

# Wisconsin Emissions Reduction Roadmap



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Sustainability  
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# Acknowledgements and Disclaimer

The Wisconsin Department of Administration (DOA), Office of Sustainability and Clean Energy (OSCE) is delivering this roadmap as a tool to support investments in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, spur economic growth, protect and preserve natural resources, improve air quality, and enhance the health and well-being for all residents in Wisconsin.

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# Introduction

The Wisconsin Department of Administration, Office of Sustainability and Clean Energy (OSCE) leads the state of Wisconsin in addressing the effects of climate change through programs and policies that support the use of clean energy resources and technology. Governor Tony Evers' Executive Order #38 created the office and charges the OSCE to partner with other state agencies and state utilities to achieve the goal of ensuring all electricity consumed within Wisconsin is 100 percent carbon-free by 2050.<sup>i</sup> By consistently facilitating interagency coordination, the OSCE elevates and aligns clean energy and sustainability work across agencies. Additionally, the OSCE serves as an information and resource hub for Wisconsin local governments, businesses, and residents. This is done by providing energy information and meeting with stakeholders (businesses, Native Nations, local governments, utilities, etc.) to discuss and support the advancement of policy and projects and gather input on state-led efforts.

The U.S. Environmental Protection Agency's (US EPA) Climate Pollution Reduction Grants (CPRG) program is a \$5 billion investment over four years that provides states, local governments, Native Nations, and territories with funding to develop and implement plans for reducing greenhouse gas (GHG) emissions and other harmful air pollution. The OSCE serves as the designated state lead for the CPRG Program and developed the Wisconsin Emissions Reduction Roadmap (roadmap) with support from the phase one planning award to the state of Wisconsin. Along with the OSCE, one Metropolitan Statistical Area (MSA) in Wisconsin (Milwaukee-Waukesha, WI Metro Area) received a planning grant along with two MSAs outside of the state in Minnesota (Minneapolis-St. Paul-Bloomington, MN-WI Metro Area) and Illinois (Chicago-Naperville-Elgin, IL-IN-WI Metro Area) that cover a small portion of Wisconsin. In addition, multiple Native Nations located in Wisconsin opted into the CPRG program, including the Midwest Tribal Energy Resources Association (representing five Nations in Wisconsin), St. Croix Chippewa Indians of Wisconsin, Sokaogon Chippewa Community - Mole Lake Band of Lake Superior Chippewa, Forest County Potawatomi, and Red Cliff Band of Lake Superior Chippewa.

The elements in the scope of Wisconsin's roadmap support the US EPA's Fiscal Year 2022-2026 Strategic Plan Goal 1 (Tackle the Climate Crisis); Objective 1.1 (Reduce Emissions that Cause Climate Change) through:

- Emissions reductions associated with the priority measures identified during strategic planning.
- Justice40 metrics identified and tracked (health, social, and economic).<sup>ii</sup>
- Individuals and communities who have been most impacted by pollution and climate change are involved in the planning and decision-making process.
- Transparency on applicable laws, rules, and regulations.
- Actions aligned with state, local, private, Inflation Reduction Act (IRA), Bipartisan Infrastructure Law (BIL), Creating Helpful Incentives to Produce Semiconductor and Science Act (CHIPS), America Rescue Plan Act (ARPA), and other funding and programs.



- Number of community members participating in roadmap development; Meetings, events, stakeholder sessions, etc.; and/or, dissemination of project/technology information via listservs, websites, and outreach events.

This roadmap is based on extensive strategic planning and analysis with key stakeholders to set priorities, via the identified sectors. As part of the process to develop this roadmap the OSCE also reviewed existing local climate action planning processes and overlayed them with the statewide strategies. This provided a more holistic statewide view of the priorities in the state, outlined in the approach section below. The OSCE conducted stakeholder outreach, which is outlined in the engagement section below. This roadmap is flexible and tailored to Wisconsin's specific resources and capacity and includes a mix of key sectors responsible for emitting and absorbing GHG.

## Overview

The OSCE produced this roadmap to support investment in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, spur economic growth, and enhance the quality of life for all residents in Wisconsin. The measures contained herein should be construed as broadly available to any entity in the state eligible for receiving funding under the US EPA's CPRG program and other funding streams, as applicable.

**Table 1: Overview of Wisconsin's Roadmap**

Element	Definition
<b>GHG Inventory</b>	A list of emission sources and sinks, and the associated emissions quantified using standard methods. Emissions include air pollutants carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), fluorinated gases (F-gases) including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF <sub>6</sub> ), and nitrogen trifluoride (NF <sub>3</sub> ).
<b>Benefits Analysis</b>	Improvements in air quality/reduction in harmful air pollutants. This includes co-benefits, positive effects beyond the stated goal of a GHG reduction measure (e.g., improved public health outcomes, economic benefits, increased climate resilience).
<b>GHG Reduction Measures</b>	Policies, programs, actions, or projects that reduce GHG emissions or enhance carbon removal.
<b>Low Income/Disadvantaged Communities (LIDAC) Benefits Analysis</b>	Communities with residents that have low incomes, limited access to resources, and disproportionate exposure to environmental or climate burdens.
<b>Review of Authority to Implement</b>	Identification of the ability and authority to implement a measure or whether authority should be obtained.
<b>Intersection with Other Funding Availability</b>	Consideration of the public investment available because of the passage of the BIL and IRA.

The scope of this roadmap encompasses a statewide, multi-sector approach which includes the following focus areas:

- Industrial Efficiency, Electrification, and Decarbonization,
- Building Electrification and Retrofitting,
- Clean Transportation, Fuels, and Infrastructure,

- Transit Planning and Expansion,
- Distributed Renewable Energy, and
- Agriculture and Soil Solutions.

## Approach

In 2019, Governor Tony Evers created the OSCE to serve as a central point of coordination for climate and clean energy programs and policies across the state enterprise. This coordination helps to create collective actions around strategies to address climate change and the state's clean energy transition. In addition to the work of the OSCE, in October 2019, Governor Evers established the Governor's Task Force on Climate Change (Task Force) via Executive Order #52, which then commenced work and subsequently published a final report in December 2020.<sup>iii,iv</sup> The Task Force advanced a set of 55 recommendations covering nine sectors and three policy pathways. Sectors include climate justice and equity, energy, transportation, agriculture, resilient systems, clean economy, education, food systems, and forestry.

As directed by Governor Evers, in April 2022 the OSCE published the state's first-ever Clean Energy Plan.<sup>v</sup> The plan outlines over 70 strategies to address climate change via the transition to a clean energy economy. Key strategies include prioritizing health equity, environmental justice, and equitable economic development; fast-tracking workforce development and a just transition; economic development; accelerating government-led efforts (Lead-by-Example); accelerating clean energy technology deployment; maximizing energy efficiency; modernizing buildings and industry; and innovating transportation.

Led by the OSCE, the state of Wisconsin's work on reducing emissions and combatting climate change has required extensive interagency participation and robust stakeholder engagement. The OSCE engaged with 21 state agencies, the Universities of Wisconsin, local governments, and Native Nations on both the Task Force and Clean Energy Plan development efforts. This work was expanded as part of the CPRG application preparation process. The OSCE has reached out to the Native Nations located within Wisconsin's borders, the state's nine Regional Planning Organizations, and many political jurisdictions (either directly or through a relevant association) to ensure they are participating as a coordinating entity. The OSCE also conducted extensive community engagement to receive input and hear lived experiences from those who have not necessarily been engaged or had the resources to do so in the past. The above entities were engaged throughout the entirety of the planning process and have access to the final list to move forward with applications for federal CPRG implementation dollars if they desire to do so. For any of the above eligible entities to apply for CPRG implementation funding, their application must address a priority action in this roadmap.

The OSCE also collaborated closely with the Southeastern Wisconsin Regional Planning Commission (SEWRPC), the lead organization of the MSA planning grant in Milwaukee, and participated in meetings with the MSA leads in Minnesota (Metropolitan Planning Group) and Illinois (Metropolitan Mayors Caucus). The OSCE also meets regularly with several Native

Nations and will continue to support their planning through their timeline. The primary focus of coordination is to align priorities and engage stakeholders.

As part of the planning process, the OSCE worked with UW-Milwaukee and the Wisconsin Local Governments Climate Coalition (WLGCC) to review existing local climate action planning processes and overlay them with the statewide Task Force on Climate Change recommendations and Clean Energy Plan strategies. Appendix B highlights the recommendations and strategies in both reports. This provided a holistic statewide view of the priorities. In addition to extensive engagement and the overview and analysis of existing related plans; the approach included energy and emissions benchmarking and scenario summaries; and tracking of outputs and impacts (Justice40 metrics, LIDAC benefits, emissions reductions, etc.).

Lastly, the modeling outlined in this roadmap considers Wisconsin's carbon budget and utilizes the best available data, analysis, and input to examine what strategies will make considerable strides toward emissions reductions in select sectors. Modeling is not used to predict the future and do not constitute the setting of goals, but rather is based on a set of assumptions (specifically, select priority emissions reduction actions) and provides a trend of what could happen in the future, if fully implemented. The assumptions and expected impacts do not consider new technology, new policies, or unforeseeable events in the future. Where possible, estimated impacts from the strategies in the roadmap are modeled using the Rocky Mountain Institute and Energy Innovation Policy and Technology, LLC's Energy Policy Simulator (EPS).<sup>vi, vii</sup>

## **Low-Income Disadvantaged Communities Identification and Analysis<sup>viii</sup>**

The implementation of the measures included in this roadmap are anticipated to provide significant benefits to low-income and disadvantaged communities (LIDACs). Within each measure detailed below is a list of impacts identified for LIDACs and expected co-benefits. This section identifies each LIDAC within the jurisdiction of this roadmap as well as risks, benefits, and impacts assessment. In the Coordination and Outreach section, the OSCE identifies how Wisconsin meaningfully engaged with LIDACs in the development of this roadmap, and how Wisconsin will continue to engage in the future. The OSCE partnered with the University of Wisconsin - Madison, Nelson Institute for Environmental Studies, Energy Analysis and Policy Program (EAP team) to conduct this analysis.

### **Identifying LIDACs**

US EPA guidance defines LIDACs as “communities with residents that have low incomes, limited access to resources, and disproportionate exposure to environmental or climate burdens”. In identifying Wisconsin's LIDACs, the OSCE followed US EPA's recommended definition from the LIDAC Technical Guidance: (1) any Census tract that is included as disadvantaged in the Climate and Economic Justice Screening Tool (CEJST); (2) and/or any census block group that is at or

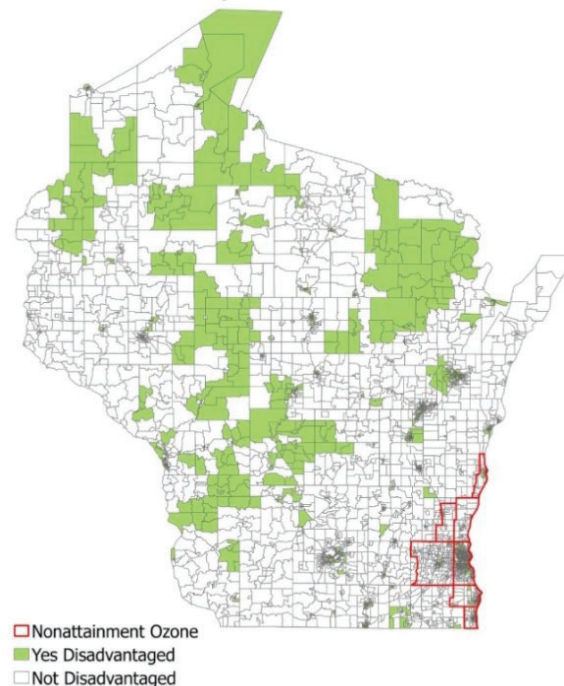
above the 90<sup>th</sup> percentile in any Supplemental Index of the Environmental Justice Screening and Mapping Tool (EJScreen) when compared to the nation or state; and/or (3) any geographic area within Tribal lands and indigenous areas as included in EJScreen.<sup>ix,x</sup> The EAP team constructed a list of Wisconsin LIDACs by downloading the *US EPA IRA Disadvantaged Communities* layer as a table from EJScreen (under the *Places* icon), which includes all LIDACs in the U.S. The team then deleted the non-Wisconsin identifiers (IDs) and removed the block group (IDs) that were not categorized as LIDAC. The LIDACs identified in Wisconsin have been listed as block group IDs in Appendix D. To provide more detailed information on each LIDAC block group, the EAP team matched the block group IDs from the *US EPA IRA Disadvantaged Communities* layer, with the block group IDs from EJScreen. The EJScreen data was downloaded from US EPA's website using their *Download EJScreen Data* page.<sup>xi</sup> The preliminary evaluation of the data sources described above has found that:

- 34% of Wisconsin's block groups (1,475 out of 4,292) are considered disadvantaged.
- 27.5% of Wisconsin's population (1,617,485 individuals living in the 1,475 LIDAC block groups, based on the census population of each) are considered disadvantaged.
- Of the 1,475 disadvantaged block groups, 132 are Tribal block groups.

