

STATE OF WISCONSIN

CLEAN ENERGY PLAN



Prepared by the Wisconsin Office of Sustainability and Clean Energy, Great Plains Institute, and Slipstream, Inc

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Version 1.0





Governor Tony Evers

FOREWORD

“The climate crisis is taking an undeniable toll on the health, safety, and economic well-being of folks across our state. The livelihood of Wisconsin farmers is in danger with extreme and unpredictable weather taking a toll on crops and production, our state’s tourism industry and economy depends on our vast and valuable natural resources, and as health professionals have indicated, the health of our people depends on the health of the

environments they live in. Every Wisconsinite—whether they live in the Driftless, the Central Sands, the Northwoods, or in the heart of our urban areas—has experienced the effects of climate change in one way or another, and reducing carbon emissions and bolstering clean energy opportunities will remain a priority for me as long as I am governor. We don’t have to choose between mitigating climate change and protecting our environment and affordable energy and economic development. Wisconsin is ready for bold and urgent solutions that will stop treating these goals as mutually exclusive—we can and will do both. Together, we can deliver on our promise to leave our kids with a better life and a better world than the one we inherited by building a sustainable state and economy for the future.”

We offer our appreciation and acknowledgments for the significant contributions of climate leaders, advocates, and organizations that went into the making of this report.

ACKNOWLEDGEMENTS

This Clean Energy Plan (CEP), prepared by the Wisconsin Department of Administration (DOA), Wisconsin Office of Sustainability and Clean Energy (OSCE), creates a pathway to multi-sector deep decarbonization and a transition to a strong clean energy economy that prioritizes environmental justice, ensures a diverse workforce, and technology innovation, as directed in Executive Order #38, signed by Governor Evers on August 19, 2019.

OSCE recognizes and thanks representatives from the Great Plains Institute for their considerable contributions in facilitation, analysis, resources, and insight throughout the development of Wisconsin's CEP.

OSCE is also thankful to Slipstream Inc. for their leadership in coordinating the technical analysis and modeling for the CEP, and the multiple organizations providing technical expertise ensuring timely analysis, ideas, and modeling to support key pathways and strategies. These organizations include Just Transition Fund; Center for Energy and Environment; the University of Wisconsin-Madison, Population Health Institute, Mobilizing Action Toward Community Health; Rocky Mountain Institute; the University of Wisconsin-Madison, Center for Sustainability and the Global Environment; Focus on Energy®; and ZEF Energy.

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OSCE is also thankful for the many contributors who participated in the process via stakeholder engagement activities, providing essential perspectives and subject matter expertise to advise on key pathways and strategies. OSCE engaged stakeholders via public listening sessions, by participating in statewide events, and collecting online written comments.

In addition, OSCE is grateful for the contributions of agency leadership and staff who provided guidance and review of the CEP.

ACRONYM LIST

| | |
|-----------------|---|
| BAU | Business As Usual |
| BTU | British Thermal Unit |
| CEP | Wisconsin Clean Energy Plan |
| CES | Clean Energy Standard |
| CHP | Combined heat and power |
| CI | Carbon intensity |
| CMAQ | Congestion Mitigation Air Quality Program |
| CO ₂ | Carbon Dioxide |
| COBRA | United States Environmental Protection Agency's CO-Benefits Risk Assessment |
| C-PACE | Commercial Property Assessed Clean Energy |
| DATCP | Wisconsin Department of Agriculture, Trade and Consumer Protection |
| DERs | Distributed Energy Resources |
| DHS | Wisconsin Department of Health Services |
| DNR | Wisconsin Department of Natural Resources |
| DOA | Wisconsin Department of Administration |
| DOC | Wisconsin Department of Corrections |
| DSPS | Wisconsin Department of Safety and Professional Services |
| DWD | Wisconsin Department of Workforce Development |
| EERS | Energy efficiency resource standard |
| EIA | United States Energy Information Administration |
| EPS | Rocky Mountain Institute and Energy Innovation Policy and Technology, LLC's Energy Policy Simulator |
| EV | Electric vehicle |
| GDP | Gross Domestic Product |
| GHG | Greenhouse gas |
| GTFCC | Governor's Task Force on Climate Change |
| IECC | International Energy Conservation Code |
| IOU | Investor-Owned Utility |
| IRP | Integrated Resource Plan |
| kW | kilowatt |
| kWh | kilowatt-hour |
| LICS | Low-income community solar |
| LULUCF | Land use, land-use-change, and forestry |

| | |
|----------------------|--|
| MATCH | Mobilizing Action Toward Community Health |
| MISO | Midcontinent Independent System Operator |
| MMTCO ₂ E | Million Metric Tons of CO ₂ Equivalent |
| MPSC | Midcontinent Power Sector Collaborative |
| MTEC | Midcontinent Transportation Electrification Coalition |
| MTERA | Midwest Tribal Energy Resources Association |
| MW | Megawatt |
| NO _x | Nitrogen Oxides |
| OEJ | Office of Environmental Justice |
| OSCE | Wisconsin Office of Sustainability and Clean Energy |
| PBR | Performance-based regulation |
| PIM | Performance incentive mechanism |
| PM _{2.5} | Fine Particulate matter, generally 2.5 micrometers and smaller |
| PM ₁₀ | Particulate matter, generally 10 micrometers and smaller |
| PSCW | Public Service Commission of Wisconsin |
| R&D | Research and development |
| RMI | Rocky Mountain Institute |
| ROE | Return on Equity |
| RPS | Renewable Portfolio Standard |
| RTS | Renewable Thermal Standard |
| SO _x | Sulfur Oxides |
| TPO | Third-Party Ownership |
| USCA | United States Climate Alliance |
| U.S. EPA | United States Environmental Protection Agency |
| UW | University of Wisconsin |
| WEDC | Wisconsin Economic Development Corporation |
| WEDTI | Wisconsin Energy Distribution and Technology Initiative |
| WHEDA | Wisconsin Housing and Economic Development Authority |
| WHP | Waste heat to power |
| WICCI | Wisconsin Initiative for Climate Change Impacts |
| WisDOT | Wisconsin Department of Transportation |
| ZEV | Zero-Emission Vehicle |

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EXECUTIVE SUMMARY

Over the past several decades, the United States and the world at large have experienced increasing threats from climate change, continued dependence on traditional fossil fuels, as well as a growing energy burden. Like many other states, Wisconsin recognizes the urgency of addressing such threats which affect the livelihoods, natural environment, and well-being of all current and future Wisconsinites. 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. Staying on our current emissions path will only exacerbate the impacts of climate change and Wisconsinites should not have to deal with the harmful effects of increased heat, humidity, and precipitation.

The Wisconsin Clean Energy Plan aims to change the adverse trajectory of climate change impacts. In August 2019, with the issuance of Executive Order #38, Governor Tony Evers directed the Wisconsin Office of Sustainability and Clean Energy (OSCE) to create a comprehensive clean energy plan (CEP). This CEP directly addresses the effects of climate change and environmental justice through programs and policies; supports the use of clean energy resources and technology; fosters innovation; protects public health and identifies and creates energy workforce opportunities. The CEP builds on a variety of past work and has considered the thoughts, plans, and suggestions of people and entities throughout Wisconsin, including utilities, private industry, frontline communities, Tribal Nations, government, academia, environmental not-for-profits, and many more.

