustainable mobility initiatives. Finally, creating a rideshare program with EVs not only provides affordable and environmentally friendly transportation solutions but also fosters community engagement and economic opportunities within LIDACs. Overall, the shift to EVs offers a holistic approach to addressing transportation challenges in LIDACs while promoting environmental sustainability and social equity.

Geographic Location and Impacted Low Income and Disadvantaged Communities

This measure will impact all four counties within the MSA: Grand Rapids, Kent, Ionia, and Ottawa. See Appendix C for associated LIDAC Census Block Identification Numbers for each county.

Metrics for Tracking Progress

The following metrics will be used to track the progress of Measure 2.1. Additional metrics may be added during the CCAP phase as existing actions are refined and new actions are added.

- Amount of public EV charging stations
- Usage of public EV charging stations
- Amount of ICE Food Rescue reefer vehicles replaced with EVs
- Vehicle miles traveled for EVs ICE vehicles

Table 7: Measure 2.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		**Action Description**	**Estimated Annual GHG Emission Reduction** ($MT\ CO_2e$)
2.1.1	City of Grand Rapids Fleet Electrification	Replacing the City of Grand Rapids' current fleet with all electric (as currently offered) vehicles.	3,249

Table 7: Measure 2.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction ($MT CO_2e$)
2.1.2	City of Grand Rapids EV Carshare Expansion	Expand existing carshare fleet by 50% and fund a study for long-term sustainability of the program.	2,807
2.1.3	C4EVR	EV rideshare initiative aimed at reducing GHG emissions, fostering climate justice awareness, and establishing EV infrastructure to transform Grand Rapids.	1,110
2.1.4	Kent County Essential Needs Task Force EV Fleet Shift	Establish a fleet of EVs to partially replace and expand existing transportation services for LIDAC.	247
2.1.5	Finance Expanded Food Rescue Work	Replacement of diesel ICE food rescue trucks to EV versions.	232
2.1.6	Grandville Water Plant Biogas EV Charging & Fleet Electrification	Installation of electric vehicle charging stations at the Clean Water Plant (CWP) and two utility vehicle upgrades to EV. The stations would be available for public use and used for CWP fleet vehicles.	210
2.1.7	East Grand Rapids Refuse Truck and Fire Truck Electrification	Electrify two garbage trucks and one fire truck.	194
2.1.8	LIDAC EV Charging Infrastructure	Establish four Black-owned EV charging sites in LIDAC throughout Grand Rapids.	184

Table 7: Measure 2.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction ($MT CO_2e$)
2.1.9	Corewell Health EV/Hybrid Fleet Transition	Corewell Health is committed to transitioning 50% of new fleet vehicles to alternative fuels, including electric vehicles and hybrid vehicles. The initiative will start in 2024.	85

Table 8: Measure 2.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
2.1.1	City of Grand Rapids	Waiting for the HDEV truck offerings to evolve to a point where the trucks can do the work required.	• 2017 – Fleet electrification began • Ongoing – Continued fleet electrification as funds become available and EV technology advances
2.1.2	City of Grand Rapids	City Commission approval obtained	• 2023 – Procure EVSE vendor • May 2024 – Program launch (3-years)
2.1.3	C4	Prospectus completed in 1 year	Create capitol project management plan, purchase infrastructure and vehicles, hire ambassadors, conduct community outreach

Table 8: Measure 2.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
2.1.4	GVMC, ENTF	RFP process/create a collaborative agreement	• October 2024 – Collaboration work • March 2025 – Order vehicles • January 2026 – Utilize vehicles • October 2026 – First emission reduction reports
2.1.5	Feeding America West Michigan (FAWM)[16]	Hire program coordinator, EV conversions, reporting	• First 3 months – Hire program coordinator • Annually – 5 EV conversions; partners report metrics to program coordinator
2.1.6	City of Grandville Clean Water Plant	Authority Obtained.	As soon as funding becomes available equipment will be purchased and installed.
2.1.7	City of East Grand Rapids	Authority obtained.	Order trucks. May take up to two years to receive EVs.
2.1.8	Jumson Investments & Scales Consulting, RED E Enterprises	Obtain approval from Consumers Energy to upgrade the current service to accommodate EV chargers	• June 2024 – Site preparation • September 2025 – Project completion
2.1.9	Corewell Health	Authority obtained	• Q1 2024 – Alternative Fuel Vehicle (AFV) Goal business plan approval • Q2 2024 – secure internal budget and

Table 8: Measure 2.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
			additional funding from public and private funding sources • Q3 2024 – begin planning stages for EV charging station infrastructure including our energy providers, selecting our contractor, permits, site visits, etc. • Q4 2024 - Obtain engineering designs and electrical drawings. • Q1-Q2 2025 – Construction phase for installation of EV charging stations. • Q3 2025 – Ribbon cuttings and go live.

[16] *Financing expanded food rescue network is repeated below in Measure 3.1 Action 3.1.5 as there are dual benefits of shifting to electric vehicles and reducing the production of landfill waste.*

Potential Funding Sources

The following actions have identified potential funding sources. The funding sources listed below are not confirmed and do not represent a commitment by the associated agency or any other entity. Additional funding sources will be assessed during the CCAP phase.

Action		Potential Funding Source
2.1.7	East Grand Rapids Refuse Truck and Fire Truck Electrification	City general fund

2.1.9	Corewell Health Hybrid Fleet Transition	Internal capital expenditure funding, grant funding, tax credits, and corporate incentives

Measure 2.2 Reduce miles traveled by vehicles powered by internal combustion engines

ICEs produce GHG emissions through the combustion of fossil fuels. ICEs can become more efficient but will always produce some GHG emissions. The only way to eliminate emissions from ICEs is to transition the engine to a new technology, which is the goal of Measure 2.1, or shift the way people are transported. Measure 2.2 aims to reduce ICE vehicle miles travelled (VMT) through improvements in transportation logistics or shift ICE VMT to zero-emission methods like walking and cycling. Numerous methods are available for shifting ICE VMT, including improved walking and cycling infrastructure and/or better access to public transportation. The actions presented in Table 9 are examples of implementation-ready projects in the MSA. Table 9 is not an exhaustive list of actions associated with Measure 2.2; during the CCAP phase, additional implementation-ready projects will be added, and new actions will be developed to achieve the region and state's goal of climate neutrality by 2050.

Estimate of the quantifiable greenhouse gas emissions reductions

To estimate the GHG emissions reductions below, the Project Team used the annual GHG emission reductions for each action in Table 9 and the projected timelines from Table 10. The Project Team collaborated with the submitter of each action to calculate the emission reduction assumptions or conducted a high-level quality check for each calculation. The estimation assumes that each action will be implemented. More precise emission reduction projections and data verification will be performed during the CCAP Phase.

Estimate of total quantifiable GHG emissions reductions through 2030 (MT CO_2e)	156,018
Estimate of total quantifiable GHG emissions reductions through 2050 (MT CO_2e)	1,715,848

Low Income and Disadvantaged Communities Benefits

Reducing miles traveled by vehicles powered by ICEs through Measure 2.2 holds substantial benefits for low income and disadvantaged communities, offering tangible improvements in several key aspects of daily life including, reducing high transportation expenses, improving air quality, reducing the risk of health issues, and providing pathways to new green jobs.

By reducing miles traveled and associated costs, individuals and families with limited financial resources can experience significant relief from the burden of high transportation expenses, freeing up funds for other essential needs such as housing, healthcare, and education. Moreover, enhanced fuel efficiency contributes to mitigating air pollution and improving air quality in urban areas where marginalized communities often reside, thereby reducing the risk of respiratory

illnesses and other health issues disproportionately affecting these populations. Additionally, advancements in fuel-efficient technologies and the adoption of cleaner transportation options can create job opportunities in industries related to green technologies, providing pathways to economic empowerment and stability for individuals in underserved communities. Overall, improving fuel efficiency not only addresses economic disparities but also fosters healthier environments and greater socioeconomic resilience, ultimately enhancing the overall well-being and quality of life for low income and disadvantaged communities.

Geographic Location and Impacted Low Income and Disadvantaged Communities

This measure will impact all four counties within the MSA: Kent, Ionia, Montcalm, and Ottawa. See Appendix C for associated LIDAC Census Block Identification Numbers for each county.

Metrics for Tracking Progress

The following metrics will be used to track the progress of Measure 2.2. Additional metrics may be added during the CCAP phase as existing actions are refined and new actions are added.

- Total amount of vehicles converted from ICE vehicles to AFVs
- Percentage of fleet vehicles that are AFVs
- Vehicle miles traveled for AFVs and ICE vehicles

Table 9: Measure 2.2 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		**Action Description**	**Estimated Annual GHG Emission Reduction** (MT CO_2e)
2.2.1	Multi-Jurisdictional Grand River Greenway Trail	Construct a 112-mile non-motorized trail connecting the City of Grand Haven to the City of Lowell.	77,975
2.2.2	EZBannerz	Creation of a methodology and product to install or change light pole banners without using a bucket truck.	10
2.2.3	Ottawa County Biosolid Dry Facility	The creation of a Water Reclamation Facility (WRF) regional biosolids drying facility would reduce trucking miles to and from the landfill and land application sites.	6.5

Table 10: Measure 2.2 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
2.2.1	Kent County Parks and Recreation Department and Ottawa County Parks and Recreation Department	Approval from Kent County and Ottawa County Board of Commissioners already received.	Design is already underway, with construction to begin in 2025. Estimated completion in 2028.
2.2.2	Multiple municipalities, DDAs and electric utilities	Start with existing banner users and convert them.	Ready for immediate implementation following agency approval.
2.2.3	Holland Board of Public Works[17]	Operations contract by 2027 at the latest	Under construction by 2026 and operational by 2028.