Figures 1 and 2 illustrate the geographic distribution of LIDACs in Wisconsin and Southeast Wisconsin, respectively.

**Figure 1. Wisconsin's LIDACs are the green colored block groups. The red lines are Wisconsin's nonattainment areas, which are only for 2015 ozone nonattainment. Non-attainment area designation is based on data provided by the Wisconsin Department of Natural Resources.**

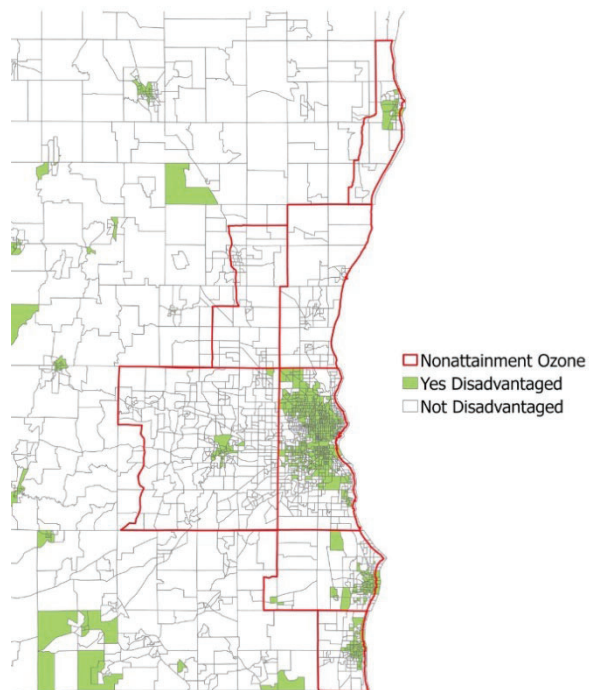
### Low-Income Disadvantaged Block Groups in Wisconsin





**Figure 2. LIDAC block groups located in the nonattainment areas of southeastern Wisconsin: Milwaukee area (five counties), Kenosha County, and Sheboygan County.**

## Low-Income Disadvantaged Block Groups in Wisconsin's Nonattainment Areas



## Climate Risks, Impacts, and Vulnerabilities among LIDACs

This section briefly summarizes the climate risks, impacts, and vulnerabilities within Wisconsin, with a particular emphasis on LIDACs. The effects of climate change disproportionately affect marginalized groups, exacerbating existing social and economic disparities.<sup>xii</sup> The LIDACs in Wisconsin face disproportionate impacts from climate change due to a combination of social, economic, and environmental factors. Vulnerabilities arise from inadequate infrastructure, limited access to resources, and the inability to adapt to changing conditions. Wisconsin is also susceptible to various climate risks, including extreme weather events, rising temperatures, changes in precipitation patterns, and worsening air quality.<sup>xiii,xiv</sup> Heat waves, intense storms, and flooding events have become more frequent and severe, posing threats to infrastructure, agriculture, and public health. The disproportionate impacts on LIDACs include, but are not limited to:

- **Health Risks:** Rising temperatures contribute to the spread of vector-borne diseases, while poor air quality from increased wildfires and heatwaves exacerbates respiratory conditions.<sup>xv,xvi</sup> Limited access to healthcare and resources further compounds the health risks faced by disadvantaged communities, creating a cycle of vulnerability.
- **Economic Disparities:** The economic repercussions of climate change also hit LIDACs harder. Agricultural disruptions affect livelihoods, and extreme weather events can lead to job losses, especially in sectors sensitive to climate variability. Additionally, property damage from flooding or storms often results in increased financial burdens for those without adequate insurance or resources to recover. A transition to in-state energy resources would help Wisconsin regain dollars and jobs.<sup>xvii</sup>

- **Vulnerabilities:** Understanding the vulnerabilities of LIDACs is crucial for developing effective emissions reduction strategies. Collaborative efforts involving community engagement, policy changes, and targeted investments in infrastructure are essential. Green infrastructure projects, renewable energy, electrification, and more can enhance resilience in disadvantaged neighborhoods.
- **Housing Inequality:** As areas transition to cleaner technologies, there is a risk of increased property values and potential gentrification. Strategies should be in place to avoid the displacement of existing residents, ensuring that the benefits of environmental improvements are shared equitably.

## Qualitative LIDAC Benefit Assessment

The implementation of the measures included in Wisconsin’s roadmap are anticipated to have a broad range of benefits. Anticipated benefits, and any potential disbenefits associated with measure implementation, are summarized in the following sections. The OSCE and EAP team reviewed the categories of burden from the CEJST tool and will consider adoption of additional metrics for future reporting.<sup>xviii</sup> For the initial qualitative assessment, burdens were categorized as follows:

- **Economic Development:** the economic development category encompasses issues such as insufficient access to resources, education, and employment opportunities; often perpetuating a cycle of poverty and inequality.
- **Environmental Justice:** the environmental justice category signifies LIDACs’ disproportionate exposure to environmental hazards and pollution, amplifying health risks and exacerbating socio-economic disparities within these communities.
- **Air Quality & Health:** the air quality and health category encapsulates the heightened vulnerability of LIDAC residents to adverse health effects resulting from poor air quality, often stemming from proximity to industrial activities and traffic emissions and volume.
- **Energy Burden:** the burden of energy refers to the challenges associated with inadequate access to affordable and reliable energy sources.
- **Transportation Access:** the transportation access category encompasses the challenges associated with limited availability of affordable and reliable transportation options, hindering residents’ mobility, access to essential services, and economic opportunities, thereby contributing to social and economic disparities within these communities.
- **Safe & Affordable Housing:** the burden of safe and affordable housing for LIDACs involves the challenges associated with insufficient access to secure and reasonably priced housing, leading to substandard living conditions, homelessness, and perpetuation of socio-economic disparities within these communities.

US EPA’s April 2023 Technical Guidance defined direct and indirect benefits based on the measures’ geographic proximity to LIDACs:

- **Direct Benefits:** projected benefits of GHG reduction measures that could be implemented on GHG emission sources located within LIDACs.
- **Indirect Benefits:** expected advantages of actions that might be taken on sources outside such communities but could nonetheless have benefits for identified LIDACs.<sup>xix</sup>

The attribution to benefit categories is preliminary and anticipated to evolve with ongoing stakeholder communications. A summary of direct and indirect benefits is provided with each measure in the sections below. For a full qualitative LIDAC analysis for each measure, see *Assessing Potential Benefits of Greenhouse Gas Mitigation Measures for Low-Income and Disadvantaged Communities in Wisconsin*.<sup>xx</sup> Additionally, this roadmap outlines specific outreach and engagement activities and next steps on how the OSCE will continue to engage LIDACs throughout the implementation.

## Coordination and Outreach Activities

The central goals of the OSCE's coordination and outreach efforts are to ensure strong input from interagency and intergovernmental entities and to foster empowered engagement from key stakeholders and the public, with emphasis on providing early and frequent engagement with low-income and disproportionately impacted communities. As the OSCE developed the roadmap, they leveraged existing partnerships with state agencies, local governments, Native Nations, and community organizations to expand their network and ensure they achieved inclusive representation from low-income and disproportionately impacted communities. The OSCE's commitment to equity, justice, and collective action is evidenced in methods used in the statewide planning efforts outlined below, which include robust stakeholder engagement activities.

**Governor's Task Force on Climate Change Report:** Through the Governor's Task Force on Climate Change, the OSCE worked closely with a diverse group of 32 Task Force members to develop 55 policy recommendations to combat the climate crisis. The Task Force included representatives from agriculture, the business community, Native Nations, state agencies, utility companies, labor, youth, public health professionals, local government, and other industries and communities from across the state. The Governor's Task Force on Climate Change hosted over 1,000 participants at five public listening sessions; 69 of 72 counties participated in the planning effort; and the Task Force received 513 public comments. The Task Force delivered the Governor's Task Force on Climate Change Report in December 2020.

**Wisconsin Clean Energy Plan:** Building from the recommendations and public participation in the Governor's Task Force on Climate Change Report, in 2021 the OSCE commenced bringing together extensive advisory teams to create Wisconsin's first-ever Clean Energy Plan (CEP). The OSCE hosted four sector-specific listening sessions and an environmental justice focus group on the development of the CEP. Following the release of the CEP, the OSCE staff markedly increased their clean energy and sustainability outreach efforts throughout the state. They presented and sought input on the CEP and its related work at 43 conferences, meetings, and events whose audiences included state agency staff, environmental advocacy groups, environmental justice groups, labor, utility representatives, nonprofits, businesses, Native Nations, and local governments. In 2022, the OSCE's estimated reach at these CEP events was approximately 2,875 individual stakeholders. After extensive engagement, Wisconsin published

the CEP in April 2022, and subsequently released the Clean Energy Plan Progress Report in May 2023 to highlight progress towards recommendations in the plan and ensure transparency and accountability to residents.

The relationships forged in the creation of the above plans served as a springboard to further expand outreach and engagement efforts to develop Wisconsin's roadmap. The following section outlines stakeholder engagement activities relevant to this roadmap planning process.

**Climate Pollution Reduction Grant:** The OSCE, using US EPA's continuum of authentic community engagement as a foundation, provided information regarding CPRG planning through a transparent manner that allowed reasonable opportunities for input on preliminary and final planning products.<sup>xxi</sup> At the outset of CPRG planning, the OSCE outlined a comprehensive process to gather the voices of Wisconsinites and ensure that this roadmap reflects the values of Wisconsin. The first step was to conduct a gap analysis of existing stakeholder lists to ensure equitable engagement from all stakeholder groups, particularly those who will be impacted by the implementation of this roadmap.

The OSCE also built upon strong relationships with state agencies, sub-state entities, and Native Nations developed in collaboration on the Task Force and CEP. This work continues as part of the CPRG planning process. The OSCE reached out directly to the 11 federally recognized Native Nations located within Wisconsin's borders, the state's nine Regional Planning organizations, and many political jurisdictions (either directly or through a relevant association) to ensure engagement and access to CPRG planning resources. The OSCE also worked closely with nine state agencies through a CPRG agency advisory team workgroup, individual agency meetings, and other recurring cross-agency coordination calls. The OSCE also consulted with subject matter experts throughout the state representing labor, environmental justice, natural working lands, renewable energy, energy efficiency, and more for input on measures from existing action plans and provided expertise on programs, policy, and data to assist in moving measures forward.

Historically, Native American communities have been left out of the conversation on transforming our energy system. Furthermore, Native communities often face a disproportionate burden of the effects from a changing climate. In seeking to mitigate climate damage, Native Nations must be empowered in decision-making processes, including enabling and supporting the incorporation of traditional Indigenous knowledge. Therefore, as part of the CPRG planning process, OSCE began outreach to Native Nations in September 2023 at the Tribal Energy Symposium hosted at the Forest County Potawatomi Community Center in Crandon, WI. In November, OSCE participated in a state Tribal Consultation to hear from Native leaders regarding energy priorities, projects, and barriers to implementation. The OSCE then reached out to Native Nations in Wisconsin to build partnership to advance shared climate action and clean energy priorities. Following this outreach, OSCE met individually with staff from four Native Nations to learn about cultural values, seek input on the planning process, share resources, and offer technical support. The OSCE also coordinated with the Midwest Tribal Energy Resources Association (MTERA) as they developed a plan for Native Nations in US EPA

Region 5. Once priority measures were finalized in February 2024, OSCE shared the list and resources with all leaders and relevant staff of Native Nations in Wisconsin to help ensure transparency and funding accessibility. Moving forward, the OSCE will continue engagement with Native Nations to ensure equitable access to resources and funding and further explore opportunities for partnership. The timeline in Appendix E highlights relevant meetings, presentations, and opportunities for input related to OSCE engagement with Native Nations.