Wisconsin's CEP provides a framework to ensure that Wisconsin businesses, communities, and people are well-positioned to share in the work of this plan and to take advantage of the large influx of federal dollars for clean energy and environmental justice initiatives. Wisconsin's CEP is one of many necessary steps toward meeting the state's carbon-free power and climate goals while staying within our carbon budget, the total allowable carbon emissions to prevent continued increased global temperatures. This CEP is designed to be comprehensive yet flexible and adaptable to technological, market, and behavioral changes.

Clean Energy Plan Objectives

Recognizing the existing conditions and goals in Wisconsin, the CEP seeks to achieve the following objectives:

- Putting Wisconsin on a path for all electricity consumed within the state to be 100 percent carbon-free by 2050,
- Ensuring that the State of Wisconsin is fulfilling the carbon reduction goals of the 2015 Paris Agreement,
- Reducing the disproportionate impacts of energy generation and use on low-income communities and communities of color,
- Maximizing the creation of, and equitable opportunities for, clean energy jobs, economic development and stimulus, and retention of energy investment dollars in Wisconsin,
- Improving reliability and affordability of the energy system,
- Strengthening the clean energy workforce through training and education, while retraining workers affected by the transition from fossil fuel to clean energy sources, and
- Protecting human and environmental health by reducing ecosystem pollution from fossil fuels.

Wisconsin Clean Energy Transition Value Statement

As Wisconsin seeks to transition to cleaner energy, it looks to embrace and encourage others to adopt three core values: **justice, equity, and collective action**. These core values will not only ensure communities that have been most impacted by climate change benefit from this transition but also ensure that all Wisconsin communities benefit. Wisconsin will be a stronger and more thriving state when all communities have access to a clean environment and economic opportunity. In addition, the implementation of the work outlined in the State of Wisconsin Clean Energy Plan requires collective action. Government, industry, private sector, non-profit, and other large systems all bear responsibility for doing this work.

A long-standing reliance on fossil fuels, poor environmental policy decisions, and broader historical injustices have had a detrimental effect on various communities in the state. We must prioritize transforming environmental, health, and economic conditions for communities disproportionately impacted by climate change. Transitioning to clean energy provides Wisconsin with this opportunity. A just and equitable clean energy transition can lessen the energy burden that is often placed on families with low incomes and lessen financial hardships for those who are already struggling to make ends meet.

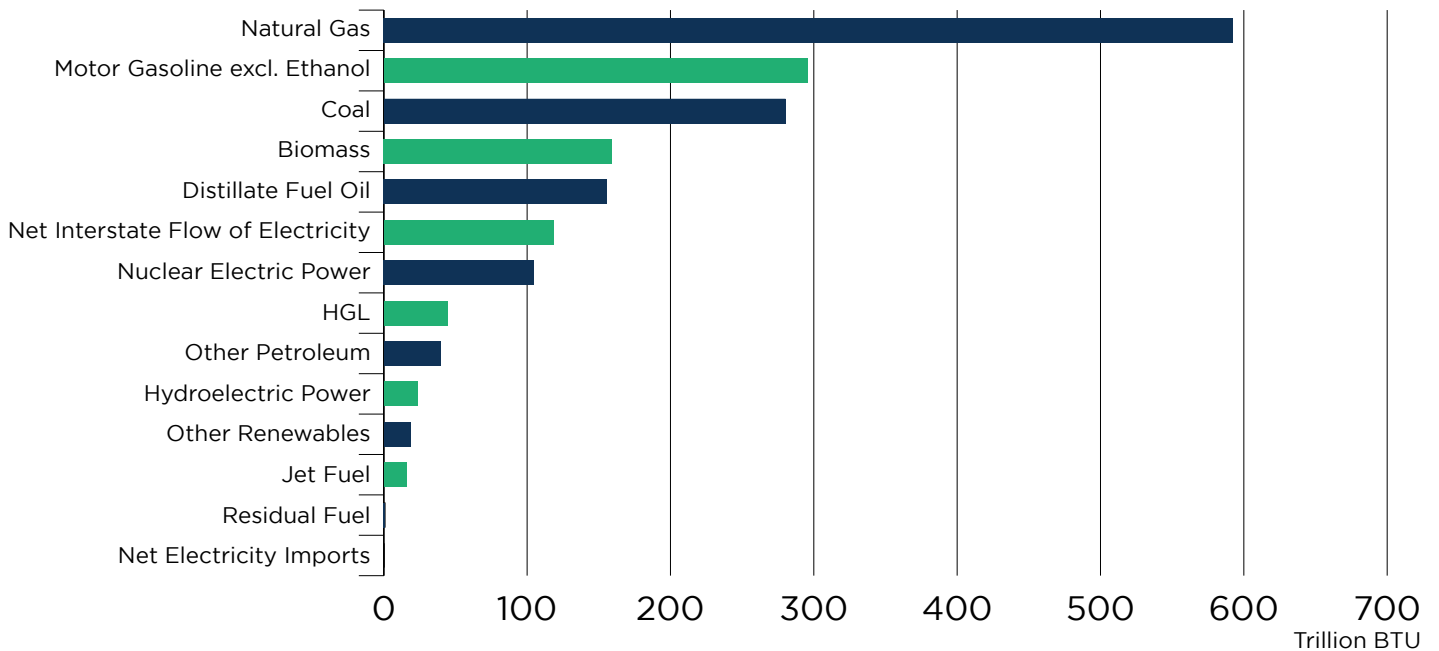
To help ensure a just and equitable transition, individuals who have been most impacted by pollution and climate change must be involved in the decision-making process, and this process must include diverse voices as it relates to race and ethnicity, sex and gender, socioeconomic status, and geography. Engaging and involving diverse representation, sharing power and resources, equitable policy development and implementation, and putting people above profit will help the state ensure that there is equitable access to the benefits of the clean energy transition. This includes providing a holistic approach to deliver the widest variety of clean energy technologies and services including energy efficiency, renewable energy generation, low-to-no-carbon transportation options, clean infrastructure, low-carbon food options, and others.

Job creation, business and community development, and resources must be shared across the state and communities—and communities that have most felt the impacts of climate change and have faced systemic barriers to wealth and opportunity must also see and feel the benefits of this transition. When delivering technologies and service, we must work to ensure—to the greatest extent possible—the jobs created during this transition not only employ Wisconsinites but people within the communities they serve. The clean energy transition also provides the state with the opportunity to reduce the \$14 billion that are sent out of the state for fossil fuel production. Instead, we should invest these dollars into clean energy technologies and services here in Wisconsin so the state and the people of Wisconsin benefit economically. Furthermore, much of these dollars should be directed to communities that have seen the least investment.