[17] *The Ottawa County Biosolid Dry Facility is repeated below in Measure 3.1 Action 3.1.4 as there are dual benefits of reducing miles traveled by vehicles powered by internal combustion units and reducing the production of landfill waste.*

Potential Funding Sources

No potential funding sources have been identified for this measure.

4.3 Waste

Measures within this category specifically address GHG emissions within the waste sector. Regionally, 1% of GHG emissions result from waste. Collectively the measures below have the potential to annually reduce regional waste GHG emissions by 38,898 MT CO2e.

Measure 3.1 Reduce the production of landfill waste

GHG emissions are constantly emitted from the waste stream due to the decomposition of waste and the transportation of waste. Measure 3.1 aims to reduce the production of landfill waste because when waste is sent to a landfill it produces the most GHG emissions relative to other waste disposal methods (e.g., reducing waste, composting, recycling). Reducing the amount of landfill waste can also have significant co-benefits like reduction in air pollution and water pollution. The actions presented in Table 11 are examples of implementation-ready projects in the MSA. Table 11 is not an exhaustive list of actions associated with Measure 3.1; during the CCAP phase, additional implementation-ready projects will be added, and new actions will be developed to achieve the region and state's goal of climate neutrality by 2050.

Estimate of the quantifiable greenhouse gas emissions reductions

To estimate the GHG emissions reductions below, the Project Team used the annual GHG emission reductions for each action in Table 11 and the projected timelines from Table 12. The Project Team collaborated with the submitter of each action to calculate the emission reduction assumptions or conducted a high-level quality check for each calculation. The estimation assumes that each action will be implemented. More precise emission reduction projections and data verification will be performed during the CCAP Phase.

Estimate of total quantifiable GHG emissions reductions through 2030 (MT CO_2e)	686,549
Estimate of total quantifiable GHG emissions reductions through 2050 (MT CO_2e)	5,038,517

Low Income and Disadvantaged Communities Benefits

Reducing the production of landfill waste through Measure 3.1 yields numerous benefits for LIDACs across various fronts including mitigating pollution, reducing costs associated with waste management, improving air quality, creating green job opportunities, and providing healthier food options.

Firstly, diverting waste from landfills through recycling, composting, and other sustainable waste management practices helps mitigate environmental pollution and conserves valuable resources, contributing to healthier living environments for LIDAC residents. Additionally, by reducing the

volume of waste generated, communities can lower the costs associated with waste management, leading to financial relief for residents who often bear the burden of waste disposal expenses. Moreover, minimizing waste accumulation helps improve air quality by reducing the decomposition of organic matter in landfills, thereby mitigating the release of harmful gases and pollutants into the atmosphere, which is particularly beneficial for LIDACs disproportionately affected by environmental hazards. Furthermore, initiatives focused on waste reduction and management create apprenticeship and job opportunities, offering valuable training and employment prospects for individuals in LIDACs, thereby fostering economic empowerment and community development. Lastly, food rescue programs targeting food-insecure populations not only provide access to healthier food options but also address food waste issues, serving as a resource for LIDACs by ensuring food security and nutritional well-being. Overall, reducing waste production represents a multifaceted approach to improving the quality of life and fostering resilience in LIDACs by addressing environmental, economic, and social challenges simultaneously.

Geographic Location and Impacted Low Income and Disadvantaged Communities

This measure will impact all four counties within the MSA: Grand Rapids, Kent, Ionia, and Ottawa. See Appendix C for associated LIDAC Census Block Identification Numbers for each county.

Metrics for Tracking Progress

The following metrics will be used to track the progress of Measure 3.1. Additional metrics may be added during the CCAP phase as existing actions are refined and new actions are added.

- Cubic yards of compost
- Amount of Food scraps diverted from WTE
- Pounds of materials recycled
- Amounts of end products created
- Tons of materials diverted

Table 11: Measure 3.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		**Action Description**	**Estimated Annual GHG Emission Reduction** (MT CO_2e)
3.1.1	Kent WTE Facility Emissions Equipment Upgrade	Replacing the Emissions Control System at the Waste to Energy Plant, continuing operation and reducing the amount of waste sent to landfills.	98,800

Table 11: Measure 3.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction ($MT CO_2e$)
3.1.2	Kent County Anaerobic Digester	Biodigester constructed in Kent County pulling 140,000 tons of organics in MSW stream, and 95,000 tons of source separated organics in West Michigan Waste Shed.	79,900
3.1.3	Food Loss & Waste Reduction	Divert food and food waste into meals, compost and other beneficial products along with helping businesses and residents prevent food waste through transformative investments in food loss and waste reduction solutions.	27,621
3.1.4	Ottawa County Biosolid Dry Facility	The creation of a WRF regional biosolids drying facility would reduce the amount of solids being landfilled and land applied.	4,536
3.1.5	Finance Expanded Food Rescue Work	Rescues short shelf-life or distressed food and quickly transports it to food access sites for freely sharing with food insecure populations, where the food would otherwise go to waste.	4,400
3.1.6	Public Thread X	Community-based upcycling, design, and innovation lab to reduce textile waste and remanufacture into upcycled goods.	1,822
3.1.7	Goodwill Textile Recycling	Collection, sorting, de-trimming, and recycling textiles.	321
3.1.8	City of Grand Rapids – Multi-Family Recycling Program	Offering recycling at the Grand Rapids Housing Commission's various locations.	190

Table 11: Measure 3.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction ($MT CO_2e$)
3.1.9	Grand Rapids Regional Compost Program	Expansion of yard waste composting facility to allow for the composting of food waste. This project would reduce the amount of waste sent to local landfills.	8.4

Table 12: Measure 3.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
3.1.1	Kent County Department of Public Works	1. Promulgated revised Maximum Achievable Control Technology for MSW combustors November 2024 as published in the Federal Register. 2. RFQ issued by Kent County Fiscal Services – Purchasing Division 3. Approval by Kent County Board of Public Works Contracts and notice to proceed	• 2025 - Engineering design package • 2026 - Permit modifications, project bidding, contract(s) awarded; equipment orders placed • 2027 – New emission controls equipment delivered and installed - lowered GHG emissions

Table 12: Measure 3.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
3.1.2	Kent County Dept. of Public Works and Kent County	Kent County Board of Commissioners approval	• Q4 2024 – Approval by Kent County Board of Commissioners • Q1 2025 – Finalize design and permits • Q2 2025 – Contracts and notice to proceed • Q2 2027 – Facility construction complete • Q3 2027 – Facility startup and shakedown
3.1.3	Multiple municipalities supported by regional and national NGOs	Resolutions/letters of support from participating municipalities	Goal of 5,000 tons of food waste diverted from waste stream within the first year
3.1.4	Holland Board of Public Works	Operations contract by 2027 at the latest.	Under construction by 2026 and operational by 2028.
3.1.5	FAWM	Hire program coordinator, EV conversions, reporting	• First 3 months – Hire program coordinator • Annually – 5 EV conversions; partners report metrics to program coordinator
3.1.6	Public Thread and partners/vendors	Authority obtained	LCAs and DECLARE labeling are near-term milestones. The creation of textile credits is a longer-term goal.

Table 12: Measure 3.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
3.1.7	Goodwill, in partnership with Harvest Nano	Need approval from local Goodwill CEO	Start with pilot in Summer 2024, and a 10x operations size increase in the year following.
3.1.8	City of Grand Rapids	Authority obtained	Project launch May 2024 with Grand Rapids Housing Commission. 6-12 months on return data.
3.1.9	City of Grand Rapids	EGLE standards for site to be met, RFP on purchase which is 3 months after approval	Goal of 50,000 lbs. of food waste diverted from waste stream within first year.

Potential Funding Sources

The following actions have identified potential funding sources. The funding sources listed below are not confirmed and do not represent a commitment by the associated agency or any other entity. Additional funding sources will be assessed during the CCAP phase.

Action		Potential Funding Source
3.1.7	Goodwill Textile Recycling	$1 M committed to pilot project from Goodwill Industries of West Michigan and EGLE Infrastructure Grant

4.4 Sequestration

Measures within this category sequester GHG emissions. GHG gas sequestration is a process that involves removing and storing atmospheric GHG gases, which ultimately results in lowering the overall amount of GHGs in the environment. Unlike the other categories, sequestration measures do not target a specific sector; instead, they aim to reduce the total GHG emissions for the entire region. Collectively the measures below have the potential to reduce regional GHG emissions by 350,685 MT CO_2e through sequestration.

Measure 4.1 Sequester greenhouse gas emissions

GHG emissions can be reduced by sequestering carbon through either natural processes, such as photosynthesis and respiration in plants, or through carbon capture technology. Both methods offer significant benefits, but technological sequestration can be costly and is not yet as reliable as natural sequestration. The actions presented in Table 13 are examples of implementation-ready projects in the MSA. Table 13 is not an exhaustive list of actions associated with Measure 4.1; during the CCAP phase, additional implementation-ready projects will be added, and new actions will be developed to achieve the region and state's goal of climate neutrality by 2050.

Estimate of the quantifiable greenhouse gas emissions reductions

To estimate the GHG emissions reductions below, the Project Team used the annual GHG emission reductions for each action in Table 13 and the projected timelines from Table 14. The Project Team collaborated with the submitter of each action to calculate the emission reduction assumptions or conducted a high-level quality check for each calculation. The estimation assumes that each action will be implemented. More precise emission reduction projections and data verification will be performed during the CCAP Phase.