The OSCE also worked through several channels to ensure municipalities were informed of opportunities for engagement and had the resources to access available funding. OSCE worked with the WLGCC, the Green Tier Legacy Communities, regional planning commissions, the Wisconsin Towns Association, the Wisconsin Counties Association, the League of Wisconsin Municipalities, Workforce Development Boards, individual local governments, and other stakeholders who represent municipalities. The OSCE and Wisconsin Department of Natural Resources (DNR) also coordinated closely with the SEWRPC to ensure alignment between state and local CPRG planning with the Milwaukee MSA. Additionally, the OSCE initiated work through a sub-award with UW-Milwaukee to identify local priorities through analyzing local climate and comprehensive plans. The OSCE will continue to work closely with local governments to facilitate collective action, empower local knowledge, and ensure equity through the implementation of actions in this roadmap. The timeline in Appendix E highlights relevant meetings, presentations, and opportunities for input related to OSCE engagement with local governments.

Throughout the CPRG planning process, the OSCE attended or presented at over 44 conferences, meetings, and events, with an estimated reach of 765 individual stakeholders statewide. The OSCE also hosted a public stakeholder webinar and distributed a public input survey.<sup>xxii</sup> The webinar recording, public input survey, up-to-date information on the planning process, staff contact information, and other resources were made available to the public at [www.osce.wi.gov](http://www.osce.wi.gov). Additionally, the OSCE conducted one-on-one meetings with as many stakeholders as possible to inform entities of opportunities for engagement, hear input on the planning processes, and provide resources for project-specific requests.



# Wisconsin's Greenhouse Gas Inventory

In Executive Order #38, Governor Tony Evers committed Wisconsin to a goal of ensuring all electricity consumed in the state is 100 percent carbon-free by 2050 and that Wisconsin is contributing to U.S. climate emissions reduction targets, as part of the U.S. nationally determined contribution (NDC) of the Paris Agreement, which is now 50-52 percent economywide net GHG emissions reductions below 2005 levels by 2030. While GHG emissions in the state have decreased since 2005, the state will need to do more to meet these emission reduction targets. The data below is the foundation of that effort and tracks Wisconsin's progress towards meeting state and national goals for GHG emissions reductions.

The DNR, in cooperation with the OSCE, identified, evaluated, and utilized existing data resources to develop a statewide inventory of the major sources of GHG emissions within Wisconsin and used that inventory data to develop this roadmap.<sup>xxiii</sup> The GHG inventory utilized the US EPA's State Inventory Tool (SIT),<sup>xxiv</sup> state-level GHG inventories prepared by the US EPA,<sup>xxv</sup> and data reported to US EPA's Greenhouse Gas Reporting Program (GHGRP)<sup>xxvi</sup> together with any independent, sector-specific estimates prepared by the state. The Wisconsin inventory includes the following sectors and gases:

## **Sectors**

1. Electricity
2. Residential, Commercial, & Industrial
3. Transportation
4. Industrial Processes
5. Natural Gas and Oil
6. Waste
7. Agriculture
8. Land-Use, Land-Use Change & Forestry (LULUCF)

## **GHGs (across all sectors)**

carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), fluorinated gases (F-gases) including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>)

For this roadmap, the OSCE and DNR received approval from US EPA to utilize the state's most current GHG inventory. The *2021 Wisconsin Greenhouse Gas Emissions Inventory Report* published by the DNR provides a breakdown of Wisconsin emissions by economic sector. The data by sector for 1990, 2005, and 2018, shows that the gross GHG emissions decreased by 9.5 percent from 2005 to 2018. The electricity sector showed the largest decrease in emissions from 2005 to 2018 (20.1 percent). During that period, industrial emissions decreased by 10.8 percent while transportation, natural gas and oil, and waste sectors showed modest decreases. Between 2005 and 2018, agricultural emissions increased by 21.3 percent (mostly methane and nitrous oxide), the highest increase in emissions among all sectors.

Land use, land-use change, and forestry (LULUCF) are also defined as GHG inventory sectors because these natural and working lands can add or remove carbon dioxide from the atmosphere and play a key role in the response to climate change. The *2021 Wisconsin Greenhouse Gas Emissions Inventory Report* includes carbon storage estimates from natural and

working lands. The LULUCF sector sequestered or stored 19.1 million metric tons (MMT) of carbon dioxide equivalents (CO<sub>2</sub>e) in 2018. Storing that amount of carbon is equivalent to removing the emissions from just over 4.1 million passenger vehicles driven on Wisconsin's roads over one year. Table 2 details GHG emissions in MMTCO<sub>2</sub>e for all economic sectors.

**Table 2. Wisconsin GHG emissions in MMT CO<sub>2</sub>e by Sector<sup>xxvii</sup>**

Sector	1990	2005	2018	Change (2005 to 2018)	
				Amount	Percent
Electricity	41.0	58.7	46.9	-11.8	-20.1
<i>Generation</i>	33.4	48.3	39.2	-9.1	-18.8
<i>Import</i>	7.6	10.4	7.7	-2.7	-26.0
Residential	9.6	10.2	10.2	0.0*	+0.0*
Commercial	4.9	6.2	6.7	0.5	+8.1
Industrial	14.5	15.8	14.1	-1.7	-10.8
Transportation	29.0	40.2	39.9	-0.3	-0.7
Industrial Processes	0.8	3.5	4.2	0.7	+20.0
Natural Gas and Oil	0.2	0.6	0.5	-0.1	-16.7
Waste	3.0	3.2	3.1	-0.1	-3.1
<i>Solid Waste</i>	2.3	2.3	2.2	-0.1	-4.3
<i>Wastewater</i>	0.7	0.9	0.9	0.0*	+0.0*
Agriculture	17.2	16.4	19.9	3.5	+21.3
<b>Gross Total Emissions</b>	<b>120.3</b>	<b>154.9</b>	<b>145.4</b>	<b>-9.5</b>	<b>-6.1</b>
LULUCF	-19.3	-15.9	-19.1	-3.2	-20.1
<b>Net Total Emissions</b>	<b>101.1</b>	<b>139.0</b>	<b>126.3</b>	<b>-12.7</b>	<b>-9.1</b>

\* Totals may not sum due to independent rounding. Does not exceed 0.05 MMT CO<sub>2</sub>e or 0.05 percent.

This inventory accounts for seven different GHGs. Table 3 shows gross state emissions by type of GHG for 2005 and 2018.

**Table 3. Wisconsin GHG emissions in MMT CO<sub>2</sub>e by Gas**

GHG	2005	2018	Percent of 2018 Emissions	Change	
				Amount	Percent
Carbon Dioxide (CO <sub>2</sub> )	131.3	118.4	81.4	-12.9	-9.8
Methane (CH <sub>4</sub> )	12.6	14.7	10.1	+2.1	16.7
Nitrous Oxide (N <sub>2</sub> O)	8.8	9.3	6.7	+0.5	5.7
F-Gases (HFC, PFC, NF <sub>3</sub> and SF <sub>6</sub> )	2.2	3.1	2.1	+0.9	40.9
Total - All Gases	154.9	145.4	100	-9.5	-6.1

Note: Totals may not sum due to independent rounding.

# Wisconsin's Greenhouse Gas Reduction Measures

Wisconsin has identified six priority emissions reduction implementation measures. The measures in this section have been identified as priority measures for the purposes of pursuing funding to implement emissions reductions through CPRG implementation grants. Table 4 summarizes Wisconsin's priority measures and the potential emissions reductions associated with each measure. This list is not exhaustive of Wisconsin's priorities. Rather, the priority implementation measures included in this roadmap meet the following criteria:

- The measure is implementation ready in the near-term, meaning that the design work for the policy, program, or project is complete enough that a full scope of work and budget can be included in a CPRG implementation grant application.
- The measure can also be completed in the near term, meaning that all funds will be expended, and the project completed, within the five-year performance period for the CPRG implementation grants.
- The measure advances the following state priorities: significant and sustained emission reductions; public health; equity; justice; rural development; maximizing reach; reserving nature; retaining or creating quality jobs; retaining and attracting businesses to the state; and collective action to address climate change.

**Table 4. Wisconsin Priority Climate Action Measures Summary**

Priority Measure	Cumulative estimated GHG emission reductions (MMT CO <sub>2</sub> e) **		Implementing Agency or Agencies***	Geographic Scope
	2025–2030	2025–2050		
Industrial Efficiency, Electrification, and Decarbonization	8.0	15.6	DOA	Wisconsin
Building Electrification and Retrofitting	2.425	13.625	DOA	Wisconsin
Clean Transportation, Fuels, and Infrastructure	10.5	13.4	DOA, WisDOT, DNR	Wisconsin
Transit Planning and Expansion*	11.1	10.1	Local Governments	Wisconsin
Distributed Renewable Energy	0.708	1.242	DOA	Wisconsin
Agriculture and Soil Solutions	0.6	1.5	DOA, UW	Wisconsin

*\*GHG emissions for this section incorporate a holistic view of transportation electrification broader than what is defined and are not reflective of the specific scope of the measure.*

*\*\*Methodology can be found in Appendix A.*

*\*\*\* DOA = Department of Administration, WisDOT = Wisconsin Department of Transportation, DNR = Wisconsin Department of Natural Resources, UW= University of Wisconsin – Madison*

The implementation of the measures included in this roadmap are anticipated to have a broad range of benefits across the state of Wisconsin and Native Nation lands. Quantifications of GHGs are done at a statewide level and are not meant to be predictions, but rather indications of the potential for emissions reductions under ambitious decarbonization scenarios associated with the related actions. The assumptions used in development of the quantifications are

similarly representative of potential and should not be interpreted as specific state goals or commitments, as outcomes will vary based on actual program implementation details and timelines that will be developed fully as implementation funding opportunities are realized. Within each measure, the OSCE detailed specific priority actions that could be taken to achieve the measure; the anticipated co-pollutant reductions associated with the implementation of the priority measures identified in this roadmap; and the effects of the measures on economic development, environmental justice, energy burden, air quality and health, transportation access, and safe and affordable housing within LIDACs. A schematic representation of the direct and indirect benefits for industrial efficiency, electrification, and decarbonization are provided for each measure.

## Implementation Schedule and Milestones

If the measures in this roadmap are pursued as part of a multi-partner coalition, the implementation schedules would be determined based on coalition-wide planning activities. If pursued as a state-level action, assuming implementation award funding is received by the end of 2024, program design and launch is anticipated to take 1-3 years. Where possible, the OSCE has identified potential implementing agencies for each measure presented in this roadmap. However, this does not constitute a guarantee of leadership for a measure.

## Co-Pollutants Emission Changes from Priority Measures

This section provides an estimate of the statewide potential for GHG and co-pollutant emission reductions resulting from sector-level deployment of selected emissions reduction measures. The OSCE utilized the EPS to analyze the emission impacts of the proposed mitigation measures. The EPS tool refers to individual measures as “policies” and collections of measures as “energy policy scenarios”. The resulting EPS scenario is intended to represent the total potential of all proposed measures calculated on EPS, implemented statewide. The team extracted the sector-level emissions reported by the EPS tool for this scenario. The GHG-equivalent emissions are reported (excluding land use), directly from the EPS tool, as well as co-pollutant emissions for fine particulate matter (PM<sub>2.5</sub>), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOCs), and carbon monoxide (CO), which are regulated under the Clean Air Act to protect human health and public welfare. For these co-pollutants, the percent emission change (relative to 2020) reported by the EPS tool were multiplied by the statewide pollutant total reported in US EPA’s National Emission Inventory for 2020 (excluding biogenic and fire sources).<sup>xxviii</sup> Table 5 reports projected emissions reductions (relative to 2023) for 2030, 2040, and 2050.