Lastly, transitioning Wisconsin to a clean energy economy is a shared responsibility among all levels of government and governing bodies, the utility, energy, and transportation industries, the private sector, and non-governmental organizations. Collective action and collaboration among these systems are necessary to ensure a fair, just, and equitable clean energy transition.

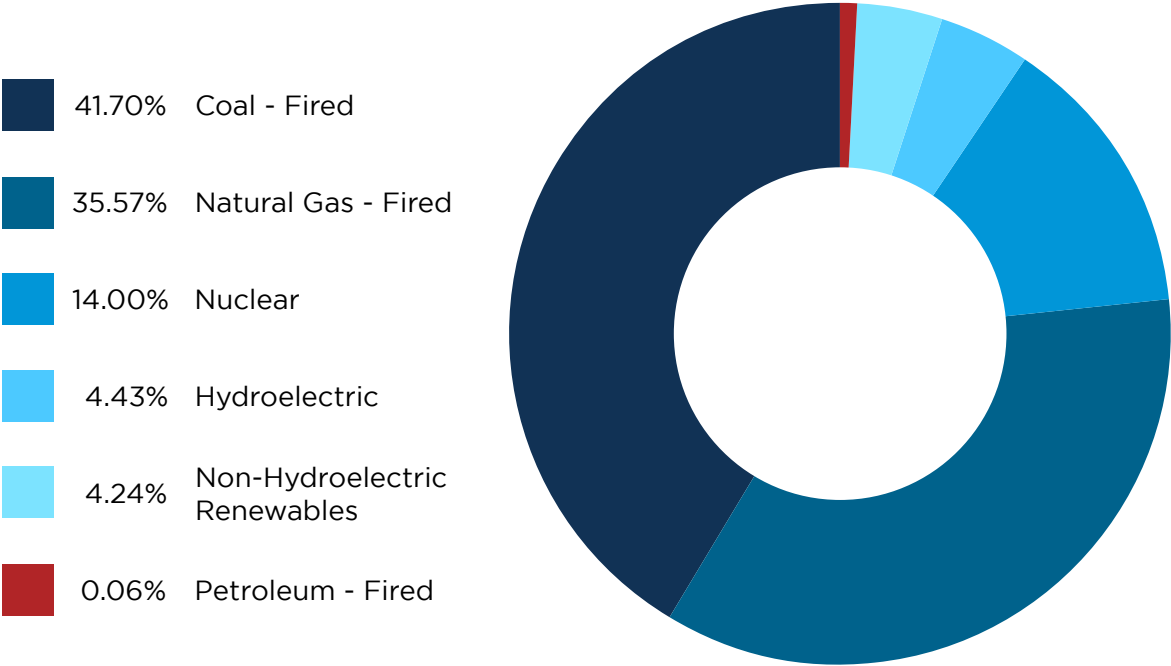
Energy - According to the U.S. Energy Information Administration (EIA), the energy sector has the largest single source of greenhouse gas (GHG) emissions through the burning of fossil fuels, including coal, oil, and gas. In 2019, burning fossil fuel for energy resulted in 92 percent of total U.S anthropogenic carbon dioxide (CO₂) with the remaining 8 percent coming from terrestrial sinks impacted by human activity, through LULUC in agriculture and forestry. The state's dependence on fossil fuels to meet its energy generation and consumption needs contributes to regional, national, and global GHG emissions. Wisconsin's 2019 energy consumption estimates below show a heavy reliance on coal, natural gas, and motor gasoline.

i. Wisconsin Energy Consumption Estimates



The following chart shows the breakdown of Wisconsin's 2019 electricity generation by fuel source, again showing a heavy reliance on coal, natural gas.

ii. Wisconsin Net Electricity by Source (Jun 2021)



Emissions – The 2021 Wisconsin Greenhouse Gas Emissions Inventory Report, published by the Wisconsin Department of Natural Resources (DNR) provides a breakdown of Wisconsin emissions by economic sector. The table below shows Wisconsin's GHG emissions by sector for 1990, 2005, and 2018. Gross GHG emissions decreased by 9.5 percent from 2005 to 2018. The electricity sector showed the largest decrease in emissions from 2005 to 2018 (20.1 percent). During that period, industrial emissions decreased by 10.8 percent while transportation, natural gas and oil, and waste sectors showed modest decreases. The 2021 Wisconsin Greenhouse Gas Emissions Inventory Report shows between 2005 and 2018, the agricultural emissions increased by 21.3 percent (mostly methane and nitrous oxide releases from agricultural

soils), the highest increase in emissions among all sectors. The report shows that Wisconsin's emissions reductions trends are not on track to meet statewide goals of fulfilling the Paris Agreement GHG reduction targets.