Estimate of total quantifiable GHG emissions reductions through 2030 (MT CO_2e)	1,121
Estimate of total quantifiable GHG emissions reductions through 2050 (MT CO_2e)	5,255,561

Low Income and Disadvantaged Communities Benefits

Sequestration through carbon capture technologies and tree planting initiatives offer significant benefits to LIDACs by addressing various environmental and public health challenges including, increasing access to green spaces, decreased risk of flooding, improving air quality, and reducing negative health conditions from air pollution.

Firstly, carbon capture helps mitigate climate change by capturing and storing carbon dioxide from GHG emissions, thereby reducing the overall carbon footprint of energy production, and

contributing to global efforts to limit GHG emissions. Concurrently, planting trees increases access to green spaces in nature-deprived locations, providing opportunities for recreation, relaxation, and community engagement while fostering biodiversity and enhancing urban aesthetics. Moreover, tree planting initiatives contribute to reducing the risk of flooding by stabilizing soil, absorbing excess rainwater, and mitigating the impact of stormwater runoff, thereby enhancing community resilience to extreme weather events and safeguarding against flood-related damages. Additionally, these efforts improve air quality by sequestering carbon dioxide and other pollutants, which helps mitigate respiratory illnesses and other negative health conditions associated with air pollution, particularly prevalent in LIDACs disproportionately affected by environmental hazards. By addressing climate change, enhancing green infrastructure, and promoting public health, sequestration offers holistic solutions to improve the overall well-being and quality of life in LIDACs.

Geographic Location and Impacted Low Income and Disadvantaged Communities

This measure will impact two counties within the MSA: Kent and Ottawa. See Appendix C for associated LIDAC Census Block Identification Numbers for each county.

Metrics for Tracking Progress

The following metrics will be used to track the progress of Measure 4.1. Additional metrics may be added during the CCAP phase as existing actions are refined and new actions are added.

- Trees planted
- Trees watered
- Survival rate of trees
- Tree canopy coverage percentage
- Plant stack emissions

Table 13: Measure 4.1 Action Descriptions & Estimated Annual Greenhouse Gas Emission Reductions

Action Title		Action Description	Estimated Annual GHG Emission Reduction (MT CO_2e)
4.1.1	Carbon Capture at Holland Energy Park	Holland's natural gas power plant will need carbon capture technology within 15 years due to Michigan's new energy laws.	350,000

4.1.2	Grand Rapids Environmental Justice Tree Project (FGRP)	Planting 25,000 trees throughout the GVMC region in CEJS areas, while creating 60 seasonal jobs for 5-7 years.	425
4.1.3	Grand Rapids Environmental Justice Tree Project (C4)	C4 seeks CPRG funding to fulfill its roles within FGRP's project submission (4.1.1) for community engagement and outreach, Justice40 integration, youth engagement & leadership development.	
4.1.4	City of Grand Rapids – Tree Planting	Over the next 5 years, Friends of Grand Rapids Parks is planning to plant close to 15,000 trees, half of which would come from CPRG funding.	260

Table 14: Measure 4.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	**Implementing Agency or Agencies**	**Milestones for Obtaining Implementing Authority**	**Implementation Schedule and Milestones**
4.1.1	Holland Board of Public Works	Authority obtained	Construction would start as early as 2033.
4.1.2	FGRP	Agreements signed with the municipality	• Notification of Grant - Outreach to municipalities, vacant site analysis, recruit volunteers, contact tree suppliers • Grant Period Begins – Site analysis, create timeline of plantings, hire foresters, begin education in schools, plant trees, repeat annually • Grant Period Ends – Tree maintenance 2+ years

Table 14: Measure 4.1 Action Implementing Agencies, Milestones for Obtaining Implementing Authority, & Implementation Schedules

Action	Implementing Agency or Agencies	Milestones for Obtaining Implementing Authority	Implementation Schedule and Milestones
4.1.3	C4	Agreements signed with the municipality	Outreach to marginalized communities, community events, facilitate stakeholder input, lead Justice40 assessment, develop & implement equity & inclusion strategy, establish/manage youth green teams, provide training and mentorship
4.1.4	City of Grand Rapids, in partnership with FGRP	Publicly available land is not sufficient, so FGRP is incorporating private land plantings to accommodate.	FGRP will begin planting 7,500 trees under US Forestry grant over five years beginning in 2024.

Potential Funding Sources

The following actions have identified potential funding sources. The funding sources listed below are not confirmed and do not represent a commitment by the associated agency or any other entity. Additional funding sources will be assessed during the CCAP phase.

Action		Potential Funding Source
4.1.4	City of Grand Rapids Tree Planting	US Forestry Grant

5 Next Steps

The PCAP is the first phase of the CPRG process, the next phase of the process is the development of the CCAP. The CCAP will be complete in July 2025 and will build on the framework developed in the PCAP. The CCAP will include an update of all sections within the PCAP and contain new Sections.

5.1 Updated Sections

During the CCAP phase the Project Team will update each section included in the PCAP.

Greenhouse Gas Inventory

The GHG inventory will be updated to include all significant GHG sources and sinks based on the GPC BASIC+ framework (the PCAP followed the GPC BASIC framework). This includes additional sectors, sub-sectors, and scopes. The inventory in the CCAP will include the Industrial Processes and Product Use (IPPU) sector, consisting of two sub-sectors broken out: 1) industrial processes and 2) product use. The second additional sector considered will be Agriculture, Forestry and Other Land Use (AFOLU), consisting of three sub-sectors: 1) livestock 2) land and 3) aggregate sources and non-CO_2 emission sources on land.

In addition, the GHG inventory will expand on the Stationary Energy and Transportation sectors by including scope 3 GHG emissions, those generated outside the geographic boundary but consumed within the geographic boundary. Lastly, with the extended timeframe, all sector and subsector calculations will be refined and based on more granular data collection.

Low Income and Disadvantaged Communities Analysis

LIDAC analysis will continue to be a key feature of the CCAP which includes continued and expanded engagement. The project team is actively working with the LAC to determine the best approach to engage the wider LIDACs throughout West Michigan during the CCAP phase. The LAC has been brainstorming different ways to engage with the community, and it has been agreed that attending community events, such as neighborhood events and festivals, is essential. By participating in these events, the team can share information and collect feedback through interactive activities. The LAC has also discussed holding focus groups in LIDAC communities to provide feedback on the CCAP, which would take the form of a facilitated exercise or discussion. Finally, the LAC has recognized the importance of information sharing and plans to work with neighborhood associations and community organizations to include CPRG engagement opportunities in their newsletters and social media channels.

In addition to expanded engagement, the Project Team will include the following in the CCAP LIDAC Benefits Analysis:

- A qualitative discussion and quantitative assessment of the expected benefits to LIDACs associated with each GHG reduction measures included in the CCAP.

- The proportion of benefits expected to accrue in the identified communities as compared to the total benefits resulting from the GHG emission reduction measures described in the CCAP.
- A summary of the stakeholder input received and how the input was incorporated.

Quantified Reduction Measures

Throughout the PCAP process the Project Team will develop new reduction measures and update existing reduction measures to achieve the goal established by the MI Healthy Climate Plan. CCAP reduction measures will be formatted in the same way as PCAP measures, but it is expected for there to be multiple new measures and actions.

5.2 New Sections

During the CCAP phase the Project Team will develop multiple new sections that will add additional depth and context to the plan.

Greenhouse Gas Emissions Projections

The Project Team will develop near-term (2030) and long-term (2050) GHG emissions reduction projections. For near- and long-term projects the Project Team will create two scenarios. First, the Project Team will project both regional GHG emissions and sinks in the absence of CCAP measures and GHG emissions under a scenario where the CCAP is fully implemented.

Greenhouse Gas Reduction Targets

The Project Team will develop near-term (2030) and long-term (2050) economy-wide GHG emission reduction targets in-line with the MI Healthy Climate Plan. The targets will be consistent with the United States' commitment to reduce GHG emissions 50-52% relative to 2005 levels by 2030 and to reach net-zero GHG emissions by 2050.

Benefits Analysis

For each reduction measure in the CCAP, the Project Team will quantify co-pollutant reductions (e.g., PM2.5, NOx, SO2, VOCs, air toxics, etc.) and/or other benefits associated with the reduction measure.

Intersection with Other Funding Availability

The Project Team will identify what other funding programs are available to the action implementing agencies or have been secured by action implementing agencies from federal, state, local and private sources.

Workforce Planning Analysis

The Project Team will conduct an analysis of anticipated workforce shortages that could prevent action implementing agencies from achieving the goals described in the CCAP and identify

potential solutions and partners at the state, regional, and/or local level that are equipped to help address those challenges.

Appendix A: Action Descriptions

The descriptions below appear exactly how they were submitted to the Project Team.

Action 1.1.1: City of Grand Rapids Solar on Municipal Property (landfill)

The City of Grand Rapids proposes a solar project on the Butterworth Landfill. This project uses a 16 MW solar estimate for a 25,710 MT CO_2e reduction. The proposed timeline ranges from 12-30 months depending on the final size of the project. In addition to air pollutants being eliminated, there is an estimated 62.8% reduction by 2030 in GHG emissions. As a U.S. Superfund site, the Butterworth Landfill requires compliance with consent decree and ballasted panels, leading to a higher estimated cost of $45M. This falls into Tier D: $10-50 million.

