



WISCONSIN OFFICE OF  
**Sustainability  
& Clean Energy**



# WISCONSIN'S Emissions Reduction Roadmap - Actions for Sustainability in Wisconsin

**JUNE 2026**

# ACKNOWLEDGMENTS

The Wisconsin Department of Administration, Office of Sustainability and Clean Energy, is delivering this report to the residents, businesses, and governmental bodies of Wisconsin to support investments in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, drive economic growth, protect and preserve natural resources, improve air quality, and promote the health and well-being of all residents in Wisconsin.

The Office of Sustainability and Clean Energy acknowledges and thanks those listed below for their contribution to this plan:

- Organizations from the States Deployment Initiative - Conveners Network for their significant contributions in facilitation, analysis, resources, and insight throughout Wisconsin's planning process development.
- The University of Wisconsin-Madison's Nelson Institute for Environmental Studies, Energy Analysis and Policy Program, the University of Wisconsin-Madison Data Sciences Institute, and the University of Wisconsin-Milwaukee's Office of Sustainability, for their contributions to the benefits analysis, engagement analysis, and review of local climate action plans, respectively.
- State agency leadership and staff who provided guidance and review of this plan, with particular thanks to the Wisconsin Department of Natural Resources for completing the greenhouse gas inventory report, to the Wisconsin Department of Health Services for their contributions to the benefits analysis, and the Department of Workforce Development's contributions to the workforce planning analysis.
- Vermont Energy Investment Corporation for completing the modeling and technical analysis for the actions outlined in this plan.
- The many contributors participated in the process via stakeholder engagement activities, with particular thanks to the Wisconsin Climate Action Navigators network and Climate Pollution Grant Technical Teams, who provided essential perspectives and subject matter expertise to advise on key pathways and strategies. Stakeholders were engaged through meetings, participating in statewide events, and writing online comments.

Prepared by:

Wisconsin Department of Administration  
Office of Sustainability and Clean Energy  
101 E. Wilson St., 5th Fl.  
Madison, WI 53703

[osce@wisconsin.gov](mailto:osce@wisconsin.gov)

## DISCLAIMER

This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement 00E03465 to the Wisconsin Department of Administration. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the agency endorse trade names or recommend the use of commercial products mentioned in this document.

# TABLE OF CONTENTS

<b>Preface</b> .....	5
<b>Everyone Has A Role</b> .....	5
<b>How To Read This Plan</b> .....	5
<b>Section I - Climate Change And Greenhouse Gases</b> .....	7
How Climate Change Is Impacting Wisconsin .....	7
Wisconsin’s Greenhouse Gas Inventory.....	10
<b>Section II - Climate And Clean Energy Planning</b> .....	14
<b>Section III - Plan Development Process</b> .....	16
<b>Section IV - Community Engagement And Climate Action Capacity Building</b> .	18
Engagement For Planning.....	18
Building A Climate Action Movement Defined By Communities.....	22
<b>Section V - Benefits</b> .....	23
Benefits Analysis Summary.....	22
<b>Section VI - Wisconsin Greenhouse Gas Reduction Actions</b> .....	25
Greenhouse Gas Emissions Projections And Reduction Targets .....	26
Agriculture .....	33
Commercial And Residential Buildings.....	37
Energy Generation.....	45
Industrial Process And Facilities.....	51
Natural And Working Lands.....	55
Transportation .....	60
Waste And Materials .....	66
<b>Section VII - Workforce Planning</b> .....	70
<b>Conclusion</b> .....	73
<b>Appendix A: My Climate Action Plan</b> .....	74
<b>Appendix B: Acronyms</b> .....	75
<b>Appendix C: Bibliography</b> .....	76

# PREFACE

## EVERYONE HAS A ROLE

The Wisconsin Department of Administration's (DOA) Office of Sustainability and Clean Energy (OSCE) presents this Emissions Reduction Roadmap - Actions for Sustainability in Wisconsin (Roadmap) to Wisconsin residents, organizations, businesses, utilities, government agencies, and others throughout the Midwest region who are interested in actions we can collectively take to reduce the impacts of climate change. At its most basic, climate change is a shift in temperature and weather patterns. At its most complex, climate change is a global problem characterized by the release of millions of tons of harmful greenhouse gas (GHG) emissions, coastal degradation, and extreme weather events that cost the state and region billions of dollars every year. The OSCE recognizes these adverse effects of climate change and their influence on our resilience, energy security, economy, natural resources, tourism, transportation systems, and land use. We all have a role in adjusting to and lessening the severity of climate change.

Since climate change is primarily driven by human activities (and has been since the 1800s), it only makes sense that we take ownership and responsibility to change our activities to address the issue. With that, the OSCE developed this plan, based on thoughtful discussions and extensive public input, to define actions with measurable results. It serves as a blueprint for moving away from “business as usual” and offers a pathway for individuals, households, businesses, and government to make changes that reduce emissions. The collective effort and spirit of cooperation can help the world change course and prevent further worsening of the climate crisis, with the hope that, over time, the crisis can be averted. We encourage you to see yourself in this movement from your own perspective and create a personal action plan. To do so, the OSCE created a “My Climate Action Plan” worksheet (Appendix A) so that, as you read through the plan, you can identify your role, which sector or action interests you, and ways to follow up to help implement and measure our progress.



The OSCE is working with state agencies and public universities to continue identifying opportunities to address climate change through its operations and programs, this is referred to as “Lead-by-Example.” The OSCE intends to explore and align work and programs with this plan to support further implementation of climate action within the enterprise.

## HOW TO READ THIS PLAN

This Roadmap provides a strategic direction for the state and its partners to act to:

- Identify opportunities to reduce GHG emissions across multiple economic sectors.
- Strengthen overall environmental, economic, and social resilience.
- Reduce costs for Wisconsin families and communities.
- Identify and bolster the workforce aligned with emission reduction strategies, and
- Ensure all actions are equitable and intentionally minimize unintended and disproportionate impacts.

## SECTION 1-4: WHY THIS PLAN AND HOW WE GOT HERE

**Section 1:** Provides a brief history with background information and context on the impacts of climate change in Wisconsin. This section also examines Wisconsin's emissions profile, including a list of emission sources and sinks, with the associated emissions quantified.

**Section 2:** Offers background on past clean energy and climate planning efforts and how they align with this plan.

**Section 3:** Presents an overview of why and how the plan was developed.

**Section 4:** Summarizes the outreach and engagement efforts as well as public input related to the plan.

## SECTION 5: BENEFITS

**Section 5:** Explains how the direct benefits of actions are categorized and interpreted.

## SECTION 6: LIST OF KEY ACTIONS

**Section 6:** This section provides policies, programs, actions, and projects that reduce GHG emissions or enhance carbon removal. Emission reductions have been quantified by their individual impacts, and projections of total emissions are calculated cumulatively. Co-pollutant impacts are also quantified for the full suite of actions. The actions are grouped by economic sector, and each sector also shows positive effects beyond the stated goal of a GHG-reduction action (e.g., improved public health outcomes, economic benefits, increased climate resilience).

## SECTION 7: WORKFORCE PLANNING

**Section 7:** A workforce planning analysis that shows the workforce impacts aligned with the plan's goals.

### ACTION IS HAPPENING

It is important to highlight the great work happening locally across the state to reduce climate change impacts, build resilience, advance environmental justice, and build Wisconsin's clean energy and climate workforce. You will see these stories throughout this plan. We encourage you to reach out to the people and organizations highlighted to learn more and to help you move forward with any projects and initiatives you may be working on. Don't know where to start? Reach out to the OSCE at [osce@wisconsin.gov](mailto:osce@wisconsin.gov).

## SECTION I

# CLIMATE CHANGE AND GREENHOUSE GASES

## HOW CLIMATE CHANGE IS IMPACTING WISCONSIN

Wisconsin's climate is changing. Climate challenges include hotter, more humid weather with more intense and frequent heavy rainfalls, as well as freezing winter rain instead of snow, followed by severe winter freezes (such as those caused by a polar vortex). These changes affect Wisconsin's economic sectors, human health, and safety. (WICCI, 2026)<sup>i</sup>

## WEATHER

The Wisconsin Initiative for Climate Change Impacts (WICCI) states that 2010-2019 was the wettest decade for Wisconsin, with an annual average precipitation of 37.0 inches, a 17 percent increase since 1950. The state experienced an increase in extreme heat events, driven by record warming, mainly in the south-central region. These extreme weather and precipitation events led to severe flooding in Dane County (Aug 2018) and Milwaukee (August 2025), unexpected nighttime heat, rapid shifts between dry and wet weather, and significant economic losses and recovery costs for residents and local governments.

In 2024, Wisconsin experienced its warmest year since records began in the 1890s, with trends including winters warming faster than other seasons, a significant reduction in Great Lakes ice cover, and a shift of March from a winter to a spring month. In fact, on March 9, 2026, record-shattering spring-like warmth occurred even in the state's northern regions, reaching 70 degrees Fahrenheit in Green Bay and 68 degrees in Appleton.<sup>ii</sup> Only a few days later, on March 16, the state experienced an extreme weather change with frigid conditions across the region, dumping 5 inches to over 2.5 feet in areas throughout the state of snow under blizzard conditions.<sup>iii</sup> The WICCI report further notes that by mid-century, Wisconsin is projected to see wetter winters and springs, potential summer droughts, more frequent and severe extreme precipitation events, increased variability between wet and dry periods, and a tripling of extremely hot days (90 degrees Fahrenheit or higher) and warm nights (low temperature of 70 degrees or above), along with ongoing shifts in seasonal timing. These changes will lead to related impacts, such as the arrival of new pests,

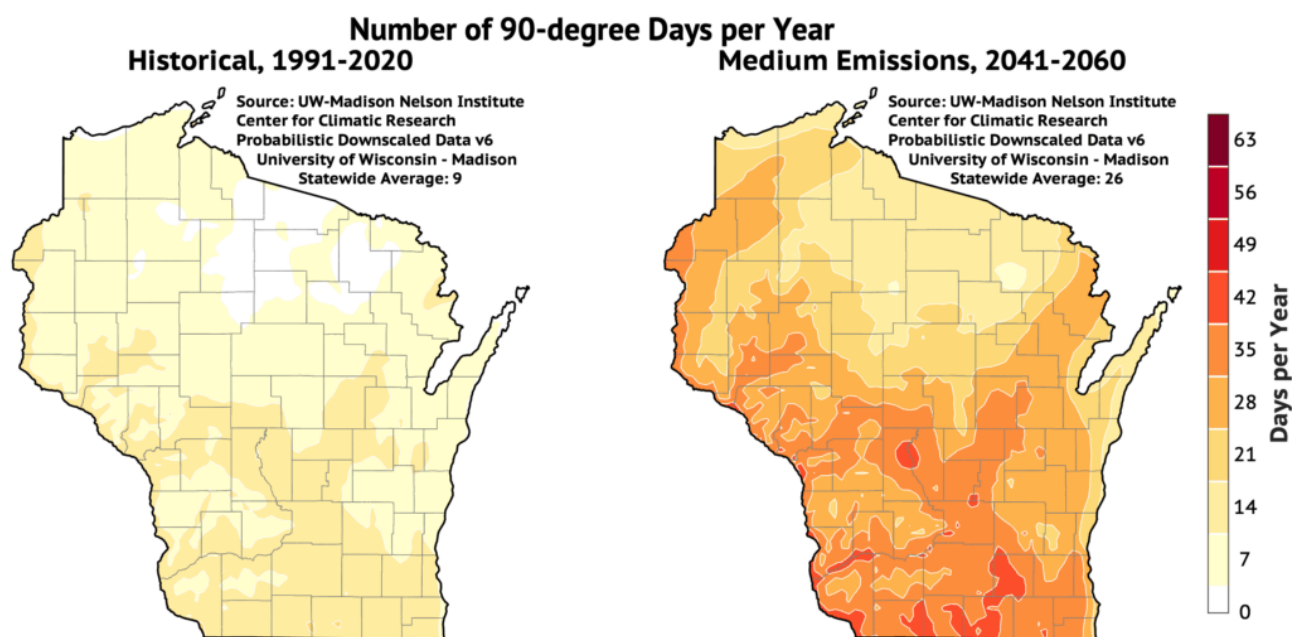
**“Spring Warmth Peaks Early Before Turning Wet and Wintery Mix - Record-challenging warmth Monday gives way to storms Tuesday and an unsettled rain-snow pattern through the weekend.”**

*WMTV News, March 8, 2026*

infrastructure stress from heavier rainfall and temperature fluctuations, rising mental health concerns linked to climate uncertainty, a decline in recreation and tourism (a \$25.8 billion industry), and serious negative effects on agriculture (a \$116.3 billion industry), including complex changes driven by extreme precipitation, drought, and heat stress.

Figure 1, from the WICCI 2026 Assessment Report, below shows the historical average and projected average through 2060, with an increase from 9 days to 26 days of extreme heat.

**Figure 1: Historical and Projected Average of High Heat Days in Wisconsin**



## THE HUMAN AND ECONOMIC COSTS

Whether it be the loss of life during an extreme weather event, long-term illness due to air pollution, or the costly economic toll climate change is having on farmers and rural communities, the changing climate is impacting everyone. Climate inaction is projected to have tremendous health and economic costs, and recent studies indicate these costs are already weighing on residents in Wisconsin.

In economic terms, Wisconsin communities have already endured tens to hundreds of millions of dollars in damage over the past decade due to extreme precipitation. Rising precipitation leads to more flooding and storm surges, impacting communities and industries along the Mississippi River and the Great Lakes, as well as tourism along Wisconsin's waterways and beaches. A warmer, wetter climate also increases variability in precipitation and temperature. These fluctuations are already negatively affecting Wisconsin's agriculture and livestock

sectors, which rely on stable weather patterns. According to the National Oceanic and Atmospheric Administration's Billion-Dollar Weather and Climate Disasters database, between 2000 and 2024, Wisconsin experienced 41 severe storms, 4 floods, 2 winter storms, and 7 drought-related disasters, totaling around \$260 billion in damage.<sup>iv</sup>

Recognizing the impacts of severe weather events, Wisconsin needs to be prepared to protect communities from the effects of climate change. In 2024, the Center for Climate Integrity published that communities in Wisconsin would need at least \$16.7 billion to protect communities from climate change through 2040.<sup>v</sup> Specifically, taxpayers in Wisconsin will face the following costs:

- **\$6.67 billion** to improve **stormwater management** to mitigate flooding.
- **\$5.09 billion** to increase **road maintenance** because of heavy rain and heat stress.
- **\$2.56 billion** to **plant and maintain trees** to combat urban heat islands.
- **\$810.4 million** to **install air conditioning** in public buildings.
- **\$374.7 million** to **reinforce bridges** against anticipated climate wear and tear.
- **\$347.8 million** to respond to an increase in **Lyme disease** cases.
- **\$293 million** to build **coastal defenses** to protect infrastructure from coastal erosion and changing lake levels.
- **\$208.8 million** to respond to an increase in **West Nile Virus** cases.
- **\$205.7 million** to protect rural communities from **flooding**.
- **\$80.8 million** to **heat and cool public buildings** in response to changing temperatures.
- **\$49 million** to expand and operate **cooling centers**.
- **\$35.5 million** to respond to an increase in **pediatric asthma** cases.

It is essential to emphasize the local social and environmental impacts of climate change. Some at-risk coastal communities may have smaller tax bases, making them less able to respond to and recover from severe storms and contamination events. Additionally, Wisconsin is home to 11 federally recognized Native Nations and one non-state or federally recognized Nation, which maintain strong cultural, spiritual, health, and economic connections to fisheries, native habitats, and wild species and cultivars that are stressed by increased warming and precipitation.

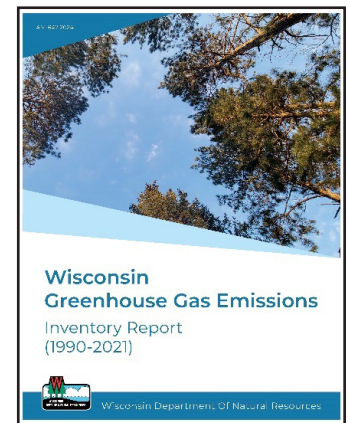
From an environmental perspective, rising temperatures are reducing snowpack and causing warmer winters, threatening Wisconsin's iconic cold-water fisheries as many species reach their survival limits due to shifting temperature ranges. Extreme heat affects the physical and chemical properties in lakes, the spread of infectious diseases and pests, and increased storm surges along beaches and marinas. These issues disproportionately affect outdoor recreation and tourism industries that depend on the health and stability of these natural resources.

Rising global temperatures will worsen these socio-economic inequalities and could create new challenges without ambitious, state-led climate action.

- We must create opportunities to reduce carbon emissions and boost renewable energy.
- We also need to improve our infrastructure's ability to adapt and strengthen overall environmental, economic, and social resilience.
- We must educate and train our workforce with the skills necessary for a transition to a low-carbon economy; and
- We must ensure all actions are equitable and intentionally minimize unintended and disproportionate impacts.

## WISCONSIN'S GREENHOUSE GAS INVENTORY

The Wisconsin Department of Natural Resources (DNR), in cooperation with the OSCE, Public Service Commission of Wisconsin, the Wisconsin Department of Agriculture, Trade, and Consumer Protection, and the Wisconsin Department of Transportation, identified, evaluated, and utilized existing data resources to develop a statewide inventory of primary GHG emission sources within Wisconsin and used that data to create this plan.<sup>vi</sup> The GHG inventory relied on the EPA's State Inventory Tool (SIT), data reported to the EPA's Greenhouse Gas Reporting Program, and any independent, sector-specific estimates prepared by the state. The Wisconsin inventory includes the following sectors and gases:



### SECTORS

- Electricity
- Residential, Commercial, & Industrial
- Transportation
- Industrial Processes
- Natural Gas and Oil
- Waste
- Agriculture
- 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>)

Table 1 shows Wisconsin's GHG emissions by sector for 1990, 2005, and 2021, highlighting the progress over time. Overall, GHG emissions dropped by 11 percent from 2005 to 2021. The electricity sector saw the largest decrease in emissions, down 28 percent. During that period, industrial emissions fell by 25 percent, while the transportation, natural gas, oil, and waste sectors experienced modest declines. Between 2005 and 2021, agricultural emissions increased by 20 percent (mainly methane and nitrous oxide), marking the largest rise among all sectors.

Another factor in emissions reductions is land use, land-use change, and forestry (LULUCF), which are also classified as GHG inventory sectors because these natural and working lands can either add or remove CO<sub>2</sub> from the atmosphere and are essential in addressing climate change. The Wisconsin Greenhouse Gas Emissions Inventory Report (1900-2021) provides estimates of carbon storage from natural and working lands. In 2021, the LULUCF sector sequestered or stored 19.0 million metric tons of CO<sub>2</sub> equivalent (MMTCo<sub>2</sub>e). Storing that amount of carbon is roughly equivalent to removing emissions from just over 4.4 million passenger vehicles operated for a year.

**Table 1. Total GHG Emissions by Sector (MMTCo<sub>2</sub>e)**

<b>Economic Sector</b>	<b>1990</b>	<b>2005</b>	<b>2021</b>	<b>Amount Change 2005-2021</b>	<b>% Change 2005-2021</b>
Agriculture	18.6	17.1	20.5	3.5	20
Transportation	29.4	42.7	41.7	-1.0	-2
Electricity	<u>41.3</u>	<u>58.6</u>	<u>42.1</u>	<u>-16.5</u>	<u>-28</u>
• Production	33.4	49.4	35.2	-14.3	-29
• Imported Electricity	8.0	9.2	6.9	-2.2	-24
Buildings	<u>28.4</u>	<u>31.6</u>	<u>27.9</u>	<u>-3.7</u>	<u>-12</u>
• Residential	9.6	10.2	9.8	-0.4	-4
• Commercial	4.9	6.3	6.7	0.4	-7
• Industrial	13.9	15.1	11.4	-3.7	-25
Natural Gas and Oil	2.0	2.4	2.4	0.0*	-0.4
Industrial Process	0.8	3.7	4.2	0.5	14
Waste	<u>4.5</u>	<u>5.2</u>	<u>5.0</u>	<u>-0.3</u>	<u>-5</u>
• Solid Waste	4.0	4.7	4.4	-0.3	-6
• Wastewater	0.5	0.6	0.6	0.0*	-2
<b>Gross Emissions</b>	<b>125.0</b>	<b>161.3</b>	<b>143.8</b>	<b>-17.5</b>	<b>-11</b>
LULUCF	-21.5	-20.7	-19.0	1.7	-8
<b>Net Emissions</b>	<b>103.5</b>	<b>140.5</b>	<b>124.8</b>	<b>-15.8</b>	<b>-11</b>

**Note: Totals may not be summed up due to independent rounding. The numbers indicated by an asterisk (\*) were non-zero values that were rounded to zero. See full report for additional details.**

From 1990 to 2005, GHG emissions rose each year except in 1992, 1998, and 2003. GHG emissions in Wisconsin reached their highest level in 2005 at 140.5 MMTCo<sub>2</sub>e. Emissions decreased from 2006 to 2009 and fluctuated between 2010 and 2019. There was a sharp decline in emissions in 2020, dropping to their lowest level since 1995. Emissions then increased again in 2021. Figure 2 shows the change in total emissions from 1990 through 2021. The LULUCF category is represented here as “Natural and Working Lands” to encourage consistency throughout the remainder of the plan. “Industry” includes, Industrial Buildings, Industrial Process, and Natural Gas and Oil sectors combined.