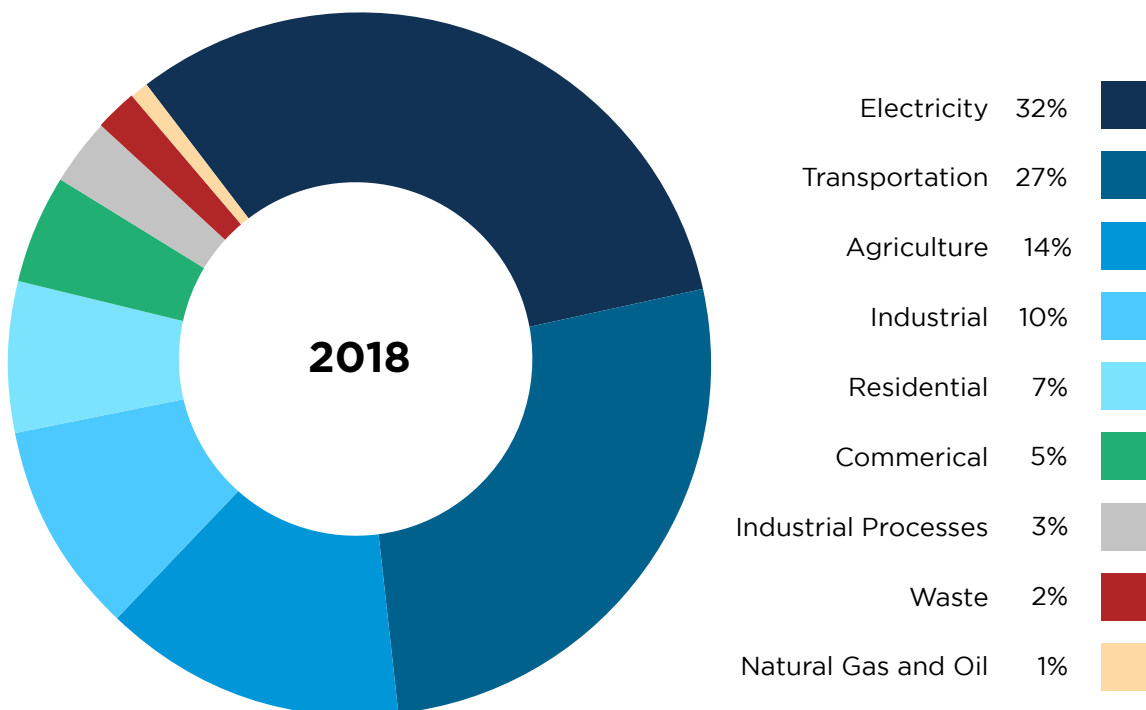
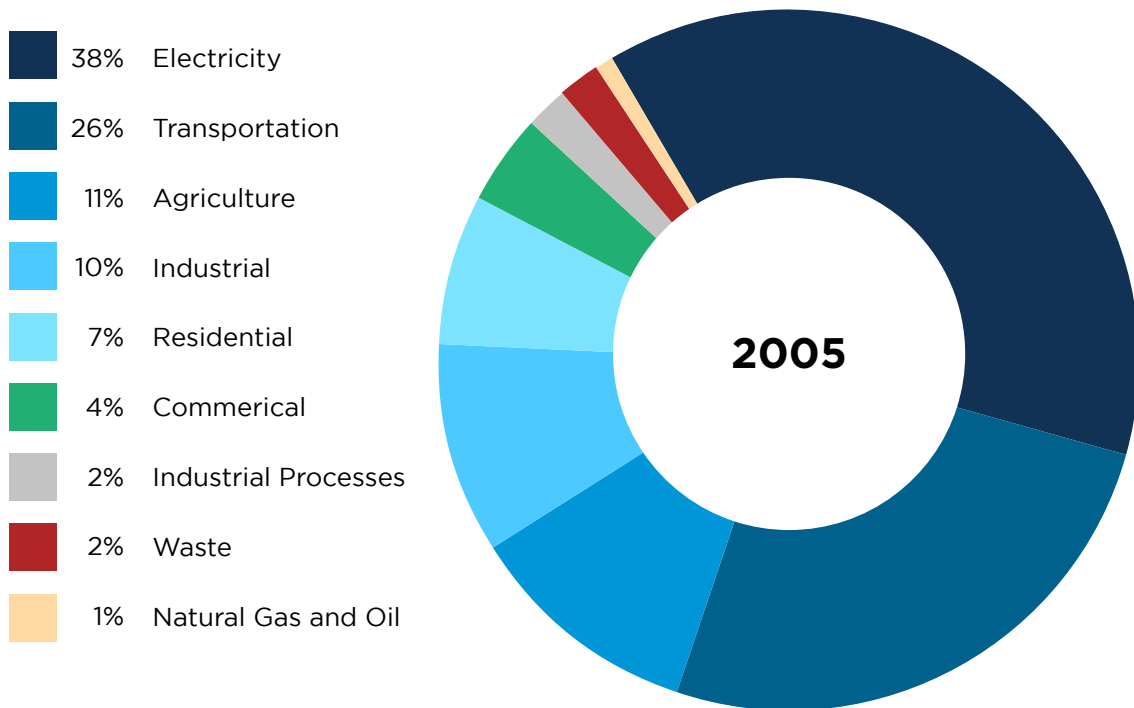
Land use, land-use change, and forestry (LULUCF) are also defined as GHG inventory sectors because these natural and working lands can add or remove carbon dioxide from the atmosphere and play a key role in the response to climate change. The 2021 GHG Emissions Inventory includes carbon storage estimates from natural and working lands. The LULUCF sector sequestered or stored 19.1 MMTCO₂E in 2018. Storing that amount of carbon is equivalent to removing the emissions from just over 4.1 million passenger vehicles driven on Wisconsin's roads over one year.

iii. Wisconsin GHG Emissions by Economic Sector (MMTCO₂E)

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

* Does not exceed 0.05 MMTCO₂E or 0.05 percent. Totals may not sum due to independent rounding.

iv. 2005 and 2018 Wisconsin GHG Emissions by Economic Sector (Percent)



Cost of Inaction

Failure to address the health inequities associated with emissions results in missed opportunities to directly address the health of Wisconsin Indigenous, Black, Hispanic/Latino, Hmong American, Asian American, and other communities of color.



Economy - Despite significant strides in the deployment of clean energy in Wisconsin, primarily through solar and wind development, Wisconsin continues to see significant energy end-use expenditures. Only a small percentage of the energy consumed in Wisconsin is produced in the state; therefore, much of the money Wisconsin spends on energy is sent out of state. This creates a spending deficit of \$14.4 billion (leaving the state annually). There is the need to increase efficiency and invest in more renewable energy in our state, and in the infrastructure to also bring in cost-effective renewable energy from outside of Wisconsin.



Agriculture, Forestry, and Tourism – Climate inaction in Wisconsin will result in tremendous costs to our agricultural industries, statewide infrastructure, and our economy. Warmer temperatures can reduce crop productivity and heat stress can decrease animals’ ability to produce meat, milk, or eggs. In addition to being harmful to our agricultural sector, warmer winters will decrease the economic activity from winter tourism due to the potential for reduced snowfall amounts. Wisconsin (along with Minnesota and Michigan) leads the country in snowmobile registrations. The ski and snowmobile industries alone are worth an estimated \$2.1 billion in value added to the Midwest’s economy. As our winters continue to become warmer and shorter, Wisconsin residents will experience less value added to their economy through winter tourism.

Health – Wisconsin needs to support the communities historically and still today harmed and overburdened by the traditional energy system and the correlated emissions that this system contributes to increased climate change impacts. Inequities in living conditions disproportionately place low-income communities and some communities of color at greater risk of the health impacts from climate change. Low-income communities and communities of color are more likely to be exposed to environmental toxins and poor air quality that increases the risk of respiratory illnesses and asthma exacerbation. Failure to address the health inequities associated with emissions results in missed opportunities to directly address the health of Wisconsin Indigenous, Black, Hispanic/Latino,

Hmong American, Asian American, and other communities of color. The University of Wisconsin-Madison, Center for Sustainability and the Global Environment (SAGE) performed a preliminary screening of the potential air quality and health improvements from decarbonizing Wisconsin's energy supply. They concluded, based on the pathways outlined in the CEP:

- In addition to reducing CO₂ emissions, changes to the energy supply will also reduce fine particulate matter (PM_{2.5}), nitrogen oxides (NOx), and sulfur oxides (SOx) emissions,
- The estimated premature mortality avoided was 102-231 deaths per year,
- Estimates for annual avoided hospital admissions, including for acute bronchitis (131), non-fatal heart attacks (9-11), other cardiovascular admissions (17), and asthma (36),
- Additional annual impacts include an estimated 11,900 avoided days of work lost to illness, and
- Annual financial benefits for Wisconsinites were \$78-\$247 million from avoided non-fatal health impacts and \$970 million to \$2.5 billion from avoided mortality.





Strategies Summary

As the State of Wisconsin assessed its path to a clean and reliable energy future, four key strategies emerged to create momentum and action:

- **Accelerate clean energy technology deployment** – increasing funding options for projects, investing in infrastructure, new emissions goals, expanding state energy resources for generation, technology innovation, equitable expansion of clean energy, and leveraging existing policies and programs.
- **Maximize energy efficiency** – strengthening energy efficiency standards and goals to reduce energy waste, create jobs, and save consumers money on energy costs.
- **Modernize buildings and industry** – addressing building codes, supporting electrification, expanding funding, and supporting industry and businesses in their transition.
- **Innovate transportation** – support the transition to low- to no-emission vehicles and support refueling options, along with planning and increased options to move people around.