Action 1.1.2: Electrification of the Grand Rapids Steam District

Vicinity Energy proposes electrification of the Grand Rapids steam district with renewable energy from solar at Butterworth landfill. This would effectively reduce the GHG impact of large, older buildings in the downtown core by up to 60% without expensive retrofits of individual properties. These discussions are already underway with both Vicinity and with Consumers Energy. The project would have an immediate local GHG impact with benefits for several downtown-adjacent target areas, including Black Hills, Roosevelt Park, and John Ball neighborhoods. The cost estimate of this project is $4.27M, which falls into Tier E: $2-10 million.

Action 1.1.3: Waste to Energy Steam Interconnect Replacement

Kent County DPW and Vicinity Energy propose this project to export steam from WTE to the downtown heating district, partially displacing natural gas use in the boilers, as a part of a larger effort to help the City of Grand Rapids meet its sustainability and climate goals. The existing steam interconnect, installed by Kent County in 1990, would need to be replaced to export steam. Assuming the WTE is interconnected to the DHCO and supplies on average 30,000 lbs/hr of steam to the district at an availability of 90%, this would displace roughly 44% of the current annual customer load that is provided by natural gas (approximately 236,500 Mlbs of steam), which at average efficiencies will result in approximately 16,600 MT CO_2 avoided. The cost estimate of this project is $15M, which falls into Tier D: $10-50 million.

Action 1.1.4: Kent County Landfill Solar

Kent County proposes solar installations at three separate landfills: Sparta Landfill, North Kent Landfill, Kentwood Landfill. The process is scheduled over the span of four years:

- 2024 – RFP by Kent County Fiscal Services – Purchasing Division
- 2025 – Board of Public Works approval and contracts awarded
- 2026 – Site engineering and public engagement, EGLE due diligence and due care
- 2027 – Interconnection agreements, construction underway

- 2028 – Commercial operation

The combination of solar at the three landfill sites would create an avoidance of GHG emissions of approximately 15,123 MT CO_2e/year. The cost estimate for this action is $42M, which falls into Tier D: $10-50 million.

Action 1.1.5: Solar Park on Brownfields

This project seeks grant funding to create an inventory and feasibility of solar on Brownfield opportunities on public properties in GVMC's region as a strategy to increase renewable energy on the distribution and sub-transmission grid. By doing so, this will benefit resiliency and local communities, as well as to help state and national clean and renewable energy goals be achieved. The goal is to create policy coordination and best practices shared between State and other Brownfield authorities at the county level. A site inventory will be created ranking high probability sites into tiers, based upon various criteria: type of Brownfield, size of Brownfield, proximity to exiting utility infrastructure, legal clarity of ownership, community support, etc. A public-facing protocol will be created to codify solar development including de-risking and de-costing, to achieve higher cost effectiveness than greenfield developments.

When calculating GHG reductions, viable Brownfield acreage for solar panels was only considered if there was a minimum of 10 acres available. Using GIS Open Data on Brownfields in Michigan, it was determined there were 1,110 acres available, of which 30-50% were deemed viable for solar installation, assuming 5 MW usage per acre. Four hours of peak sunlight per day was assumed from the National Renewable Energy Laboratory, at 20% panel efficiency. The cost estimate for this action is $970,000, which falls into Tier E: $2-10 million.

Action 1.1.6: City of Wyoming Anaerobic Digester

The City of Wyoming is currently working on a digester feasibility study in collaboration with Donohue and Associates, Inc. This study is expected to be finished by early 2024. At present, biosolids are either dewatered and disposed of in landfills (which accounts for around 25% of the total disposal volume) or applied to local farm fields (which accounts for around 75% of the total disposal volume). The introduction of a digester to the City's Clean Water Plant is anticipated to significantly reduce disposal volumes, generate energy, and decrease GHG emissions. Additionally, this process will result in a byproduct that can be beneficially reused on agricultural lands. The estimated cost of this action is $50 million, which falls into Tier D: $10-50 million.

Action 1.1.7: City of Grand Rapids Community Solarize Program

The City of Grand Rapids is proposing a 5-year program to solarize 200 residential homes annually in partnership with the GLREA and solar developers. The program aims to accommodate 200 homes each year and reduce 10,609 MT CO_2e over the course of 5 years. One full-time city staff will manage the program. Additionally, there is interest in increasing the number of LIDAC households and subsidizing the cost of solar panels. The progress of the program will be tracked

by keeping a record of the number of homes and energy saved. The program will continue to run as long as funding stays available. The estimated cost of the project is $624,485. If the program expands to include subsidies for LIDAC communities, the GHG reduction will increase to 21,208 MT CO_2e, and the project cost will increase to $21M. This falls into either Tier E: $2-10M or for the larger program Tier D $10-50 million.

Action 1.1.8: Harbor Island Community Solar

The City of Grand Haven proposes a community solar project on the Grand Haven Board of Light and Power's approximate 10-acre Harbor Island property of the J.B. Sims coal plant Brownfield site. It is envisioned that the community solar array/garden would be built in stages based on participation of anchor client(s), community participants and local non-profits. A grant from the CPRG would be extremely beneficial in moving this project forward. After simulation for power, it was determined the output would be 4.0 GWh per year, which is sufficient for ~ 600 average Grand Haven Board of Light and Power residential customers. The fully subscribed array would have 2.63 MW of solar panels. The site is owned by the City of Grand Haven and is within a coal community energy census tract so a project could receive an additional 10% incentive from the federal government's IRA program in addition to the other eligible incentives. The proposed project would reduce CO_2 emissions by 2,498 MT/year.

The SIMS site is rated as the 23rd worst contaminated coal power plant site in the U.S. The coal plant was torn down about 2 years ago. This ranking is likely due to its unique history as a city dump and coal power generating site using both unlined and lined CCR retention ponds. Grand Haven was also the home of Eagle Ottawa leather for many decades. It was the largest producer of automotive leather and used PFAS based chemicals. The total cost estimate for this action is $10.2M, which falls into Tier D: $10-50 million.

Action 1.1.9: Finance Low Income and Disadvantaged Communities - Serving Nonprofit Solar

This project is planned to be administered by a non-profit organization most aligned to administer the CPRG funding solar installation on human service & housing nonprofit-owned buildings. 501(c)3 nonprofit organizations would be eligible if they are in the housing/shelter, food, agriculture and nutrition, youth development, or general human services sector. Eligible nonprofit organizations would apply for funding to install solar systems on one or more of their fully owned buildings. The funding would cover all design, acquisition, and installation costs. This project would like to install 2,700 KW worth of solar panels and target at least 37 different qualifying nonprofit buildings, which would produce over 3 million kWh and offset an estimated 2,338.9 MT CO_2e annually. An equitable selection process would be used to ensure coverage across the four areas. The Community Action House has noted interest in the role of implementing agency for this project. Upon receiving funding, they would hire the necessary staff for coordinating this work within three months. Following this, the target installation goal is 10

solar arrays per year. The total cost estimate for this action is $9,075,000, which falls into Tier E: $2-10 million.

Action 1.1.10: Solar For All

This project seeks CPRG Implementation Grant funding to equip low income and disadvantaged individuals with the tools and resources necessary to become active participants in the design of community-owned solar projects, prioritizing community education and engagement, while accelerating the work to address environmental injustices with community-driven solutions. The funding will be used primarily for the creation of good-paying jobs for low income and disadvantaged families living within EPA's CEJST geographic area.

The goal is to give communities the opportunity to own their electricity generation, to gain more democratic control over decisions about their energy systems, maximize the impacts of their financial incentives, create local resilience, and generate community wealth to benefit the local economy. The GHG reduction estimate was calculated assuming 1,012 annual subscribers = 0.15% of the Kent County population. The cost estimate for this action is $1,500,000, which falls into Tier E: $2-10 million.

Action 1.1.11: E.H. Zero Solar on Multi-Family Housing Properties

The City of Grand Rapids will use funding to identify and enter contracts with multi-family housing properties to install solar on the rooftops. The city plans to install solar on 5 properties, and solar with battery storage on 3 properties. The 8 properties will have a combined total of 320 units. Some affordable housing properties have already constructed the properties to be solar ready. After 9 months of contracting properties, another 9 months will be used to purchase equipment and install the solar, for a total 18-month timeline. The action will generate an estimated total of 1.54 million kWh. The upfront cost estimate for this action is $4.4 million, but there is an expected $1.8 million in tax credits. $2.5 million is budgeted for solar equipment and $150,000 for storage. This action falls into Tier E: $2-10 million.

Action 1.1.12: City of Grand Rapids Solar on 8 Municipal Buildings

The City of Grand Rapids aims to install solar panels on the rooftops of 8 different municipal buildings, including the City Hall, police department, and fire station. The roofs have been assessed for solar installation for five of the eight buildings and three buildings already are being designed or constructed to prepare for solar installation. The annual energy generation resulting from the installation of solar would be 1.41 million kWh, which equates to GHG emissions reductions of 987 MT CO_2e. The total cost estimate for this project is $3.2 million, which falls into Tier E: $2-10 million.

Action 1.1.13 & 3.1.2: Kent County Anaerobic Digester

This project is for the construction of an anaerobic digester in Kent County over a three-year span, which will remove 140,000 tons of organics presently in the Kent County municipal solid waste stream annually and from MSW landfills. An additional 95,000 tons of source separated organics in the West Michigan waste shed will be captured, generating 650,000 MMBTU of RNG annually. After approval by the Kent County Board of Commissioners, the design will be finalized and permits applied for, with construction completion in Q2 2027.