Figure 2. Wisconsin GHG Emission Trends 1990-2021

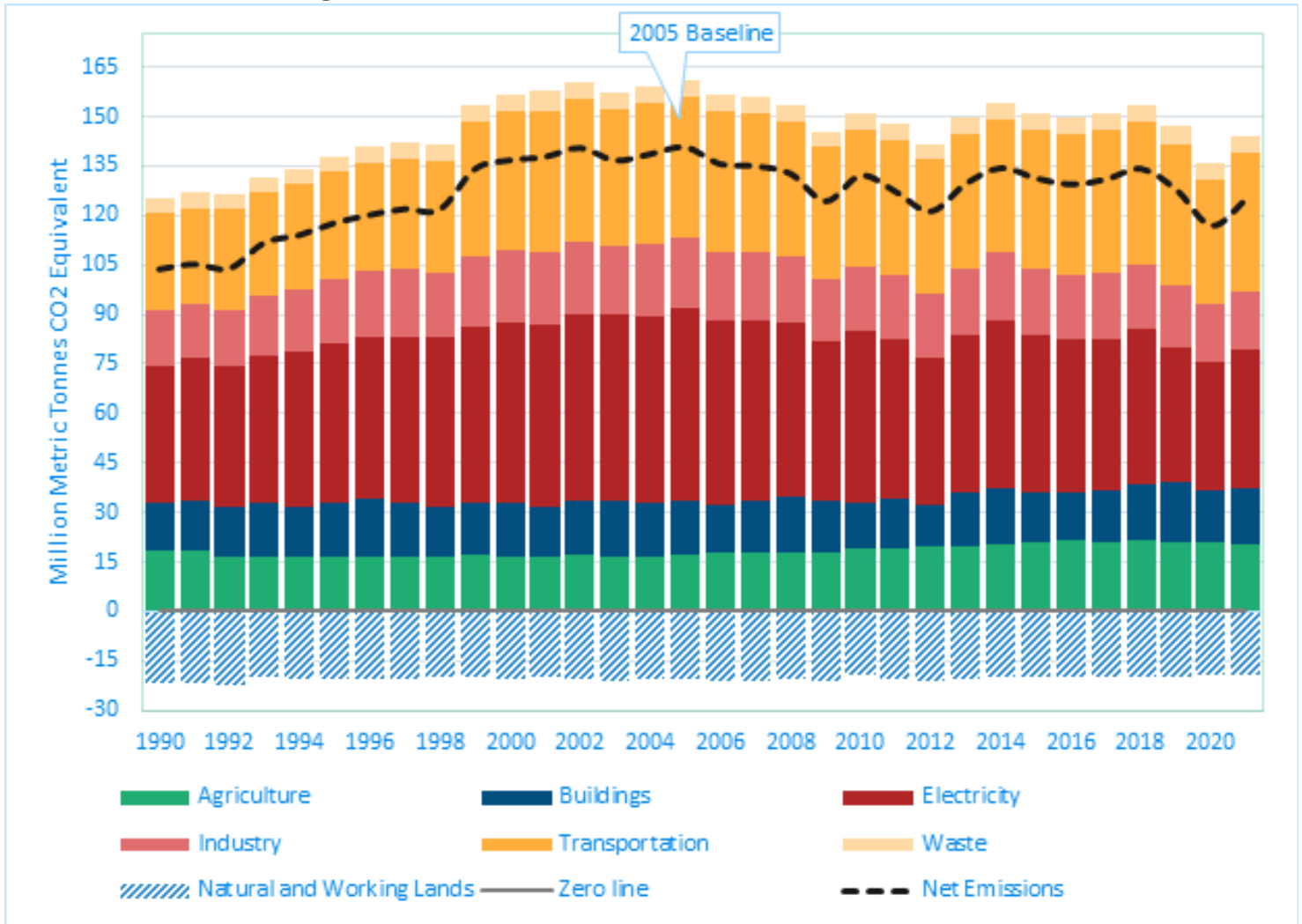


Figure 2 is a stacked bar chart representing all economic sectors present in the plan and contains a net emissions trend line. The net emissions trend line slopes upward, starting at around 105 MMTCO<sub>2</sub>e in 1990, and ending at around 125 MMTCO<sub>2</sub>e in 2021. Notably, the transportation and electricity generation sectors are consistently the largest sectors. Natural and Working Lands represent the only net emissions sink of the sectors - meaning that they capture and store more carbon than they emit.

**Table 2. Wisconsin GHG Emissions by GHG (MMTCO<sub>2</sub>e)**

GHG	2005	2021	% of 2021 Emissions	Amount Change	% Change
Carbon Dioxide (CO <sub>2</sub> )	128.1	110.6	77	-17.6	-14
Methane (CH <sub>4</sub> )	17.0	19.8	14	2.8	17
Nitrous Oxide (N <sub>2</sub> O)	9.0	9.4	7	0.4	5
F-Gases (HFC, PFC, NF <sub>3</sub> , and SF <sub>6</sub> )	2.4	2.8	2	0.4	15
<b>Total - All Gases</b>	<b>156.5</b>	<b>142.6</b>	<b>100</b>	<b>-14</b>	<b>-9</b>

**Note: Totals may not be summed up due to independent rounding.**

The state continues to make progress on reducing emissions and implementing measures outlined in state climate plans. Tracking progress toward those goals will require both further updates to the statewide GHG emissions inventory and further data and information on the implementation of specific measures. The DNR has initiated an update to the GHG Emissions Inventory Report to include the most recently available data in the SIT, 2023.



## SECTION II

# CLIMATE AND CLEAN ENERGY PLANNING

Recognizing the importance of addressing climate change, Gov. Tony Evers has remained steadfast in his commitment to innovative, inclusive, and forward-looking actions that position Wisconsin as a leader in reducing GHG emissions and preparing for the impacts of climate change.

### UNITED STATES

## CLIMATE ALLIANCE

In February 2019, Gov. Evers announced that he would join the U.S. Climate Alliance, a bipartisan coalition of 24 governors representing about 54 percent of the U.S. population and 59 percent of the U.S. economy. This coalition is committed to advancing innovative and impactful climate solutions to grow the economy, create jobs, protect public health, and achieve the U.S. goals under the Paris Agreement. They pursue this through action across shared policy priority areas, including GHG targets and governance; electricity; transition and equity; transportation; buildings; industry; climate finance; resilience; natural and working lands; and carbon pricing and damage valuation.



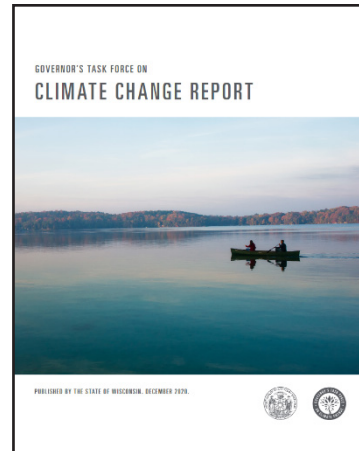
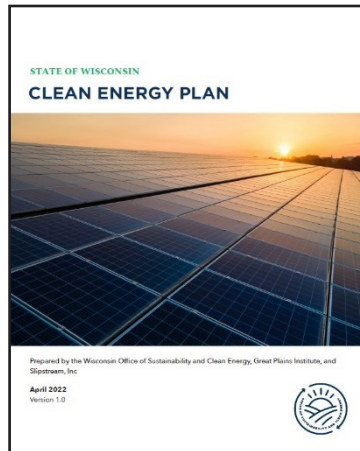
OSCE serves as a central point of coordination for climate and clean energy programs and policies across the state enterprise. This coordination helps create collective actions to implement strategies to address climate change and the state's clean energy transition.

Following this announcement, in August 2019, Gov. Evers issued Executive Order #38, which established the OSCE.<sup>vii</sup> He tasked the office with: 1) achieving a goal of all electricity consumed in Wisconsin be 100 percent carbon-free by 2050 in partnership with other state entities; 2) ensuring Wisconsin reduces emissions in line with the Paris Agreement; 3) developing a clean energy plan; 4) promoting clean energy workforce training; 5) fostering clean energy innovation, research, and business development; and 6) creating efficiency standards for new and existing state buildings. The



Furthermore, in October 2019, Gov. Evers signed Executive Order #52, establishing the Governor's Task Force on Climate Change (Task Force).<sup>viii</sup> The Task Force was tasked with developing policy recommendations to effectively mitigate and adapt to the impacts of climate change for the benefit of Wisconsin communities. After its formation, the Task Force created three subcommittees: Healthy Communities and a Strong Economy; Land Use and Conservation; and Energy, Housing, Infrastructure, and Transportation. In December 2020, the Task Force submitted its final report, advancing 55 recommendations across nine sectors and three policy pathways: budget, legislative, and executive action. Sectors include climate justice and equity, energy, transportation, agriculture, resilient systems, clean economy, education, food systems, and forestry.

In April 2022, the OSCE released the state's first-ever Clean Energy Plan (CEP).<sup>ix</sup> The plan outlines over 70 strategies to combat climate change by shifting to a clean energy economy. Major strategies include prioritizing health equity, environmental justice, and fair economic growth; speeding up workforce development and a just transition; supporting economic growth; accelerating government-led initiatives (Lead-by-Example); advancing clean energy technology deployment; maximizing energy efficiency; modernizing buildings and industry; and innovating transportation. The OSCE releases annual CEP Progress Reports outlining the implementation since the plan was released.



For both the Task Force and CEP development efforts, outlining actions to reduce emissions further and combat climate change required extensive interagency cooperation and active stakeholder engagement. The OSCE collaborated with 21 state agencies, the Universities of Wisconsin, local governments, and Tribal Nations. The above planning efforts significantly contributed to the development of the state's Roadmap, establishing the framework to address climate change.



## SECTION III

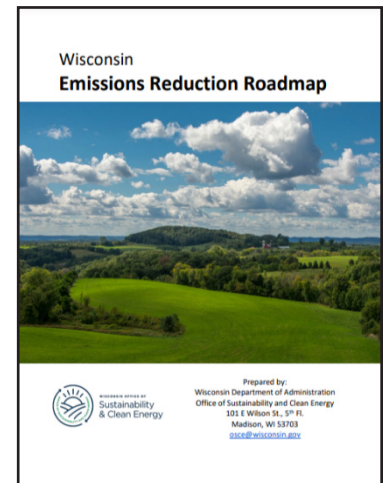
# PLAN DEVELOPMENT PROCESS

In June 2023, Wisconsin received a \$3 million planning grant from the U.S. Environmental Protection Agency’s (EPA) Climate Pollution Reduction Grants (CPRG) program. This initiative has allocated \$5 billion over four years to help states, local governments, Tribal Nations, and territories develop and implement plans to reduce GHG emissions and other harmful air pollutants. Gov. Evers appointed the OSCE as the state’s leader for the CPRG program.

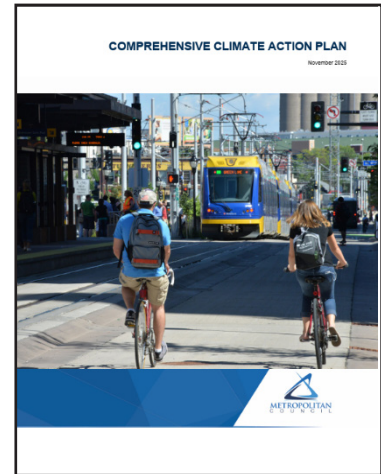
In March 2024, the OSCE published Wisconsin’s first Emissions Reduction Roadmap, also known as the Priority Climate Action Plan (PCAP).<sup>x</sup> The PCAP outlined key actions to support investments in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, promote economic growth, and improve the quality of life for all Wisconsin residents. This Roadmap took the first step beyond the Clean Energy Plan to identify emissions reductions beyond the energy sector, including natural working lands, carbon sinks, and other LULUCF opportunities.

Housed within the pages of this document, building on the PCAP, the state’s GHG inventory, and past climate and clean energy planning efforts, is a Roadmap for action. This Roadmap is a comprehensive climate action plan (CCAP) that offers a more detailed look at mitigation strategies to address climate change. This Roadmap focuses on climate change mitigation actions in seven sectors: agriculture, commercial and residential buildings, energy generation, industrial processes and facilities, natural and working lands, transportation, and waste and materials management. The OSCE developed this Roadmap as the next step in providing strategic direction for the state and its partners to act upon, including:

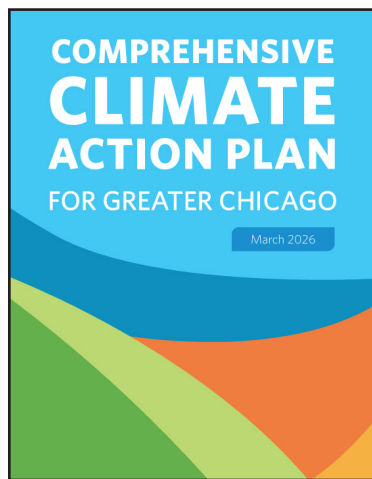
- Identifying opportunities to reduce GHG emissions across various economic sectors.
- Enhancing overall environmental, economic, and social resilience.
- Lowering costs for Wisconsin families and communities.
- Identifying and strengthening the workforce dedicated to emission reduction strategies, and
- Ensuring all actions are fair and intentionally reduce unintended and disproportionate effects.



In addition to the state’s climate action planning efforts, one Metropolitan Statistical Area (MSA) in Wisconsin, the Milwaukee-Waukesha, Wisconsin Metro Area, received a planning grant. Two MSAs outside the state—Minnesota (Minneapolis-St. Paul-Bloomington, Minnesota-Wisconsin Metro Area) and Illinois (Chicago-Naperville-Elgin, Illinois-Indiana-Wisconsin Metro Area)—each of which covers a small part of Wisconsin, also developed CCAPs. The OSCE closely collaborated with the Southeastern Wisconsin Regional Planning Commission (SEWRPC), the lead organization for the MSA planning grant in Milwaukee, and participated in meetings with MSA leaders in Minnesota (Metropolitan Planning Group) and Illinois (Metropolitan Mayors Caucus). To date, the Illinois and Minnesota MSA’s have published their CCAPs. In November 2025, the Met Council published its “Comprehensive Climate Action Plan”, which includes 11 counties in MN and St. Croix and Pierce counties in WI.<sup>xi</sup> In March 2026, the Chicago Metropolitan Agency for Planning published the “Comprehensive Climate Action Plan for Greater Chicago”, covering 12 counties in Illinois and Indiana, as well as Kenosha County in Wisconsin.<sup>xii</sup> The OSCE continues to collaborate with the MSAs in the region to ensure the successful implementation and coordination of actions impacting Wisconsin communities.

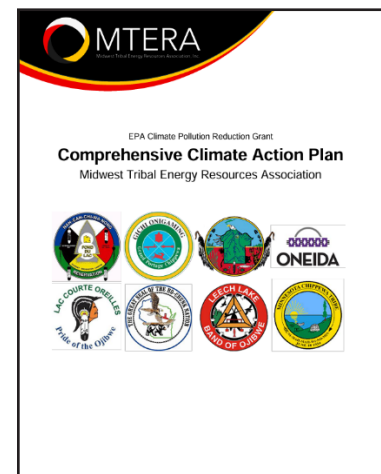


Several Tribal Nations in Wisconsin participated independently in the CPRG program, including the Midwest Tribal Energy Resources Association, MTERA (representing the 11 federally recognized Nations in Wisconsin), St. Croix Chippewa Indians of Wisconsin, Sokaogon Chippewa Community - Mole Lake Band of Lake Superior Chippewa, Forest County Potawatomi, and Red Cliff Band of Lake Superior Chippewa. The OSCE connected with the Tribal Nations throughout the planning process to get updates on their climate, clean energy, and resilience-related initiatives.



Finally, the OSCE partnered with Vermont Energy Investment Corporation (VEIC) to conduct detailed modeling outlined in this plan, which considers Wisconsin’s carbon budget and uses the best available data, analysis, and input to evaluate which actions will make substantial

progress toward emissions reductions across multiple sectors. Modeling does not predict the future or set goals; instead, it relies on a set of assumptions—specifically, selected emissions-reduction actions—and illustrates a potential trend if these actions are fully implemented. The assumptions and expected impacts do not include new technology, new policies, or unforeseen future events.



## SECTION IV

# COMMUNITY ENGAGEMENT AND CLIMATE ACTION CAPACITY BUILDING DEVELOPMENT PROCESS

### ENGAGEMENT FOR PLANNING

The OSCE has prioritized stakeholder engagement since its founding in 2019. In partnership with the Task Force, which included representatives from agriculture, the business sector, Tribal Nations, state agencies, utility companies, labor, youth, public health professionals, local governments, and other industries and communities statewide, the Office developed recommendations for the Governor’s Task Force on Climate Change Report. During this process, the Task Force hosted 1,000+ participants across 5 public listening sessions. Additionally, 69 of 72 counties participated in the planning, and the Task Force received 513 public comments. This effort helped ensure that the final 55 recommendations in the Governor’s Task Force on Climate Change Report accurately reflected the concerns of Wisconsinites.

In 2021, the OSCE began working on the CEP. This plan was based on the recommendations and public comments collected during the development of the Governor’s Task Force on Climate Change Report. To ensure the plan reflected best practices and community needs, the OSCE formed various advisory teams.

Along with these advisory groups, the OSCE held four sector-specific listening sessions and established an environmental justice focus group to balance community and expert input. After releasing the CEP, the OSCE staff greatly expanded their outreach efforts on clean energy and sustainability throughout the state. They presented and gathered feedback on the CEP and related initiatives at 43 conferences, meetings, and events, engaging audiences that included state agency staff, environmental advocacy and justice groups, labor, utility representatives, nonprofits, businesses, Tribal Nations, and local governments.

These relationships, built by the Task Force and the creation of the CEP, served as a foundation for outreach and engagement efforts to inform Wisconsin’s Roadmap. The OSCE began its climate action planning efforts for both the PCAP and this Roadmap by conducting a gap analysis of current stakeholder lists to ensure participation from all groups. Recognizing that many communities have historically been excluded from decision-making, the



OSCE gave early notice of the plan and created opportunities for multi-stakeholder involvement during the Roadmap development. The OSCE aimed to include Tribal Nations, state agencies, and local communities from the start, moving beyond just informing and consulting to actively involving each group in the planning process. To accomplish this, the office directly engaged with the 11 federally recognized Tribal Nations in Wisconsin, the nine Regional Planning organizations within the state, and various political jurisdictions, either directly or through relevant associations, to offer initial engagement opportunities and provide access to CPRG planning resources.

From 2023 to 2026, the OSCE conducted a comprehensive outreach campaign to involve Wisconsinites in their communities, helping them understand the climate impacts they face and the solutions they seek. The OSCE held over 74 meetings and one-on-one discussions with residents across the state, attended nearly 50 additional events, and maintained contact with seven of Wisconsin's 11 federally recognized Tribal Nations. Overall, the OSCE directly engaged with more than 6,670 residents, municipalities, and local governments throughout Wisconsin.

## MUNICIPALITIES AND LOCAL GOVERNMENTS

---

The OSCE used multiple channels to ensure municipalities were aware of engagement opportunities and had the resources to access funding. During plan development, the OSCE worked with the Wisconsin Local Government Climate Coalition (WLGCC), the DNR Green Tier Legacy Communities, regional planning commissions, the Wisconsin Towns Association, the Wisconsin Counties Association, the League of Wisconsin Municipalities, Workforce Development Boards, local governments, and other municipal stakeholders. The OSCE and DNR also collaborated closely with SEWRPC to ensure alignment between state and local CPRG planning within the Milwaukee MSA. Additionally, the OSCE completed a project with the University of Wisconsin (UW)-Milwaukee to identify local priorities by analyzing climate and comprehensive plans.

## TRIBAL NATIONS

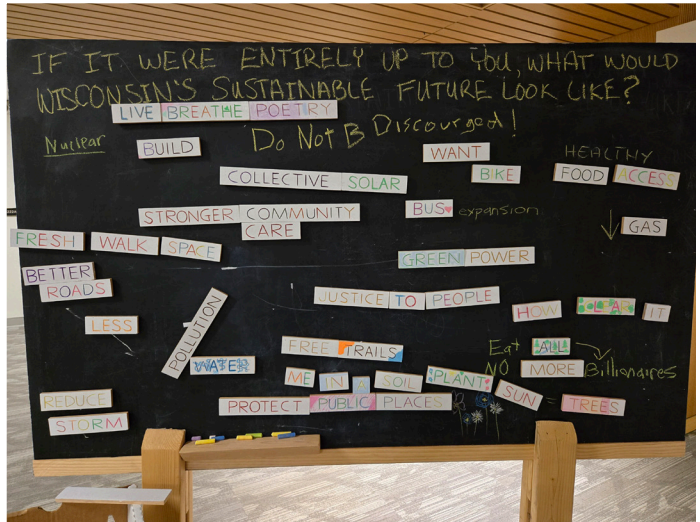
---

The OSCE began reaching out to Tribal Nations in September 2023 during the Tribal Energy Symposium held at the Forest County Potawatomi Community Center in Crandon, WI. After finalizing the priority actions in February 2024, the OSCE shared the list and resources with all Tribal Nation leaders and relevant staff in Wisconsin to promote transparency and access to funding. In November 2024, the OSCE took part in a state Tribal Consultation to hear from Native leaders about energy priorities, projects, and barriers to implementation. The OSCE then reached out to Tribal Nations in Wisconsin to build partnerships that support shared climate action and clean energy goals. Following this outreach, the OSCE met individually with staff from seven of the 11 federally recognized Tribal Nations to learn about their cultural values, gather input on the planning process, share resources, and provide technical support. The OSCE also coordinated with MTERA as they developed a plan for Tribal Nations in EPA Region 5.

## SUBJECT MATTER EXPERTS

The OSCE aimed to ensure that those working in affected sectors and communities across the state could provide direct input on the plan. Starting in August 2024, the OSCE scheduled recurring meetings for sector-specific stakeholder discussions. The descriptions used to define the advisory team sector divisions acknowledged that many emissions-reduction actions affect multiple sectors.