Below are additional ways the CEP ensures an inclusive transition:

Prioritizing health equity, environmental justice, and equitable economic development – Historically, Tribal Nations and Indigenous communities, Black, Hispanic/Latino, Hmong American, Asian American, other communities of color, people who have low incomes, people with disabilities, immigrants, women, senior residents, veterans, and rural communities have been left out of the conversation on transforming our country’s energy system and transitioning to clean energy. The development of the traditional energy system has focused on overall costs and emissions, leaving some residents behind and others suffering a disproportionate burden of the energy system. In seeking to mitigate

climate damage, these communities must be involved in decision-making on clean energy technologies, jobs, financial impacts, and health impacts. As an example, maximizing energy efficiency reduces energy costs for individuals, families, and communities with low to middle incomes, ensuring that they too benefit from Wisconsin's transition to clean energy. Deployment of technology must also be affordable and available to all residents and communities.

Fast-tracking workforce development and a just transition –

Wisconsin must achieve an inclusive and equitable clean energy workforce through a clean energy workforce development program to systematically train and prepare workers for the nation and the state's transition to clean energy. The CEP works intentionally to provide clean energy job opportunities for those that have been excluded from the traditional energy economy. Opportunities should include training, apprenticeships, and high-paying jobs for such workers. This also may include requirements such that businesses that benefit from state clean energy policies and incentives must have a workforce that is reflective of the populations specific to the regions of the state.

Additionally, the CEP addresses a just transition from traditional fossil fuel energy generation and use. For some years, utility companies have been taking the lead to close coal plants around the country and in Wisconsin have been closing due to several factors, including the low cost of natural gas, the dramatic reduction in the cost of renewable generation, environmental regulation, and demand from customers for cleaner energy. Utility jobs being displaced often offer some of the best wages, benefits, and working conditions in their area. Loss of these jobs can have a significant impact on the individual workers and their families, as well as their communities. Often the location of the plants and the use of the land as a coal-fired power plants, make the closed facilities difficult to redevelop.

Accelerating government-led efforts (Lead-by-Example)

Drawing from the lived experiences, expertise, and knowledge of Tribal Nations, local government representatives, and state agency employees, governments can be leaders in efforts to reduce emissions, conserve energy, and transition to new technologies. These efforts are

often referred to as “Lead-by-Example” where government entities analyze and transition their facilities and fleets to realize substantial cost savings, reduce GHG emissions, improve energy supply, build resilience, and procure more sustainable products. Lead-by-Example also offers increased public awareness of the costs and benefits of clean energy technologies, while also providing transparency on the government’s internal goals and activities to address climate change and transition to clean energy. This CEP outlines strategies to elevate and support these efforts.

For each of these pathways above, 71 strategies were identified as *Immediate Action* (integrated into a workplan to commence near-term); and 16 identified as *High-Impact* (those that will result in the greatest GHG reductions, may be implemented over a longer period, and may be informed by the immediate action strategies). In each category, there are also *Future* strategies, which are important to cite but do not fall into either the high-impact or immediate designations.

Wisconsin's CEP is one of many necessary steps toward meeting the state's carbon-free power and climate goals and staying within our carbon budget. The preceding strategies compose the first phase of what will be a living document and process for equitable, inclusive, and impactful clean energy planning and implementation.

v. First-Year Planning Timeline

**Serves as a model for annual planning*



The framework for moving the CEP and its implementation forward is composed of three key elements, a summary of which follows:

- Engage Wisconsinites in our shared clean energy progress by collecting public input and sharing progress transparently. The OSCE will maintain and promote a website where the status of each CEP strategy is updated at least quarterly with relevant, supporting analysis and information.
- Measurement and Verification (M&V):
 - a. Measure the results of CEP implementation to understand the status of each strategy and progress toward goals. OSCE will create a work plan derived from this initial CEP that identifies each strategy, goal, responsible actors, timelines, and metrics for assessing progress.
 - b. Work with stakeholders and agency partners, OSCE will identify data availability and analysis gaps and collaborate to secure needed information, whether existing in state agencies or requiring new, primary data collection efforts.
- Provide an Annual Report to report out ongoing data collection, synthesis, and analysis that is accurate and relevant to understanding Wisconsin's evolving clean energy ecosystem and CEP implementation progress. The OSCE will create and share publicly an annual report describing the CEP outcomes and post corresponding analysis and modeling results for the public to view.



INTRODUCTION

Over the past several decades, the United States (U.S.) and the world at large have experienced increasing threats from climate change, continued dependence on traditional fossil fuels, as well as a growing energy burden in disproportionately impacted communities. Like many other states, Wisconsin recognizes the urgency of addressing such threats which affect the livelihoods, natural environment, and well-being of all current and future Wisconsinites.¹

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. Staying on our current emissions path will only exacerbate the impacts of climate change and Wisconsinites should not have to deal with the harmful effects of increased heat, humidity, and precipitation.

Weather

Weather - The Wisconsin Initiative for Climate Change Impacts (WICCI) states that Wisconsin's climate is warmer, wetter, and we are experiencing more extreme events². Statewide annual average precipitation rose to 37.0 inches, a 17 percent increase, since 1950. The decade from 2010 to 2019 was the wettest on record. Additionally, over the past 10 years, Wisconsin has experienced an influx of extreme weather events, including tornadoes, flooding, Derechos (straight-line winds), life-threatening heat, and polar vortexes. In 2019, a polar vortex brought Wisconsin one of its longest stretches of sub-zero temperatures with some parts of the state experiencing wind chill down to minus 60 degrees Fahrenheit (F).³ In 2019, a derecho in northern Wisconsin damaged 63,000 acres on the Chequamegon-Nicolet National Forest, an area larger than Milwaukee. Such damage not only impacts state and county forests but also causes timber and pulpwood prices to decrease due to oversupply from blowdown trees.



Statewide annual average precipitation rose to 37.0 inches, a 17% increase, since 1950.

In addition to experiencing these above weather events, the last two decades were the warmest on record for Wisconsin, with temperatures above those of the 1930s Dust Bowl years.⁴ In Wisconsin, extreme heat events cause elevated levels of heat stress, heat stroke, and heat exhaustion. A 2020 University of Wisconsin's Global Health Institute report stated, "Extreme heat kills more Wisconsinites than other weather disasters (i.e., tornadoes, floods, blizzards) combined."⁵ By 2050, Wisconsin average temperatures are projected to warm 2 - 8 degrees above the late

20th-century average. By mid-century extreme heat days (over 90 degrees F) in Wisconsin are projected to triple.⁶

It is expected, by 2050, more than 7.1 million outdoor workers in the US will see 10% or more of their earnings at risk annually due to extreme heat.