**Table 5. Emissions of EPS-reported Emission Trajectory Changes in tons.**

	GHG	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	VOCs	CO
<b>By 2030</b>	-32,211,000 -27%	-3,996 5%	-6,837 -6%	-910 -43%	-3,547 -2%	-71,577 -9%
<b>By 2040</b>	-47,382,600 -40%	-5,190 -7%	-15,326 -14%	-749 -36%	-8,295 -4%	-144,909 -19%
<b>By 2050</b>	-55,285,000 -46%	-5,270 -7%	-17,741 -16%	-664 -32%	-1,896 -1%	-173,548 -23%

## Measure 1: Industrial Efficiency, Electrification, and Decarbonization

According to the 2021 Wisconsin Greenhouse Gas Emissions Inventory Report, non-electricity energy usage such as space, water, and industrial process heating for the industrial sector accounted for 9.7 percent of gross emissions statewide. While this sector has seen an overall decrease from the base year 2005, it is still the fourth-highest emitting sector in Wisconsin. Industrial facilities are also among the last in the state to continue using coal combustion, accounting for 13.1 percent of industrial sector emissions, with petroleum following at 22.5 percent, and natural gas claiming the remaining 64.4 percent. The combustion of coal and petroleum is highly inefficient compared to other available fuels and results in high co-pollutants and detrimental impacts on the communities working in and living around these facilities. Improvements in industrial facilities are often cost-prohibitive and require intense energy and efficiency assessments. A cost-effective overall reduction in emissions in this sector would require both fuel-switching to electricity and clean hydrogen, carbon capture efforts, as well as efficiency improvements in industrial facilities that reduce overall energy demand and fuel usage. Wisconsin is home to an Industrial Assessment Center and the award-winning Focus on Energy® program, both of which have a strong working relationship with industrial facilities located in Wisconsin, and which can support the efforts of facilities looking to take advantage of existing federal tax credits and any incentives that might come from this effort.

### Relevant GHG Inventory Sector:

Industry, Buildings

### Cumulative GHG emission reductions 2025-2030:

8.0 MMT CO<sub>2</sub>e

### Cumulative GHG emission reductions 2025-2050:

15.6 MMT CO<sub>2</sub>e

## Priority Actions

### 1.1 FACILITATE AN INDUSTRIAL DECARBONIZATION CHALLENGE THROUGH A COALITION OF MIDWEST STATES

#### ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions	8.0	15.6
<b>Model:</b> Energy Policy Simulator		

#### IMPLEMENTING AGENCY

Wisconsin Department of Administration, Wisconsin has been involved in introductory conversations with other states and organizations on the possibility of forming a coalition effort to address this priority action.

#### POTENTIAL METRICS FOR TRACKING PROGRESS

- Number of qualified facilities/organizations applying for the funding.



- Number of qualified facilities/organizations successfully implementing projects within the given timeline.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced in each participating state and across the coalition region, both on an annual basis and over the duration of the program.

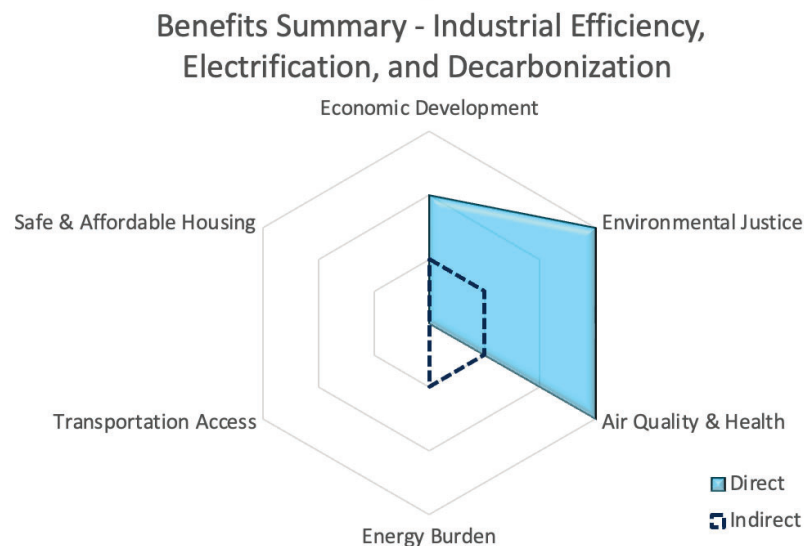
## Federal Funding Intersection

This measure intends to fill gaps in funding left after implementation of the federal 48C Clean Manufacturing Tax Credit. That program is currently funded at \$4 billion, applications were due in December 2023, and recipients of 48C credits are not yet announced. The demand for the 48C Clean Manufacturing Tax Credit program is expected to exceed available funding, resulting in the potential for unfunded yet high-quality projects to spur innovation and reduce emissions. Efforts to advance this priority action will build on the 48C grants and focus on projects that do not receive 48C funding.

## LIDAC Analysis

Improving energy efficiency for industrial processes and buildings leads to lower manufacturing costs, more competitive local businesses, and reduces harmful emissions, particularly where combustion sources are electrified. Better energy management by industrial businesses will reduce overall energy usage, potentially at peak times, thus reducing grid-operation costs for all customers. Implementing a GHG measure focused on industrial efficiency and electrification can have direct and indirect benefits for LIDACs represented below.

**Figure 3. Schematic representation of the direct and indirect benefits for the industrial efficiency, electrification, and decarbonization measure.**



## Measure 2: Building Electrification and Retrofitting

Residential and commercial buildings account for a combined 11.6 percent of gross emissions in the state of Wisconsin. In addition, emissions in these areas have been increasing since the base year 2005, with commercial building emissions rising 8.1 percent in that time. While coal combustion represents almost none of the fuel used in these areas, petroleum still accounts for 19.0 percent of residential and 15.3 percent of commercial fuel types, with natural gas taking up the remaining amount.

As the Midcontinent Power Sector Coalition highlighted in their *A Roadmap to Decarbonization in the Midcontinent - Buildings*, “Decarbonization of buildings will require making buildings more energy efficient and replacing fossil fuels currently used for space and water heating with very-low and zero-carbon electricity, as well as pursuing very-low and zero-carbon alternative fuels such as renewable natural gas and hydrogen.”<sup>xxix</sup>

**Relevant GHG Inventory Sector:**  
Buildings

**Cumulative GHG emission reductions  
2025-2030:**  
2.425 MMT CO<sub>2</sub>e

**Cumulative GHG emission reductions  
2025-2050:**  
13.625 MMT CO<sub>2</sub>e

Many residents struggle to afford the necessary improvements and equipment replacements to decarbonize their homes. While programs do exist within the state to support them, the demand is often much higher than the funding available. In addition, residents often need costly improvements to their homes prior to even being able to qualify for the weatherization, energy efficiency upgrades, and fuel-switching equipment offered. A recent analysis of the State’s weatherization program showed that almost half of all applicants had to be deferred from the program due to a variety of conditions such as hazardous living and working conditions, repairs needed on the home, and the presence of asbestos-containing materials. Furthermore, owners of multi-family and multi-unit complexes often face considerable costs when considering energy efficiency and electrification upgrades - costs that would be burdensome to pass onto their residents at a time when affordable housing is difficult to find. Various sources of funding for residential and commercial upgrades are available but include a complex map of eligibility requirements that are often difficult for individuals to navigate on their own.

Public entities are also in need of support for building electrification and retrofitting. They face many of the same issues as residents and commercial building owners but encounter unique challenges in obtaining funding for upgrades and improvements. The Public Service Commission of Wisconsin, Office of Energy Innovation has administered multiple rounds of a successful grant program designed to help public entities secure funding for these upgrades called the Energy Innovation Grant Program (EIGP). After reviewing the data from 2018-2022 grant years for the program, it is evident that the need is considerably higher than the funding available. Table 6 below shows a summary of the EIGP requests and awards for 2018-2022.

**Table 6: EIGP 2018-2022 Awards Summary**

Grant Year	Total Grants	Percent of Total	Total Grant Dollars	Percent of Total
Application Total Requested	440		137,669,641.35	
Total Grant Request Awarded	141	32%	31,989,362.51	23%
Total Unawarded Request	299	68%	105,680,278.84	77%

## Priority Actions

### 2.1 IMPROVE THE EFFICIENCY OF HOMES AND BUILDINGS THROUGH BUILDING COMPONENT ELECTRIFICATION

#### *ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS*

	<b>2030 (MMT CO<sub>2</sub>e)</b>	<b>2050 (MMT CO<sub>2</sub>e)</b>
Estimated GHG Emissions Reductions	1.8	11.5
<b>Model:</b> Energy Policy Simulator		

#### *IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Administration

#### *POTENTIAL METRICS FOR TRACKING PROGRESS*

- Number of electric building components sold and installed.
- Number of buildings served.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

### 2.2 RETROFIT EXISTING BUILDINGS

#### *ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS*

	<b>2030 (MMT CO<sub>2</sub>e)</b>	<b>2050 (MMT CO<sub>2</sub>e)</b>
Estimated GHG Emissions Reductions	0.6	2.0
<b>Model:</b> Energy Policy Simulator		

#### *IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Administration

#### *POTENTIAL METRICS FOR TRACKING PROGRESS*

- Number of buildings retrofitted.
- Measured annual amount of energy used in retrofitted buildings.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

## 2.3 CREATE A PRE-WEATHERIZATION PROGRAM AND INTEGRATE BUILDING INCENTIVES

### ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions	0.025	0.125
<b>Model:</b> Formula		

### IMPLEMENTING AGENCY OR AGENCIES

Wisconsin Department of Administration

Wisconsin has been involved in introductory conversations with other states and organizations on the possibility of forming a coalition effort to address this priority action.

### POTENTIAL METRICS FOR TRACKING PROGRESS

- Number of homes deferred from Weatherization Program to Pre-weatherization Program.
- Number of homes pre-weatherized.
- Number of contacts to program administrator for assistance.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

## Federal Funding Intersection

The pre-weatherization and integrated building incentives program is fundamentally about improving the outcome of a suite of revenue streams by offering an integrated approach to **leveraging and coordinating other related but distinct opportunities for federal funding**. For example:

- The Clean Energy and Energy Efficiency Tax Credits will provide \$37 billion for residential clean energy improvements.
- The National Clean Investment Fund and Clean Communities Investment Accelerator will provide \$20 billion in financing for clean energy projects.
- Solar for All will provide \$7 billion for solar in LIDACs.
- The Homes Energy Rebates Programs will provide \$8.8 billion for electrification and efficiency updates.
- The Weatherization Assistance Program will provide \$3.5 billion for weatherization of low-income households.

Note: A small portion of several other federal funding sources can be used for pre-weatherization, none of which can cover the full amount necessary for the level of remediation required: Weatherization Assistance Program (typically 15% of state formula funds, restrictions on eligible measures and costs) and pilot of DOE Weatherization Readiness Funds; Low-Income Household Energy Assistance Program (mostly energy bill assistance, up to 25% of funds could be used to supplement WAP/home health activities); and under Solar for All, only a small

portion of funding can go to supporting roof repair to facilitate PV deployment, among other enabling upgrades (up to 20% of funding).

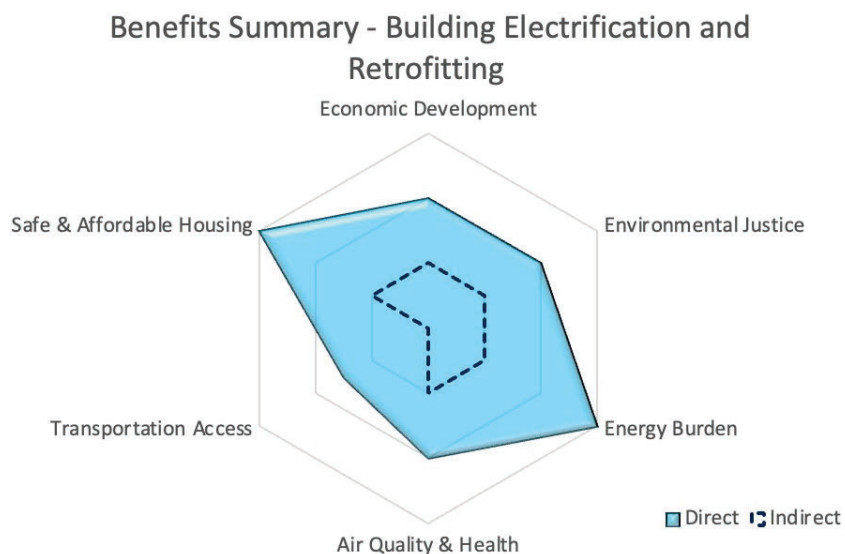
Despite over \$75 billion invested in infrastructure, there is not one cohesive, programmatic approach to make sure that the money is spent equitably. Using flexible CPRG funds will ensure this once in a generation federal funding is spent well, gets continually reinvested, and transforms the clean energy economy.

Municipal and other sub-state entities can take advantage of many federal tax credit programs through the elective pay provisions added under IRA. However, this is a new process for many entities. Providing technical assistance to maximize available incentives would be a critical part of any outreach effort tied to these programs.