The cost estimate for this project is $400M, which falls into Tier A: $200-500 million.

Action 1.1.14: East Grand Rapids Community Facilities Solar Arrays

The City of East Grand Rapids is preparing to initiate turnkey solar array projects aimed at significantly reducing GHG emissions and enhancing sustainability. These roof-mounted solar arrays will be strategically placed on various city facilities, including the Municipal Complex, Library, Community Center, Public Safety buildings, and the Department of Public Works Complex.

The estimated annual GHG emissions reduction for the entire project is approximately 234 metric tons, equating to a total reduction of 5,861 metric tons of carbon dioxide over 25 years, as calculated by the EPA. Notably, the solar arrays will contribute to a 24% reduction in electrical consumption for the Municipal Complex, Library, Community Center, and Public Safety buildings. Simultaneously, the Department of Public Works Complex will achieve a remarkable 100% reduction in its electrical usage.

The City of East Grand Rapids is the implementing agency for this initiative, and the project is shovel-ready with all necessary reference materials already submitted. Implementation can commence as early as this spring, ensuring swift progress. The solar arrays will be strategically placed on city facilities within the City of East Grand Rapids.

Funding for the project is anticipated to come from a PPA or an EPA grant. To monitor progress effectively, a live website will be established to showcase real-time energy production. Additionally, utility agreement reviews will be conducted annually to ensure accurate tracking and performance evaluation.

The City of East Grand Rapids currently possesses the authority to implement this measure. In summary, the City of East Grand Rapids Community Facilities Solar Arrays project represents a comprehensive and sustainable approach to reducing carbon GHG emissions, enhancing energy efficiency, and promoting long-term environmental sustainability for the community. The estimated cost for this action ranges from $1.3 million to $2 million, which puts it in Tier E: $2-10 million.

Action 1.1.15: JustAir – Expansion of AQ Network

This project is proposed with secondary partner, C4. JustAir proposes to expand its current air quality network in Grand Rapids beyond the city to include (up to) the four wider counties in its region: Kent, Ionia, Montcalm, and Ottawa. In doing this it will build on its successful work with C4 that established a community air quality monitoring network in Grand Rapids' 49507 ZIP code, JustAir's wider Grand Rapids network, and JustAir's current project delivering an air quality monitoring network to all of Wayne County, Michigan.

From the outset it is important to note that this is submitted as a project idea only. Formal partnerships with counties have not been secured at this time, despite promising conversations with Kent County about JustAir's network expansion throughout the county. There is extreme value for adding these additional counties in terms of: creating jobs immediately at the planning phase, as well as laying the groundwork for reduced energy costs for families and businesses and cleaner air by reducing air pollution across West Michigan. The goal is to bring together regional stakeholders to collaborate on a formal proposal with much greater preliminary engagement from the four counties in the region.

An expansion of JustAir and C4's work to wider West Michigan would build on these successful elements and introduce new ones. JustAir and C4's success makes a potential multi-county expansion not only shovel ready but critical in the planning phase of greenhouse gas reduction projects, since air quality monitoring effectively maps air pollution zones (which strongly correlate with climate pollution). Moreover, one of the benefits of community level air quality monitoring is its ability to demonstrate the potential and real impact of projects through pre- and post-analysis of areas slated for greenhouse gas reduction projects. A network within a four-county region can effectively alert residents to air quality issues, but also gather targeted data on larger, more geographically distributed sources than a tight urban monitoring network can.

With Planning Grant funding, JustAir and C4 would bring localized air quality monitoring to new counties, strengthening the West Michigan network for data purposes, equipping more residents, and critically, providing greater insight into the range of greenhouse gas sources within this four-county region. This scale of project would allow local governments the ability to take a targeted approach to data collection at sites of interest for CPRG projects.

This project would allow for air quality monitoring, community engagement and education, air quality data analysis, and best-in-class reporting and recommendations to ensure air quality data is used to create change. In addition, this project would further upskill and empower local workers into the green economy by developing local training and employment opportunities for air quality monitoring installation and maintenance. The cost estimate of this project is $4M, which falls into Tier E: $2-10 million.

Action 1.2.1: Corewell Health Energy Efficiency

Corewell Health's Energy Director and the Facilities team will be focusing on energy efficiency projects and upgrading aging energy related infrastructure. There are three different upgrading projects they hope to achieve.

The Lemmon Holton Cancer Pavilion will receive updated LED lighting and HVAC controls. This will lead to a GHG emissions reduction of 878 MT CO_2e, or a 19% reduction from 2023 GHG emissions. The target date for implementation is July 1st, 2025, and the cost is estimated at $1,500,000.

The Grand Rapids Medical Center will receive energy efficiency infrastructure improvements resulting in 1,700 MT CO_2e in reductions, or 5% reduction from 2023. The cost estimate for the project is $7,000,000 and the target implementation date is January 1st, 2026.

The Blodget Hospital will also receive energy efficiency infrastructure improvements resulting in 1,600 MT CO_2e in reductions, or 9% reduction from 2023. The cost estimate for this project is $3,200,000 and the target implementation date is January 1st, 2026.

The total cost of this action is $11,700,000, which falls into Tier D: $10-50 million.

Action 1.2.2: City of Grand Rapids – Water Utility Efficiency

The processing and transport of potable water and sewage are extremely energy intensive processes. At the City of Grand Rapids, the filtration and supply of potable water accounts for approximately 35% of total municipally generated GHG emissions and the transport and processing of wastewater accounts for an additional 20%. Together, the City's two water utilities account for 55% of all municipally generated GHG emissions. It is important to note that these calculations only account for GHG emissions generated by customers located in the City of Grand Rapids, and the water utilities service many customer communities that further increase the amount of energy consumed and GHG emissions generated by water and sewer services. Finally, this strategy applies across the entire four-county region for all municipal water and sewer utilities.

The City of Grand Rapids would release an RFP for professional services to conduct energy audits, identify efficiency opportunities, and estimate costs to achieve a 10% electricity reduction for both the Water Filtration Plant and Water Resource Recovery Facility. The cost estimate for this project is $5M, which falls into Tier E: $2-10 million.

Action 1.2.3: Holland Home Energy Education

The Holland Board of Public Works and Holland Energy Fund currently operate a Home Energy Education Program that financially assists residents in completing energy improvements in their homes. Assuming 5,000 participating residents, the avoided GHG emissions from electricity and

gas energy efficiency implementation totals 1,800 MT CO_2e. In the first year of existence, the project reached over 300 customers. A goal of 5,000 participants in the next 10 years represents a fifth of the total residential electric utility customers in the city. For 3 years following the education visit, the participant's gas and electricity usage are tracked. Each home receives $300 in energy efficiency materials, and the program pays auditors $200 per home visit, for a total cost of $500 per home, or an estimated $2,500,000 for 5,000 participants. This falls into Tier E: $2-10 million.

Action 1.2.4: Net Zero Kent County Admin Building

Kent County will be building a new administrative building and aims to make it the first net-zero county administration building in Michigan. This includes infrastructure for partial electrification of the county's fleet. The new facility would be located within the Grand Rapids 2030 district. Neutralizing carbon from the new building will lower operating costs and bolster community vibrancy as it serves a population of over 650,000 and accommodates over 30,000 onsite visits per year. Design for the 100,000 square foot building will commence in 2024, with 18 months of construction beginning in spring of 2025, and the building will be fully operational in 2027. The total cost estimate for this action is $100 million, which falls into Tier C: $50-100 million.

Action 1.2.5: E.H. Zero Home Repair Program

This project aims to create a model for retrofitting older homes to be carbon neutral and all-electric ready. A secondary goal of the program is to leverage existing resources such as weatherization and utility programs for a whole homes approach that streamlines the application processes for residents. The City of Grand Rapids plans for a nine-month process to identify and enter into contracts with properties, purchase equipment and install solar. The estimated cost of this action is $2.6M with tax credits, $4.4M without tax credits, which falls into Tier E: $2-10 million.

Action 2.1.1: City of Grand Rapids Fleet Electrification

The project would consist of replacing the City of Grand Rapids' current fleet with all electric (as currently offered) vehicles. Grand Rapids would collaborate with other municipalities, Consumer's Energy, Grand Rapid's electric circuit, vehicle/equipment vendors, and charging infrastructure providers to complete the project. This project is in the design and engineering phase. EPA's GHG reduction would be 3,249 metric tons according to EPA.gov. Decreased GHG emissions from an electrified city fleet would generate healthier communities. The total cost is approximately $172.4 million, which falls into Tier B: $100-200 million.

Action 2.1.2: City of Grand Rapids EV Carshare Expansion

The City of Grand Rapids is currently investing in an equity-driven community carshare program. Further funding would increase the fleet by 50% and fund a study for long-term sustainability of the program with community-driven ownership. The City Commission has previously approved

and funded the pilot program, and increased funding would allow them to increase timeline and contract spend. The current program is set to launch in May 2024 and run through May 2027. The success of the program will be tracked by studying travel patterns, member feedback, public input, etc. This project is estimated to reduce 2,807 MT CO_2e. The total cost estimate for this action is $2 million, which falls into Tier E: $2-10 million.