Weather events result in significant economic and health impacts. A 2019 study found that ten climate-sensitive events that occurred throughout the country—including extreme heat in Wisconsin, harmful algal blooms in Florida, and Western wildfires—resulted in an estimated \$10 billion in health costs.⁷ According to the National Oceanic and Atmospheric Administration’s Billion-Dollar Weather and Climate Disasters database, between 2011 and 2021 there were 16 severe storms and two drought-related billion-dollar disasters that affected Wisconsin with a result of \$110 billion in impacts.⁸

With no action to reduce emissions, increased heat will substantially reduce the number of days it is safe to work outside. It is expected, by 2050, more than 7.1 million outdoor workers in the U.S. will see 10 percent or more of their earnings at risk annually due to extreme heat. African American and Hispanic/Latino workers are disproportionately represented in outdoor industries and are therefore most at risk for earnings loss due to extreme heat. Without specific attention to justice and equity, communities of color will face the largest burden of warming temperatures.⁹

Health and Justice

Health and Justice - The public consistently cites the health impacts of climate change as one of their leading concerns.¹⁰ Over 200 health journals have called for action on climate change.^{11,12} In addition, the Conference of the Parties for the Paris Agreement is now framing climate change as a public health issue.¹³

Wisconsin needs to support the communities historically and still, today harmed and overburdened by the traditional energy system, and the correlated emissions that this system contributes to increased climate change impacts. The U.S. Environmental Protection Agency (EPA) defines overburdened communities as those having,

“Situations where multiple factors, including both environmental and socioeconomic stressors, may act cumulatively to affect health and the environment and contribute to persistent environmental health disparities.”¹⁴ This includes communities with residents with low-income, people of color, Tribal Nations, and all those impacted by emissions from fossil fuel energy generation and use, which directly contributes to climate change impacts. There is a need to ensure a just transition for fossil fuel communities, those who have powered our state, our homes, and our industries for so long, guaranteeing that jobs and economic benefits reach them.

There is a need to ensure a just transition for fossil fuel communities, those who have powered our state, our homes, and our industries for so long, guaranteeing that jobs and economic benefits reach them.

The U.S. EPA further analyzed and focused on overburdened and vulnerable communities in the report, *“Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts.”* While climate change affects all Americans, regardless of socioeconomic status, the impacts of climate change have a deeper effect on vulnerable populations (i.e., individuals with low incomes, people of color, individuals with no high school diploma, and adults 65 years of age and older). Based on the U.S. EPA’s analysis on vulnerable groups and associated climate change impacts (on air quality and health, flooding and traffic, and property, extreme temperatures on health and labor), the report concluded the highest level of climate change impacts are felt in areas populated by people of color, examples include:

- Black and African American individuals are more likely to live in areas with the highest projected mortality rates and childhood asthma diagnosis due to climate-driven changes related to increases in extreme temperatures and particulate air pollution, respectively.
- Hispanic and Latino individuals and American Indian and Alaska Natives are more likely to live in areas with the highest projected labor hour losses in weather-exposed industries (construction and agriculture) due to climate-driven increases in high-temperature days.
- Asian American individuals are more likely to live-in areas with the highest projected increases in traffic delays from climate-driven changes in coastal high-tide flooding.¹⁵

The report further examined the climate-driven impacts on select vulnerable populations showing residents with low incomes tend to live in areas with the highest

projected labor losses. Additionally, those without a high school diploma are more likely to live in areas with increased inland flooding.

Additionally, the National Congress of American Indians states that “Indigenous peoples of North America are disproportionately vulnerable to climate change. The most vulnerable industries, settlements, and societies are generally those in coastal and river flood plains; those whose economies are closely linked with climate-sensitive resources; and those in areas prone to extreme weather events. Nearly all Tribes fit into one of those categories, and most Alaska Native communities fit into all three.”



Warmer weather also exacerbates vector-borne illnesses. With longer growing seasons and warmer average temperatures in Wisconsin, the transmission season for insects (ticks and mosquitos that carry Lyme disease, West Nile virus) may increase. Scientists anticipate infections from the insect-borne disease will likely increase.¹⁶

All the above issues can affect the mental health of Wisconsinites. Wisconsin Department of Health Services (DHS) Climate and Health Program studies how climate change impacts public health in Wisconsin. They report that increases in precipitation can cause stress and mental health disorders, flood-related food and waterborne illness, injuries, and drowning. Increasing droughts can cause food insecurity and respiratory distress from increased dust, pollen, and airborne particulates.¹⁷

Economic – The Risky Business project published a series of reports quantifying the economic risks posed by climate change. One report, *Heat in The Heartland: Climate Change and Economic Risk in The Midwest*, examined the economic risks to the Midwestern U.S. presented by climate change and opportunities to reduce them.¹⁸ The report notes that as temperatures continue to rise, the Midwest’s agricultural sector is at risk to suffer economic impacts from climate change. The Midwest is responsible for 65 percent of U.S. production of corn and soybeans and without significant adaption by farmers, the agricultural sector can expect to suffer yield losses and economic damages.



Additionally, the tourism industry in the U.S., which employs more than 35,000 workers, will face earnings loss as warmer winters lead to decreased snow and ice for outdoor sports. *Heat in The Heartland: Climate Change and Economic Risk in The Midwest* also notes that two Midwest States, Wisconsin, and Minnesota, are expected to have warmer winters. This may result in fewer fish and less seasonal recreation. Wisconsin's outdoor recreation is a top driver for Wisconsin's economy that creates \$7.8 billion contributed to the state's gross domestic product; 93,000 jobs across diverse sectors supported; \$3.9 billion in compensation provided to Wisconsinites; and positions the state as a leader in outdoor recreation manufacturing.¹⁹ Climate impacts have a direct correlation to the reduced recreation and seasonal outdoor activities resulting in a substantial decrease in the billions of dollars that can directly affect Wisconsin's economy.

Wisconsin's Clean Energy Plan

Wisconsin's Clean Energy Plan

The Wisconsin Clean Energy Plan aims to change the adverse trajectory of these climate change impacts. In August 2019, Governor Tony Evers issued Executive Order #38 in which he directed the Office of Sustainability and Clean Energy (OSCE) to create a comprehensive clean energy plan (CEP).²⁰ Recognizing the existing conditions in Wisconsin, and the role the state plays in both regional and national emissions reductions initiatives, the plan seeks to achieve the following objectives:

- Putting Wisconsin on a path for all electricity consumed within the state to be 100 percent carbon-free by 2050,
- Ensuring that the State of Wisconsin is fulfilling the carbon reduction goals of the Paris Agreement²¹,
- Reducing the disproportionate impacts of energy generation and use on low-income communities and communities of color,
- Maximizing the creation of, and equitable opportunities for, clean energy jobs, economic development and stimulus, and retention of energy investment dollars in Wisconsin,
- Improving reliability and affordability of the energy system,
- Strengthening the clean energy workforce through training and education while retraining workers affected by the transition from fossil fuel to clean energy sources, and
- Protecting human and environmental health by reducing ecosystem pollution from fossil fuels.