## LIDAC Analysis

The electrification of buildings, energy storage, and energy efficiency projects and practices have the potential to substantially reduce utility bills and increase energy reliability. Therefore, these strategies hold tremendous promise for increasing equity and decreasing the high energy burdens experienced by low-income households, communities disproportionately impacted by climate change, and Native Nations. The building electrification and retrofitting measures could help address environmental injustices by mitigating the impact of indoor air pollution and improving building comfort, performance, and affordability. Implementing a GHG measure focused on building electrification and retrofitting, particularly in LIDACs, can bring about several direct and indirect benefits identified below.

**Figure 4. Schematic representation of the direct and indirect benefits for the building electrification and retrofitting measure.**





### Measure 3: Clean Transportation, Fuels, and Infrastructure

Transportation sector emissions account for the second-largest share of GHG emissions in Wisconsin at 27 percent in 2018. According to the MPSC *A Roadmap to Decarbonization in the Midcontinent - Transportation Electrification*, “carbon emissions in the transportation sector depend on the interplay of three primary factors: the carbon content of the fuel used to power vehicles, the efficiency of the vehicles, and how far the vehicles are driven, usually measured in

vehicle miles traveled.” Policies to decarbonize the transportation sector should focus on decreasing the carbon content of the fuel that powers vehicles and improving the efficiency of vehicles to emphasize zero-emission vehicle (ZEV) operation in the state.<sup>xxx</sup>

#### Relevant GHG Inventory Sector:

Transportation

#### Cumulative GHG emission reductions

**2025-2030:**

10.4 MMT CO<sub>2</sub>e

#### Cumulative GHG emission reductions

**2025-2050:**

13.4 MMT CO<sub>2</sub>e

Cars, buses, trucks, off-road vehicles, commercial aircraft, boats, and rail all contribute to transportation end-use emissions. Strategies that reduce or eliminate our fossil fuel dependence are critical to creating a clean, resilient transportation system and directly address climate change in Wisconsin. Passenger and light duty trucks account for 58 percent of transportation emissions in 2018 with diesel heavy-duty vehicles taking up the next spot at 24.6 percent.

Advancements in transportation technology since 2018 have been extensive. Wisconsin is poised to capitalize on these efforts due to development of the state’s Wisconsin Electric Vehicle Infrastructure (WEVI) Program. A robust network of public chargers is a prerequisite to support the transition to cleaner transportation. The WEVI Program, in deploying approximately 64 charging locations throughout the state as detailed on page 73 of the approved 2023 WEVI Plan, will be a means to accelerate electric vehicle (EV) adoption and therefore reduce GHG emissions.<sup>xxxi</sup> This infrastructure will help Wisconsin prepare for an influx of electric passenger and light-duty vehicles. However, more needs to be done to ensure the transition to ZEVs is supported across all vehicle classes. A similar plan should be considered for medium- and heavy-duty vehicle charging and alternative-fueling infrastructure. Furthermore, purchasing electric vehicles and the charging infrastructure needed to support them is still too cost-prohibitive for many individuals and organizations. Reducing barriers to purchasing electric vehicles and the charging infrastructure buildout is important.

Wisconsin has identified an opportunity to initiate a region-wide transition to electric medium- and heavy-duty vehicles by addressing the charging infrastructure gaps along key commercial corridors. Expanding charging infrastructure accessible to the public along the key commercial corridors that pass through Wisconsin and neighboring states is essential to transition to ZEV fleets and is integral to the state’s commitment to environmental sustainability and GHG emissions reduction. Wisconsin aims to develop an optimized plan for the location of

infrastructure for medium- and heavy-duty electric vehicles, integrating technical and safety benchmarks for charging stations while considering transportation statistics, grid information, and projected usage patterns. Subsequently, charging facilities will be established at high-priority sites as determined by the study.

On a smaller scale, small engine equipment powered by two and four-stroke motors also contributes to transportation GHG emissions in Wisconsin. These smaller engines often lack the advanced emissions controls found in cars and trucks. The replacement of small gasoline-powered equipment provides an opportunity for Wisconsin to address not only GHG emissions, but important air pollutants like particulate matter (PM), nitrogen oxides (NOx), and air toxins. This specific subsector of emissions also notably lacks funding from other sources.

Another area of potential emissions reductions is in the utilization of low-carbon cement in transportation infrastructure. The potential to participate in a coalition to catalyze innovation and deployment of low-carbon cement and concrete would be transformative. The coalition would target and mitigate barriers to currently deployable emissions reduction measures such as the substitution of cement with supplementary cementing materials (SCMs) and low carbon cement mixes, as well as methods to use less clinker in cement, use less cement in concrete, improve plant energy efficiency, use alternative and/or renewable fuel sources for heat, capture emissions at cement plants, and utilize different source materials and chemical reactions to produce innovative, ultra-low carbon cement.

## Priority Actions

### 3.1 REDUCE BARRIERS FOR ACCESS TO ELECTRIC VEHICLES AND ASSOCIATED INFRASTRUCTURE

#### *ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS*

	<b>2030 (MMT CO<sub>2</sub>e)</b>	<b>2050 (MMT CO<sub>2</sub>e)</b>
Estimated GHG Emissions Reductions	0.4	1.2
<b>Model:</b> Energy Policy Simulator		

#### *IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Administration

#### *POTENTIAL METRICS FOR TRACKING PROGRESS*

- Number of electric vehicles purchased.
- Number of charging units installed.
- Kilowatt hours (kWh) used from charging.
- Amount of petroleum displaced.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

### 3.2 SUPPORT RECYCLING AND REPLACEMENT OF SMALL ENGINES

#### *ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS*

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions	0.04	0.08
<b>Model:</b> MOVES		

#### *IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Natural Resources

#### *POTENTIAL METRICS FOR TRACKING PROGRESS*

- Number of gasoline-powered small engine equipment recycled.
- Number of electric or alternative fuel powered small engine equipment purchased.
- Amount of petroleum displaced.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

### 3.3 EXPAND MEDIUM-HEAVY DUTY ELECTRIFICATION AND HYDROGEN INFRASTRUCTURE

#### *ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS*

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions	9.7	8.8
<b>Model:</b> Energy Policy Simulator		

#### *IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Transportation, Wisconsin has been involved in introductory conversations with other states and organizations on the possibility of forming a coalition effort to address this priority action.

#### *POTENTIAL METRICS FOR TRACKING PROGRESS*

- Number of medium- and heavy-duty electric vehicles on the road.
- Number of charging and alternate fuel stations installed that can serve medium- and heavy-duty electric and alternative fuel vehicles.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

### 3.4 UTILIZE LOW-CARBON CEMENT IN TRANSPORTATION INFRASTRUCTURE

#### ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS

	2030 (MMT CO <sub>2e</sub> )	2050 (MMT CO <sub>2e</sub> )
Estimated GHG Emissions Reductions	0.393	3.313
<b>Model:</b> Formula		

\*Indirect Scope 3 emissions reductions for Wisconsin as a purchaser of low-carbon cement and concrete.

#### IMPLEMENTING AGENCY OR AGENCIES

Wisconsin Department of Transportation

Wisconsin Department of Administration

Wisconsin has been involved in introductory conversations with other states and organizations on the possibility of forming a coalition effort to address this priority action.

#### POTENTIAL METRICS FOR TRACKING PROGRESS

- Number of procurement commitments from member states.
- Establishment of production and procurement targets.
- Collaborative events with producers, states agencies, and technical experts.
- Plant upgrades.
- Decrease in plants' energy use.
- Increase in production and purchase of low carbon blended cements and advanced mix designs.
- Demonstration projects.
- Updated specifications (preference for performance-based specifications); and federal funding for low carbon cement/ concrete projects acquired.
- Total annual emissions from cement producers.
- Scope 3 emissions from procured cement/concrete for state projects.

### Federal Funding Intersection

Funding sources related to priority actions 3.1 - 3.3 could include the following:

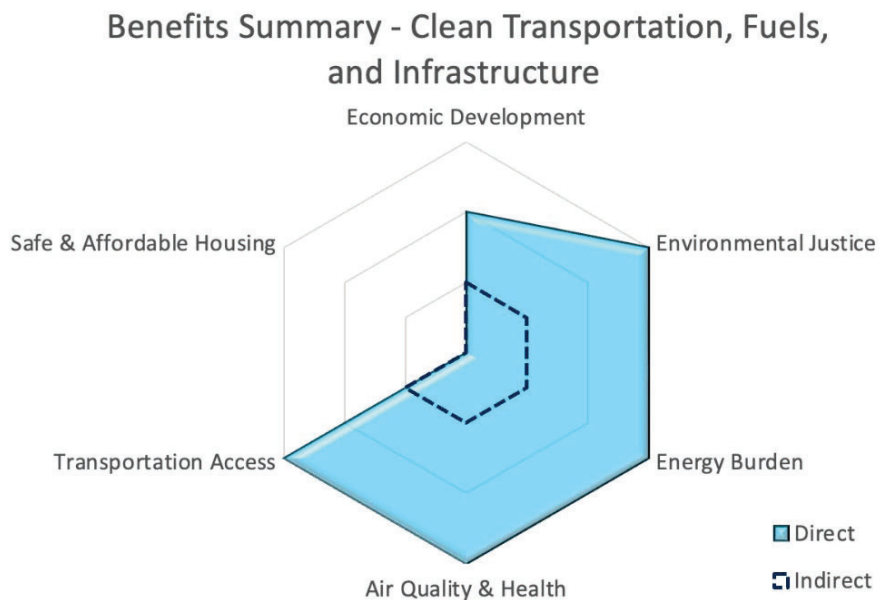
- Volkswagen settlement grants.
- Federal EV and commercial lawn mower purchase rebates.
- US EPA Clean School Bus program.
- US Department of Transportation's (US DOT), Federal Transit Administration Low- or No- Emission and Grants for Buses and Bus Facilities Competitive Programs.
- Diesel Emissions Reduction Act.
- US Department of Homeland Security, Federal Emergency Management Agency Congestion Mitigation and Air Quality Improvement Program.
- IRA Clean Ports
- US DOT Federal Highway Administration (FHWA), Charging and Fueling Infrastructure Discretionary Grant
- IRA Alternative Fuel Vehicle Refueling Property Credit Direct Pay

- US DOT FHWA, National Electric Vehicle Infrastructure program
- 48C and 45Q tax credits
- US DOT, Low Carbon Materials grant program
- US EPA Reducing Embodied GHG Emissions for Construction Materials and Products grant program.
- US General Services Administration, Low Embodied Carbon Program
- US Department of Energy, pilot projects and research/development
- Federal Buy Clean Initiative

## LIDAC Analysis

Low-income communities and communities of color are disproportionately affected by air pollution from transportation. Emissions from gasoline and diesel vehicles, such as NO<sub>x</sub>, PM2.5, and hydrocarbons are a major source of pollution causing significant health problems such as asthma, cancer, and lung and heart diseases. Compared to conventional fuels, electric vehicles eliminate tailpipe emissions that can greatly impact the health of communities. Pursuing clean transportation solutions is expected to result in economic, health, and social benefits including improved air quality, safer streets, local economic development, and improved mobility for low- and moderate-income communities. There are direct and indirect benefits from transportation electrification and clean fuels deployment that are further delineated below.

**Figure 5. Schematic representation of the direct and indirect benefits for clean transportation, fuels, and infrastructure measures.**





## Measure 4: Transit Planning and Expansion

In addition to transportation electrification and other clean fuel switching, the build out of public transportation, transportation planning, and support of other modes of transportation through the expansion of bicycle and e-bike usage and the development of pedestrian pathways present an opportunity for Wisconsin to address disparities in alternative transportation access. Communities across the state are considering mode-shifting and alternative transportation options in their local plans and the state is well-positioned to support them in those efforts. According to EPS's measure documentation, "example measures include improved public transit systems, more walking and bike paths, zoning for higher density along transit corridors, zoning for mixed-use developments, roadway and congestion pricing, and increased parking fees. Commercial passenger and freight flight trips may be shifted to inter-city rail or eliminated using technology such as videoconferencing."