- **AGRICULTURE:** Emissions in this sector result from farming activities such as crop cultivation, soil treatment, fertilization, and emissions from livestock, including enteric fermentation and manure management.
- **COMMERCIAL AND RESIDENTIAL BUILDINGS:** GHG emissions from the RCI (Residential, Commercial, Industrial) sectors include non-electricity energy use such as space heating, water heating, and industrial process heating. Although industrial buildings are included in the GHG inventory alongside residential and commercial buildings, the industrial buildings discussed here were covered by the Industrial Team for the purposes of the advisory groups.
- **ENERGY:** This sector covers both direct emissions from electric generating units (EGUs) within the state and indirect emissions from imported electricity used in Wisconsin, along with emissions from non-electric energy sources like natural gas and oil.
- **INDUSTRY:** The industrial process sector accounts for non-energy GHG emissions that occur during the handling and use of specific chemicals in certain industrial processes.
- **NATURAL AND WORKING LANDS:** Because land (soil), trees, and plants emit and store carbon, this sector considers both direct emissions from sources and the indirect impacts of storing carbon (carbon sequestration) in forests and agricultural soils.
- **TRANSPORTATION:** Emissions estimated for this sector cover both highway and non-highway mobile sources.
- **WASTE AND MATERIALS:** Waste sector emissions account for GHG emissions related to solid waste and wastewater activities.



These groups discussed best practices, the current state of sustainability in each sector, and potential actions for this Roadmap. The meetings were open to the public and attended by industry professionals, university researchers, agency representatives, and others with relevant experience. A total of 141 individuals registered to participate in the advisory teams.

## **BUILDING A CLIMATE ACTION MOVEMENT DEFINED BY COMMUNITIES**

The OSCE has actively engaged with stakeholders throughout the planning process, demonstrating a commitment to equity, justice, and collective action. In 2024, the OSCE launched the Wisconsin Climate Action Navigators (WI-CAN) Network, a collective action initiative aimed at building a network of change leaders who rapidly advance transformative climate action. The WI-CAN network consists of leaders in energy and environment from across the state who work together to:

- Empower local communities, and give them chances to set and pursue their climate goals, and promote collaboration across different sectors.
- Develop, coordinate, and promote strong climate action and outreach efforts across the state.
- Offer extra capacity and technical support, especially to low-income and at-risk communities.
- Establish ongoing communication and feedback loops to involve Wisconsinites in a shared just transition by gathering input and sharing progress transparently.

**WI-CAN**  
**a collective action initiative aimed at building a network of change leaders who rapidly advance transformative climate action.**

The WI-CAN network is open to any individual or organization committed to advancing innovative, community-led climate and clean energy efforts. The goal is to expand the network, reach deeper into communities, and empower them to share their needs, projects, and implementation barriers. Meetings with participating navigators include numerous organizations, governments (state, local, and Tribal), and non-profits, as well as individuals who want to pursue transformative climate action in their communities. The WI-CAN network not only provided input on this Roadmap but continues to help identify potential projects that could qualify for federal and philanthropic funding and determine and support technical assistance needs for local initiatives.

In 2025, the OSCE was excited to award funding through the WI-CAN network. So far, these awards have empowered grassroots organizations and local leaders to launch projects that directly address their communities' specific priorities. The program is both creating a more resilient, equitable, and sustainable Wisconsin and guiding the state's long-term climate action strategy. In 2025, the OSCE awarded just over \$390,000 to partners to boost community involvement and support local priorities on climate action. In 2026, the OSCE announced a second round of funding for the network called the Community Climate Action (CCAS) Support program. The OSCE awarded just over \$280,000 to support capacity building, local planning, and boosting engagement.

Now with more than 350 participants, the WI-CAN network continues to grow and enhance meaningful engagement by leveraging its network of climate leaders to address and reduce climate impacts.

## KNOW YOUR HOME: SOLAR ENERGY AND WEATHERIZATION PROJECT

*A Faith-based and Community Collaboration*

Beecham Outreach Center is located in Milwaukee's 53206 neighborhood, where 47.5 percent of residents and 2/3 of the children live below the poverty line. The Center aims to transform the community through offering solutions that cover all five social determinants of health: care, education, social and community context, economic stability, and neighborhood. Their Solar Energy and Weatherization project, funded by the OSCE, was one way of reaching those goals. The project aimed to provide the tools and resources people need to improve the quality of life in their community and enhance neighborhood beautification.

Many people in the 53206 zip code live in homes that need repair and are unable to pay for them, and don't have the knowledge to make the repairs themselves. A six-week Know Your Home Course was Beecham's creative solution to this issue. In the summer of 2025, from June to August, participants met to learn about their homes from the basement to the roof. They learned how to use basic tools, how to maintain and improve their homes, and identify issues early. The course didn't just give people practical skills; it also gave them autonomy over their homes, enhanced the neighborhood's visual appeal, and gave participants opportunities to improve their neighborhood together.

Since the end of the course in August of 2025, many participants have used and shared the skills they gained with their family members and neighbors—spreading the impact beyond the original students. The Know Your Home Course is a great example of how simple ideas can dramatically improve the quality of life for many while increasing community resilience.

# SECTION V

## BENEFITS

### BENEFITS ANALYSIS SUMMARY

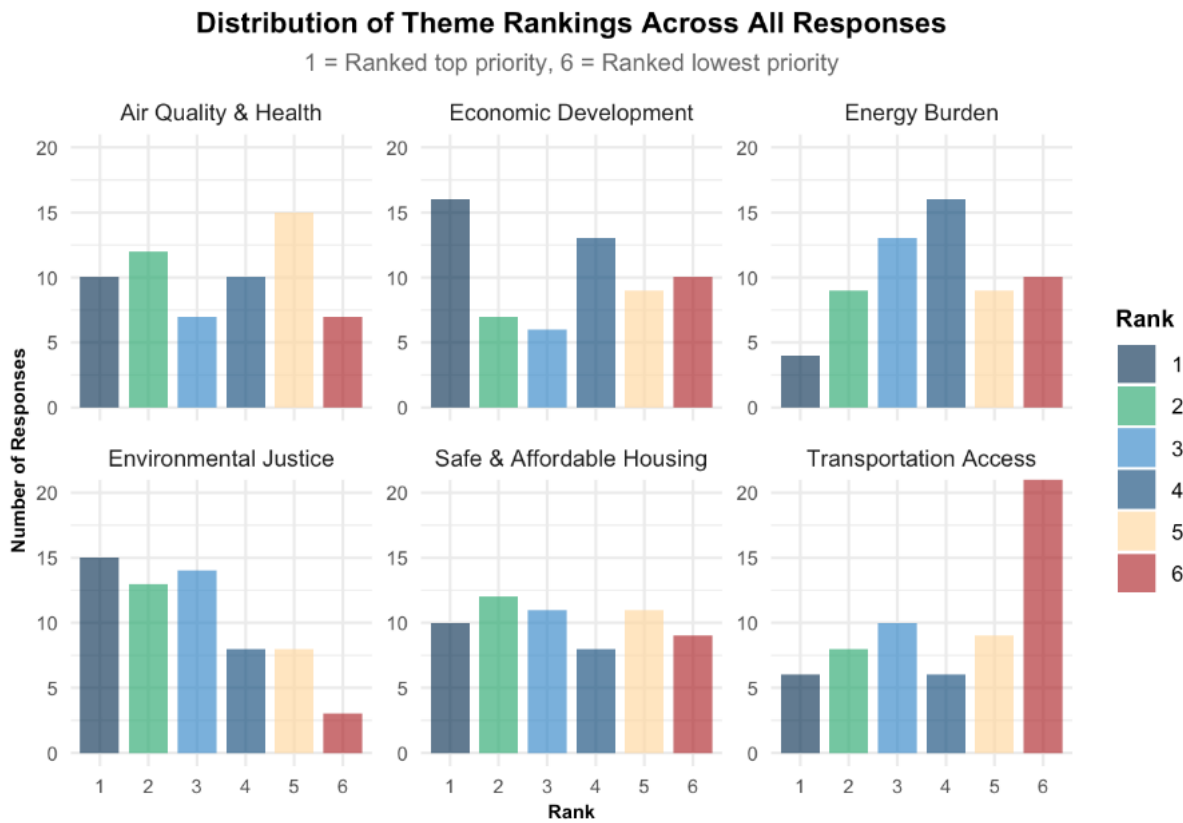
The implementation of the actions included in Wisconsin's Roadmap is expected to generate a wide range of environmental, economic, and social benefits. While quantitative modeling captures many of the anticipated GHG reductions, a full understanding of the Roadmap's value requires considering co-benefits and potential trade-offs that are harder to measure. The OSCE contracted the UW-Madison, Nelson Institute for Environmental Studies, Energy Analysis and Policy Program (EAP team), to conduct a benefits analysis on the selected GHG reduction actions. The qualitative benefit assessment provides a structured evaluation of these outcomes, recognizing their potential to significantly impact public health, community resilience, and economic opportunity across the state. The Wisconsin Department of Health Services (DHS) assisted in reviewing the report.

The EAP Team did a complete qualitative and geographic analysis of direct and indirect benefits and any potential disbenefits of actions.<sup>xiii</sup> The actions are grouped into six economic sectors: buildings, energy, industry, land use, transportation, and agriculture/waste. For each sector, projected outcomes are evaluated across seven benefit categories: economic development, environmental justice, air quality and health, water quality, energy burden, transportation access, and safe and affordable housing. This structure allows for consistent comparisons across sectors while emphasizing the unique ways each set of actions can improve quality of life. Special consideration is given to where actions might benefit or disbenefit Low Income and Disadvantaged Communities (LIDACs).

- **ECONOMIC DEVELOPMENT** benefits include reducing costs, creating jobs, attracting investment, and strengthening both local and regional economies.
- **ENVIRONMENTAL JUSTICE** benefits are recognized when actions can reduce disproportionate environmental and health burdens on at-risk communities.
- **AIR QUALITY AND HEALTH** benefits include lowering harmful pollutants and promoting better public health outcomes.
- **WATER QUALITY** benefits are recognized by protecting groundwater, surface waters, and overall watershed health.
- **ENERGY BURDEN** benefits include lowering household energy costs, especially where energy is least affordable.
- **TRANSPORTATION ACCESS** benefits are identified when actions can expand into affordable, reliable, and clean mobility options.
- **SAFE AND AFFORDABLE HOUSING** benefits emphasize improving safety, resilience, and affordability, particularly for vulnerable populations.

Additionally, the Data Science Institute at UW-Madison (DSI) analyzed a survey conducted by the OSCE to evaluate public priorities among the listed benefit categories. Figure 3, reproduced from the DSI report titled “Survey Analysis: Survey Results for the WI Comprehensive Climate Action Plan,” shows that each benefit category was a top priority for at least some respondents. Environmental Justice was ranked highest, while Transportation Access was ranked lowest. Overall, these results confirm that the benefit categories used in this assessment accurately represent the priorities of the communities surveyed. The Water Quality benefit category identified by the EAP team was added to the benefits report after the survey based on repeated mentions of benefits in this area, hence why it doesn’t appear in the analysis below.

**Figure 3. Survey Analysis: Survey Results for the WI Comprehensive Climate Action Plan**



**Table 3. Themes in Order of Relevance as per Community Members’ Ranking**

Priority	Theme	Mean (± SD) Score	Total Score
Highest	Environmental Justice	2.84 (± 1.52)	173
Mid	Economic Development	3.36 (1.84)	205
Mid	Safe & Affordable Housing	3.41 (1.71)	208
Mid	Air Quality & Health	3.48 (1.69)	212
Low	Energy Burden	3.77 (1.48)	230
Low	Transportation Access	4.15 (1.79)	253

**Note: Lower mean and total scores indicate higher priority.**

## SECTION VI

# WISCONSIN GREENHOUSE GAS REDUCTION ACTIONS

Wisconsin has identified several potential actions intended to reduce emissions. This list does not encompass all of Wisconsin's priorities. The actions included here were guided by input from stakeholders and state agencies and were considered the most suitable for the plan based on one or more of the following criteria:

- Advances state priorities, including achieving meaningful and sustained emission reductions; protecting public health; promoting equity and justice; supporting rural development; maximizing outreach; conserving nature; maintaining or creating quality jobs; attracting and retaining businesses; and fostering collective action to combat climate change;
- The potential for GHG reduction;
- The State's role in the implementation process;
- The community impacts and co-benefits;
- Existing public support;
- Prior planning conducted at the state or local level to support; and
- Workforce implications.

Actions included in the PCAP, produced in March 2024 for the EPA, were prepopulated into the suite of actions in this plan. Where possible, the OSCE identified actions supported by other state plans. State plans under consideration include:

- Governor's Task Force on Climate Change Report<sup>xiv</sup> (OSCE)
- Wisconsin Clean Energy Plan<sup>xv</sup> (OSCE)
- Wisconsin Electric Vehicle Infrastructure Plan<sup>xvi</sup> (Wisconsin Department of Transportation, WisDOT)
- Wisconsin State Rail Plan 2050<sup>xvii</sup> (WisDOT)
- State Forest Action Plan<sup>xviii</sup> (DNR).

**The implementation of the actions outlined in this plan is expected to bring broad benefits across Wisconsin and Native Nation lands.**

Quantification of GHGs is conducted at the statewide level. They are not intended to be predictions, but rather indications of the potential for emissions reductions under ambitious decarbonization scenarios associated with related actions. The assumptions used in developing these quantifications are similarly representative of possible outcomes. They should not be seen as specific state goals or commitments; actual program implementation details and timelines will vary based on the specifics and timelines that will be fully developed as funding opportunities for implementation are realized.

The OSCE has identified numerous existing state programs that support the actions listed in this plan, many of which are state and federally funded. While this list is not exhaustive, it highlights Wisconsin's efforts, the progress made so far, and the support already in place for the plan's actions. Programs listed are current as of April 2026. Some may be experiencing funding changes due to federal or state-level adjustments.

Funding for the potential actions included in this plan can come from various sources. Some typical funding sources for state programs include:

- Biennial Budget appropriation.
- Legislative action.
- State grant programs.
- Federal grant programs.
- Utility ratepayer benefits programs/incentives (Focus on Energy® or municipal, electric cooperative programs).
- Program revenue.
- Philanthropic funding.

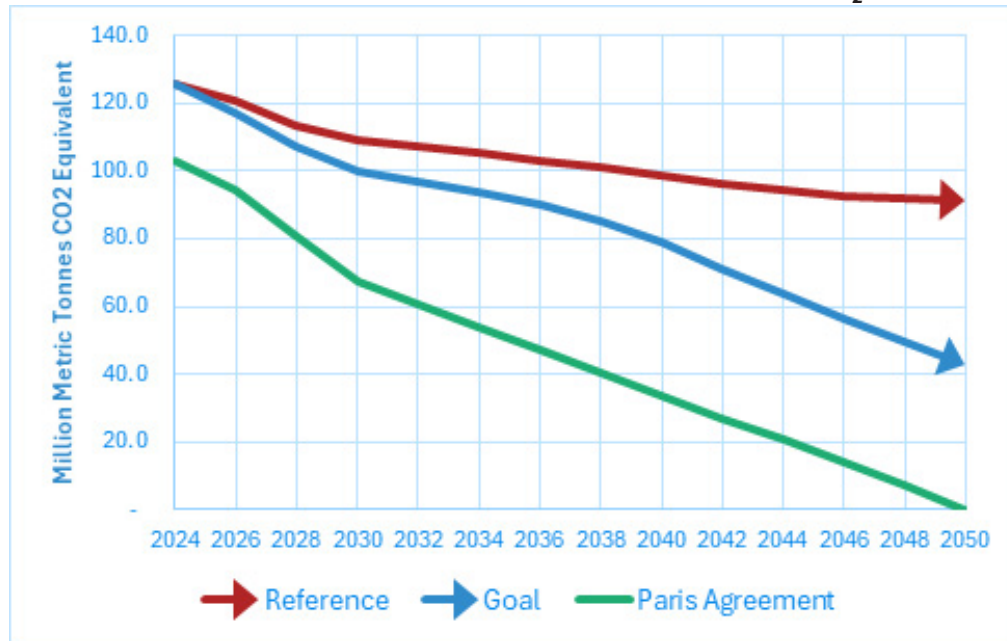
When feasible, the state will pursue public funding opportunities that align with the plan's actions. Additionally, there are many ways philanthropic and private funding can support the plan's actions.

## GREENHOUSE GAS EMISSIONS PROJECTIONS AND REDUCTION TARGETS

Wisconsin joined the U.S. Climate Alliance in 2019 and has adopted its goals to, collectively with other Alliance members, cut net GHG emissions by at least 26-28 percent by 2025, 50-52 percent by 2030, 61-66 percent by 2035, and achieve net-zero by 2050, all below 2005 levels. Additionally, Gov. Evers signed Executive Order #38, which set a goal of 100 percent carbon-free electricity by 2050. These goals are ambitious yet achievable with determined action. Due to changes in funding and policy at the federal and state levels, and the complex political landscape in which this plan was developed, the OSCE opted to take a practical view of Wisconsin's policies and efforts and craft a plan that reflected that reality. Actions in this plan represent an ambitious yet realistic assessment of what can be achieved in the near term to reduce GHG emissions.

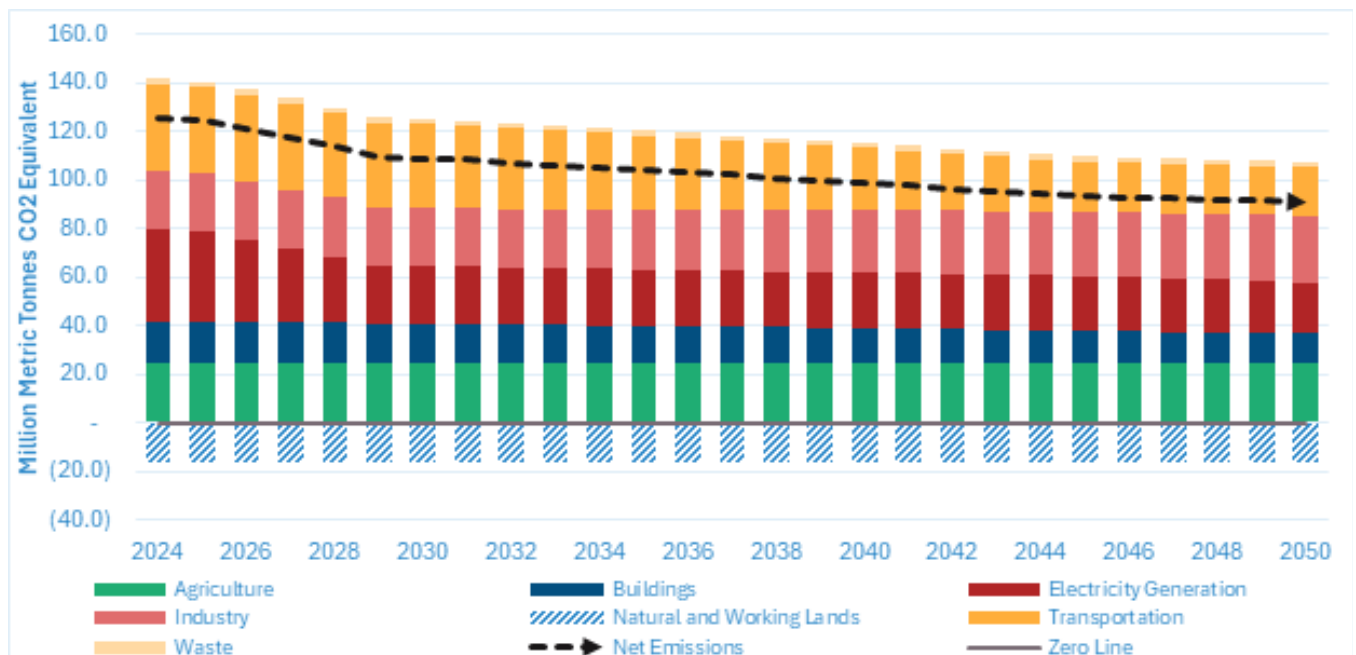
The graph in Figure 4 shows the reference (or baseline) scenario, the goals of this plan based on the included actions, and the Paris Agreement's trajectory. The **reference** scenario, depicted with a red arrow, represents the anticipated trajectory of Wisconsin's GHG emissions based on established state and federal policies at the time of modeling. In other words, it is what would happen regardless of the actions in this plan. The **goal** scenario in the middle of the graph, depicted with a blue arrow, represents what *could* happen should the actions within the plan be enacted in alignment with the modeling assumptions. The green line at the bottom of the graph represents how emissions would need to change over time for Wisconsin to meet the objectives of the **Paris Agreement**. For the green line to become our reality, residents, businesses, non-profits, local governments, state entities, and the governmental bodies will need to act. Wisconsinites understand that collective action is the only path to meeting these ambitious goals.

**Figure 4. Annual Emissions by Scenario (MMTCO<sub>2</sub>e)**

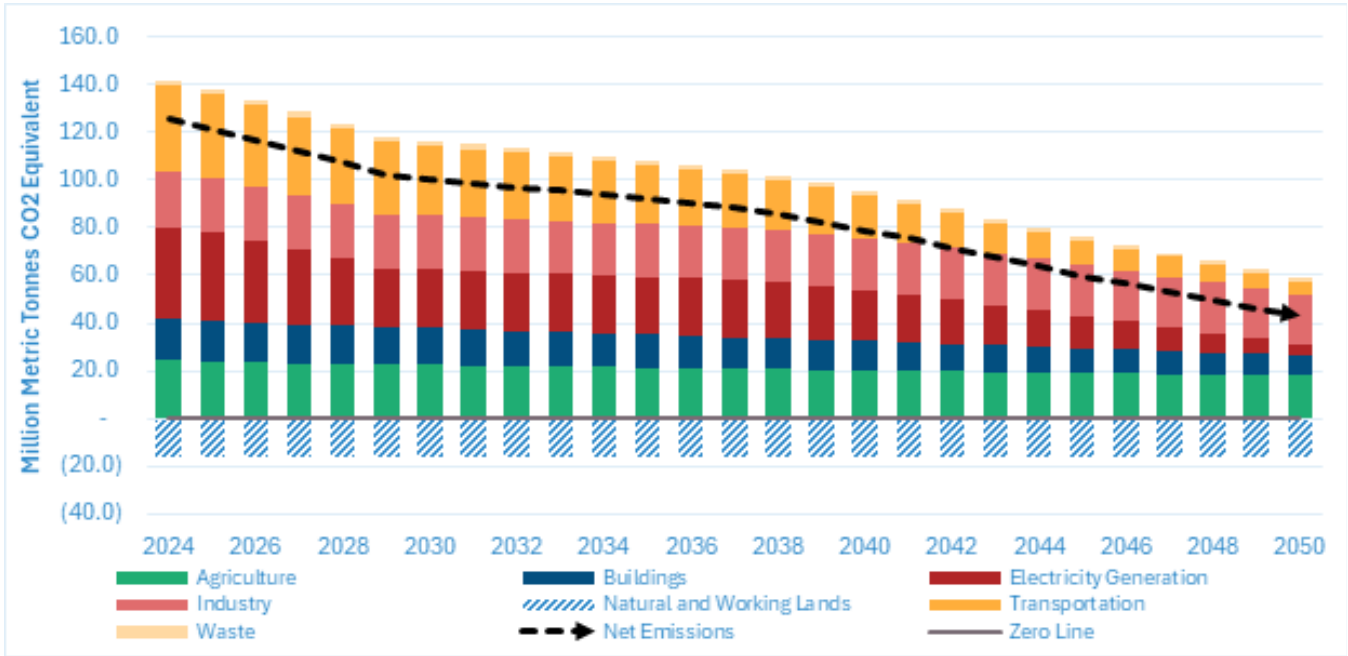


Figures 5 and 6 display GHG emissions trajectories for both the reference and goal scenarios outlined in this plan. These graphs illustrate a complex interaction between sectors. Often, a reduction in GHG emissions from one action can be offset by an increase in emissions elsewhere under the reference scenario. The OSCE sought to balance these intricate relationships by modeling the interaction among sectors. For instance, increased electrification of appliances and homes may decrease GHG emissions in the building sector. Still, it could lead to higher emissions in the energy generation sector if energy efficiency improvements or clean energy generation are not implemented alongside them. The projections shown represent potential outcomes if all actions were to be enacted simultaneously.