This plan represents a portion of the action needed to address climate change by targeting an expeditious transition to a clean energy economy. The strategies included in the CEP provide a roadmap that accomplishes Wisconsin's objective of achieving a carbon-neutral power sector and reducing a range of other energy-related emissions. This is a Clean Energy Plan, which differs from a Climate Action Plan, in that it does not include strategies for non-energy-related greenhouse gas emissions reduction, carbon sequestration, and adaptation. Governor Evers convened a Task Force on Climate Change and is committed to implementing the recommendations in their Final Report, which are broader than those included in the Clean Energy Plan.

Wisconsin Clean Energy Transition Value Statement

As Wisconsin seeks to transition to cleaner energy, it looks to embrace and encourage others to adopt three core values: **justice, equity, and collective action**. These core values will not only ensure communities that have been most impacted by climate change benefit from this transition but also ensure that all Wisconsin communities benefit. Wisconsin will be a stronger and more thriving state when all communities have access to a clean environment and economic opportunity. In addition, the implementation of the work outlined in the State of Wisconsin Clean Energy Plan requires collective action. Government, industry, private sector, non-profit and other large systems all bear responsibility for doing this work.

A long-standing reliance on fossil fuels, poor environmental policy decisions, and broader historical injustices have had a detrimental effect on various communities in the state. We must prioritize transforming environmental, health, and economic conditions for communities disproportionately impacted by climate change. Transitioning to clean energy provides Wisconsin with this opportunity. A just and equitable clean energy transition can lessen the energy burden that is often placed on families with low incomes and lessen financial hardships for those who are already struggling to make ends meet.

To help ensure a just and equitable transition, individuals who have been most impacted by pollution and climate change must be involved in the decision-making process, and this process must include diverse voices as it relates to race and ethnicity, sex and gender, socioeconomic status, and geography. Engaging and involving diverse representation, sharing power and resources, equitable policy development and implementation, and putting people above profit will help the state ensure that there is equitable access to the benefits of the clean energy transition. This includes providing a holistic approach to deliver the widest variety of clean energy technologies and services including energy efficiency, renewable energy generation, low-to-no-carbon transportation options, clean infrastructure, low-carbon food options, and others.

Job creation, business and community development, and resources must be shared across the state and communities—and communities that have most felt the impacts of climate change and have faced systemic barriers to wealth and opportunity must also see and feel the benefits of this transition. When delivering technologies and service, we must work to ensure—to the greatest extent possible—the jobs created during this transition not only employ Wisconsinites but people within the communities they serve. The clean energy transition also provides the state with the opportunity to reduce the \$14 billion that are sent out of the state for fossil fuel production. Instead, we should invest these dollars into clean energy technologies and services here in Wisconsin so the state and the people of Wisconsin benefit economically. Furthermore, much of these dollars should be directed to communities that have seen the least investment.

Lastly, transitioning Wisconsin to a clean energy economy is a shared responsibility among all levels of government and governing bodies, the utility, energy, and transportation industries, the private sector, and non-governmental organizations. Collective action and collaboration among these systems are necessary to ensure a fair, just, and equitable clean energy transition.

Many Wisconsinites are directly affected by climate change impacts and are ready for change. In 2020, Yale Program on Climate Change Communication conducted a survey of Wisconsinites who expressed notably high interest in a few areas about clean energy.²² Specifically:

- 86 percent of Wisconsinites support funding research into renewable energy,
- 75 percent support regulating carbon dioxide (CO₂) as a pollutant, and
- 82 percent support providing rebates for energy-efficient vehicles and solar panels.

86%

support funding research into **renewable energy**.

72%

support **regulating carbon dioxide (CO₂)** as a pollutant.

82%

support providing **rebates for energy-efficient vehicles and solar panels**.

As the State of Wisconsin assessed its path to a clean, reliable, and affordable energy future, four key pathways emerged to create momentum and action to meet the above objectives:

- **Accelerate clean energy technology deployment** - increasing funding options for projects, investing in infrastructure, new emissions goals, expanding state energy resources for generation, technology innovation, equitable expansion of clean energy, leveraging existing policies and programs.
- **Maximize energy efficiency** - strengthening energy efficiency standards and goals to reduce energy waste, create jobs and save consumers money on energy costs.
- **Modernize buildings and industry** - addressing building codes, supporting electrification, expanding funding, and supporting industry and businesses in their transition.
- **Innovate transportation** - supporting the transition to low- to no-emission vehicles and supporting refueling options, along with planning and increased options to move people around.

Below are additional ways the CEP ensures an inclusive transition:

- Prioritizing health equity, environmental justice, and equitable economic development,
- Fast-tracking workforce development and just transition, and
- Accelerating government-led efforts (Lead-by-Example).

The development and implementation of this CEP in Wisconsin will require initiatives, policies, and strategies across several sectors. Numerous strategies for clean energy span multiple sectors. For example, electric vehicles exist within the transportation sector, but their effectiveness and success rely significantly on shifts in the power sector: Is the distribution grid sufficiently robust to handle the additional load? Does the electric generation mix consist of enough clean energy to maximize transportation emission savings? Similarly, if we aim to electrify our heating processes in the building sector, what are the impacts on the power sector? This CEP attempts to identify and address these cross-sector issues to ensure the greatest reduction of GHG emissions possible.

We must do all that we can to make our energy cleaner to preserve the environment for equitable access to clean energy while reducing the energy burden, making energy more affordable for all, and realizing improved health outcomes. We will drive climate change mitigation and adaptation through nature-driven solutions, utilizing Wisconsin-based resources, and reducing emissions of GHG and criteria pollutants. Energy consumers increasingly want to know where their energy comes from. In response, we will strive for greater transparency on energy resources, generation, and transmission, along with accountability related to the transition to clean energy. Beyond the tremendous environmental benefits from a cleaner energy system, there exist substantial economic and job benefits. We will work to lower the energy burden, advance innovation in clean energy technology, and drive Wisconsin's leadership in clean energy.

Wisconsin's CEP provides a framework to ensure that Wisconsin businesses, communities, and people are well-positioned to share in the work of this plan. Wisconsin's CEP is one of many necessary steps toward meeting the state's carbon-free power and climate goals while staying within our carbon budget, Wisconsin's total allowable carbon emissions to prevent continued increased global temperatures. We also recognize that federal investment and broad federal action are necessary for any state to advance clean energy initiatives. A partnership between the state and the federal government is crucial in the future (*Appendix III - Bipartisan Infrastructure Law Programs*). This CEP is designed to be comprehensive yet flexible and adaptable to technological, market, and behavioral changes. The strategies contained within the CEP compose the first phase of what is a living document and put into practice a process for equitable, inclusive, and impactful clean energy planning and implementation.