**Relevant GHG Inventory Sector:**  
Transportation

**Cumulative GHG emission reductions 2025-2030:**  
11.1 MMT CO<sub>2</sub>e

**Cumulative GHG emission reductions 2025-2050:**  
10.1 MMT CO<sub>2</sub>e

## Priority Actions

### 4.1 ENABLE MODE SHIFTING TO ALTERNATIVE FORMS OF TRANSPORTATION AND EXPAND PUBLIC TRANSIT

#### *ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS*

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions	1.4	1.3
<b>Model:</b> Energy Policy Simulator		

#### *IMPLEMENTING AGENCY OR AGENCIES*

Local Units of Governments

#### *AUTHORITY TO IMPLEMENT*

The authority to implement such measures would be determined by the governmental body seeking funding.

#### *IMPLEMENTATION SCHEDULE AND MILESTONES*

Implementation schedule and milestones would depend upon a variety of factors relative to the implementing authority's focus and capabilities.

#### *POTENTIAL METRICS FOR TRACKING PROGRESS*

- Public transit ridership.
- Vehicle counts done on roadway arteries.

- Completed public transit plans.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

## 4.2 ELECTRIFY PUBLIC TRANSIT

### ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions	9.6	8.8
<b>Model:</b> Energy Policy Simulator		

*Note: The above calculation represents the impact of the full measure including fuel switching in other vehicle classes not represented by this measure. A more precise calculation could be used to quantify the measure for individual vehicle replacements.*

### IMPLEMENTING AGENCY OR AGENCIES

Local Units of Governments

### AUTHORITY TO IMPLEMENT

The authority to implement such measures would be determined by the governmental body seeking funding.

### IMPLEMENTATION SCHEDULE AND MILESTONES

Implementation schedule and milestones would depend upon a variety of factors relative to the implementing authority's focus and capabilities.

### POTENTIAL METRICS FOR TRACKING PROGRESS

- Number of internal combustion engine (ICE) buses replaced with ZEV buses.
- Number of new ZEV buses purchased.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program

## Federal Funding Intersection

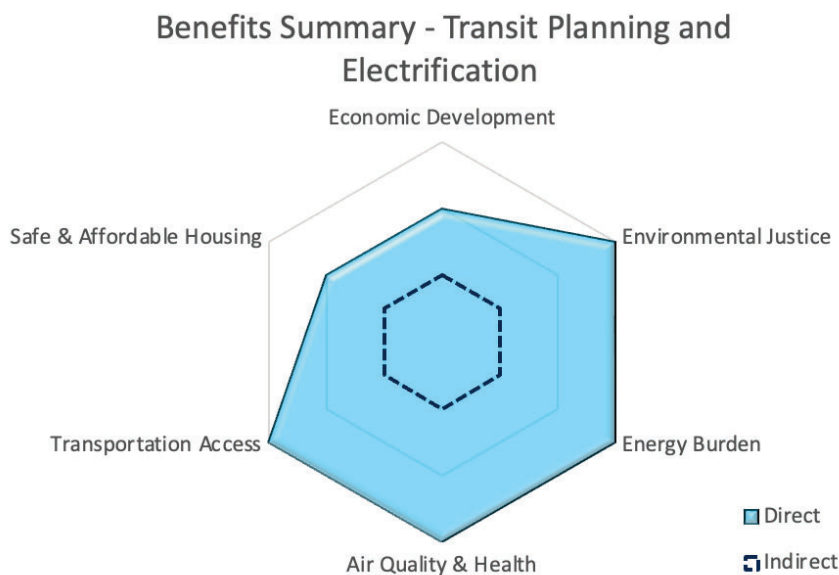
There are numerous federal programs to support such efforts detailed above including Federal IRA Tax Credits, Low- or No- Emissions Bus Program, Transit Oriented Development Pilot Program, Charging and Fueling Infrastructure Discretionary Grant Program, Environmental and Climate Justice Block Grants – Change Grants, and Active Transportation Infrastructure Investment Program.

## LIDAC Analysis

Low-income communities and communities of color are disproportionately affected by air pollution from transportation. Emissions from gasoline and diesel vehicles, such as NO<sub>x</sub>, PM<sub>2.5</sub>, and hydrocarbons, are a major source of pollution causing significant health problems such as asthma, cancer, and lung and heart diseases. Compared to conventional fuels, electric vehicles

eliminate tailpipe emissions that can greatly impact the health of communities. Pursuing clean transportation solutions is expected to result in economic, health, and social benefits including improved air quality, safer streets, local economic development, and improved mobility for low- and moderate-income communities. Implementing a GHG measure on transit planning and electrification with a focus on LIDACs may yield several direct and indirect benefits identified below.

**Figure 6. Schematic representation of the direct and indirect benefits for the transit planning and electrification measure.**



## Measure 5: Distributed Renewable Energy

Electricity generation is Wisconsin's highest emissions sector, though the sector has been trending downward in emissions since 2005. Emissions in this sector are primarily driven by the burning of coal. While utilities are taking drastic steps to reduce emissions, the build out of many measures detailed in this report will depend on an increase in electricity consumption. One way to aid in relieving demand on the grid is to build out renewable energy production at residences and buildings across the state. The deployment of renewable energy and storage systems for local government buildings to reduce energy costs and provide resilience in case of an electric grid outage is a priority for Wisconsin. Support could include additional incentives to complement newly available "direct pay" options for local governments to receive energy tax credits and technical assistance for such projects.

**Relevant GHG Inventory Sector:**  
Electricity Generation, Buildings

**Cumulative GHG emission reductions  
2025-2030:**  
0.708 MMT CO<sub>2</sub>e

**Cumulative GHG emission reductions  
2025-2050:**  
1.242 MMT CO<sub>2</sub>e

## Priority Actions

### 5.1 SUPPORT DISTRIBUTED WIND, GEOTHERMAL, BIOGAS, SOLAR, STORAGE INSTALLATIONS

#### *ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS*

	<b>2030 (MMT CO<sub>2</sub>e)</b>	<b>2050 (MMT CO<sub>2</sub>e)</b>
Estimated GHG Emissions Reductions	0.7	1.2
<b>Model:</b> Energy Policy Simulator		

#### *IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Administration

#### *POTENTIAL METRICS FOR TRACKING PROGRESS*

- Number of facilities installing renewable energy and storage.
- Number of kilowatts of installed renewable energy.
- The expected lifespan of projects .
- Number of performance years to quantify lifetime pollution reductions.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

## 5.2 IMPROVE RESILIENCY OF LOCAL GOVERNMENTS THROUGH INSTALLATION OF SOLAR AND STORAGE

### ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions*	0.009	0.042
<b>Model:</b> PVWatts, ReOpt		

\*Should a revolving loan fund model be utilized, emissions reductions would increase.

### IMPLEMENTING AGENCY OR AGENCIES

Wisconsin Department of Administration

Wisconsin has been involved in introductory conversations with other states and organizations on the possibility of forming a coalition effort to address this priority action.

### POTENTIAL METRICS FOR TRACKING PROGRESS

- Number of facilities installing renewable energy and storage.
- Number of kilowatts of installed renewable energy.
- Number of kilowatts of battery power installed.
- Number of kilowatt hours battery capacity installed.
- Expected lifespan of projects.
- Number of performance years to quantify lifetime pollution reductions.
- Amount of CO<sub>2</sub> and other co-pollutants emissions reduced at each participating site, both on an annual basis and over the duration of the program.

## Federal Funding Intersection

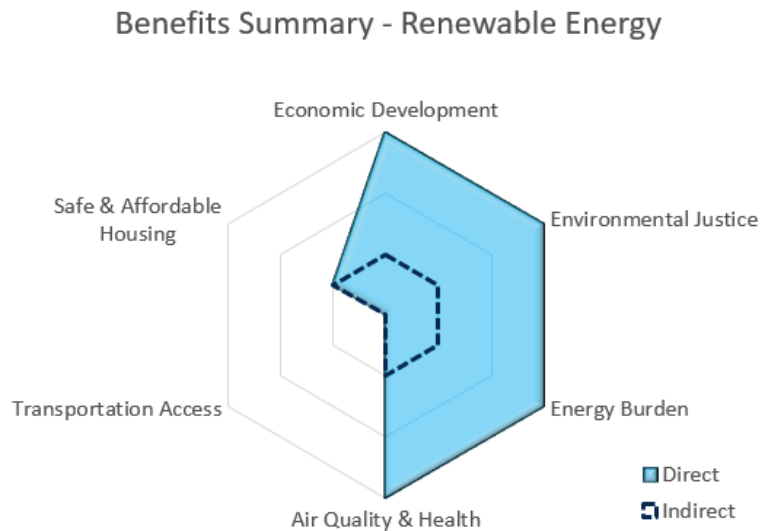
These strategies intend to leverage the complementary funding available through elective pay (sometimes called direct pay) of certain clean energy tax credits (§45Y, §48E). These tax credits only cover up to 30% of the projects contemplated under this measure, which may be insufficient for some buildings to achieve a return on investment through cost-savings from energy bills. In addition to directly supporting projects through technical assistance and deployment of renewable energy and storage systems, this measure will also serve to educate potential recipients on the available tax credits and provide technical assistance to recipients in designing such systems. As a result, this measure will catalyze widespread adoption of renewable energy and storage systems.

The following additional funding sources were identified as available for the purpose of installing solar plus storage projects but are not believed to be duplicative due to different program foci: US Department of Energy's Energy Efficiency and Conservation Block Grant, US EPA's Greenhouse Gas Reduction Fund, and Federal Emergency Management Agency's Building Resilient Infrastructure and Communities.

## LIDAC Analysis

This measure is intended to lower costs and barriers for new distributed renewable energy systems. Relevant activities may include incentives for industry, municipalities, and universities to install renewable energy systems including battery storage to support grid resiliency and lower emissions. Implementing a GHG measure for renewable energy can have several direct and indirect benefits for LIDACs as identified below.

**Figure 7. Schematic representation of the direct and indirect benefits for distributed renewable energy.**





## Measure 6: Agriculture and Soil Solutions

Soil carbon storage is a highly impactful way of improving the removal of CO<sub>2</sub>. There are a variety of methodologies that Wisconsin is interested in researching and implementing including improved tillage practices, retiring organic and marginal soils, and establishing windbreaks/shelterbelts.

### Priority Actions

#### Relevant GHG Inventory Sector:

Agriculture/Natural and Working Lands

#### Cumulative GHG emission reductions

**2025-2030:**

0.6 MMT CO<sub>2</sub>e

#### Cumulative GHG emission reductions

**2025-2050:**

1.5 MMT CO<sub>2</sub>e

### 6.1 PROMOTE SOIL CARBON INTENSITY BEST PRACTICES.

#### ESTIMATE OF THE QUANTIFIABLE GHG EMISSIONS REDUCTIONS

	2030 (MMT CO <sub>2</sub> e)	2050 (MMT CO <sub>2</sub> e)
Estimated GHG Emissions Reductions	0.6	1.5
<b>Model:</b> Energy Policy Simulator		

#### IMPLEMENTING AGENCY OR AGENCIES

Wisconsin Department of Administration, Wisconsin has been involved in introductory conversations with other states and organizations on the possibility of forming a coalition effort to address this priority action.

#### POTENTIAL METRICS FOR TRACKING PROGRESS

- Number of farms enrolled in program.
- Metric tons of soil carbon improvements.

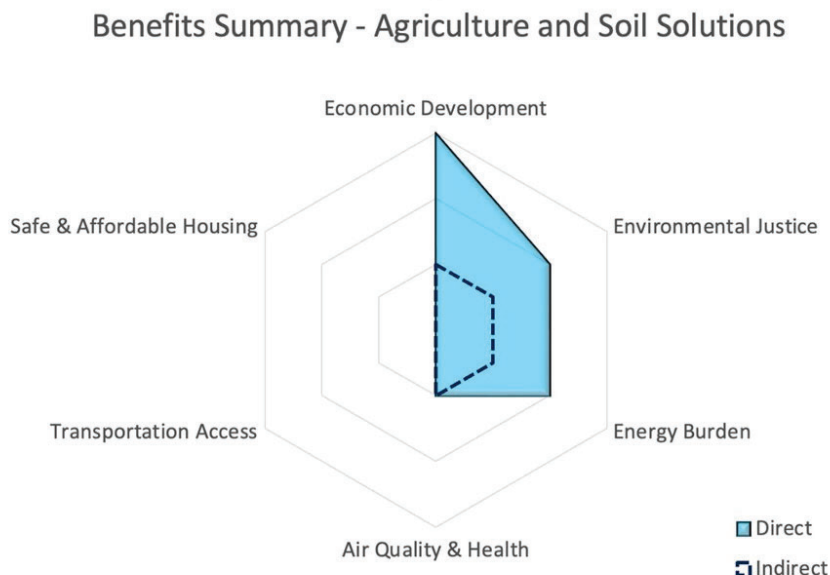
### Federal Funding Intersection

Federal funding exists to support some of the actions represented by this measure in the Natural Resources Conservation Service's Environmental Quality Incentives Program (EQIP) and Conservation Innovation Grants (CIG). A more thorough analysis of federal programs will be completed before funding is applied for in the CPRG program.