**Figure 5. Emissions by Year and Sector, Reference Scenario**

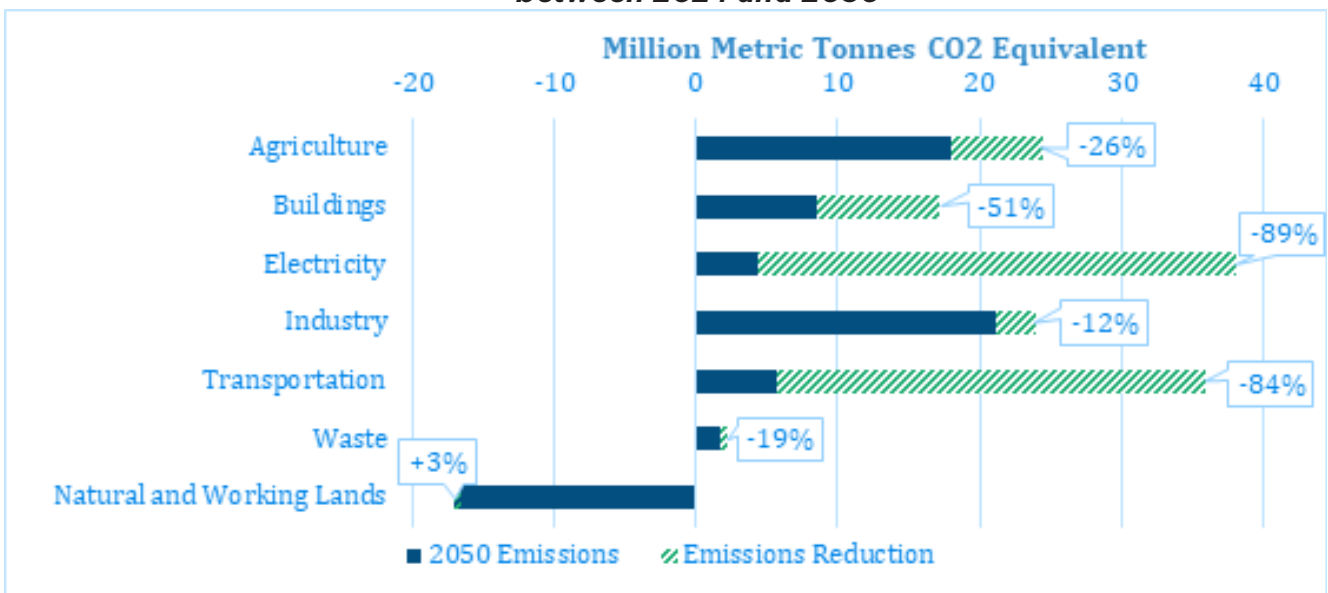


**Figure 6. Emissions by Year and Sector, Goal Scenario**



Similarly, Figure 7 shows the percent change in GHG emissions by sector within the goal scenario between 2024 and 2050. This illustrates the potential impact of the actions outlined within the plan, should they all be implemented. Most notably, we see drastic declines in the Electricity and Transportation sectors (89 percent decline and 84 percent decline, respectively). This is expected given that they are the two highest GHG Emissions sectors at present and therefore have the greatest room for reductions. As highlighted in Section 1’s Wisconsin’s Greenhouse Gas Inventory subsection, Natural and Working Lands are the one sector where we see an emissions sink – or GHG emissions that are stored instead of released into the atmosphere. The modeling projects that Natural and Working Lands will store three percent more GHG emissions if the plan is fully implemented, thereby contributing to lower net emissions overall.

**Figure 7. Change in GHG Emissions (MMT CO<sub>2</sub>e) from Emissions Reductions Actions between 2024 and 2050**



The OSCE collaborated with VEIC and state agency partners to model changes in emissions resulting from actions outlined in the plan. Additionally, VEIC reviewed the modeling from the 2022 Clean Energy Plan and aligned the goal scenario to include all actions in the CEP, as well as those explicitly called out in the Roadmap. Where the Roadmap advanced decarbonization further than the CEP through overlapping actions, the Roadmap’s assumptions were prioritized, ensuring it achieved greater statewide emission reductions than the CEP. Incorporating the CEP modeling assumptions significantly improved the emissions reduction scenario, highlighting the power of comprehensive, sector-by-sector planning. However, it is important to note that the CEP’s modeling results do not directly translate into those of the relevant sectors in the Roadmap. Several factors influence this: different modeling software was used for each plan (Energy Policy Simulator for CEP, Low Emissions Analysis Platform [LEAP] for this Roadmap); the modeling was conducted five years apart under very different state and federal policy environments; and the assumptions embedded in the models are not always directly comparable (for example, building electrification: in the Energy Policy Simulator, it is represented as a percentage of new appliances purchased that are electric, while in LEAP, it is modeled as a percentage of all appliances that are electric).

Tables 4.1-4.6 present each action’s GHG-reduction potential. **Note to those doing the math:** the actions listed in the following tables show each action’s individual GHG reductions relative to the reference scenario and do not account for variability arising from interactions with other sectors, as the figures above outline. Due to the previously mentioned interactions between actions, the total sum of GHG reductions in the following tables may not exactly match the projections.

**Table 4.1. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Agriculture Action**

#	GHG Reduction Actions	2025-2030	2025-2050
1.1	Promote soil carbon intensity best practices	1.62	4.19
1.2	Increase funding to support local food systems	1.90	4.26
1.3	Support farm waste management	2.56	6.72

**Table 4.2. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Commercial and Residential Buildings Action**

#	GHG Reduction Actions	2025-2030	2025-2050
2.1	Continue Wisconsin’s leadership in building codes	0.04	0.13
2.2	Improve the efficiency of homes and buildings through building component electrification	1.40	8.20
2.3	Retrofit existing buildings	1.00	5.60
2.4	Create a pre-weatherization program	0.02	0.10
2.5	Support the development of thermal energy networks in residential areas	0.01	0.18
2.6	Work with utilities to develop inclusive utility investment programs	0.89	1.05
2.7	Expand the deployment of low-carbon building materials	0.002	0.05

**Table 4.3. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Energy Generation Action**

#	GHG Reduction Actions	2025-2030	2025-2050
3.1	Support distributed wind, geothermal [heat pumps], biogas, solar, and storage installations	7.42	21.39
3.2	Invest in upgraded systems to enhance emerging technologies	6.21	10.87
3.3	Explore a flexible, market-based program to reduce GHG emissions in the power sector	0.53	1.59

**Table 4.4. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Industrial Process and Facilities Action**

#	GHG Reduction Actions	2025-2030	2025-2050
4.1	Support commercial and industrial energy efficiency	1.43	3.54
4.2	Facilitate industrial decarbonization with training and incentives	0.10	0.96
4.3	Implement a renewable thermal standard that incorporates newer technologies and efficiencies	1.30	1.90

**Table 4.5. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Natural and Working Lands Action**

#	GHG Reduction Actions	2025-2030	2025-2050
5.1	Promote sustainable forest management practices	0.11	0.39
5.2	Support Wisconsin wood product utilization	0.61	1.18
5.3	Encourage tree canopy growth in communities	0.03	0.15
5.4	Adopt a “No Net Loss” goal for natural landscapes	0.36	1.26

**Table 4.6. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Transportation Action**

#	GHG Reduction Actions	2025-2030	2025-2050
6.1	Reduce barriers for access to electric vehicles and associated infrastructure	0.34	4.61
6.2	Support recycling and replacement of small engines	0.001	0.005
6.3	Expand medium-heavy duty electrification and hydrogen infrastructure	1.50	8.80
6.4	Enable mode-shifting to alternative forms of transportation and expand public transit	2.80	0.70
6.5	Electrify public transit	0.04	0.20
6.6	Deploy location-efficient development strategies to reduce travel times	1.68	5.45

**Table 4.6. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Waste and Materials Action**

#	GHG Reduction Actions	2025-2030	2025-2050
7.1	Deploy a state-wide food waste program	0.43	1.25
7.2	Support biodigester development	0.11	0.50
7.3	Improve methane capture at municipal solid waste facilities	0.69	1.38

## CO-POLLUTANT EMISSIONS CHANGES FROM ACTIONS

Along with a qualitative analysis of benefits and potential drawbacks, the EAP team at UW-Madison conducted a co-pollutant assessment of the GHG-reduction actions. The data used for this co-pollutant evaluation include Base Year GHG Emissions, 2050 Business-as-Usual Emissions, and 2050 Emissions Including Roadmap Actions, based on the action quantification and projections outputs. GHG emission changes show the net difference between the 2050 Business-as-Usual Emissions and 2050 Emissions Including Roadmap Actions.

Co-pollutants include Nitrogen Oxides ( $\text{NO}_x$ ), Sulfur dioxide ( $\text{SO}_2$ ), Ammonia ( $\text{NH}_3$ ), Carbon Monoxide (CO), secondary particulate matter with a diameter of 2.5 micrometers and smaller ( $\text{PM}_{2.5}$ ), particulate matter with a diameter of 10 micrometers ( $\text{PM}_{10}$ ), Volatile Organic Compounds (VOCs), all together defined as Criteria Air Pollutants (CAPs), and 148 unique Hazardous Air Pollutants (HAPs), including lead.

HAPs are otherwise known as air toxins or toxic air pollutants and are identified by EPA as those known or suspected to cause a variety of negative

health impacts, such as cancer, reproductive effects, or birth defects, or adverse environmental effects. Examples of HAPs that might be familiar to the average person would be lead, asbestos, and mercury.

CAPs are different from HAPs in that they are identified by the Clean Air Act of 1970 as common air pollutants, and the EPA is required to set National Ambient Air Quality Standards for them. These pollutants are found across the United States and can have significant impacts on human and environmental health, as well as cause property damage.

Unless noted otherwise, percent changes in criteria air pollutants (CAPs) and hazardous air pollutants (HAPs) are proportional to the percent change in GHGs. For fuel combustion and mobile sources, co-pollutant emissions were scaled based on the reported change in  $\text{CO}_2$  emissions. For livestock and waste sources, co-pollutant emissions were scaled based on the reported change in  $\text{CH}_4$  emissions.

Co-pollutant changes were excluded when GHG reductions could not be easily linked to co-pollutant emissions. This applies to actions for agricultural soil carbon practices, forest and land management, and wood-product utilization. For industrial actions, co-pollutants were only considered if they correspond to combustion emissions (i.e., process heat). Otherwise, changes to CAP and HAP pollutants were not included for industrial processes because these emissions may occur independently of GHG mitigation actions. Additionally, co-pollutant changes were not considered for aircraft due to a lack of aircraft emissions data in the Base Year Multipollutant Inventory.

CAP emissions changes were estimated for  $\text{NO}_x$ ,  $\text{SO}_x$ ,  $\text{NH}_3$ , CO, primary  $\text{PM}_{2.5}$ , primary  $\text{PM}_{10}$ , and volatile organic compounds. Additional emission changes were calculated for 148 unique HAPs, including lead. Emission reductions are summarized in Table 11 below.

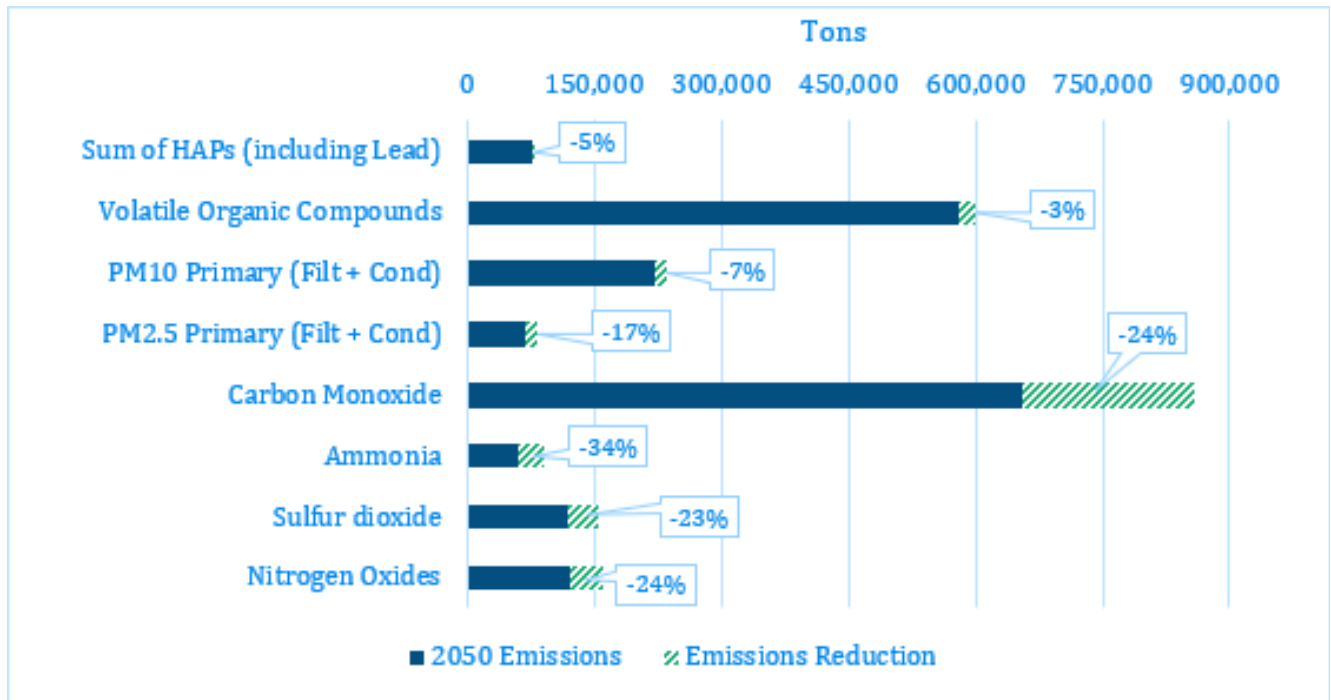


**Table 5. Statewide 2050 Emissions Reductions from Roadmap Actions Expressed Relative to Base Year Emissions**

Co-pollutant (tons)	Nitrogen Oxides	Sulfur dioxide	Ammonia	Carbon Monoxide	PM25 Primary (Filt + Cond)	PM10 Primary (Filt + Cond)	Volatile Organic Compounds	Sum of HAPs (including Lead)
Base Year Inventory	159,500	153,603	90,080	857,746	82,673	236,210	599,738	80,327
2050 Emissions Reduction	37,913	35,051	30,306	202,513	13,920	15,857	19,388	3,657
2050 Reduction As a percent of Base Year	-23.8%	-22.8%	-33.6%	-23.6%	-16.8%	-6.7%	-3.2%	-4.6%

These potential changes in co-pollutants resulting from the proposed emissions-reduction actions outlined in the plan are illustrated in Figure 8. While all co-pollutants show a decrease in emissions, the most noticeable impacts are on ammonia and nitrous oxide.

**Figure 8. Change in Co-Pollutants (tons) from Emissions Reductions Actions between 2024 and 2050**





## AGRICULTURE

Agricultural emissions encompass sources and sinks related to animal husbandry, crop production, and soil management. Agriculture is one of only two sectors that have experienced an increase in GHG emissions in the recent inventory. It also ranks as the third-largest sector, following energy and transportation. Many factors affecting how the agriculture sector operates could influence the increases observed since 2005, including growth in agricultural production in Wisconsin, de-regionalization of the food industry, changing practices in animal husbandry, the rise of confined animal feeding operations (CAFOs), and the decline in soil health caused by intensive crop production.

Wisconsin has long been a national leader in agricultural production, and our farmers are at the forefront of reducing carbon emissions by participating in producer-led initiatives, conducting on-farm research, and caring for their land, water, and other resources.

Wisconsin can become a climate-smart agriculture leader by adopting agricultural practices and systems that mitigate GHG emissions, enhance carbon sequestration, and adapt to climate change while promoting sustainable food production and increasing

### Current Support for Action in the Agriculture Sector

#### Wisconsin 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
- Buy Local, Buy Wisconsin Grants
- Food Security and Wisconsin Products Grant Program
- Resilient Food Systems Infrastructure program
- Tribal Elder Community Food Box Program

#### Wisconsin Department of Health Services - Women, Infants, and Children (WIC): Farmers Market Nutrition Program

- Senior Farmers Market Nutrition Program
- Double Up Food Dollars

#### Focus on Energy®

- Utility Ratepayer Funded Programs - Agribusiness
- Feasibility Studies for Biogas and Biomass Projects

resilience to climate-related challenges. The state can support these efforts by increasing and expanding funding for incentives and educational programs, as well as helping more local food producers build business relationships and connect with their communities.

From a co-benefits and emissions reduction perspective, the agricultural actions included in this plan can have a significant, direct impact on the following:<sup>xix</sup>

- **ECONOMIC DEVELOPMENT** - Involving LIDACs in the planning and implementation of these initiatives offers opportunities for economic empowerment. This may include training programs, skill development, and the establishment of small businesses related to waste management and agricultural practices. For example, new businesses could emerge to collect, sort, and process organic waste, providing feedstock for anaerobic digesters. These actions also support broader rural economic development through growth in regenerative agriculture and bioenergy sectors.
- **AIR QUALITY & HEALTH** - Initiatives that focus on understanding and improving soil carbon intensity often incorporate sustainable agricultural practices. These practices may help improve air quality by reducing ammonia emissions that contribute to PM<sub>2.5</sub> formation.
- **WATER QUALITY** - Improved waste management and reduced agricultural runoff can protect groundwater quality, reducing nitrates and bacteria in private wells, and reduce environmental health risks for rural housing, including in LIDACs. Further, reduced runoff will slow down the leaching of pollutants/contaminants into groundwater aquifers.

**Table 6. Potential Projected GHG Emissions Reductions (MMTCO<sub>2e</sub>) by Agriculture Action**

#	GHG Reduction Actions - Agriculture	2025-2030	2025-2050
1.1	Promote soil carbon intensity best practices	1.62	4.19
1.2	Increase funding to support local food systems	1.90	4.26
1.3	Support farm waste management	2.56	6.72

## 1.1 PROMOTE SOIL CARBON INTENSITY BEST PRACTICES

Agricultural soil improvements that reduce GHG emissions from farming practices can include nutrient management, cover crops, reduced- or no-till methods, cutting back on chemical fertilizers, and promoting the expansion of agrivoltaics. Support for this action includes assistance from government agencies such as the Department of Agriculture, Trade, and Consumer Protection (DATCP), local government units, and Tribal Nations.

For example, the Producer-led Watershed Protection Grant Program (PLWPG) shows how the state can support improvements in soil carbon storage. The program’s goal is “to improve Wisconsin’s soil and water quality by supporting and advancing producer-led conservation solutions that increase on-the-ground practices and farmer participation in local watershed efforts.” According to the “2024 Conservation Progress Report” produced by DATCP, grant requests have increased by more than 500 percent since the program began in 2016, and participants implemented conservation practices on over 1.69 million acres in 2024. The implemented practices were estimated to have reduced GHG emissions by

169,361 metric tons in 2023.

Support for the PLWPG remains strong, and conservation practices have shown significant improvement on the lands where they are applied. Expanding the program to cover a larger portion of Wisconsin's 13.8 million acres of farmland could substantially lower agricultural emissions. Additional support might include more financial assistance, crop premiums, and technical help.

Evaluating the success of this action could include measuring the number of acres enrolled in programs and the tons of CO<sub>2</sub> sequestered.

## 1.2 INCREASE FUNDING TO SUPPORT LOCAL FOOD SYSTEMS

Wisconsin has a proud history of farming and local food programs. Local food programs primarily reduce emissions from food transportation while also offering many other benefits for producers and their local communities. Support for this action includes assistance from government agencies such as the DATCP and the Department of Health Services (DHS), local government units, and Tribal Nations.

The GTFCC Report recommends “increasing funding to the state’s Farm-to-School and Buy Local, Buy Wisconsin programs; creating and funding the Governor’s Farm-to-Fork proposal; and supporting programs that promote local food system development to connect people with healthy and nutritious food options.” Additionally, participants in the Stakeholder Advisory Teams recommended developing a Double Up Food Bucks program through the Gus Schumacher Nutrition Incentive Program (GUS-NIP) with the U.S. Department of Agriculture.