Action 2.1.3: C4EVR

C4 has introduced the C4EVR program, an EV rideshare initiative aimed at reducing greenhouse gas emissions, fostering climate justice awareness, and establishing EV infrastructure to transform Grand Rapids. Situated in Michigan, an automotive hub, Grand Rapids provides a unique opportunity for C4 to forge partnerships with major car and battery manufacturers like Ford and General Motors. The collaboration extends to various sectors, including EV chargers, battery storage, infrastructure installation, electrical worker unions, software applications, EV mechanics, carwashes, insurance companies, banks, and government entities at different levels.

While EV prices have decreased, they remain inaccessible to frontline communities. C4EVR addresses this issue by focusing on frontline engagement, offering education, employment, and rides. BIPOC drivers undergo comprehensive training, gaining expertise in EVs, climate justice, and community solutions. These drivers become ambassadors, educating the community at schools, events, houses of worship, festivals, and other gathering places. The capital project for C4EVR centers around a neighborhood of focus, serving as an education center with infrastructure for 10 EVs. This site showcases education, green workforce development, and green entrepreneurship. Media vignettes will document every aspect of the program, promoting the climate justice message widely.

C4EVR plans to acquire a property meeting government EJ screening criteria, renovating it into a climate justice and EV education center with a resilient storage garage. The emphasis is on energy efficiency, utilizing advanced insulation, reflective roofing, efficient appliances, and green infrastructure, including solar panels and EV chargers. To implement this vision, a detailed plan outlines project development stages, partnerships, and collaborations with various stakeholders. Grant funds will cover property acquisition, building renovation, staffing, training, EV procurement, electrical system upgrades, charging station installation, and community outreach. The plan also accounts for rideshare driver training, team building, program launch events, evaluation processes, and ongoing support for frontline communities. Additionally, the grant will be leveraged to attract matching funds and collaborators, magnifying the program's impact. Expertise in grant writing, rideshare systems training, budget development, personnel management, real estate development, EV training, software customization, media production, website management, advertising, debt service, and human resources training will be crucial for successful implementation.

When calculating GHG reductions, the shift to 10 EVs was assumed, running 16 hours/day, 6 days/week. The cost estimate for this project is $20M, which falls into Tier D: $10-50 million.

Action 2.1.4: Kent County Essential Needs Task Force EV Fleet Shift

The Kent County Essential Needs Task Force aims to establish a fleet of electric vehicles that will be used to partially replace and expand existing transportation services for LIDAC community members who face transportation disadvantages such as not owning a vehicle or having a disability. The GHG emissions reductions would be around 247 MT CO_2e per year in Kent County alone, with hopes to expand into the other counties in the region. The Task Force would work with GVMC to implement the electric vehicles. The Task Force would put together a collaborative agreement between the agencies operating each fleet, which would lay out the timeframes for ordering and beginning to utilize EVs in the fleets. Collaboration would begin in October 2024, and the Task Force would begin ordering vehicles in March 2025, with the hopes of beginning to utilize the vehicles in January 2026. By October 2026, they expect to have first reports of GHG emissions reductions from the partner agencies. The Task Force would track the miles traveled by the EVs and the number of residents served with the expanded fleet. The total cost estimate for this action is $15,530,000, which falls into Tier D: $10-50 million.

Action 2.1.5 & 3.1.5: Finance Expanded Food Rescue Work

This project is planned to be administered by a non-profit organization most aligned to administer the CPRG funding and food rescue vehicles into the region's key food rescue entities. The food being 'rescued' is diverted from landfills, significantly reducing food waste and greenhouse gases. By reducing the amount of still wholesome food that goes to landfills through food rescue, the impact is doubled - environmentally there are significant emission reductions, and food insecurity can be addressed with wholesome, fresh/perishable, healthy food options that are otherwise often less obtainable in traditional emergency food systems.

The nonprofits undertaking food rescue work in the four GVMC counties annually divert millions of pounds of food from landfills while supporting food insecure neighbors. A significant portion of their expenditures are operating costs of refrigerated food rescue trucks. By fully funding a conversion of local truck routes to EV refrigerated box trucks, food rescue can be sustained and expanded. This will free up nonprofit resources formerly developed to more expensive maintenance and fuel purchase requirements of ICEs.

The cost estimate for this project is $7.37M, which falls into Tier E: $2-10 million.

Action 2.1.6: Grandville Water Plant Biogas EV Charging & Fleet Electrification

Grandville plans to switch from gasoline-powered vehicles to electric vehicles for their fleet. As part of this plan, the plant intends to install a charging station at the CWP that will have both normal and fast-charging stations, which may include battery storage to reduce the impact of peak demand. These charging stations will be available to the newly implemented CWP electric fleet and the general public. In addition, the electrification of two diesel utility vehicles (John

Deere gators) would bring the GHG reduction total to 210 MT CO_2e annually. The cost estimate for this action is $1,217,000, which falls into Tier E: $2-10 million.

Action 2.1.7: East Grand Rapids Refuse Truck and Fire Truck Electrification

The City of East Grand Rapids plans to purchase two refuse trucks and one fire truck, which will be classified as Class 7 and Class 8 electric vehicles. The main aim of the project is to reduce GHG emissions, and the estimated quantifiable reduction in GHG emissions is 193.9 metric tons annually, which amounts to 2,908.5 metric tons for a period of 15 years (end lifecycle untested for class 7 and 8 EV trucks). The City of East Grand Rapids will be the implementing agency for the project. The implementation schedule and milestones will begin once the funding is approved and the EVs may take up to two years to receive. The project is in East Grand Rapids, and the funding sources include EPA grant, city general fund, and MERF. The project progress will be tracked by fuel usage and offset by city solar and wind RECs for carbon neutrality on the electric side as well. All participating organizations have the authority to implement this measure, and the project cost is estimated to be $3,800,000, which falls into Tier E: $2-10 million.

Action 2.1.8: Low Income and Disadvantaged Communities EV Charging Infrastructure

Scales Consulting aims to partner with Jumson Investments LLC, The Adinkra Group, RED E. (EV charging station provider), KIGT eChargers, Arcimoto, and other potential collaborators, to support LIDAC by providing accessible, affordable, and clean EV charging solutions. The project includes the installation of 16 Level 3 chargers and four Level 2 chargers, as well as conducting learning sessions on EVs and career opportunities with local youth. Funding will also be used to pilot Arcimoto EVs for potential scalability. Other potential avenues for EV usage include tourist rentals, car sharing, last-mile delivery, and emergency response. The timeline for the project spans from May 2024 through May 2026, and will include the installation and launching of charging stations, community learning sessions, Arcimoto pilot, evaluation of the project's impact, and gathering feedback. The total cost estimate for the action is $2 million, which falls into Tier E: $2-10 million.

Action 2.1.9: Corewell Health EV/Hybrid Fleet Transition

Corewell Health is undertaking a transformative initiative aimed at sustainability and environmental responsibility. Aligned with the Healthcare Anchor Network (HAN) Impact Purchasing Commitment AFV fleet goal, the organization is committed to transitioning at least 50% of its newly acquired or leased fleet vehicles to alternative fuel options, including EVs and hybrids, by fiscal year 2025. This strategic move not only contributes to significant cost savings, including reduced fuel and maintenance expenses, but also addresses environmental concerns by curbing GHG emissions. In addition to improving operational efficiency, the initiative directly

supports Corewell Health's overarching mission to enhance health, instill humanity, and inspire hope. The comprehensive plan involves replacing aging ICE vehicles with AFVs over the next decade, with an estimated reduction of 848.6 MT CO_2e in GHG emissions by 2033. The project also includes the development of essential EV charging infrastructure across key locations in West, East, and Southwest Michigan, ensuring a seamless transition to alternative fuel options. Corewell Health is committed to community engagement, transparency, and collaboration, actively seeking external funding sources such as grants, tax credits, and corporate incentives to drive the initiative forward. Through this Sustainable Fleet Transformation Initiative, Corewell Health aims to set a precedent for sustainable practices within the healthcare sector while contributing to a healthier environment for the communities it serves. The estimated cost for this action is $1,631,898, which falls into Tier E: $2-10 million.

Action 2.2.1: Multi-Jurisdictional Grand River Greenway Trail

The transportation sector is the largest contributor to GHG emissions in the United States, and by reducing the number of miles driven by car, especially in single-occupancy vehicles, GHG emissions can be significantly reduced. Trails and greenways serve as carbon-free alternatives to vehicular travel, connecting residents to each other in and between communities, and to opportunities along the trails. Well designed and constructed trails can also serve as green infrastructure facilities that also address other climate issues. Trails that have tree cover and water-smart landscaping reduce urban “heat island” effects, reduce flooding and improve air quality.

The Kent County and Ottawa County Parks and Recreation Departments are planning to construct a 112-mile, non-motorized trail connecting the City of Grand Haven at the western edge of Ottawa County to the City of Lowell at the eastern edge of Kent County. This system will serve as the backbone of a broader network of hundreds of miles of local and regional trails that reach into nearly every community in West Michigan. Based on a United States Department of Transportation study, there is a projected 1.33% shift from vehicle travel to walk or bike, leading to a 77,975 MT CO_2e reduction in GHG emissions per year. The cost estimate for this project is $81M, which falls into Tier C: $50-100 million.

Action 2.2.2: EZBannerz

EZBannerz is a carbon-free method to install or change light pole banners without using a bucket truck. The GHG emissions reductions associated with not using a bucket truck for each banner change is 0.09 MT CO_2e per truck. Assuming a truck changes 25 banners per day and roughly 500 banners throughout Grand Rapids, this leads to an annual reduction of 10 MT CO_2e/year. Immediate implementation would be seen in 200 banner pilot projects, with a cost of $239 per banner and a few extension pole tools at $600 each. The total cost for the action would be $53,800, which falls into Tier E: $2-10 million.