### LIDAC Analysis

Climate-smart agriculture encompasses agricultural practices and systems that mitigate GHG emissions, enhance carbon sequestration, and adapt to climate change while promoting sustainable food production and increasing resilience to climate-related challenges. Adopting these practices can lower production costs for farmers, increase market access for sustainably produced goods, and contribute to rural economic development. Potential benefits are identified below.

**Figure 8. Schematic representation of the direct and indirect benefits for the agriculture and soil solutions measure.**



## Non-Emissions Focused Initiatives

### Climate and Clean Energy Workforce Development Program

Efforts to provide support for workforce development related to the deployment of energy efficiency, renewed electrification opportunities, and renewable energy implementation throughout the state are a necessary part of any climate-changing emissions reduction measures and actions. Specifically, to ensure success of these measures and actions, OSCE, in conjunction with the Wisconsin Department of Workforce Development, will support employers to create relevant jobs with family-supporting wages and high-quality benefits, assist job seekers and employees to connect with those jobs, expand apprenticeship and other clean-energy related training program opportunities, and collaborate with labor unions, development boards, technical colleges and other educational institutions, and other workforce partners. While many actions have already been taken in Wisconsin to support workforce transitions as outlined in the Wisconsin Clean Energy Plan 2023 Progress Report, support is still needed to ensure an equitable and inclusive workforce. Wisconsin will be completing a full workforce inventory of clean energy jobs for inclusion in the next steps of the CPRG Planning grant process.

#### *KEY IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Workforce Development (DWD)  
 Wisconsin Department of Administration

#### *POTENTIAL RECIPIENTS OF SECURED IMPLEMENTATION FUNDING*

DWD, Workforce Development Boards, Wisconsin Technical Colleges, Universities of Wisconsin

## **Outreach and Engagement Through the Wisconsin Climate Action Navigators**

The Wisconsin Climate Action Navigators (WI CAN) will support outreach and engagement related to climate pollution reduction efforts occurring around the state at all levels. OSCE leveraged a portion of CPRG planning funding to launch the WI CAN initiative in November 2023 as an extensive community engagement effort. The goal of this effort is to catalyze transformative climate action through:

1. Extend OSCE's reach into local communities by leveraging a trusted network to help develop, coordinate, and promote robust clean energy education and outreach efforts across the state.
2. Elevate local priorities and increase opportunities for community self-determination and cross-sector collaboration.
3. Setting up continuous communication and feedback loops to engage Wisconsinites in shared clean energy progress by collecting public input and sharing progress transparently.

The connections made as part of this initiative will inform the creation and deployment of the state's Comprehensive Climate Action Plan, help rapidly diffuse funding opportunities, and subsequently establish an ongoing network of communities and partners that will carry this work through the coming decades. Read more about WI CAN's future efforts in Next Steps.

#### *KEY IMPLEMENTING AGENCY OR AGENCIES*

Wisconsin Department of Administration

## **Authority to Implement**

Executive Order #38, issued by the Governor Tony Evers, via the authority of the Constitution of and the Laws of the State, designates the Department of Administration – Office of Sustainability and Clean Energy to ensure the State of Wisconsin is fulfilling the carbon reduction goals of the 2015 Paris Climate Accord and working with stakeholders to ensure all electricity consumed in the state is 100% carbon free by 2050. Under s. 16.54, Wis. Stats., the Governor on behalf of the state is authorized to accept federal funds made available to the State. All applications for and receipt of federal funds by a state agency, as well as the creation of federally funded positions, are subject to the Governor's approval.

## Next Steps

After submission of this roadmap to the US EPA, the immediate next step is to apply for CPRG phase 2 implementation funding. Simultaneously, OSCE will begin to develop Wisconsin's CCAP. Wisconsin's CPRG Phase 2 Implementation Grant application(s) and Comprehensive Climate Action Plan( CCAP) development will have support from the Wisconsin Climate Action Navigators. The following section details US EPA's requirements and OSCE's approach to creating and delivering a holistic CCAP, which centers lived experiences and spurs transformative climate action.

**Developing Wisconsin's CCAP:** While this roadmap outlines high-impact and implementation ready measures with direct benefits to LIDACs, it is not intended to be a holistic representation of all measures Wisconsin could implement to realize transformative emissions reduction. Measures and actions in this roadmap are designed to be competitive in CPRG Phase 2 Implementation Grants and serve to complement the implementation of existing initiatives and priorities not outlined in this roadmap. Where this roadmap is narrow, the CCAP will provide an all-encompassing, multi-sector pathway to define strategies for energy and non-energy related GHG emissions reduction, carbon sequestration, and mitigation.<sup>xxxii</sup> As required by US EPA, Wisconsin's CCAP will include the following:

- GHG inventory, emissions projections, and reduction targets,
- Quantified GHG reduction measures,
- Benefits analysis,
- LIDAC benefits analysis,
- Review of authority to implement,
- Leverage and intersection with other funding,
- Workforce planning analysis, and
- Stakeholder engagement activities.

**Ongoing stakeholder engagement: catalyzing transformative climate action - WI CAN** represents a new framework for authentic community engagement in the development and implementation of this roadmap, the CCAP and beyond. OSCE began gathering stakeholder feedback and buy-in for WI CAN in September 2023 and hosted the first in-person meeting in January 2024. The design of WI CAN draws from a collective impact approach<sup>xxxiii</sup> where OSCE serves as the backbone organization. Over 70 organizations from across WI attended the January 2024 in-person meeting, including community-based organizations, Native Nations, other Wisconsin state agencies, local government coalitions, LIDAC representatives, workforce development organizations, agriculture experts, universities, environmental justice advocates, industry representatives, business advocates, and labor groups. Moving forward, WI CAN provides a framework to empower Wisconsinites to engage in the clean energy transition and climate action in three key ways:

1. Extend OSCE's reach into local communities by leveraging a trusted network to help develop, coordinate, and promote robust clean energy education and outreach efforts across the state.

2. Elevate local priorities and increase opportunities for community self-determination and cross-sector collaboration.
3. Set up continuous communication and feedback loops to engage Wisconsinites in shared clean energy progress by collecting public input and sharing progress transparently.

As OSCE moves on to implementing priority actions identified in this roadmap and developing the CCAP, WI CAN serves as new model for authentic community engagement that can help build trust in government, equitably diffuse funding, provide resources and technical assistance to underserved communities, and drive systemic change. Not only will OSCE's planning, implementation, and engagement efforts serve to continue to transform Wisconsin's energy system to a clean energy economy and directly address climate change impacts, but they will also create family-supporting jobs, improve public health, address historic injustice, and protect our planet for generations to come.

## Appendix A: Quantified Emissions Background

The Office of Sustainability and Clean Energy used a variety of quantification methods for determining the potential emissions reductions for each measure and strategy. In many cases, Rocky Mountain Institute’s Energy Policy Simulator (EPS) v3.4.3 tool was used to identify measures and potential emissions reductions related to those measures. EPS shows a “business as usual” (BAU) case to aid in comparison for selected measures. The BAU case assumes a reduction in overall GHG emissions due to other enacted policies. In other cases, individual formulas or calculations were used to determine potential GHG emissions related to a measure based on a variety of datasets and inputs.

These calculations are not meant to be predictions, but rather indications of the potential for emissions reductions under ambitious decarbonization scenarios associated with the related actions. The assumptions used in the development of quantifications are similarly representative of potential and should not be interpreted as specific state goals or commitments, as outcomes will vary based on actual program implementation details and timelines that will be developed fully as implementation funding opportunities are realized. The methods for quantification utilized for each strategy are outlined below.

### Industrial Efficiency, Electrification, and Decarbonization

#### FACILITATE AN INDUSTRIAL DECARBONIZATION CHALLENGE THROUGH A COALITION OF MIDWEST STATES.

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	103.0	90.5
Reduction from Base Year 2025	-	10.5	23.0
Reduction from Business as Usual	-	8	15.6

### Building Electrification and Retrofitting

#### IMPROVE THE EFFICIENCY OF HOMES AND BUILDINGS THROUGH BUILDING COMPONENT ELECTRIFICATION.

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	109.2	94.6
Reduction from Base Year 2025	-	4.3	18.9
Reduction from Business as Usual	-	1.8	11.5



### RETROFIT EXISTING BUILDINGS.

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	110.4	104.1
Reduction from Base Year 2025	-	3.1	9.4
Reduction from Business as Usual	-	0.6	2.0

### CREATE A PRE-WEATHERIZATION PROGRAM AND INTEGRATE BUILDING INCENTIVES.

The OSCE created a formula based on metrics from the Weatherization Assistance Program and EPA guidance for determining GHG emissions reductions potential for this measure.

<b>Model:</b> Formula	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
GHG Emissions Reductions	0.025	0.125

## Clean Transportation, Fuels, and Infrastructure

### REDUCE BARRIERS FOR ACCESS TO ELECTRIC VEHICLE AND ASSOCIATED INFRASTRUCTURE

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	110.6	104.9
Reduction from Base Year 2025	-	2.9	8.6
Reduction from Business as Usual	-	0.4	1.2

### SUPPORT RECYCLING AND REPLACEMENT OF SMALL ENGINES.

<b>Model:</b> MOVES	2025 (metric tons)	2030 (metric tons)	2050 (metric tons)
Business as Usual	415,242.7	415,242.7	415,242.7
GHG Emissions with Measure	-	373,718.4	332,194.1
Reduction from Base Year 2025	-	41,524.3	83,048.5
Reduction from Business as Usual	-	41,524.3	83,048.5

### EXPAND MEDIUM-HEAVY DUTY ELECTRIFICATION AND HYDROGEN INFRASTRUCTURE.

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	101.3	97.3
Reduction from Base Year 2025	-	12.2	16.2
Reduction from Business as Usual	-	9.7	8.8

### UTILIZE LOW-CARBON CEMENT IN TRANSPORTATION INFRASTRUCTURE.

Georgetown Climate Center developed calculations and a formula for determining Wisconsin's Scope 3 indirect emissions related to a coalition-based measure that would transform the low-carbon cement industry.

<b>Model:</b> Formula	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
GHG Emissions Reductions	0.393	3.313

## Transit Planning and Expansion

### ENABLE MODE SHIFTING TO ALTERNATIVE FORMS OF TRANSPORTATION AND EXPAND PUBLIC TRANSIT.

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	109.6	104.8
Reduction from Base Year 2025	-	3.9	8.7
Reduction from Business as Usual	-	1.4	1.3

### ELECTRIFY PUBLIC TRANSIT.

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	101.3	97.3
Reduction from Base Year 2025	-	12.2	16.2
Reduction from Business as Usual	-	9.7	8.8

## Distributed Renewable Energy

### SUPPORT DISTRIBUTED SOLAR, GEOTHERMAL, WIND, AND BIOGAS INSTALLATIONS.

<b>Model:</b> Energy Policy Simulator	2025 (million metric tons CO <sub>2</sub> e)	2030 (million metric tons CO <sub>2</sub> e)	2050 (million metric tons CO <sub>2</sub> e)
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	110.3	104.9
Reduction from Base Year 2025	-	3.2	8.6
Reduction from Business as Usual	-	0.7	1.2

### **IMPROVE RESILIENCY OF LOCAL GOVERNMENTS THROUGH INSTALLATION OF SOLAR AND STORAGE.**

Great Plains Institute estimated GHG and criteria pollutant emission reductions based on a case evaluation. Actual emissions reductions will vary depending on selected program parameters.