In 2023, Gov. Evers signed Act 201 into law, allowing the DHS to utilize funding as a match for the GUS-NIP grant, thus enabling the agency “to support and evaluate projects intended to increase the purchase of fruits and vegetables by providing incentives at the point of purchase among income-eligible consumers participating in the USDA Supplemental Nutrition Assistance Program (SNAP)”.<sup>xx</sup> Creation of the Double Up Food Bucks program would promote the use of SNAP dollars at local farmers’ markets across the state, thereby encouraging the purchase of healthy foods and local produce. Many mechanisms exist to support local food systems, including implementing local food benefit programs, offering technical assistance to farmers and cooperatives, and increasing financial backing for farm-to-table projects.

Evaluating the success of this action could include measuring the amount of SNAP dollars used at local farmers’ markets and the number of organizations participating in local food programs.

### 1.3 SUPPORT FARM WASTE MANAGEMENT

---

The latest Wisconsin Greenhouse Gas Inventory Report (1990-2021) shows that emissions from enteric fermentation (a process in animals' digestive systems that produces methane) and manure management account for two-thirds of agricultural emissions. These sources have seen the largest growth since 2005. Progress has been made in researching feed additives that reduce enteric fermentation in animals. UW-Madison's Division of Extension Dairy Program is studying how selective breeding and microbial manipulation, among other management strategies, can lower enteric fermentation in Holsteins.

Support for this action includes assistance from government agencies such as the DATCP, local government units, and Tribal Nations. The state could promote sustainable farming by offering incentives for farms to adopt feed additives that may decrease fermentation rates. Additionally, the state could establish programs to encourage best practices for manure management, increase the use of regional or on-farm biodigesters to lower manure emissions, and offset fossil fuel emissions by expanding renewable energy production on farms or at regional manure management facilities. Support for these initiatives could be provided through tax incentives, technical assistance, grants, and private investments.

Evaluating the success of this action could include the number of farms in state partnership programs, the number of animals covered by state-run programs, the number of farms with renewable energy production, the number of farms managing manure with biodigesters or anaerobic digesters, the amount of methane produced annually by animals, and the amount of methane produced annually by manure management operations.





## COMMERCIAL AND RESIDENTIAL BUILDINGS

Direct emissions from commercial and residential buildings mainly originate from space heating and cooling, water heating, some cooking appliances, and refrigerant leakage. These direct emissions differ from indirect emissions associated with electricity generation required to power buildings. In Wisconsin, residential and commercial buildings accounted for 13 percent of gross emissions in 2021. Furthermore, emissions in these sectors have been increasing since 2005, with commercial building emissions rising by 7 percent during that period.

The CEP, published in 2022, outlines several strategies for buildings that residents, business owners, non-governmental organizations, and units of government can adopt to reduce emissions from building operations. It includes some actions identified by stakeholders and modeling as having the greatest impact on reducing emissions, along with a few additional actions to help bridge any remaining gaps. These strategies cover building codes and energy efficiency.

**Table 7. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e)  
Commercial and Residential Buildings Action**

#	GHG Reduction Actions – Commercial and Residential Buildings	2025-2030	2025-2050
2.1	Continue Wisconsin’s leadership in building codes	0.04	0.13
2.2	Improve the efficiency of homes and buildings through building component electrification	1.40	8.20
2.3	Retrofit existing buildings	1.00	5.60
2.4	Create a pre-weatherization program	0.02	0.10
2.5	Support the development of thermal energy networks in residential areas	0.01	0.18
2.6	Work with utilities to develop inclusive utility investment programs	0.89	1.05
2.7	Expand the deployment of low-carbon building materials	0.002	0.05

From a co-benefits and emissions reduction perspective, the building actions included in this plan can have a significant, direct impact on the following:<sup>xxi</sup>

- **ENVIRONMENTAL JUSTICE** - Building electrification and energy efficiency upgrades can be designed to lower energy burdens, which can be especially beneficial for lower-income households. Targeted incentives and on-bill financing mechanisms can help remove upfront cost barriers, especially when combined with strong community engagement to address LIDAC-specific needs and ensure benefits are shared equitably. LIDAC communities can be prioritized for pre-weatherization services, energy audits, and access to financial incentives. Coordinating building upgrades with social service delivery may further increase participation.
- **AIR QUALITY & HEALTH** - Upgrading ventilation systems and shifting from combustion-based to electric appliances can enhance indoor air quality. Better indoor air quality and decreased exposure to combustion-related pollutants support improved public health outcomes. These benefits are especially important in LIDACs, where substandard housing conditions are more widespread. The advantages of electrification will be especially significant when converting away from wood fuel, which is disproportionately responsible for PM<sub>2.5</sub> emissions in homes.
- **ENERGY BURDEN** - Implementing energy efficiency actions can greatly cut energy bills for residents of upgraded buildings. This is especially helpful for low-income households that allocate a large portion of their income to energy costs. Lower energy expenses can enable individuals to afford using air conditioning without having to cut back on essentials like food or healthcare.
- **SAFE & AFFORDABLE HOUSING** - As climate change is expected to increase the frequency of extreme temperatures in Wisconsin, home upgrades such as improved insulation and modern heating and cooling systems can enhance comfort and lower vulnerability. These retrofitting actions are especially crucial for LIDACs, which are more vulnerable to extreme weather events. Upgraded housing will lead to lower indoor air temperatures, reduce health risks from both extreme heat and cold for vulnerable populations, including LIDAC communities, where energy costs may be a concern. Retrofitting can also involve removing or mitigating hazardous building materials, thereby reducing residents' exposure to toxins and creating a safer, healthier living environment. For example, retrofitting buildings by removing lead or galvanized pipes would decrease lead exposure. Better indoor air quality can improve cognitive performance and decrease infection risk in both homes and workplaces. In cases of electrification, substitute appliances may also reduce exposure to carbon monoxide from poorly maintained, ventilated, or adjusted gas appliances.



## FROM FAITH TO ACTION: CHURCHES, MULTI-FAMILY, AND SMALL BUSINESS PROPERTIES ADVANCING ENERGY EFFICIENCY AND GREEN INFRASTRUCTURE

*Milwaukee, Wisconsin*

Launched in 2023, the Greening Congregations Initiative (GCI) led by The Sherman Park Community Association aims to establish a streamlined pathway for houses of worship (HOWs), multi-family and small business properties in Milwaukee's Sherman Park, Lindsay Heights, and Harambee neighborhoods to combine energy efficiency upgrades with green infrastructure (GI) solutions. Through partnerships with the local government, non-profits, and philanthropic funders, the initiative integrates technical energy assessments, financing pathways, workforce development, and community engagement into deployable projects.

Since its launch, more than 30 community engagement meetings, community dinners, and luncheons have been held where field experts have shared resources with residents. One of the 13 congregations that received a free energy assessment, Bethel-Bethany United Church of Christ, has installed insulation in major attic areas of the church and added door air gap sealing and converted all lights to LED lighting, reducing energy usage and heat output of lights by 39 percent, saving approximately \$300 annually.

Further, a total of eight GI systems, such as rain gardens and rain barrels, have been installed at various project-focused locations. These installations are projected to capture thousands of gallons of stormwater annually, helping protect local waterways and mitigate runoff in the neighborhoods. The group also designed and implemented a youth environmental stewardship initiative that hires and provides stipends to high school students from the neighborhood school district thereby exposing them to career and training pathways in clean energy and green stormwater infrastructure.



Photo credit: Victor Nino, PhD

## 2.1 CONTINUE WISCONSIN'S LEADERSHIP IN BUILDING CODES

---

Updating building codes to reflect current best practices can enhance energy efficiency and lower fossil fuel use for heating, cooling, and water heating in new developments. Support for this action includes assistance from government agencies such as the Department of Safety and Professional Services (DSPS), local government units, and Tribal Nations.

Building code updates can promote the electrification of other sectors. Since the release of the GTFCC Report, DSPS's Commercial Building Code Council has updated the commercial building code, aligning Wisconsin's codes with the 2021 International Building Code (IBC) standards, with some Wisconsin-specific modifications. In 2022, the DSPS launched the Wisconsin Advisory Council on Building Sustainability, created under Wis. Stat. §§ 227.13 and 440.042(1), to review all building and construction codes and provide recommendations to increase safety, resiliency, and sustainability.

While building codes often set minimum energy efficiency standards during construction, they may not ensure that a building maintains those standards throughout its lifetime. Creating Building Performance Standards that align with existing building codes can help ensure buildings continue to meet energy efficiency goals. Some local governments in Wisconsin are already implementing Building Performance Standards or requiring benchmarking by commercial property owners within their jurisdictions.

Evaluating the success of this action could include measuring additional code updates that include sustainability or renewable/energy-efficient technologies, as well as GHG emissions in the buildings sector.

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

---

Energy efficiency is the most affordable and cleanest way to meet Wisconsin's energy needs, avoiding the construction of additional expensive power plants. Moreover, electrifying homes and buildings by installing heat pumps and appliances decreases emissions from on-site fossil fuel combustion. Support for this initiative includes assistance from government agencies, such as the Public Service Commission of Wisconsin (PSCW) and the DOA, local government units, and Tribal Nations.

Wisconsin's Focus on Energy® program, an award-winning utility incentive initiative overseen by the PSCW, has been leading the way in helping homes and businesses upgrade their building components for over 25 years. This program not only promotes economic development by creating jobs but also helps customers save on utility bills. Increasing the funding that investor-owned utilities (IOUs) are required to contribute to Focus on Energy®, as well as increasing the amounts that municipal utilities and co-ops can collect for this purpose, will allow Focus on Energy® to expand and deepen its impact. The program can grow by serving more customers and becoming stronger through additional incentives, including support for the beneficial electrification of buildings and vehicles, battery storage,

and microgrids. Funding should also be directed toward job training and economic growth within the sector, as energy efficiency can foster a clean energy economy in Wisconsin through manufacturing and installation jobs.<sup>xxii</sup> In 2026, during the Quadrennial Planning Process (which determines Focus on Energy's<sup>®</sup> incentives and offerings), the PSCW is considering an emissions-reduction-optimized scenario alongside others, recognizing the importance of reducing adverse environmental impacts as a key measure of the program's success.

**Wisconsin is the first state in the nation to launch the Home Efficiency (HOMES) portion of the Home Energy Rebates program**

To increase cost savings for consumers, the PSCW also directed Focus on Energy<sup>®</sup> to manage the Home Energy Rebates program under the Inflation Reduction Act, which provides rebates for energy-efficient home upgrades, electrification, and appliances to income-qualified families.

In addition, the Division of Energy, Housing, and Community Resources within

the state's DOA manages the Weatherization Assistance Program, a crucial initiative funded by the U.S. Department of Housing and Urban Development (HUD). This program allocates funds to low-income families to improve the energy efficiency of their homes and lower energy costs. Increased incentives provided through state and local programs, along with public awareness efforts could support this initiative.

Evaluating the success of this action could include measuring the number of electric building components sold and installed; the number of buildings served; the amount of CO<sub>2</sub> and other co-pollutant emissions reduced at each participating site, both on an annual basis and over the duration of the program.

## 2.3 RETROFIT EXISTING BUILDINGS

Using existing buildings instead of constructing new ones helps preserve the embodied carbon stored inside and reduces emissions from new construction. Retrofits can include envelope improvements, equipment upgrades, electrification, and more. Property owners can be encouraged to get retrofits through education and incentives. Support for this action includes assistance from agencies such as the Wisconsin Housing and Economic Development Authority (WHEDA), DOA, and the PSCW, as well as local governments, Tribal Nations, Housing Authorities, and Local Community Action Programs (CAPS).

Programs like the Wisconsin Housing and Economic Development Authority's (WHEDA) More Like Home™ Repair & Renew Loan can help income-qualified homeowners make costly repairs with a lower-than-market-rate loan. Supporting municipalities that want to address this issue can be achieved through legislation, education, and technical assistance.

Evaluating the success of this action could include measuring the number of buildings retrofitted; the measured annual energy use in retrofitted buildings; and the amount of CO<sub>2</sub> and other co-pollutant emissions reduced at each participating site, both on an annual basis and over the duration of the program.

## 2.4 CREATE A PRE-WEATHERIZATION PROGRAM

---

Many residents find it difficult to afford the necessary upgrades and equipment replacements needed to decarbonize their homes. Support for this action includes assistance from agencies such as the WHEDA, Wisconsin Economic Development Corporation (WEDC), and the PSCW, as well as local governments, Tribal Nations, Housing Authorities, and Local Community Action Programs (CAPS).

The state provides programs to help residents improve the energy efficiency of their homes, but demand often exceeds available funding. Residents often need costly upgrades to qualify for weatherization, energy-efficiency improvements, and fuel-switching equipment. A recent analysis of the state's weatherization program found that nearly half of all applicants were deferred due to hazardous living conditions, urgent home repairs, or the presence of asbestos-containing materials. Furthermore, owners of multi-family and multi-unit complexes face significant expenses when considering energy-efficiency and electrification upgrades, which are difficult to pass on to residents, especially when affordable housing options are limited. Various funding sources for residential and commercial upgrades exist, but often involve complex eligibility requirements that can be challenging for individuals to navigate on their own.

The CEP emphasizes the importance of a comprehensive, whole-home approach. This includes using multiple programs alongside the Weatherization Assistance Program and the Focus on Energy<sup>®</sup> program to prepare homes for weatherization. These efforts may involve necessary repairs and other healthy-home upgrades, such as grab bars, carbon monoxide detectors, ventilation improvements, childproofing, and more. Collaboration among the DHS, WEDC, Focus on Energy<sup>®</sup>, and DOA Community Development Block Grant programs, as well as Weatherization Assistance Programs, to fund renewable energy projects and improve energy efficiency in both new and rehabilitated units will help reduce energy consumption and costs.

Evaluating the success of this action could include measuring the number of homes deferred from the Weatherization Program to the Pre-weatherization Program, the number of homes pre-weatherized, the number of contacts with the program administrator for assistance, and the amount of CO<sub>2</sub> and other co-pollutant emissions reduced at each participating site, both annually and over the course of the program.

## 2.5 SUPPORT THE DEVELOPMENT OF THERMAL ENERGY NETWORKS IN RESIDENTIAL AREAS

---

Thermal energy networks (TENs) are systems that utilize geothermal heat pumps, wastewater, and waste heat to provide heating and cooling for multiple

buildings, not just one. They help lower emissions at the building level and give many households and businesses the opportunity to benefit from switching to renewable energy collectively rather than individually. Wisconsin can support TEN developments by establishing clear regulatory guidelines for ownership, encouraging their use as alternatives to expanding gas systems, and creating appealing rate structures for customers. Support for this action includes assistance from agencies such as the PSCW, DOA, as well as Local Governments, Tribal Governments, Housing Authorities, and Local Community Action Programs (CAPS).

Evaluating the success of this action could include measuring the number of TENs created and the number of buildings served by TENs.

## **2.6 WORK WITH UTILITIES TO DEVELOP INCLUSIVE UTILITY INVESTMENT PROGRAMS**

---

Utilities and third-party lenders can cover upfront costs for upgrades and allowing customers to pay these costs through their utility bills. Unlike other on-bill loan programs, inclusive utility investments (or tariffed on-bill programs) connect upgrades to the meter rather than the individual, making them accessible to those who cannot provide capital or credit, or who are unwilling or unable to take on personal debt to complete upgrades. The CEP also notes that utilities should ensure that customers with low incomes, multifamily residents, and renters have access to opt-in financing options for energy efficiency projects. Like Property Assessed Clean Energy (PACE) financing programs, these will let customers pay for energy-saving upgrades gradually over time on their monthly bills. The state can establish such programs through legislation, and other Midwestern states can serve as models for this approach. Supporting this action could also involve agencies like the PSCW and Tribal Nations.

Evaluating the success of this action could include measuring the number of buildings with on-bill financing projects, decreased customer energy costs, utility peak load reductions, low default rates, total loans issued and amounts, source of capital (including a more diverse portfolio), and customer types.

## **2.7 EXPAND THE DEPLOYMENT OF LOW-CARBON BUILDING MATERIALS**

---

Wisconsin produces mass timber, low-carbon concrete and cement, and recycled asphalt, all of which provide opportunities for Wisconsinites to lower emissions from new construction. The state might support this initiative by creating Environmental Product Declarations (EPDs), offering technical assistance, and Lead-by-Example, in which governmental agencies set policies and procure such materials. Support for this action includes directives and assistance from agencies such as the DNR, DSPS, DATCP, WisDOT, and DOA, as well as local governments and Tribal Nations.

WisDOT was awarded a Low Carbon Transportation Materials (LCTM) Grant from the Federal Highway Administration that aims to model the environmental impacts

of concrete and asphalt used on WisDOT projects. It will create a nutrition-label-type system that defines CO<sub>2</sub> and other environmental factors as part of a life-cycle assessment. The goal of the program is to model current construction materials - concrete, asphalt, glass, and steel - and then determine how much “greener” they can be made. In addition to utilizing low-carbon materials in their projects, the WisDOT has been recycling materials as part of their construction projects for years. The department has tracked efforts as part of the Mobility, Accountability, Preservation, Safety, and Service (MAPSS) performance measure to quantify quantities and approximate cost savings. Both the use of low carbon transportation infrastructure and recycled materials help to make Wisconsin’s transportation system more sustainable.

This action includes ongoing research into and deployment of policies that reduce the embodied energy of building materials. The state and other relevant agencies and partners need to continue exploring and recommending methods to account for carbon emissions in infrastructure project development and material procurement. It also suggests establishing a standardized approach for evaluating and reporting embodied carbon emissions for Wisconsin’s most commonly used construction materials, and developing EPDs for project planning and bid evaluation. This might include assessing the energy needed for the extraction, processing, production, and transportation of materials to construction sites. To support this, an analysis of the materials and current governance related to state procurement should be conducted.

Additionally, this action supports Wisconsin wood product utilization and protects Wisconsin forests by expanding opportunities to use sustainable Wisconsin wood products, including increased investments in research, development, and commercialization of mass timber, cross-laminated timber, biochar, and other technologies for carbon storage. The generation of renewable thermal energy (woody biomass) to offset fossil fuel use helps protect Wisconsin forests as carbon sinks. Specifically for mass timber, the Mass Timber Task Force was created at DSPS under Wis. Stat. § 227.13 to advise the Department and the Commercial Building Code Council on matters related to the development of mass timber guidelines.

Evaluating the success of this action could include measuring the board feet of local-use dimension lumber milled and sold each year, the metric tons of carbon stored in wood products, and the number of projects funded by state programs.





## ENERGY GENERATION

Although electricity generation in Wisconsin has generally decreased since 2005, resulting in the largest emissions reduction during that period, it remains one of the main sources of emissions along with transportation, according to the latest Wisconsin Greenhouse Gas Emissions Inventory Report. These emissions are mainly driven by coal burning. While utilities have made significant progress, reducing emissions by 28 percent from 2005 to 2021, many future efforts to decarbonize other sectors will depend on increased electricity use. Additionally, the rise in energy consumption due to load growth could outweigh the improvements made. Emissions reductions in this sector are challenging to track due to the interplay between transportation and building electrification, along with evolving federal funding and incentives.

That said, the CEP outlines several key pathways to reach Gov. Evers' goal of making 100 percent of Wisconsin's consumed electricity carbon-free by 2050. Increased deployment of wind and solar energy, technologies such as renewable natural gas, geothermal, hydrogen, and others, and the acceleration of energy storage growth will contribute significantly to achieving this goal. The expansion of renewable energy will include various types, from large utility-scale projects to community solar and small distributed systems like rooftop solar. It will also be essential to facilitate the connection of these resources to the grid. Additionally, we must ensure proper siting of renewable projects while safeguarding property owners' rights. Additional technologies and initiatives are needed, such as advanced nuclear power, integrated demand-side management to optimize power use on the distribution grid, and market improvements

### Current Support for Action in Energy Generation

#### Public Service Commission of Wisconsin - Office of Energy Innovation

- Energy Innovation Grant Program
- Grid Resilience Program
- Focus on Energy®
  - Solar for Homes
  - Renewables for Businesses

#### Wisconsin Economic Development Corporation

- Green Innovation Fund
- Business Development Credit

#### Wisconsin Department of Administration

- Energy Savings Conservation Programs

through the Midcontinent Independent System Operator (MISO), which manages supply and demand in Wisconsin and many other states.

From a co-benefits and emissions reduction perspective, the energy generation actions can have a significant, direct impact on the following:<sup>xxiii</sup>

- **ECONOMIC DEVELOPMENT** - The growth of distributed renewable energy creates skilled jobs in the solar, wind, and energy storage sectors, as well as long-term roles in system maintenance. These projects may also attract private investments and federal funding, especially in areas with shovel-ready projects or strong labor markets. Job training programs in clean energy sectors can generate new income opportunities, and prioritizing LIDAC workforce participation in these programs can help reduce income inequality.
- **ENVIRONMENTAL JUSTICE** - Installing renewable energy systems on public and community-serving buildings can provide both cost savings and increased resilience for LIDACs. When combined with equitable siting policies, these projects can help ensure that benefits reach historically underserved communities.
- **AIR QUALITY & HEALTH** - Cutting emissions from fossil-fueled power plants improves local air quality and enhances respiratory health, especially benefiting vulnerable groups like children, the elderly, people with chronic illnesses, and those who live or work outdoors.
- **WATER QUALITY** - Certain renewable energy projects, such as biogas systems and geothermal installations, can decrease nutrient and pollutant discharges by replacing fossil fuel generation that relies on water-intensive cooling or wastewater-generating processes. Rooftop solar and green energy retrofits can also incorporate stormwater management features to enhance runoff quality. Utility-scale solar power removes fields from production, reducing the risk of nitrates contaminating groundwater.
- **ENERGY BURDEN** - Depending on project design and financing structure, renewable energy projects can lower energy costs for public buildings and, in some cases, for residential customers.