Action 2.2.3 & 3.1.4: Ottawa County Biosolid Dry Facility

Ottawa County is considering the construction of a WRF that could be shared with other entities to dry biosolids, cut the amount of solids disposed in half, reducing the corresponding trucking miles to dispose of the solids, and creating the possibility of generating green energy. The estimated cost of the project is $30-$50M, which falls into Tier D: $10-50 million.

Action 3.1.1: Kent Waste to Energy Facility Emissions Equipment Upgrade

This project at the Waste to Energy Facility in Kent County is to be implemented by the Kent County Department of Public Works. The Emissions Control System is planned to be replaced over a three-year period.

- 2025 - Engineering design package
- 2026 - Permit modifications, project bidding, contract(s) awarding, equipment orders placed
- 2027 - Emission control equipment installed

Without the equipment upgrade to ensure the WTE facility meets the tighter MACT emissions limits for municipal waste combustors, the facility will be unable to operate. Without the WTE facility, 98,000 tons CO_2e (new) will be generated from 190,000 tons of municipal solid waste going to Type II MSW landfills, 4,000 tons of scrap metal will not be recovered, and electrical generation for 11,000 homes will not be generated on an annual basis. In addition, without the upgrade, Vicinity Energy will be unable to export steam via proposed Action 2.2.1 – WTE Steam Interconnect Replacement, which will reduce an additional 16,600 MT CO_2e.

The cost estimate for this project is $20M, which falls into Tier D: $10-50 million.

Action 3.1.3: Food Loss & Waste Reduction

Coalition will work to divert food and food waste into meals and compost through transformative investments in food loss and waste reduction and organics recycling. Project will leverage public-private partnerships, provide proven small businesses an opportunity to scale, advance resilience and food sovereignty in justice40 communities, and accelerate private sector leadership in food waste prevention. Project will advance the state's goal of a 50% reduction in food waste by 2030 and the draft national strategy for reducing food loss and waste and recycling organics.

Action 3.1.6: Public Thread X

Public Thread is a circular design, upskilling, and manufacturing innovation lab, envisioning a community that recognizes and honors the interdependence of the environment and people by re-thinking and disrupting production and design processes through inspiring, collaborative, bold and creative action. The goal of this project is to promote a circular and regenerative economy and reduce textile waste through equitable and sustainable practices.

Public Thread X operates in the margins to connect people to how the projects are made, companies to community, innovation and design with implementation, racial equity, and opportunity, exiting economic systems with new kinds of economy, and waste with creative re-use. The cost estimate for this project is $17.5M, which falls into Tier D: $10-50 million.

Action 3.1.7: Goodwill Textile Recycling

Goodwill's textile recycling project is a community imperative, dedicating funding for textile collection, sorting, de-trimming and recycling to help advance the solutions quickly. This project focuses on the highest and best use through a reuse, repair, recycle model. Collection infrastructure already exists via non-profit thrift stores and the technology to advance solution exists as well. Throughout this project, there are three "phases".

1. Raw Material Transportation & Downsizing – This phase takes place at the Goodwill of West Michigan site. The raw material transportation distance ranges from 0-10 miles from the post-consumer cotton to nano cellulose recycling system.
2. Processing & Packaging Cellulose and Nano-Cellulose – The recycled materials go through a set of chemical and physical treatment, are dried and packed in containers for clients as an alternative to new cotton (T2T) or as an alternative to plastic (3D print, car parts, paper products, etc.).
3. Distribution to Clients – The sale of processed material to the relevant industry and/or end-users located in Michigan (West MI – Chicago and Detroit area).

The cost estimate for this project is $7-$9M, which falls into Tier E: $2-10 million.

Action 3.1.8: City of Grand Rapids – Multi-Family Recycling Program

The City of Grand Rapids is working with the Grand Rapids Housing Commission to start offering recycling at their various locations. There will be reusable bags in the individual apartments and a cart at the end of each hall/floor. Maintenance staff will empty those carts into dumpsters for servicing. The current plan is to have educational sessions with the residents on the recycling program, prior to the launch. There are scales on the forks of the front loaders to capture weights at the locations to see how much material is going to waste (a small amount may be currently recycled) to gauge how much material is being diverted to recycling. These locations will be used to set a baseline for offering service to other multi-family locations or apartments with the hope of expanding this service to all multi-family locations or apartments. The GHG reduction calculation was assuming 583 short tons of material being diverted from landfill to recycling.

Action 3.1.9: Grand Rapids Regional Compost Program

The City of Grand Rapids is considering expanding its current yard waste composting site to include food scraps from residential and local commercial businesses. The expansion would involve creating multiple food scrap drop-off locations for city residents, as well as commercial food scrap routes for local businesses and breweries.

The city has reserved space for two new compost pads that need to be developed for additional composting material. These pads will need to be set up properly to handle food scrap runoff in compliance with EGLE standards. As part of this project, a shredder/grinder will be purchased to address the additional composting volume. Wood chips are a great feed material for food scraps, and the City's Forestry department needs to find an outlet for storm debris. Additionally, surrounding municipalities have identified a need for their forestry and storm debris. The city sees an opportunity to be a regional provider of managing wood waste and giving it a second life with food scraps to make compost that would be marketed locally to community gardens, residents, and farmers.

The city of Grand Rapids plans to partner with the cities of Kentwood, Wyoming, Walker, and East Grand Rapids to manage their storm and forestry debris. Other potential partners include a Michigan equipment supplier of compost equipment, Morbark, Michigan Organics Council, local neighborhood associations, as well as local businesses in GR to receive their pre-consumer food scraps.

Residents would have access to compost, which would reduce trash costs by providing food scraps. Local community gardens and businesses in the area would also benefit from access to compost, reduced trash costs and GHG emissions.

Project planning and equipment investment costs have already taken place. The project is considered shovel-ready, but with funding, it will be possible to start putting out construction bids for pad development, equipment, and supply purchases. Collaboration with LIDAC communities would be emphasized to ensure accessibility. The GHG reduction was calculated assuming 50,000 pounds of waste diverted from landfill to compost. The estimated cost of the project is $1.4 million, which falls into Tier E: $2-10 million.

Action 4.1.1: Carbon Capture at Holland Energy Park

Holland has its own natural gas power plant that cost $250 million to build and is less than 10 years old. This plant is highly efficient and is used to melt snow in downtown Holland. However, due to new State of Michigan energy laws, Holland will likely need to rely on carbon capture technology within the next 10-15 years to continue running the plant. Carbon capture technology is expensive, likely costing tens or even hundreds of millions of dollars; however, this could result in significant carbon reduction by capturing up to 90% of GHG emissions. Currently, the plant generates about one million megawatt-hours per year and emits carbon at a rate of roughly 900 lbs. CO_2e/MWH, which means it produces over 400,000 metric tons of carbon equivalent pollution per year. Capturing 90% of these GHG emissions would result in over 350,000 metric tons of CO_2 savings per year. The estimated cost of this action is $25-50 million, which falls into Tier D: $10-50 million.

Action 4.1.2: Grand Rapids Environmental Justice Tree Project (FGRP)

There are more than 25,000 high priority tree vacancies throughout the Grand Valley Metro Council area in CEJS sites. During the hottest day of the 2023 summer, there was an 18-degree temperature on the hottest day of the year between well shaded neighborhoods and those with poor tree cover. Neighborhoods that fall into CEJS identified census tracts are often those neighborhoods with the least number of trees. Grand Rapids through Friends of Grand Rapids Parks and C4 did receive a $5 million grant for tree planting. However, this does nothing for the rest of the GVMC region. It also only covers about half of the need in Grand Rapids.

An additional 25,000 trees, along with two years of maintenance and watering for every tree would create an estimated 20 full time and 60 seasonal jobs for 5-7 years. The tree benefits continue to increase every year up until the age range of 23-25 when they max out their benefits and simply repeat for the next 50-75 years. In addition, there are significant mental health benefits to tree planting including lowering anxiety, stress, and improving physical health. This is a relatively low cost, high impact project that involves residents, can hire directly from CEJS communities, engages volunteerism, and provides a critical foundation for long term environmental and social health. It can be easily scaled up to 30,000, 40,000, or 50,000 or more trees. The project would cost an estimated $18 million.

Action 4.1.3: Grand Rapids Environmental Justice Tree Project (C4)

C4 is an integral partner in the Forest Justice in Greater Grand Rapids Project, a collaborative effort led by FGRP. As a BIPOC-led community organizing group, C4 plays a crucial role in addressing environmental injustices and enhancing community resilience. This funding proposal seeks support for C4's specific roles within the initiative. There are a handful of deliverables associated with this project including conducting targeted outreach to marginalized communities, organizing community events, workshops, and focus groups to foster environmental literacy, facilitating stakeholder input, ownership, and feedback processes, leading the Justice40 assessment to ensure equitable outcomes, developing and implementing an equity and inclusion strategy in collaboration with project partners, monitoring the project's adherence to Justice40 goals and community impact, establishing and managing Youth Green Teams to actively participate in tree maintenance and planting efforts, providing training and mentorship to young leaders in environmental justice, and fostering a cultural and generational transformation in residents' perspectives on forestry and outdoor engagement.

By the end of the five-year period, measurable outcomes of this project will include: 15,000 trees planted with 60% of the trees in areas with tree equity scores below 70, creation of 66 annual seasonal jobs and 7 new full-time jobs, development of forest health and invasive species control plans for 600 acres of forest in municipal parks, the addition of 15 miles of accessible forest trails, commitment of 35,000 volunteer hours, engagement with over 2,500 new community members from communities where plantings occur. The total cost for this action is estimated to be $2.3 million, which falls into Tier E: $2-10 million.