<b>Model:</b> PVWatts, ReOpt	2035 <i>(million metric tons CO<sub>2</sub>e)</i>	2050 <i>(million metric tons CO<sub>2</sub>e)</i>
GHG Emissions Reductions	.008628	.042142

## **Agriculture and Soil Solutions**

### **PROMOTE SOIL CARBON INTENSITY BEST PRACTICES.**

<b>Model:</b> Energy Policy Simulator	2025 <i>(million metric tons CO<sub>2</sub>e)</i>	2030 <i>(million metric tons CO<sub>2</sub>e)</i>	2050 <i>(million metric tons CO<sub>2</sub>e)</i>
Business as Usual	113.5	111.0	106.1
GHG Emissions with Measure	-	110.4	104.6
Reduction from Base Year 2025	-	3.1	8.9
Reduction from Business as Usual	-	0.6	1.5

## Appendix B: Alignment with Previous Planning

Below is a list of Governor’s Task Force on Climate Change recommendations and Clean Energy Plan strategies that align with the Wisconsin Emissions Reductions Roadmap.

Priority Measure	Clean Energy Plan and Governor’s Task Force on Climate Change References
<b>Industrial Efficiency, Electrification, and Decarbonization</b>	<ul style="list-style-type: none"> <li>• Support commercial and industrial energy efficiency. (CEP, Page 120)</li> <li>• Reduce agriculture energy use. (CEP, Page 121)</li> <li>• Support high-value conservation. (CEP, Page 132)</li> <li>• Create a plan to adopt net carbon zero thermal solutions to scale up renewable heating and cooling in the industrial and building sectors. (CEP, Page 133; GTFCC #46)</li> </ul>
<b>Building Electrification and Retrofitting</b>	<ul style="list-style-type: none"> <li>• Support clean energy and energy efficiency projects via State Agency Performance Contracting and other financing options. (CEP, Page 90)</li> <li>• Incentivize tax credit developers that incorporate energy efficiency and sustainability into the construction and rehabilitation of affordable housing developments. (CEP, Page 106)</li> <li>• Pursue a healthy whole-home approach. (CEP, Page 122-123)</li> <li>• Leverage federal funding for energy efficiency grant program. (CEP, Page 124)</li> <li>• Empower schools to fund or implement energy efficiency programs. (CEP, Page 124; 2021-2023 Executive Budget; GTFCC Rec #36)</li> <li>• Support energy efficiency improvements through the WHEDA Foundation Annual Housing Grant Program. (CEP, Page 124)</li> <li>• Deploy rapid building electrification. (CEP, Page 130)</li> <li>• Increase outreach and support deployment of air-source heat pumps. (CEP, Page 132-133)</li> </ul>
<b>Clean Transportation, Fuels, and Infrastructure</b>	<ul style="list-style-type: none"> <li>• Work to transition the State’s vehicle fleet to clean fuels and zero-emission vehicles (ZEV). (CEP, Page 88)</li> <li>• Decarbonize the transportation sector via EV and infrastructure deployment. (CEP, Page 142)</li> <li>• Implement sustainable land use planning and transportation demand management (TDM). (CEP, Page 142; GTFCC #18; GTFCC #20)</li> <li>• Support the transition to Electric Vehicles (EV) statewide. (CEP, Page 144-145)</li> <li>• Ensure that electric charging infrastructure and federal funding to support infrastructure buildout is widely available for all types of vehicles and that it reaches rural, low-income, and communities of color. (CEP, Page 145-146)</li> </ul>
<b>Transit Planning and Expansion</b>	<ul style="list-style-type: none"> <li>• Support Transit for Job Access and Reverse Commute Program funding. (CEP, Page 81)</li> <li>• Implement sustainable land use planning and transportation demand management (TDM). (CEP, Page 142; GTFCC #18; GTFCC #20)</li> <li>• Decarbonize the transportation sector via EV and infrastructure deployment. (CEP, Page 142)</li> </ul>

	<ul style="list-style-type: none"> <li>• Support the transition to Electric Vehicles (EV) statewide. (CEP, Page 144-145)</li> <li>• Ensure that electric charging infrastructure and federal funding to support infrastructure buildout is widely available for all types of vehicles and that it reaches rural, low-income, and communities of color. (CEP, Page 145-146)</li> </ul>
<b>Distributed Renewable Energy</b>	<ul style="list-style-type: none"> <li>• Reduce energy consumption and GHG emissions. (CEP, Page 89)</li> <li>• Support clean energy and energy efficiency projects via State Agency Performance Contracting and other financing options. (CEP, Page 90)</li> </ul>
<b>Agriculture and Soil Solutions</b>	Pay farmers to increase soil carbon storage in agricultural and working lands. (GTFCC #22, Page 52)
<b>Climate and Clean Energy Workforce Development</b>	<ul style="list-style-type: none"> <li>• Launch a clean energy job inventory and outreach program. (CEP, Page 78)</li> <li>• Support the Clean Energy Workforce Advisory Council. (CEP, Page 78)</li> <li>• Support communities and workers who will experience power generation plant closures. (CEP, Page 78)</li> <li>• Increase engagement and collaboration with labor unions. (CEP, Page 80)</li> <li>• Ensure the clean energy transition supports family-supporting wages. (CEP, Page 80)</li> <li>• Launch a Clean Energy Reentry Pilot Program. (CEP, Page 80)</li> <li>• Support the creation of a certified training program for digester operators. (CEP, Page 80)</li> <li>• Support Clean Jobs Training Grants. (CEP, Page 81)</li> <li>• Support clean energy and energy efficiency job creation. (CEP, Page 82)</li> <li>• Expand agriculture clean energy workforce development. (CEP, Page 82)</li> <li>• Create and deploy workforce transition plans. (GTFCC #31, Page 68)</li> <li>• Support public post-secondary educational entities. (GTFCC #32, Page 70)</li> <li>• Create new jobs through conservation and prepare individuals for work within the green energy sector. (GTFCC #33, Page 71)</li> </ul>
<b>Engagement</b>	<ul style="list-style-type: none"> <li>• Develop, coordinate, and promote robust clean energy education and outreach efforts across the state. (CEP, Page 74)</li> <li>• Increase engagement and collaboration with labor unions. (CEP, Page 80)</li> <li>• Improve the state consultation process with Native Nations. (GTFCC #02, Page 24)</li> </ul>

## Appendix C: Other State Programs

The OSCE has identified many existing state programs that support the measures listed in this roadmap. This list is not comprehensive but tells a compelling story for Wisconsin's efforts and what progress has already been made. The measures in this roadmap will complement, not duplicate, these important programs.

### Industrial Efficiency, Electrification, and Decarbonization

- Focus on Energy has limited custom and prescriptive incentives for manufacturing customers.
- Wisconsin Office of Energy Innovation
- Wisconsin Economic Development Corporation – Green Innovation Fund
- UW-Milwaukee - Industrial Assessment Center
- Wisconsin Manufacturing and Extension Partnership

### Building Electrification and Retrofitting

- Focus on Energy
- Wisconsin Office of Energy Innovation - Energy Innovation Grant Program (EIGP)
- Wisconsin Housing and Economic Development Authority – Qualified Allocation Plan
- Wisconsin Economic Development Corporation – Green Innovation Fund
- Wisconsin Department of Administration:
  - Wisconsin Home Energy Assistance Program (WHEAP)
  - Weatherization Assistance Program (WAP)
  - Home Energy Plus (HE+) Program Services
  - HOME Homebuyer and Rehabilitation Program (HHR)
  - Energy Savings Conservation Programs
  - Help for Homeowners (WHH)
- Wisconsin Department of Health Services: Asthma Safe Homes/ Healthy Homes
- Inflation Reduction Act HOMES and HEERA rebate programs

### Clean Transportation, Fuels, and Infrastructure

- Wisconsin Department of Transportation
  - Wisconsin Electric Vehicle Infrastructure (WEVI) program
  - Transportation Alternatives Program
  - Congestion Mitigation and Air Quality Improvement Program
- Wisconsin Department of Natural Resources - Diesel Emissions Reduction Act Clean Diesel Grant Program
- Wisconsin Office of Energy Innovation - Energy Innovation Grant Program
- Wisconsin Economic Development Corporation – Green Innovation Fund



## **Transit Planning and Expansion**

- Wisconsin Department of Transportation
  - Carbon Reduction Program
  - Transportation Alternatives Program
  - Congestion Mitigation and Air Quality Improvement Program

## **Distributed Renewable Energy**

- Focus on Energy
- Wisconsin Office of Energy Innovation - Energy Innovation Grant Program
  - Wisconsin Economic Development Corporation
  - Green Innovation Fund
  - Business Development Credit
- Solar for All
- Wisconsin Department of Administration
  - Energy Savings Conservation Programs

## **Agriculture and Soil Solutions**

- Department of Agriculture, Trade, and Consumer Protection:
  - Producer-Led Watershed Protection grants
  - Commercial Nitrogen Optimization Pilot Program
  - Crop insurance premium rebates for planting cover crops
  - Nutrient Management farmer education

## **Climate and Clean Energy Workforce Development Program**

- Inflation Reduction Act State-Based Home Energy Efficiency Contractor Training Grants

## Appendix D: LIDAC Census Block Group IDs

LIDAC Census Block Group IDs were collected using EJSscreen. Methods are outlined in section “Identifying Low Income and Disadvantaged Communities.”

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551390028003	551410114002			
551390029001	551410114004			

# Appendix E: Outreach and Engagement Timelines

## Native Nation Government Engagement Timeline

**September 2023:** Presentation at Tribal Energy Symposium  
**November 2023:** Attended Department of Administration Tribal Consultation  
**November 2023:** Meeting with Wisconsin Tribal Conservation Advisory Council  
**December 2023:** Letter sent to all Native Nation Leaders  
**January 2024:** Individual meetings with Native Nation government staff  
**January 2024:** Presentation at MTERA Board Meeting  
**January 2024:** Presentation at Wisconsin Tribal Conservation Advisory Council Board Meeting  
**February 2024:** Shared WI's draft priority measures and resource list to Native Nation Leaders, staff, and Tribal Consortia

## Local Government Engagement Timeline

**July 2023:** WLGCC submitted feedback on priority strategies to reduce GHG emissions  
**September 2023:** Meeting with SEWRPC  
**October 2023:** Initiated sub-award process with UW-Milwaukee to complete a local plan analysis  
**October 2023:** Presentation at Green Tier Legacy Communities Meeting  
**November 2023:** Meeting with WI Towns Association  
**November 2023:** Meeting with WI Counties Association  
**December 2023:** "WI Climate Pollution Reduction Grant Update" public stakeholder webinar ([https://www.youtube.com/watch?v=hrkFjX\\_g7sQ](https://www.youtube.com/watch?v=hrkFjX_g7sQ))  
**December 2023:** Request for priority project information via a public input survey  
**January 2024:** Meeting with Association of Regional Planning Commissions  
**January 2024:** Presentation at Green Tier Legacy Communities meeting  
**February 2024:** Shared WI Draft Priority Measures with local government stakeholders

## Other outreach activities related to CPRG planning

The below timeline below highlights other meetings, conferences, and events the OSCE attended or presented at to engage Wisconsinites, specifically LIDACs, in CPRG planning. This list is not all encompassing and the OSCE will continue to expand outreach efforts through implementation and planning.

**September 2023:** Attended Agriculture and Rural Resilience Summit  
**October 2023:** Presentation at UW Sustainability Annual Meeting  
**October 2023:** Tabling at University of Wisconsin – Stevens Point Sustainability Fair  
**October 2023:** Climate and Healthy Communities Collaborative Workgroup Meeting  
**November 2023:** Meeting with Wisconsin Building Trades Council  
**November 2023:** Meeting with Wisconsin EcoLatinos

**November 2023:** Attended Dane County High School Climate Conference

**November 2023:** Meeting with Tribal Communities Technical Assistance Center

**November 2023:** Meeting with Focus on Energy

**November 2023:** Speaker on SustainUW podcast: “Wisconsin’s Renewable Future: Spotlights the Wisconsin Office of Sustainability and Clean Energy”<sup>xxxiv</sup>

**November 2023:** Meeting with Savanna Institute

**November 2023:** Meeting with the National Association for the Advancement of Colored People (NAACP)

**December 2023:** Meeting with Wisconsin Sustainable Business Council and Wisconsin Manufacturing Extension Partnership

**December 2023:** Meeting with Wisconsin’s Green Fire

**January 2024:** Presentation at Wisconsin Climate Table meeting

**January 2024:** Meeting with Our Future Milwaukee Coalition

**January 2024:** Meeting with Dane County Youth Environmental Coalition

**February 2024:** Meeting with WI Workforce Development Board

**February 2024:** Presentation to Wisconsin Clean Energy Communities Initiative

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