**Table 8. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Energy Generation Action**

#	GHG Reduction Actions – Energy Generation	2025-2030	2025-2050
3.1	Support distributed wind, geothermal [heat pumps], biogas, solar, and storage installations	7.42	21.39
3.2	Invest in upgraded systems to enhance emerging technologies	6.21	10.87
3.3	Explore a flexible, market-based program to reduce GHG emissions in the power sector	0.53	1.59

### 3.1 SUPPORT DISTRIBUTED WIND, GEOTHERMAL [HEAT PUMPS], BIOGAS, SOLAR, AND STORAGE INSTALLATIONS

---

Wisconsin has seen a significant increase in the deployment of Distributed Energy Resources (DERs), such as wind, solar, energy storage, biogas, geothermal, and other emerging technologies. DERs generally refer to power generation, storage, or demand management connected to the electrical system, either behind the meter at a customer's site or on a utility's distribution network. Support for this action includes directives and assistance from agencies such as the PSCW, DOA, WEDC, local governments, and Tribal Nations. The state can also promote these efforts through financial incentives, technical support, and Lead-by-Example.

The GTFCC Report notes that a specialized subset of DERs is microgrids, which are self-sufficient energy systems serving discrete areas such as college and hospital campuses, business complexes, and neighborhoods. Microgrids include one or more distributed energy sources (for example, solar panels, wind turbines, and combined heat and power (CHP)) and may include battery energy storage and electric vehicle (EV) charging infrastructure. When renewable-powered microgrids are coupled with battery storage, they can also serve as tools to support community resilience during broader weather or security-caused outages. Piloting and promoting the use of such microgrids in Wisconsin can help the state meet its carbon goals and ensure energy resilience, especially for facilities that rely on uninterrupted power, such as hospitals.

To further advance this action, it is important to collaborate with MISO and stakeholders to expand opportunities and increase the financial value of clean DERS. This involves increasing the visibility and dispatch of DERs, recognizing that current MISO information on DER visibility and dispatch does not fully enable developers, utilities, and stakeholders to understand DER potential. MISO is complying with Federal Energy Regulatory Commission requests (FERC Order 2222) to provide transparency into the tracking of the integration of high-penetration DERS and to address reliability, resource adequacy planning, and new markets. It is important to align this measure with what is being shared through this process.

Evaluating the success of this action could include measuring the number of megawatts (MWs) produced by DERs and DER's percentage of grid mix in Wisconsin.

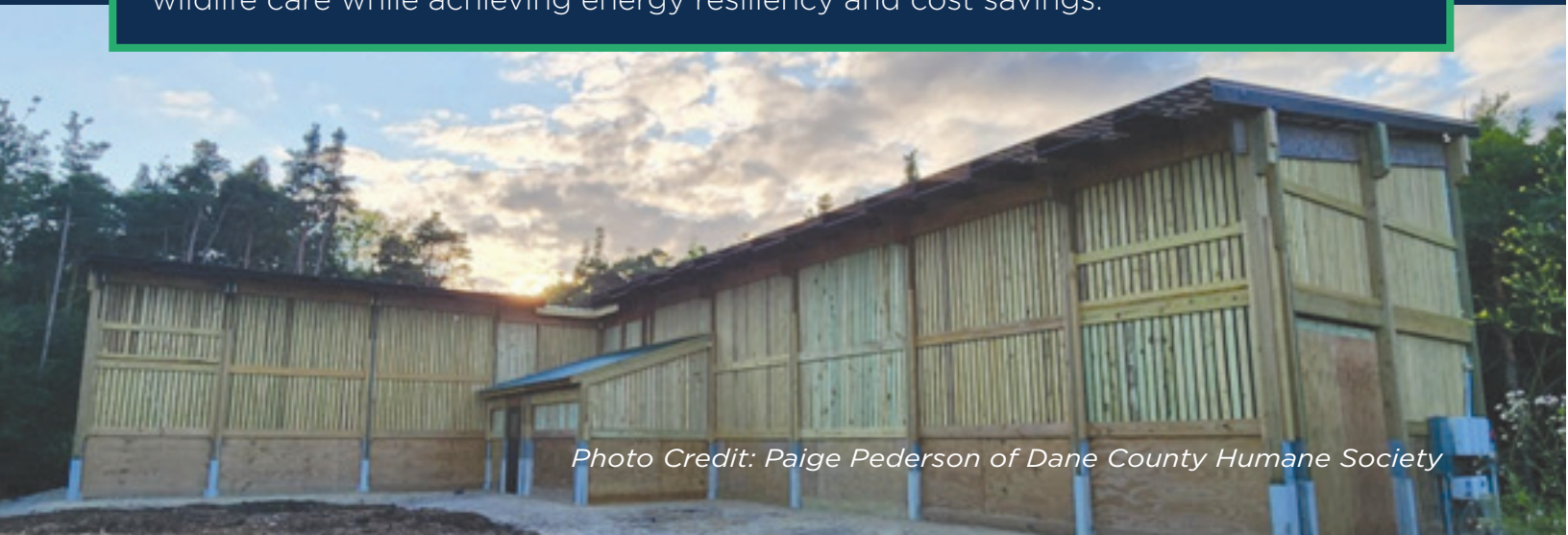


*Photo Credit: Colton Simpson of Storysage Productions*

## DANE COUNTY HUMANE SOCIETY COMMISSIONED THEIR ONE-OF-A-KIND 'SOLAR FLIGHT PEN' IN 2024

The Roger Werndli Memorial Solar Flight Pen, designed by Couillard Solar Foundation, managed by Legacy Solar, and built by WES Engineering and Earth Origin LLC is a feat of wildlife rehabilitation and renewable design. Dane County Humane Society's innovative 50kW solar plus battery storage system is a shining example of clean energy leadership and community impact which won multiple grants and awards including the PSC EIGP grant, Solar For Good grant, Backyard MadiSUN grant and RENEW Wisconsin's 2024 Clean Energy Honor Roll. Without these "difference makers", like the leadership and staff at Dane County Humane Society, tackling obstacles and creating innovative solutions, the journey to a carbon-free energy economy would remain out of reach.

This project exemplifies leadership, ambition, climate awareness, and community impact through this clean energy innovation. This system ensures reliable power for the remote Wildlife Center recovery areas, providing critical resilience against power outages for fragile animals in rehabilitation. These animals, whether destined for release back into the wild or not, benefit directly from this sustainable solution. This is truly an all encompassing approach to conservation. The new 100-foot flight pen, equipped with bifacial solar panels, enables the recovery of larger birds/ birds of prey as they regain the ability to fly and hunt before being reintroduced into their natural habitats. This project showcases how clean energy can enhance wildlife care while achieving energy resiliency and cost savings.



*Photo Credit: Paige Pederson of Dane County Humane Society*

### 3.2 INVEST IN UPGRADED SYSTEMS TO ENHANCE EMERGING TECHNOLOGIES

---

Growing renewable energy generation across the grid presents an opportunity to upgrade systems and maximize potential, such as expanding battery storage capacity and increasing demand response and load shifting capabilities. Support for these efforts can include grants, financial incentives, and regulatory actions. Support for this action includes directives and assistance from agencies such as the PSCW and WisDOT.

For example, as the CEP notes, renewable energy is increasing in Wisconsin's generation mix, making energy storage more crucial. Unlike a power plant powered by gas, coal, or nuclear energy, the availability of wind and solar resources is variable. As more renewable energy integrates into the system, the state will need storage solutions to provide support during periods of extreme heat or cold, when demand is higher, or when baseload plants are offline. Energy storage, both short- and long-term, offers various benefits to the energy system. Short-term storage (a few hours) helps bridge the energy gap during the night (for solar) or calm periods (for wind). Additionally, storage can help grid operators manage load and optimize the grid, as stored energy can be used during peak times. Future technological advances will speed up the adoption of long-term energy storage. Developing more and better uses for energy storage will benefit communities that are disproportionately affected, including by replacing power plants. Moreover, many utility customers will see reduced costs by using storage resources during peak times.

The PSC has approved 18 energy storage projects to date, with 16 co-located with energy generation and 2 stand-alone storage solutions. The total capacity of all approved projects is 1,711 MW. Most are traditional battery energy storage systems (BESS). Columbia Energy Storage Project (also known as "Energy Dome"), implemented by Alliant Energy, is notable as a unique long-duration storage system.

Evaluating the success of this action could include measuring the number of utilities implementing this action; the population served by these utilities; battery storage capacity; carbon sequestration capacity; new clean energy generation (such as nuclear and hydrogen); EV infrastructure; the amount of peak shifting and optimization to match the availability of low-cost, low-carbon generation sources; increased efficient use of existing utility assets; and expanded transmission.

### 3.3 EXPLORE A FLEXIBLE, MARKET-BASED PROGRAM TO REDUCE GHG EMISSIONS IN THE POWER SECTOR

---

Thirteen states across the country currently participate in carbon markets and use the revenue generated to fund a wide range of programs, including energy efficiency initiatives, flood preparedness and coastal resilience, clean transportation projects, and clean energy investments.<sup>xxiv</sup> Wisconsin aims to focus on reducing emissions from the power sector, which can be further decreased by establishing a flexible, market-based program that sets a declining emissions cap

and includes allowance auctions. Legislative action would be needed to create such a program. Support for this action includes direction and assistance from the PSCW.

The GTFCC Report and CEP highlight the need for Wisconsin to conduct a thorough analysis and establish a clear plan for participating in or implementing an effective carbon pricing policy. This may include creating a study commission to better understand the potential impacts of revenue-generating, revenue-neutral, cap-and-trade, or other carbon-pricing systems in Wisconsin. It could also help identify how the state can best support regional and federal carbon-pricing initiatives, or explore launching pilot programs in collaboration with the UW or a major Wisconsin-based emitter.

Evaluating the success of this action could include establishing a study commission and implementing a carbon market policy (which would require legislative action). After launching a carbon market, success could be measured by annual GHG reductions, auction clearing prices, a comprehensive statewide CO<sub>2</sub> cap, overall pollutant reductions, energy efficiency improvements and investments, and market performance.





## INDUSTRIAL PROCESS AND FACILITIES

According to the Wisconsin Greenhouse Gas Emissions Inventory Report, non-electricity energy use, such as space, water, and industrial process heating, accounted for 12.5 percent of total emissions statewide. Although this sector has decreased overall since 2005, it remains the fourth-largest emitter in Wisconsin. Most industrial emissions come from direct uses like process heating and machinery. Upgrading industrial facilities is often costly because it requires custom, tailored improvements and involves high expenses to stop production for upgrades.

Better energy management by industrial businesses can reduce overall energy use, especially during peak times, which lowers system costs for all customers. Additionally, thorough energy and efficiency assessments are essential. The state can support industrial facilities in various ways. One example is the UW-Milwaukee Industrial Assessment Center (UWM-ITAC), which offers free energy, productivity, and waste assessments to small- and medium-sized industrial facilities through funding from the U.S. Department of Energy.

From a co-benefits and emissions reduction perspective, the industrial process and facilities actions included in this plan can have a significant, direct impact on the following:<sup>xxv</sup>

- **ECONOMIC DEVELOPMENT** - Improvements in industrial efficiency and electrification can lower operating costs, helping local manufacturers stay competitive and supporting business retention and job growth. These initiatives create immediate demand for skilled labor, engineering services, and locally sourced equipment, leading to short-term employment and supply chain

### Current Support for Action in Industrial Process and Facilities

#### Public Service Commission of Wisconsin - Office of Energy Innovation

- Energy Innovation Grant Program
- Focus on Energy®
  - Custom and prescriptive incentives for manufacturing customers

#### Wisconsin Economic Development Corporation

- Green Innovation Fund

#### Wisconsin Manufacturing and Extension Partnership

#### UW-Stevens Point Wisconsin Institute for Sustainable Technology

- Paper product testing

opportunities. Additionally, this increased employment can result in more employees having health insurance coverage.

- **ENVIRONMENTAL JUSTICE** - LIDACs often face a disproportionate share of the negative impacts from industrial activities. Low-income communities are more commonly located near industrial areas with worse air quality. Industrial upgrades that focus on reducing emissions in these neighborhoods can directly benefit health and quality of life. Additional efforts to lower noise pollution and thermal emissions can also enhance local livability.
- **AIR QUALITY & HEALTH** - Reducing emissions from industrial processes improves air quality, which benefits public health in communities near industrial areas, including better heart and lung health. Lowering emissions from fossil-fueled power plants also enhances regional air quality and supports healthier populations, especially vulnerable groups such as children, the elderly, people with chronic illnesses, and those working or living outdoors.
- **WATER QUALITY** - Industrial efficiency and electrification projects can reduce wastewater discharges by minimizing process water use, improving treatment effectiveness, and eliminating certain pollutant streams associated with fossil fuel combustion. Facilities that adopt cleaner thermal technologies may also lower thermal pollution in nearby waterways.
- **SAFE & AFFORDABLE HOUSING** - Cleaner industrial practices can improve nearby neighborhoods by reducing environmental nuisances such as odors, dust, and emissions.

**Table 9. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Industrial Process and Facilities Action**

#	GHG Reduction Actions – Industrial Process and Facilities	2025-2030	2025-2050
4.1	Support commercial and industrial energy efficiency	1.43	3.54
4.2	Facilitate industrial decarbonization with training and incentives	0.10	0.96
4.3	Implement a renewable thermal standard that incorporates newer technologies and efficiencies	1.30	1.90

## 4.1 SUPPORT COMMERCIAL AND INDUSTRIAL ENERGY EFFICIENCY

Implementing energy-efficiency improvements through building upgrades and process efficiency enhancements in commercial buildings and industrial facilities can reduce energy use, whether electric or generated on-site from fossil fuels. Industrial facilities often face budget constraints and restrictions on bank borrowing. Support for energy efficiency efforts can include grants, financial incentives, and regulatory actions. Support for actions can come from agencies such as the DOA, UWM-ITAC, the Wisconsin Institute for Sustainable Technology at UW-Stevens Point, local government, and Tribal Governments. Focus on Energy® is another program that could support these efforts.

The CEP supports improving energy performance and strengthening the cost-competitiveness of Wisconsin’s industrial sector. This includes support for ISO 50001 energy management protocols, which are based on a continuous-improvement management system model, enabling organizations to incorporate energy management into their broader efforts to improve quality and environmental practices.

The CEP also emphasizes the opportunity to promote high-value conservation. Like energy efficiency, high-value conservation extends further by adopting a comprehensive, systemic approach that considers electrical energy, thermal, chemical, and material inputs and outputs. When implemented in large industrial and institutional settings, high-value conservation can cut energy costs and usage by 30-90 percent. The state can support these initiatives through technical assistance, low-cost financing, grants, or innovative lending options.

Evaluating the success of this action could involve measuring the number of facilities served, the annual reduction in GHG emissions, site-level energy consumption, participation in energy-savings programs (Focus on Energy<sup>®</sup>, International Organization for Standardization, ISO 50001), energy costs per unit of production, improved equipment efficiency, and bottom-line cost savings.

## **4.2 FACILITATE INDUSTRIAL DECARBONIZATION WITH TRAINING AND INCENTIVES**

---

A cost-effective way to reduce emissions in this sector is to switch to electricity, clean hydrogen, or geothermal energy, along with carbon capture and efficiency improvements in industrial facilities that reduce overall energy use and fuel consumption. The state can support these efforts through technical assistance, low-cost financing, grants, or innovative lending solutions. Support for action can come from agencies such as the PSCW, DNR, DOA, WEDC, and UWM-ITAC, as well as from local governments and Tribal Nations.

The CEP notes that encouraging businesses to join DNR Green Tier Charter for Climate Action, Wisconsin Sustainable Business Council's Green Master's Program, or a sector-specific business sustainability program (e.g., Sustainable Green Printing Partnership) can help drive continuous improvement and energy and cost savings to help meet clean energy and energy efficiency goals.

Evaluating the success of this action could involve measuring the number of facilities served, the annual reduction in GHG emissions, and emissions per unit of production.

## **4.3 IMPLEMENT A RENEWABLE THERMAL STANDARD THAT INCORPORATES NEWER TECHNOLOGIES AND EFFICIENCIES**

---

The state's current Renewable Portfolio Standard (RPS) only applies to electric utilities and does not include thermal generation at industrial facilities. Through legislative action, the state could establish a renewable thermal standard (RTS) requiring a portion of thermal heating at industrial sites to be powered by biofuels, biomass, thermal, solar, geothermal, air-source heat pumps, renewable natural gas, combined heat and power, or green hydrogen. Support for this action includes direction and assistance from the PSCW.

State policies played a critical role in developing markets for renewable electricity systems; 29 states have some form of RPS, and 16 have adopted a broader Clean Energy Standard. Clean/renewable thermal (heating) energy policies are not nearly as robust, but 20 states now have some form of an RTS, or at least

recognize renewable thermal technologies within their RPS.<sup>xxvi</sup> Although Wisconsin is one of those states, the presence of thermal technologies in the RPS has had no impact because utilities have complied with the RPS since those technologies were added, and there is no separate requirement for thermal technologies. The CEP notes that the following should occur:

1. Deploy a separate RTS placed on either gas utilities to displace therms (measured in British Thermal Units, BTUs) or on electric utilities with kilowatt hours (kWh) displacement (this is how Wisconsin's current thermal technologies are counted). The list of eligible technologies already includes biomass, thermal solar, and geothermal, but should be amended to include air-source heat pumps, renewable natural gas (RNG), CHP, and renewable hydrogen gas. The thermal requirements should begin at a modest amount and increase (e.g., 0.5 percent of retail electricity sales per year).
2. Utilize the CleanCounts platform, which deployed a renewable thermal tracking system in 2019 and is already equipped to accommodate this policy in Wisconsin.

Evaluating the success of this action could involve measuring the amount of thermal energy produced, the amount of renewable heat in the portfolio, participation and adoption rates, the annual reduction in GHG emissions, and the renewable energy credits (RECs) converted and traded.





## NATURAL AND WORKING LANDS

Defined in the Wisconsin Greenhouse Gas Inventory Report as “Land-use, Land-use Change, and Forestry” or LULUCF, natural and working lands include the sources and sinks of emissions caused by the sequestration of carbon in plants, soils, landfilled yard trimmings and food scraps, as well as carbon released by forest fires, tillage and crop land rotation, and the conversion of forests to agricultural lands. They also encompass emissions from fertilizing non-agricultural lands such as lawns and gardens. Although this sector is generally an emissions sink (meaning it stores more emissions than it releases), its emissions surpass those of waste and industrial process.

The GTFCC report emphasizes the importance of preserving agriculture and forest lands in Wisconsin. Extensive research and data have documented the effects of land conversion from agriculture, forestry, and grasslands to developed uses.

Wisconsin needs its agricultural land now more than ever to provide food, fiber, and fuel. Protecting the most productive farmland should be a top priority for Wisconsin’s economy, which is heavily supported by our working lands. Voluntary compliance with conservation standards and adopting conservation practices through programs like the Farmland Preservation Program and Conservation Reserve Enhancement Program not only improve water conservation, increase yield potential, and reduce erosion and fuel inputs, but also boost the soil’s capacity to sequester carbon. The financial incentives offered by these programs encourage greater adoption of soil health practices that enhance carbon storage capacity.

### Current Support for Natural and Working Lands

#### Wisconsin Department of Agriculture, Trade, and Consumer Protection

- Conservation Reserve Enhancement Program
- Farmland Preservation Program

#### Wisconsin Department of Natural Resources

- Local Use Dimension Lumber Program
- WI Forest Landowner Grant Program
- Managed Forest Law Tax Program
- Urban Forestry Grants
- Knowles-Nelson Stewardship Grants
- County Forest Sustainable Grant

Related to forestry, the Wisconsin Statewide Forest Action Plan outlines specific actions for the state and for public and private landowners to better manage natural resources. Key actions in this plan aim to stabilize emissions or enhance sequestration potential.

From a co-benefits and emissions reduction perspective, the natural and working lands actions included in this plan can have a significant, direct impact on the following:<sup>xxvii</sup>

- **ECONOMIC DEVELOPMENT** - Supporting sustainable forestry and Wisconsin wood product markets can strengthen rural economies by creating jobs in forestry, milling, and wood-based manufacturing. Increasing the use of locally sourced, low-carbon wood products in construction can also boost market growth and promote innovation.
- **ENVIRONMENTAL JUSTICE** - Community forest programs can enhance access to green spaces in underserved areas, providing environmental and recreational advantages to LIDACs. These initiatives may also help decrease disparities in heat exposure and environmental quality across neighborhoods. Tree planting and land conservation efforts can create paid job training and employment opportunities in forestry, conservation, and landscape maintenance for individuals with diverse educational backgrounds, including those from lower-income communities. Youth employment programs in urban forestry can function as career pipelines.
- **AIR QUALITY & HEALTH** - Forest buffers can enhance local air quality by filtering pollutants and reducing particulate transport from roads and industrial areas. Increasing urban tree coverage helps mitigate urban heat islands and may lower emergency room visits during extreme heat events.
- **WATER QUALITY** - Increasing forest cover and protecting natural landscapes can reduce stormwater runoff, filter pollutants, and prevent sediment buildup in rivers and lakes. Sustainable forest management also helps safeguard watersheds by maintaining soil stability and natural filtration, protecting drinking water sources. Additionally, forest management practices would stop other uses that could harm groundwater, avoiding these less beneficial activities.
- **ENERGY BURDEN** - Urban forestry and shading from tree cover can reduce energy use for cooling during the summer, which would lower household energy costs. This benefit is especially important for low-income households that may lack access to air conditioning.
- **SAFE AND AFFORDABLE HOUSING** - Trees and green buffers can boost property resilience to flooding and extreme heat, supporting safer and more livable homes, especially in vulnerable neighborhoods. Well-maintained public green spaces also enhance neighborhood desirability without requiring major redevelopment.

**Table 10. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Natural and Working Lands Action**

#	GHG Reduction Actions - Natural and Working Lands	2025-2030	2025-2050
5.1	Promote sustainable forest management practices	0.11	0.39
5.2	Support Wisconsin wood product utilization	0.61	1.18
5.3	Encourage tree canopy growth in communities	0.03	0.15
5.4	Adopt a “No Net Loss” goal for natural landscapes	0.36	1.26

## 5.1 PROMOTE SUSTAINABLE FOREST MANAGEMENT PRACTICES

Sustainable forest management involves managing forests for both timber and wildlife habitat while considering the health of rare and endangered species, water and soil quality, and broader community benefits. Support for action can come from agencies such as DNR, as well as local governments and Tribal Nations.