Action 4.1.4: City of Grand Rapids – Tree Planting

The City of Grand Rapids tree canopy goal is 40%, with the current tree canopy at 34%. The calculation of trees needed was given as acres needed to plant (1,640) and not a tree number to get to that goal. However, if the accepted amount of 200 (mature) trees can fit in a healthy forested acre, that would be about 328,000 trees needing to be planted. Over the next 5 years, FGRP is planning to plant close to 15,000 trees; 7,500 will be planted as part of their recently received U.S. Forestry grant. FGRP is already beginning this work planting 7,500 trees under a US Forestry grant over 5 years beginning in 2024. Timeline for completion dependent on access to funds and staff/resources to complete. Environmental benefits from planting trees begin to exceed costs 9 years after planting. Benefits appreciate every year after, while impact can vary by tree species. The estimated cost for this project is $218.66 million, which falls in Tier A: $200-500 million.

Appendix B: Low Income and Disadvantaged Communities Tool Methodologies

Table 15: Description of CEJST Indicators

CJEST Indicators	Description
Climate Change	Census tracts are disadvantaged if they are: • in an area where the following attributes are at or above 90% of the population for at least one of the following: expected agriculture loss rate; expected building loss rate; expected population loss rate; projected flood risk; OR projected wildfire risk AND • are in an area where the median income is at or lower than 65% of all other U.S. census tracts.
Energy	Census tracts are disadvantaged if they are: • in an area where energy costs OR PM2.5 in the air is at or above 90% of the population AND • are in an area where the median income is at or lower than 65% of all other U.S. census tracts.
Health	Census tracts are disadvantaged if they are: • in an area where the rate of asthma, diabetes, heart disease, or low life expectancy is at or above 90% of the population AND • are in an area where the median income is at or lower than 65% of all other U.S. census tracts.
Housing	Census tracts are disadvantaged if they: • experienced historic underinvestment; are in an area where housing costs are at or above what 90% of the population experiences; lack of green space; lack indoor plumbing; OR exhibit lead paint;

	AND • are in an area where the median income is at or lower than 65% of all other U.S. census tracts.
Legacy Pollution	Census tracts are disadvantaged if they: • feature at least one abandoned mine; are formerly used defense sites; are in closer proximity to hazardous waste facilities than 90% of the population; have proximity to Superfund sites (NPL); OR feature proximity to Risk Management Plan (RMP) facilities; AND • are in an area where the median income is at or lower than 65% of all other U.S. census tracts.
Transportation	Census tracts are disadvantaged if they are: • located in an area where diesel particulate matter exposure is more than 90% of the population experience; transportation barriers; OR traffic proximity and volum AND • are in an area where the median income is at or lower than 65% of all other U.S. census tracts.
Water & Wastewater	Census tracts are disadvantaged if they are: • located in an area in closer proximity to underground storage tanks (USTs) and releases than 90% of the population OR wastewater discharge; AND • are in an area where the median income is at or lower than 65% of all other U.S. census tracts.
Workforce Development	Census tracts are disadvantaged if they are: • located in an area experiencing higher linguistic isolation than at or above 90% of the population; low median income; poverty OR unemployment AND

	• more than 10% of people aged 25 years or older whose high school education is less than a high school diploma.

Table 16: Description of EJ Screen Supplemental Index

Indicator Type	EJ Screen Indicators	Description
Socioeconomic	Low-income	The percent of a block group's population in households where the household income is less than or equal to twice the federal "poverty level."
	Linguistically Isolated	Percent of people in a block group living in limited English speaking households. A household in which all members age 14 years and over speak a non-English language and also speak English less than "very well" (have difficulty with English) is limited English speaking.
	Less than High School Education	Percent of people age 25 or older in a block group whose education is short of a high school diploma.
	Unemployed	The percent of a block group's population that did not have a job at all during the reporting period, made at least one specific active effort to find a job during the prior 4 weeks, and were available for work (unless temporarily ill).
	Low Life expectancy	To highlight areas where the life expectancy is lower than National norms.
Environmental	Particulate Matter 2.5	Annual average PM2.5 levels in air.
	Ozone	Average of the annual top 10 daily maximum 8-hour ozone concentrations in air.
	Diesel Particulate Matter	Diesel particulate matter level in the air.
	Air Toxics Cancer Risk	Lifetime cancer risk from inhalation of air toxics.
	Air Toxics Respiratory Hazard Index	The ratio of exposure amounts to health-based reference amounts.

	Toxic Releases to Air	Risk-Screening Environmental Indicators (RSEI) modeled toxicity-weighted concentrations in air of Toxic Release Inventory (TRI) listed chemicals.
	Traffic Proximity	Count of vehicles on major roads within 500 meters, divided by distance in meters.
	Lead Paint	Percent of housing units built pre-1960, as an indicator of potential lead paint exposure.
	RMP Facility Proximity	Count of RMP (potential chemical accident management plan) facilities within 5 km (or nearest one beyond 5 km), each divided by distance in kilometers.
	Hazardous Waste Proximity	Count of hazardous waste facilities (within 5 km (or nearest beyond 5 km), each divided by distance in kilometers.
	Superfund Proximity	Count of proposed or confirmed sites on the NPL - also known as superfund - sites within 5 km (or nearest one beyond 5 km), each divided by distance in kilometers.
	UST	Count of Leaking Underground Storage Tanks (LUSTs) (multiplied by a factor of 7.7) and the number of USTs within a 1,500-foot buffered block group.
	Wastewater Discharge	RSEI modeled toxic concentrations at stream segments within 500 meters, divided by distance in kilometers (km).

Appendix C: Low Income and Disadvantaged Communities Census Blocks

Census Block ID Number	County
260810147013	Kent
260810147012	Kent
260810147011	Kent
260810147031	Kent
260810147033	Kent
260810147032	Kent
260810148094	Kent
260810127034	Kent
260810127032	Kent
260810127051	Kent
260810127052	Kent
260810127041	Kent
260810127053	Kent
260810127042	Kent
260810045022	Kent
260810126121	Kent
260810126122	Kent
260810126111	Kent
260810045012	Kent
260810126082	Kent
260810126101	Kent
260810126102	Kent
260810126091	Kent
260810126092	Kent
260810143002	Kent
260810129022	Kent
260810129021	Kent

260810129012	Kent
260810143001	Kent
260810129011	Kent
260810145051	Kent
260810140006	Kent
260810140005	Kent
260810140001	Kent
260810140002	Kent
260810140003	Kent
260810140004	Kent
260810137004	Kent
260810141002	Kent
260810141001	Kent
260810128002	Kent
260810142002	Kent
260810136002	Kent
260810046003	Kent
260810046002	Kent
260810142001	Kent
260810046001	Kent
260810136001	Kent
260810041001	Kent
260810041003	Kent
260810042002	Kent
260810042001	Kent
260810041002	Kent
260810040001	Kent
260810037002	Kent
260810035002	Kent
260810035001	Kent
260810032003	Kent

260810035004	Kent
260810035003	Kent
260810036001	Kent
260810032003	Kent
260810037001	Kent
260810038002	Kent
260810032004	Kent
260810032001	Kent
260810030001	Kent
260810030002	Kent
260810031002	Kent
260810029002	Kent
260810031001	Kent
260810028002	Kent
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260810145041	Kent
260810139001	Kent
260810138012	Kent
260810138011	Kent
260810139004	Kent
260810138042	Kent
260810138031	Kent

260810138032	Kent
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260810016002	Kent
260810015003	Kent

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260810022004	Kent
260810012004	Kent
260810013003	Kent
260810002002	Kent
260810114061	Kent
260810114063	Kent
260810114064	Kent
261390244012	Kent

261390245011	Kent
261390245022	Kent
260810114062	Kent
260810131001	Kent
260810102002	Kent
260810104023	Kent
260810103012	Kent
260810103011	Kent
260810103013	Kent
260810104021	Kent
261390216063	Ottawa
261390257002	Ottawa
261390257003	Ottawa
261390251013	Ottawa
261390222072	Ottawa
261390251012	Ottawa
261390249012	Ottawa
261390222083	Ottawa
261390222081	Ottawa
261390222082	Ottawa
261390245022	Ottawa
261390245011	Ottawa
261390244012	Ottawa
261390212042	Ottawa
261390205012	Ottawa
260670315002	Ionia
260670319001	Ionia
260670317004	Ionia
260670321002	Ionia
260670321003	Ionia
260670317002	Ionia

260670321001	Ionia
260670317001	Ionia
260670317003	Ionia
260670302001	Ionia
260670302003	Ionia
260670302002	Ionia
260670303001	Ionia
260670303002	Ionia
260670303003	Ionia
261179713002	Montcalm
261179713003	Montcalm
261179713001	Montcalm
261179710001	Montcalm
261179710004	Montcalm
261179708004	Montcalm
261179709003	Montcalm
261179709001	Montcalm
261179710003	Montcalm
261179710002	Montcalm
261179708003	Montcalm
261179708001	Montcalm
261179702003	Montcalm
261179703002	Montcalm
261179703003	Montcalm
261179702001	Montcalm
261179704002	Montcalm
261179708002	Montcalm
261179702002	Montcalm
261179704001	Montcalm
261179703001	Montcalm
261179704004	Montcalm

261179704003	Montcalm