Tribal Nations like the Menominee Indian Tribe of Wisconsin, as well as the state of Wisconsin, have long served as examples of sustainable management of public and private forests. Because a forest's lifespan is long, it requires a perspective different from that of most other industries and calls for management that benefits future generations rather than immediate profits. Continuing sustainable forest management practices will enhance the growth potential of existing forest lands and help sequester carbon in trees. The state can support these efforts by recognizing carbon as a forest product, improving education for landowners and forest managers, and providing increased financial support for forest landowner incentive programs.

Additionally, the GTFCC Report recommends implementing climate-focused forest management. This involves defining carbon as a forest product through state policy to help integrate climate-focused goals and practices into public and private forest management programs, potentially strengthening an emerging voluntary carbon market.

Evaluating the success of this action could involve measuring the number of forest management plans and areas covered; annual metric tons of carbon stored; number of trees planted in urban and rural areas; acres enrolled in incentive programs; increased biodiversity; improvements in soil and water quality; and increased recreation.



## 5.2 SUPPORT WISCONSIN WOOD PRODUCT UTILIZATION

Wood is extremely effective for long-term carbon storage. Buildings made from wood not only use less energy to produce and manufacture, but – through sustainable forest management – they also can store carbon that otherwise would have been returned to the atmosphere when trees die and decompose. Besides mass timber, which was discussed in the building sector, Wisconsin can also lead in utilizing smaller wood products for markets like furniture, paper, pulp, chips, biochar, and biomass for fuel. Additionally, Wisconsin can foster diverse markets by making purchasing declarations, offering certifications for local wood products, and raising awareness among consumers and landowners about the climate benefits of wood products. Support for this action can come from agencies such as DNR, DOA, and WEDC, as well as local governments and Tribal Nations.

Both the GTFCC Report and CEP highlight the importance of supporting Wisconsin wood products to create more sustainable opportunities. This includes increasing investments in research, development, and commercialization of mass timber, cross-laminated timber, biochar, and other technologies that store carbon. While it is challenging to determine exactly how much carbon could be stored in Wisconsin's wood products, it clearly presents an opportunity to grow jobs and strengthen the state's economy while increasing carbon storage. Additionally, producing thermal energy from sustainably sourced biomass—currently generated by propane or heating oil—can offset fossil fuel use and cut GHG emissions.

Evaluating the success of this action could include measuring the dollars spent on wood products, total board length for mass timber used in buildings, improved process efficiency (conversion from tree to final product), increased utilization rate, geographic location of use, and the sector of use (construction, energy, products).

### 5.3 ENCOURAGE TREE CANOPY GROWTH IN COMMUNITIES

Tree canopy growth can benefit both urban and rural areas in Wisconsin. Engaging new and familiar audiences to provide education and raise awareness of the benefits and responsibilities of planting and maintaining trees is a priority in Wisconsin. Support for this action can come from agencies such as DNR, as well as local governments and Tribal Nations.

The DNR highlights this as a key issue in the Statewide Forest Action Plan and notes that a survey of homeowners in four Wisconsin communities shows that



Wisconsinites value their trees and the benefits they provide. However, they also have concerns, including potential property damage and power outages. From decision-makers to homeowners, consistent messaging that addresses these concerns, discusses the benefits of trees, and emphasizes the importance of proactive, regular tree care and maintenance is crucial for maintaining or expanding a healthy urban tree canopy across the state. The state can support tree canopy growth by increasing financial and technical assistance for Wisconsin communities to promote more shade-tree planting initiatives and private tree-care education for homeowners. Support for action under this action can come from agencies such as DNR, as well as Local Government and Tribal Governments.

On Earth Day 2024, Gov. Evers signed Executive Order #221 and announced that the state is increasing its Trillion Trees Pledge to 100 million trees by the end of 2030. In 2024, more than 119,000 trees were planted in urban areas, and an additional 10.5 million in rural areas, bringing the total to 42.7 million. Nearly 43 percent of the state’s goals were achieved in the first four years. Building on the ongoing success of this program, tree canopy growth in communities as part of the Trillion Tree Pledge can boost carbon sequestration and provide many additional health, natural resources, and economic benefits.

Evaluating the success of this action could include measuring the number of trees planted, metric tons of carbon stored, geographic distribution of trees in both rural and urban areas, percentage of canopy cover, reduction of urban heat island effects, improvements in flood control, increased biodiversity, enhancements in soil and water quality, and increased recreation.

## 5.4 ADOPT A “NO NET LOSS” GOAL FOR NATURAL LANDSCAPES

Deforestation poses a significant threat to carbon storage and sequestration. Wisconsin has a long-standing tradition of responsible forest management. However, in recent years, large forest areas have been divided into smaller parcels, which can weaken the long-term health and value of forests. The state can help protect Wisconsin’s natural lands by identifying strategic opportunities to acquire land through simple purchases and conservation easements, and by working with landowners via incentive and education programs to preserve forests rather than converting them to non-forest uses. Support for these efforts can come from agencies such as DNR and DATCP, as well as from local and tribal governments.

A 2023 study, the Integrated Global Assessment of the Natural Forest Carbon Potential, found that globally, protected and restored forests can enhance carbon storage by up to 226 billion metric tons of CO<sub>2</sub>.<sup>xxviii</sup> Wisconsin has a role to play, and the GTFCC report emphasizes that preventing forest conversion and maintaining forests in their natural state will help protect the carbon already stored in Wisconsin’s forests. Forested land can mitigate the effects of climate change by protecting soil. Long-term increases in forest areas and growing stock enable more carbon storage. A diverse mix of forest types, ages, and sizes is crucial. Additionally, working forests protected by conservation easements benefit rural economies. Sustainable forestry practices, guided by forest certification and best practices, help ensure Wisconsin’s forests are managed in ways that support ecological, social, and economic health. However, ownership patterns reveal more landowners with smaller parcels, which contributes to fragmentation and reduces carbon storage capacity. Parcelization increases as the number of landowners grows and parcel sizes shrink, raising concerns about habitat connectivity and economies of scale in sustainable forestry, which could negatively affect both landowners and the logging industry.

Evaluating the success of this action could include measuring the acres of forest land, the acres of forest land in conservation easements, reduced fragmentation, metric tons of carbon sequestered, improvements in soil and water quality, and a reduced deforestation rate.



## TRANSPORTATION

Transportation, including both on-road and off-road gas-powered vehicles, remains a significant source of emissions in the Wisconsin Greenhouse Gas Emissions Inventory Report, alongside electricity generation. The sector has experienced a slight decrease in emissions since 2005, about 2 percent, primarily in gasoline-powered passenger cars. On-road gasoline used in transportation remains the most significant contributor to emissions in this sector, accounting for approximately 57 percent, with light-duty trucks generating the highest emissions at 37 percent of the total.

Reducing emissions in this sector is more complex than just switching from internal combustion engine (ICE) vehicles to EVs, although EVs provide significant emissions reductions. Building walkable cities that support alternative transportation options like biking, rail, and public transit can also greatly improve not only emissions but also quality of life and community well-being. Stakeholders identified several solutions that will not only help lower emissions in the near term but also prepare Wisconsin for a more resilient and accessible transportation infrastructure in the future.

From a co-benefits and emissions reduction perspective, the transportation actions included in this plan can have a significant, direct impact on the following:<sup>xix</sup>

- **ECONOMIC DEVELOPMENT** - Transit investments boost local clean energy employment. Transportation electrification and clean fuel deployment demand significant infrastructure investments, such as charging stations and maintenance facilities. These projects can create jobs in construction, manufacturing, and operations.

### Current Support for Action in the Transportation Sector

#### Public Service Commission of Wisconsin

- Energy Innovation Grant Program

#### Wisconsin Economic Development Corporation

- Green Innovation Fund

#### Wisconsin Department of Transportation

- Carbon Reduction Program
- Transportation Alternatives Program
- Congestion Mitigation and Air Quality Improvement Program
- Wisconsin Electric Vehicle Infrastructure (WEVI) program

#### Wisconsin Department of Administration

- Transit Capital Assistance Grant Program

- **ENVIRONMENTAL JUSTICE** - Disadvantaged communities are often located near highways or busy traffic corridors and face a disproportionate burden of transportation-related air pollution. LIDACs can directly benefit from improved air quality, resulting in better respiratory health and fewer pollution-related illnesses. Additionally, access to affordable public transit can provide greater mobility and economic opportunities for these communities. Targeted incentives and subsidies can make EV adoption more accessible to lower-income households, fostering economic inclusion. Furthermore, increased access to low-cost transit options can enhance opportunities for education, employment, and essential services.
- **AIR QUALITY & HEALTH** - Emissions from gasoline and diesel vehicles, including NOx, PM2.5, and hydrocarbons, are major contributors to cardiovascular and respiratory diseases. Electrifying vehicles and public transit, along with promoting mode shifts to nonpolluting options like biking and walking, eliminates tailpipe emissions and significantly reduces community exposure to harmful pollutants, lowering rates of respiratory illness and cardiovascular risks.
- **WATER QUALITY** - Cutting down on fossil fuel vehicle use decreases the risk of oil, fuel, and coolant leaks that can drain into storm drains and waterways.
- **TRANSPORTATION ACCESS** - Improving service frequency, expanding routes, and enhancing infrastructure for buses, trains, biking, and walking would directly boost mobility options.

**Table 11. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Transportation Action**

#	GHG Reduction Actions – Transportation	2025-2030	2025-2050
6.1	Reduce barriers for access to electric vehicles and associated infrastructure	0.34	4.61
6.2	Support recycling and replacement of small engines	0.001	0.005
6.3	Expand medium-heavy duty electrification and hydrogen infrastructure	1.50	8.80
6.4	Enable mode-shifting to alternative forms of transportation and expand public transit	2.80	0.70
6.5	Electrify public transit	0.04	0.20
6.6	Deploy location-efficient development strategies to reduce travel times	1.68	5.45

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

From an emissions standpoint, EVs are superior to traditional vehicles with internal combustion engines that burn gasoline or diesel fuel. As the generation mix powering EVs becomes cleaner, the difference in emissions between EVs and traditional vehicles will become even more pronounced. The percentage of EVs is growing, though not at the levels required to substantially reduce emissions from the transportation sector. A robust network of EV public chargers is a prerequisite for supporting the transition to cleaner transportation and thereby rapidly reducing GHG emissions from internal combustion vehicles running on fossil fuels. Support for these action efforts can come from agencies such as WisDOT, DSPS, PSCW, and DATCP, as well as from local governments and Tribal Nations.

For example, the Wisconsin Electric Vehicle Infrastructure (WEVI) Program is a

competitive grant program that distributes National Electric Vehicle Infrastructure (NEVI) Formula Program funds to eligible entities for the installation, ownership, operation, and maintenance of NEVI-compliant EV charging stations throughout the state. This program involves up to 80 percent federal funding and at least 20 percent non-federal matching on each project. The WEVI Program awarded 78 projects along the state's Alternative Fuel Corridor system in Round 1 of funding in fiscal years 2022 and 2023. An approximate amount of \$40 million in funds is available for future considerations regarding the program. These stations will accelerate EV adoption and, in turn, reduce GHG emissions. This infrastructure will help Wisconsin prepare for an influx of electric passenger and light-duty vehicles. Further support for this effort can include encouraging the installation of public charging stations through grants or other incentives and creating building codes that promote EV infrastructure readiness.

Evaluating the success of this action could include measuring the number of EV supply equipment installed, the number of public and private charging stations, the utilization rate of existing infrastructure, and statistics showing the distance between public charging facilities.

## 6.2 SUPPORT RECYCLING AND REPLACEMENT OF SMALL ENGINES

Replacing small gasoline-powered equipment with zero-emission alternatives gives Wisconsin an opportunity to reduce not only GHG emissions but also key air pollutants, such as PM<sub>2.5</sub> and PM<sub>10</sub>, NOx, and other air toxins. The state can support this effort with financial incentives to replace small engines. Support for these action efforts can come from agencies such as DNR and from local governments and Tribal Nations.

Small engine equipment powered by two- and four-stroke motors contributes to transportation-related GHG emissions. Smaller engines often lack the advanced emissions controls found in cars and trucks. Currently, there is no statewide program offering incentives for replacing small fossil-fueled engines with efficient electric alternatives, but successful models exist across the country for managing such programs. Additionally, raising public awareness and gaining support will be crucial for the program's success. This can be achieved by leveraging existing partnerships with community and small-business organizations and by conducting direct outreach to local equipment retailers to promote awareness and ensure consistent messaging.

Evaluating the success of this action could include measuring the number of small gasoline-powered equipment units replaced; the number of gasoline-powered small engine equipment recycled; number of electric or alternative fuel powered small engine equipment purchase; 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.

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

---

Two emerging technologies today could enable seamless regional travel for medium- and heavy-duty (MHD) zero-emission vehicles (ZEV), including megawatt charging and hydrogen fueling centers. Both need further development before they can be implemented across the region. Currently, public-access charging infrastructure along key commercial corridors through Wisconsin and neighboring states is insufficient for these ZEV fleets. Wisconsin can support these efforts by creating an optimized plan to locate charging stations for MHD ZEVs that meet technical and safety standards. The state should analyze transportation data, grid information, and projected usage patterns to develop a plan, followed by incentives to promote infrastructure growth. Support for these initiatives can come from agencies such as WisDOT and DOA, as well as local governments and Tribal Nations.

The Regional Electric Vehicle Midwest Coalition (REV Midwest) signed a memorandum of understanding in 2021 to speed up vehicle electrification in the region. The states involved believe that adopting EVs, especially medium- and heavy-duty (MHD) vehicles, will boost economic growth, support energy independence, and enhance environmental and health outcomes in the area. With a memorandum of understanding already in place, these states are well-equipped to facilitate a transition to EVs. Midwestern states are looking to identify key corridors, coordinate infrastructure deployment plans, develop safety and technical standards, and create workforce development programs.

Evaluating the success of this action could include completing plans for MHD and hydrogen infrastructure deployment, the number of public charging stations, and statistics representing the distances between public charging facilities.

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

---

To reduce transportation-related carbon emissions and energy costs, it is essential to develop and implement plans that offer low-carbon public transportation and alternative forms of transportation options for Wisconsin residents. Support for this action can come from agencies such as WisDOT and DOA, as well as local governments and Tribal Nations.

The GTFCC Report and CEP note that this is vital for promoting greater transportation equity and boosting mobility across the state. Since public and alternative forms of transportation are often the lowest-cost choice for those who cannot afford a personal vehicle, increased investment in and access to these options are crucial. In Wisconsin, if 20 percent more people in Madison and Milwaukee biked for short trips rather than driving, the state could emit 57,405 fewer tons of CO<sub>2</sub>.<sup>xxx</sup>

The expansion of public transportation, transportation planning, and support for other modes like bicycles and e-bikes, along with the development of pedestrian pathways, offers Wisconsin an opportunity to address disparities in access to alternative transportation and to lower GHG emissions from ICE vehicles. Existing

WisDOT programs such as the Transportation Alternatives Program (TAP) which provides funding for bicycle and pedestrian projects, the Congestion Mitigation and Air Quality (CMAQ) Improvement Program which helps to reduce criteria air pollutant emissions in areas with poor air quality, and transit assistance programs which help local communities with providing public transit options for residents are all good examples of how the state can enable mode-shifting away from passenger vehicle use. State support for this can include grants to local governments to enhance public transit, more walking and bike paths, the establishment of regional transit authorities (RTAs), and increased funding and ongoing support for alternative transportation.

Evaluating the success of this action could involve measuring the miles of bicycle and pedestrian pathways; the number of public transit vehicles in operation; the hours of service of public transit vehicles; the number of riders; and the number of RTAs established.

## **6.5 ELECTRIFY PUBLIC TRANSIT**

---

Electrifying public transit and school buses can help reduce GHG emissions. Support for this action can come from agencies such as WisDOT and DOA, as well as local governments and Tribal Nations.

The DOA manages the Transit Capital Assistance Grant Program to finance the replacement of eligible public transit buses under the Volkswagen Environmental Mitigation Trust. Volkswagen admitted to violating the federal Clean Air Act by selling diesel-engine vehicles equipped with software designed to cheat emissions tests. Judicial settlements require Volkswagen to pay over \$2.9 billion into an Environmental Mitigation Trust Fund. The State of Wisconsin is a designated beneficiary and will receive \$67.1 million to help offset the excess pollution caused by affected Volkswagen vehicles. The grant program funds the replacement and disposal of 1992-2009 model-year public transit buses, class 4-8, with new diesel- or alternative-fueled buses. The program prioritizes communities or routes that DOA identifies as critical for connecting employees with employers. Incentives and grants to local governments and school districts can assist with the upfront costs of electric buses.

Evaluating the success of this action could involve measuring the percentage of bus registrations as EVs, the number of students served by EV buses, and annual reductions in GHGs and co-pollutants.

## **6.6 DEPLOY LOCATION-EFFICIENT DEVELOPMENT STRATEGIES TO REDUCE TRAVEL TIMES**

---

Developing urban areas to reduce travel times and distances will decrease GHG emissions from vehicles. Strategies include zoning for higher density near transit routes, zoning for mixed-use developments, and exploring new funding methods for roads and parking. Although local governments will primarily implement this action, the state can support it by providing technical assistance and creating best practice guides. Additional support can come from agencies such as WisDOT and DOA, as well as Tribal Nations.

Evaluating the success of this action could involve measuring reductions in travel times, transit ridership, travel time reliability, and job accessibility within 30 minutes during peak morning traffic.

Photo Credit: 1000 Friends of Wisconsin



## HOW COMMUNITY TRANSPORTATION ACADEMIES INSPIRE REAL CHANGE:

*Alumni Advancing Transit Solutions at Home*

1000 Friends of Wisconsin's Community Transportation Academy (CTA) program has been offered in six communities across Wisconsin since 2023. Over the course of 10 weeks, participants in the CTA learn about transportation systems and gain the skills and tools needed to help advocate for safe, equitable, and accessible solutions that work better for everyone. One of the ultimate goals of the program is to see graduates championing policy and systems change in their own communities.

Jackie Krull was a participant in the most-recent Greater Green Bay CTA in the fall of 2025 and serves as a Village Trustee for the Village of Bellevue. Earlier this year, a private redevelopment project sought to eliminate the required sidewalk installation from its site plan, citing concerns that the sidewalk lacked immediate connections (potentially creating safety issues) and noting that the area's B-3 zoning limited nearby pedestrian destinations. During the Village Board's review process, Jackie advocated for upholding the Village's Pedestrian & Bicycle Plan, adopted in April 2025. In the plan, sidewalks are recommended on both sides of the road as part of a larger, interconnected network and part of the Village's long-range vision of linking to existing sidewalks within the next six to ten years. Ultimately, the Bellevue Village Board voted unanimously to deny the request to waive the sidewalk requirement. By requiring installation now (consistent with the adopted Pedestrian & Bicycle Plan), the Village chose to build its network step by step rather than delay progress and potentially shift the full cost to taxpayers in the future.





## WASTE AND MATERIALS

Waste makes up 3.5 percent of Wisconsin’s total GHG emissions and has decreased by 5 percent since 2005. The Wisconsin Greenhouse Gas Emissions Inventory Report monitors emissions from the waste sector, including landfills and wastewater treatment facilities, with landfills

responsible for nearly 90 percent of these emissions. When determining actions to include in this sector, stakeholders discussed gaps in regulation, opportunities to address waste before it reaches landfills, and how best to meet the needs of local waste facilities.

From a co-benefits and emissions reduction perspective, the waste and materials actions included in this plan can have a significant, direct impact on the following:<sup>xxxi</sup>

- **ECONOMIC DEVELOPMENT** - Involving LIDACs in the planning and implementation of these initiatives offers opportunities for economic empowerment. This may include training programs, skill development, and the establishment of small businesses related to waste management. For example, new businesses could emerge around the collection, sorting, and processing of organic waste, providing inputs for anaerobic digesters. These actions also support broader rural economic development through growth in regenerative agriculture and bioenergy sectors.

Current Support for Action in the Waste and Materials Sector

**Focus on Energy®**

- Feasibility Studies for Biogas and Biomass Projects

**Wisconsin Department of of Natural Resources**

- Rebates and Incentives for Water and Wastewater Utilities

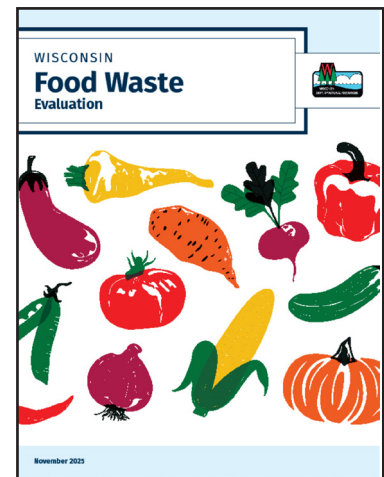
**Table 12. Potential Projected GHG Emissions Reductions (MMTCO<sub>2</sub>e) by Waste and Materials Action**

#	GHG Reduction Actions – Waste and Materials	2025-2030	2025-2050
7.1	Deploy a state-wide food waste program	0.43	1.25
7.2	Support biodigester development	0.11	0.50
7.3	Improve methane capture at municipal solid waste facilities	0.69	1.38

## 7.1 DEPLOY STATE-WIDE FOOD WASTE PROGRAM

Redirecting food waste to composting or reducing it through improved food rescue practices and consumer education can lower landfill volumes and GHG emissions. Beyond the emissions from wasted food, the water, energy, and human effort involved in food production are also lost. Food waste is especially concerning given the disparities in food access across Wisconsin. While food insecurity rates vary, on average, more than one in ten households is considered food insecure, highlighting the urgent need for food availability in many Wisconsin communities. Community stakeholders, including restaurants, governments, and retailers, can be engaged to prevent food waste, redirect surplus food to those in need, and compost food that must be disposed of. The state can support these efforts through grants, financing, technical assistance, and public outreach campaigns. Infrastructure for hauling food waste to destinations other than landfills (such as composting and anaerobic digestion facilities) will have to expand significantly to achieve the statewide food waste reduction goal of 50 percent by 2030. To expand food donation, food rescue, and food waste processing infrastructure, education, technical support, and funding will be needed. Regulatory and policy reform may also be necessary. Support for this action can come from agencies such as DNR, DATCP, DHS, and UW-Extension.

The recent Wisconsin Food Waste Evaluation report, completed by the DNR in January of 2026, estimates that 20 percent of waste in Wisconsin landfills is food waste, consisting mostly of previously edible food and food scraps.<sup>xxxii</sup> Residential and food service sources represent over 88 percent of the food waste in Wisconsin landfills. This presents an enormous opportunity to work with residents and businesses to better manage our state's food waste. The GTFCC supports the development of a food waste program, specifically a pilot program modeled after the successful Nashville Food Waste Initiative, encompassing preventing food waste, redirecting surplus food, and composting, with a special focus on areas with food deserts. The program should work directly with various stakeholders, including restaurants, farmers, grocery stores, and local communities.



Evaluating the success of this action could involve measuring the percentage of food waste in landfills, landfill emissions, pounds of food waste diverted, and the quantity of waste by pathway (donations, animal feed, composting, anaerobic digestion, etc.).

## 7.2 SUPPORT BIODIGESTER DEVELOPMENT

---

Biodigesters are an important and well-developed technology that supports the breakdown of organic waste, such as food scraps and manure, to produce RNG and/or biogas-generated electricity. When operated and managed appropriately, the process can reduce odors, eliminate pathogens, and stabilize nitrogen in digested manure, creating multiple manure waste streams that can be more precisely used in the farm's crop and nutrient management systems to ensure efficient nutrient use while reducing the risk of water quality impacts. Most biodigesters in Wisconsin are installed at municipal wastewater treatment facilities, followed by those in the dairy and agricultural sectors, food processing and industrial waste sectors, and landfills. Supporting biodigester development, especially at wastewater treatment facilities, can lower GHG emissions and serve as a fossil fuel offset. The state can help local wastewater facilities with this through technical assistance, financing, and renewable fuel credit programs. Support for this effort can come from agencies such as PSCW, DNR, DATCP, local governments, and Tribal Nations.

The CEP notes that, along with the deployment of the technology, there will also be a need to support and work with Wisconsin digester operators to develop a certified training program (e.g., American Biogas Council program) that could be rolled out with Wisconsin's technical colleges. Also, the state could support planning grants to establish regional biodigesters to optimize the production of RNG and biogas for large-scale electricity generation.

Evaluating the success of this action could include measuring the number of wastewater treatment facilities with biodigesters, the biogas production rate, the waste diversion rate, the nutrients recycled, the water conserved, the cost per unit of energy produced, the financial value of the substrate, and annual reductions in GHG emissions.

## 7.3 IMPROVE METHANE CAPTURE AT MUNICIPAL SOLID WASTE FACILITIES

---

According to the Intergovernmental Panel on Climate Change, globally, over 100 years, methane emissions have a warming effect that is 28–34 times stronger than CO<sub>2</sub>; over 20 years, up to 86 times more potent than CO<sub>2</sub>, and contribute to at least a quarter of gross warming.<sup>xxxiii</sup> Municipal solid waste facilities begin producing methane one year after collection starts. Improving methane capture could decrease emissions from flaring or leaks and generate RNG or biomethane that can serve as an alternative to fossil fuels. The state can support this initiative through regulations, technical assistance, and incentives for facilities that surpass expectations. Support for this effort can come from agencies such as DNR, as well as local governments and Tribal Nations.

Evaluating the success of this action could involve measuring methane concentration, flow rate, system efficiency, RNG/Biogas production rate, flaring/leak reductions, and annual GHG emissions reductions.



*Photo Credit: Teri Piper Thompson*

## EAU CLAIRE SCHOOLS LEAD WISCONSIN IN STUDENT-DRIVEN COMPOSTING AND WASTE REDUCTION INITIATIVES

The Eau Claire Area School District (ECASD) has become a statewide leader in school-based composting and waste-reduction through a U.S. Department of Agriculture-funded initiative that began in 2023, sparked by student interest and supported by strong community partnerships. Starting with elementary schools to build long-term habits, the district established student-led composting systems that have since expanded across 18 schools. The Memorial High School's EcoWarrior Club provides leadership with members who educate peers, monitor compost bins, and prevent contamination. Composting efforts are supported by the Eau Claire County Schools Fight Food Waste grant, which awarded \$1,000 to 12 ECASD schools for startup supplies, education, and implementation resources; and enabled students to visit Earthbound Environmental Services to observe the full composting cycle. The district also hosts a share-table system in elementary schools, donating unopened food to local food pantries, and operating schoolwide battery and e-waste collection in partnership with First Choice Computer Recycling. Funds saved from reduced landfill disposal have been integrated into the operational budget to sustain and expand composting work. Students actively extend learning through recycling audits, awareness campaigns, posters, upcycling projects, and even fundraising—such as Flynn Elementary's sale of compost soil, which generated \$1,200 to purchase compostable cafeteria supplies—closing both financial and ecological loops. As a result, 67 percent of ECASD students now compost during mealtimes, and the district diverted approximately 250,000 pounds (200 tons) of organic food waste in the 2024-25 school year. The district plans to bring the remaining schools online by the end of the 2025-26 school year.



*Photo Credit: Teri Piper Thompson*

## SECTION VII

# WORKFORCE PLANNING

The actions outlined in this plan address a changing world that will require skilled, prepared workers. Some sectors will grow through the expansion of DERs, repairs and upgrades to existing buildings, and the growth of public transit. Others will experience changes in how workers engage with their environments. A strategic look at how these changes are expected to impact Wisconsin's workforce is essential to the statewide plan.

This analysis, provided by the Department of Workforce Development (DWD) to the

OSCE, assesses projected job growth and expected annual openings for related professions that are likely to be necessary to implement the actions outlined in this plan. The projections are based on current and historical trends and do not reflect potential workforce impacts associated with implementation of the actions in this plan. The OSCE has highlighted, within each sector, which positions are currently projected to experience employment decline or a low positive employment change over the period 2022-2032. Low positive employment change is defined throughout this section as growth under 5 percent. These positions may need additional workforce development efforts to meet the increased demand anticipated in related sectors generated by implementation of this plan. Readers will notice that some positions appear in multiple sectors. The projections do not change for those positions, regardless of the sector they are shown in. Rather, the OSCE designed the sector designations to align with the rest of the plan.



## AGRICULTURE

The primary positions of interest in the agriculture sector include on-farm roles such as agricultural workers, farmers, ranchers, and other managers, as well as environmental engineers supporting the development and management of agricultural waste. Additionally, food science professionals are involved in establishing best practices for agricultural production.

Of the identified agricultural positions, there are no declines in projected employment by 2032. There are three positions that may see low positive change: Agricultural Workers; Farmers, Ranchers, and Other Agricultural Managers; and Environmental Engineering Technologists and Technicians.

## COMMERCIAL AND RESIDENTIAL BUILDINGS

---

Occupations in the buildings sector will support improvements to both new and existing buildings through energy efficiency, electrification, and other upgrades. Key roles include those involved in constructing new buildings, retrofitting existing ones, and supporting the electrification of appliances and the use of low-carbon materials.

Of the identified commercial and residential building positions, there are no declines in projected employment by 2032. There is one position that is projected to see low positive change: Tapers.

## ENERGY GENERATION

---

Energy generation actions may impact professions ranging from specialized renewable energy fields, such as wind turbine engineers and solar photovoltaic installers, to biodigester operators, electrical engineers, powerline installers, and power plant operators.

Of the identified energy generation positions, employment declines are projected by 2032 in the following positions: Electrical Power-Line Installers and Repairers, Power Distributors and Dispatchers, and Power Plant Operators. There are no positions that may see low positive change.

## INDUSTRIAL PROCESSES AND FACILITIES

---

The industrial sector, comprising the processes and facilities in this plan, will primarily be impacted by energy efficiency upgrades and decarbonization strategies. A wide range of positions, ranging from engineers and technicians to mechanics and managers, may be impacted.

Of the identified industrial process and facilities positions, Stationary Engineer and Boiler Operator positions are expected to decline in employment by 2032. Environmental Engineering Technologists and Technicians may see low positive change.

## NATURAL AND WORKING LANDS

---

Improvements in the natural and working lands sector are focused on increasing wood product utilization and improving land and forest management. These changes may impact foresters and forest industry professionals, materials scientists and engineers, and landscaping professionals. An increased need for public education and advertising will impact marketing and advertising professionals.

The natural and working lands sector is expected to see a decline in projected employment by 2032 in Forest and Conservation Workers. There are also three positions that may see low positive change: Foresters, Urban and Regional Planners, and Logging Workers.

## TRANSPORTATION

---

The transportation sector will see shifts from personal vehicle use to alternative forms of transit, thus impacting bus drivers and railroad workers. It will also see shifts in transportation design, impacting civil engineers and architects. Public education around transportation changes will impact marketing and advertising professionals as well. Supply chain manufacturers will also see an uptick in employment needs as more demand for alternative fuels, EVs and associated infrastructure increases.

The transportation sector is anticipated to have declines in projected employment in the following three positions by 2032: Bus Drivers, Transit and Intercity; Railroad Brake, Signal, and Switch Operators and Locomotive Firers; and Railroad Conductors and Yardmasters. In addition to low employment change in Environmental Engineering Technologists and Technicians identified in other sectors, the transportation sector is also expected to see low positive change in Electrical and Electronics Installers and Repairers, Transportation Equipment.

## WASTE AND MATERIALS

---

The waste sector actions focus on reducing food waste, improving methane capture, and the build out of biodigesters to support renewable natural gas collection and distribution. Key positions that may be impacted are those in environmental engineering, geology and hydrology, and water and wastewater treatment plant personnel. Advertising and marketing professionals may also be impacted by an increased need for consumer education.

The waste and materials sector is expected to see low positive change in projected employment by 2032 in Environmental Engineering Technologists and Technicians, same as in other sectors. Water and Wastewater Treatment Plant and System Operators are anticipated to see a decline.

## WORKFORCE IMPLICATIONS AND INVENTORY

---

The implications of the projected employment changes above could vary greatly, and nothing is definitive. The above projections were based on current and historical trends. Similar to GHG emissions forecasts, employment projections rely on many factors, and a change in any of these factors could have a small or large impact on the outcome. Even roles expected to grow more than 5 percent from 2022-2032 may also need more workers to meet rising demand in related sectors. Developing and securing Wisconsin's workforce is a priority for the state, which recognizes the importance of preparing workers for the increasing demand driven by clean energy deployment and modernization efforts. However, current funding and program capacity are not enough to expand workforce training to the level necessary to fully support this transition.

Meeting future demand will require stronger collaboration between government, employers, and training providers to expand short-term, industry-recognized credential programs that enable workers to quickly upskill or reskill in emerging technologies. These flexible training pathways will be crucial in ensuring employers

have access to the skilled workforce needed to implement the improvements outlined in this plan. They will also help guarantee that existing workers have opportunities to upgrade their skills as technology advances, reducing the risk of displacement as new systems and processes are adopted.

The OSCE, in partnership with the DWD and the Universities of Wisconsin, is creating a comprehensive workforce inventory focused on clean energy jobs in Wisconsin. This inventory is expected to be completed in Summer 2026, and its results will support workforce training and promote fair economic and workforce development across the state. When combined with this workforce analysis, the inventory will help partners identify where new programs may be needed to meet the goals outlined in this plan.

## CONCLUSION

Planning is essential for understanding possible and necessary actions, but it should not be done without considering implementation. The actions outlined in this Roadmap have been carefully developed with extensive stakeholder input to ensure they are reasonably practical—as long as everyone collaborates toward that goal. Legislative action, state and federal funding, and public participation are all necessary to carry out these actions.

Through the WI-CAN network, the OSCE continues to build and strengthen connections among individuals and organizations working on emissions reductions, climate action, and clean energy initiatives. More regional meetings, strategic planning, and ongoing efforts to foster community spirit will ensure this network can support the plan’s implementation well into the future.

As mentioned at the beginning of this plan, the OSCE is working with state agencies and public universities to continue identifying opportunities to address climate change through its operations and programs. This is referred to as “Lead-by-Example.” The OSCE intends to explore and align work and programs with this plan to support further implementation of climate action within the enterprise.

And finally, as part of the CPRG program requirements, the OSCE will produce a status report by summer 2027 detailing progress on the actions outlined in the plan. This report will include the results of an updated GHG inventory (based on 2023 data) and an updated workforce analysis.



### CAN'T GET ENOUGH OF THIS?

For more information related to community grants, benefits analysis, GHG Inventory, how we calculated emissions reductions, or workforce projections, please visit our website at <https://osce.wi.gov> or contact us at [OSCE@wisconsin.gov](mailto:OSCE@wisconsin.gov).

# APPENDIX A: MY CLIMATE ACTION PLAN

Everyone has a role in implementing the state's climate action plan. The OSCE developed this tool to help you consider how you might use this plan as inspiration for your own climate action.

Think about the many hats you may wear and how they may interact with this plan. I am a...

Homeowner

Student

Employee

Landowner

Business/Non-profit owner

Salesperson

Government representative

Teacher

Parent

Other \_\_\_\_\_

Out of the economic sectors this plan covers, which ones are of most interest to you?

Agriculture

Natural and Working Lands

Buildings

Transportation

Energy Generation

Waste and Materials

Industrial Process and Facilities

Which actions seemed most relevant to your day-to-day life or work?

Considering your roles, is there anything you are currently doing that furthers these actions?

What actions could you take in your current role to make progress on one of the actions identified?

What would you like to do but need more support (financial, technical, etc.) to accomplish?

Do you know any other organizations or people working on this action? If not, where might you find other organizations or people who are working on it?

Need more information or want to share your thoughts? Visit the [OSCE.wi.gov](https://www.osce.wi.gov) website or email [osce@wisconsin.gov](mailto:osce@wisconsin.gov)

# APPENDIX B: ACRONYMS

BESS: Battery Energy Storage System	MSA: Metropolitan Statistical Area
CAFO: Confined Animal Feeding Operation	MTERA: Midwest Tribal Energy Resources Association
CAP: Criteria Air Pollutant	MW: Megawatt
CAP: Community Action Program	N <sub>2</sub> O: Nitrous oxide
CCAP: Comprehensive Climate Action Plan	NF <sub>3</sub> : Nitrogen trifluoride
CH <sub>4</sub> : Methane	NOx: Nitrogen Oxides
CO <sub>2</sub> : Carbon Dioxide	OSCE: Office of Sustainability and Clean Energy
CPRG: Climate Pollution Reduction Grant	PM: Particulate Matter
DATCP: Department of Agriculture, Trade, and Consumer Protection	PCAP: Priority Climate Action Plan
DER: Distributed Energy Resources	PFC: Perfluorocarbon
DEHCR: DOA Division of Energy, Housing, and Community Resources	PSCW: Public Service Commission of Wisconsin
DHS: Department of Health Services	REC: Renewable Energy Credit
DNR: Wisconsin Department of Natural Resources	REV Midwest: Regional Electric Vehicle Midwest Coalition
DOA: Department of Administration	RTA: Regional Transit Authorities
DSPS: Department of Safety and Professional Services	RTS: Renewable Thermal Standard
DWD: Department of Workforce Development	SF <sub>6</sub> : Sulfur Hexafluoride
EAP Team: University of Wisconsin - Madison, Nelson Institute for Environmental Studies, Energy Analysis and Policy Program	SEWRPC: Southeastern Wisconsin Regional Planning Commission
EGU: Electric Generating Units	SIT: EPA State Inventory Tool
EPA: U.S. Environmental Protection Agency	SNAP: Supplemental Nutrition Assistance Program
EPD: Environmental Product Declaration	TEN: Thermal Energy Network
EV: Electric Vehicle	UW: University of Wisconsin
F-Gases: Fluorinated gases	UWM-ITAC: University of Wisconsin-Milwaukee - Industrial Training and Assessment Center
GHG: Greenhouse Gas	VEIC: Vermont Energy Investment Corporation
HAP: Hazardous Air Pollutant	VOC: Volatile Organic Compound
HFC: Hydrofluorocarbon	WEVI: Wisconsin Electric Vehicle Infrastructure
ICE: Internal Combustion Engine	WEDC: Wisconsin Economic Development Corporation
ISO: International Organization for Standardization	Wis. Stats.: Wisconsin State Statutes
LIDAC: Low-Income, Disadvantaged (at-risk) Community	WisDOT: Wisconsin Department of Transportation
LULUCF: Land-use, Land-use Change, and Forestry	WI CAN: Wisconsin Climate Action Navigators Network
M-RETS: Midwest Renewable Energy Tracking System	ZEV: Zero-Emission Vehicles
MMTCO <sub>2</sub> e: Million metric tons of carbon dioxide equivalent	

# APPENDIX C: BIBLIOGRAPHY

- i. 2026 Assessment Report: Wisconsin’s Changing Climate Envisioning a Climate-Resilient Future <https://wicci.wisc.edu/2026-assessment-report/>
- ii. <https://www.wmtv15news.com/2026/03/09/spring-warmth-peaks-early-before-turning-wet-wintery-midweek/>
- iii. Historic March 14-16, 2026 Winter Storm
- iv. [https://www.ncei.noaa.gov/access/billions/events/WI/2000-2024/?disasters\[\]=all-disasters](https://www.ncei.noaa.gov/access/billions/events/WI/2000-2024/?disasters[]=all-disasters)
- v. The Center for Climate Integrity: Confronting Wisconsin’s Climate Costs (June 2024), Retrieved January 2026 from <https://climateintegrity.org/uploads/media/Wisconsin-ClimateCostStudy-2024.pdf>
- vi. Wisconsin Department of Natural Resources, Greenhouse Gas Emissions Inventory Report (1990-2021), AM-647 2024 (2024). Retrieved 2025 from [Wisconsin-Greenhouse-Gas-Emissions-Inventory-Report-1990-2021.pdf](https://wisconsin-greenhouse-gas-emissions-inventory-report-1990-2021.pdf)
- vii. Office of Governor Evers, Wisconsin Executive Order No. 38 (2019). Retrieved 2025 from <https://evers.wi.gov/Documents/EO%20038%20Clean%20Energy.pdf>
- viii. Office of Governor Evers, Wisconsin Executive Order No. 52 (2019). Retrieved 2025 from [https://content.govdelivery.com/attachments/WIGOV/2019/10/17/file\\_attachments/1306233/EO052%20-%20ClimateChange\(Unsigned\)\\_Rotated.pdf](https://content.govdelivery.com/attachments/WIGOV/2019/10/17/file_attachments/1306233/EO052%20-%20ClimateChange(Unsigned)_Rotated.pdf)
- ix. Wisconsin Clean Energy Plan (2022). Retrieved 2024 from <https://osce.wi.gov/Documents/SOW-CleanEnergyPlan2022.pdf>
- x. Wisconsin Emissions Reduction Roadmap (2024). Retrieved 2025 from <https://www.epa.gov/system/files/documents/2024-03/wi-emission-reduction-roadmap.pdf>
- xi. Report Template
- xii. [cmap.illinois.gov/wp-content/uploads/2026-climate-action-plan.pdf](https://cmap.illinois.gov/wp-content/uploads/2026-climate-action-plan.pdf)
- xiii. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)
- xiv. Governor’s Task Force on Climate Change, Final Report (2020). Retrieved 2025 from <https://climatechange.wi.gov/Documents/Final%20Report/GovernorsTaskForceonClimateChangeReport-LowRes.pdf>
- xv. Wisconsin Clean Energy Plan (2022). Retrieved 2025 from <https://osce.wi.gov/Documents/SOWCleanEnergyPlan2022.pdf>
- xvi. Wisconsin Electric Vehicle Infrastructure Plan (2023). Retrieved 2025 from <https://wisconsin.gov/Documents/projects/multimodal/2023weviplanupdatefinal.pdf#:~:text=The%20initial%20WEVI%20Plan%20and%20this%202023.,WEVI%20Plan%20and%20this%202023%20WEVI%20Plan>
- xvii. Wisconsin State Rail Plan 2050 (2023). Retrieved 2025 from <https://drive.google.com/file/d/1PNPfwTEPRbIN6pgT5li206Q7REK6Objc/view>
- xviii. Wisconsin State Forest Action Plan (2020). Retrieved 2025 from <https://widnr.widen.net/view/pdf/77tgnbh66w/2020-Statewide-Forestry-Action-Plan.pdf?t.download=true&u=acpgx5>
- xix. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)
- xx. <https://www.nifa.usda.gov/grants/funding-opportunities/gus-schumacher-nutrition-incentive-program-nutrition-incentive-0>
- xxi. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)

- xxii. 2019-2022 Quad Economic Impacts Final Report
- xxiii. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)
- xxiv. <https://www.c2es.org/content/market-based-state-policy/>
- xxv. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)
- xxvi. <https://emp.lbl.gov/publications/us-state-renewables-portfolio-clean-0>
- xxvii. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)
- xxviii. Mo, L., Zohner, C.M., Reich, P.B. et al. Integrated global assessment of the natural forest carbon potential. *Nature* 624, 92-101 (2023). <https://doi.org/10.1038/s41586-023-06723-z>
- xxix. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)
- xxx. Maggie Grabow, Micah Hahn, and Melissa Whited. “Valuing Bicycling’s Economic and Health Impacts in Wisconsin.” The Nelson Institute for Environmental Studies, Center for Sustainability and the Global Environment, University of Wisconsin-Madison. January 2010. <https://www.railstotrails.org/resourcehandler.ashx?id=4579>.
- xxxi. [https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment\\_112425\\_Final+Report+with+Attachments+%281%29.pdf](https://static1.squarespace.com/static/5938626046c3c45036a21f0e/t/692f6cba33deef5528075e5b/1764715706688/CCAP+Benefits+Assessment_112425_Final+Report+with+Attachments+%281%29.pdf)
- xxxii. [https://dnr.wisconsin.gov/sites/default/files/topic/Waste/WDNR\\_FoodWaste\\_ExecSummary\\_Final.pdf](https://dnr.wisconsin.gov/sites/default/files/topic/Waste/WDNR_FoodWaste_ExecSummary_Final.pdf)
- xxxiii. Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F.Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, U.S.A.