PURPOSE & PROCESS

This CEP is coordinated by OSCE as directed by Executive Order #38. The purpose of the CEP is to outline strategies that will transition Wisconsin to a strong-clean energy economy. In developing the CEP, the OSCE outlined a comprehensive process to gather the voices of Wisconsinites and ensure that this plan reflects the values of our state (*Appendix II - Stakeholder Engagement*). It pursues strategies that will benefit the greatest number of Wisconsin residents. This CEP also takes into consideration the substantial work that preceded it, including:

- Governor’s Task Force on Climate Change. This task force, through Executive Order #52, under the leadership of Lieutenant Governor Mandela Barnes, reached out statewide to gather information from residents on energy-related issues during 2019 and 2020. The task force then made 55 policy recommendations on a variety of energy and environmental issues, calling for implementation by executive, budget, and/or legislative action;²³
- Midcontinent Power Sector Collaborative (MPSC), Midcontinent Transportation Electrification Coalition (MTEC), Midcontinent Building Decarbonization Roadmaps. These consensus documents included substantial presence from Wisconsin entities. The recommendations in these roadmaps were a starting point in the development of this CEP;^{24,25,26}
- The Wisconsin Energy Distribution and Technology Initiative (WEDTI). A Wisconsin stakeholder group made 14 specific consensus recommendations to help Wisconsin residents and businesses accelerate the transition to the clean energy

- economy and optimize the energy system for the state;²⁷ and
- The U.S. Climate Alliance (USCA) strategies for participating states. Wisconsin joined the USCA as part of Executive Order #38.

This CEP is designed to provide environmental justice organizations, non-governmental organizations, advocacy groups, policy makers, utilities, businesses, state governments, Tribal governments, local governments, educators, and residents an actionable plan to transition Wisconsin to a robust and affordable clean energy economy. It identifies key pathways and subsequent immediate and high-impact strategies. This CEP identifies areas where further analysis will be needed to propose new legislation, programs, or changes in policies and procedures.

The modeling outlined in the CEP considers Wisconsin's carbon budget and utilizes the best available data, analysis, and input to examine what strategies will make considerable strides towards decarbonization in all sectors, with the primary focus on the power sector. Modeling is not used to predict the future, but rather is based on a set of assumptions (specifically, select CEP strategies) and provides a trend of what could happen in the future, if fully implemented. The assumptions and expected impacts do not consider new technology, new policies, or unforeseeable events in the future. Estimated impacts from the strategies in the CEP are modeled using:

- Rocky Mountain Institute and Energy Innovation Policy and Technology, LLC's Energy Policy Simulator (EPS),^{28,29}
- Meier Engineering Research LLC's JuiceBox³⁰ (power sector), and
- U.S. EPA's CO-Benefits Risk Assessment (COBRA)³¹ (social impact).

The intention of the CEP is to be a living document that is updated periodically and used as a tool to provide ongoing measurement to address climate change, provide transparency and accountability on progress, and optimize environmental, economic, and job benefits. The CEP provides the framework where Wisconsin can pursue energy policy and can serve as a progress report by emphasizing Wisconsin's achievements and challenges and updating the strategies in the future to improve upon these efforts.



Wisconsin

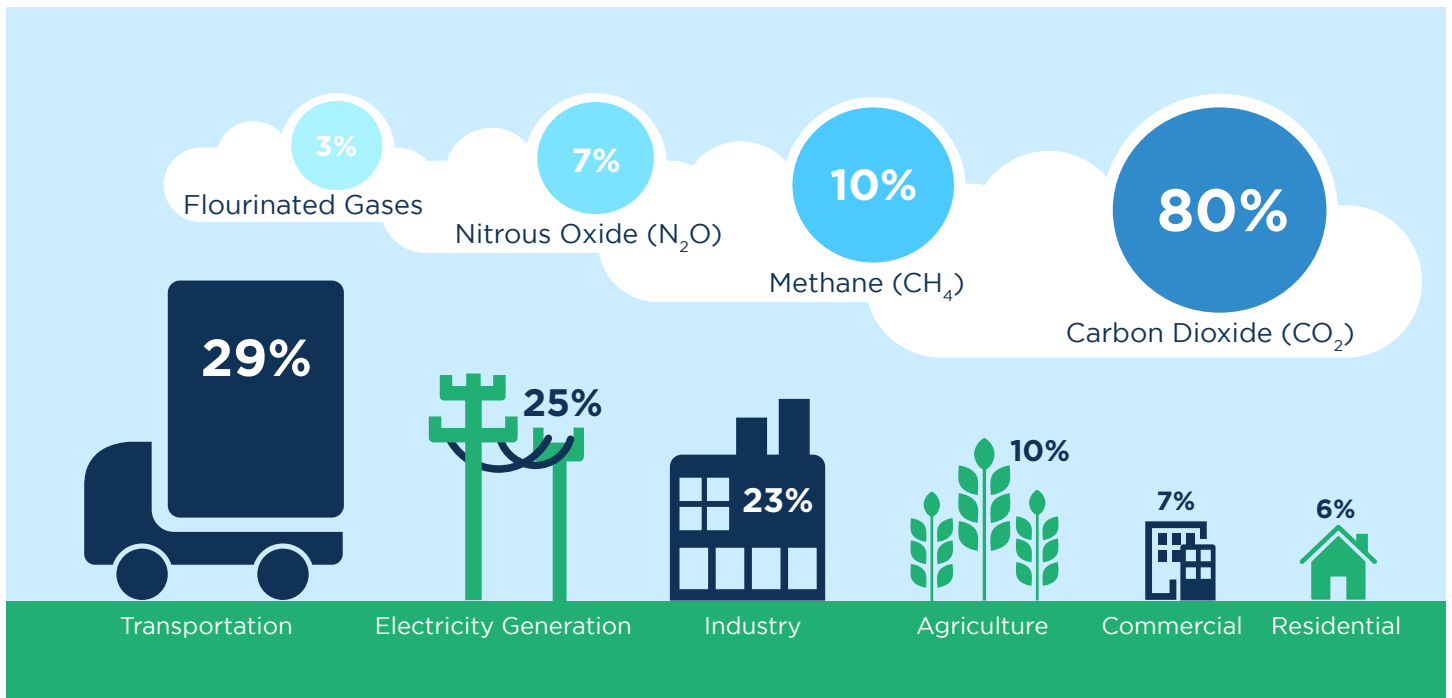
WISCONSIN'S ENERGY AND EMISSIONS PROFILE

When considering the strategies to transition to a clean energy economy, it is important to take into consideration the status of Wisconsin's energy generation and use, emissions, and social factors that may influence the pathways. In the section below, U.S., Midwest, and Wisconsin-specific data are provided to create a baseline of Wisconsin's current situation. OSCE aims to provide the most up-to-date data when available. In some cases, the years may differ based on the source and relevance of the data.

U.S. Economywide Emissions

Since 1990, the U.S. Energy Information Administration (EIA) reports the annual national GHG emissions in the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*. In the 2019 report, the total U.S. GHG emissions equated to 6,558 million metric tons of CO₂ equivalent (MMT_{CO₂E}).³² Based on 2019 data, transportation, electricity, and industry make up the top three emitting sectors, respectively. The remaining sectors, agriculture, residential, and commercial make up just under a quarter of the U.S. emissions profile (23 percent). This report also notes that the land use, land-use change, and forestry sinks reduce the profile by 12 percent or a reduction of 789 MMT_{CO₂E} emissions. This reduction is equivalent to removing the emissions from just over 171.5 million passenger vehicles driven over one year.³³

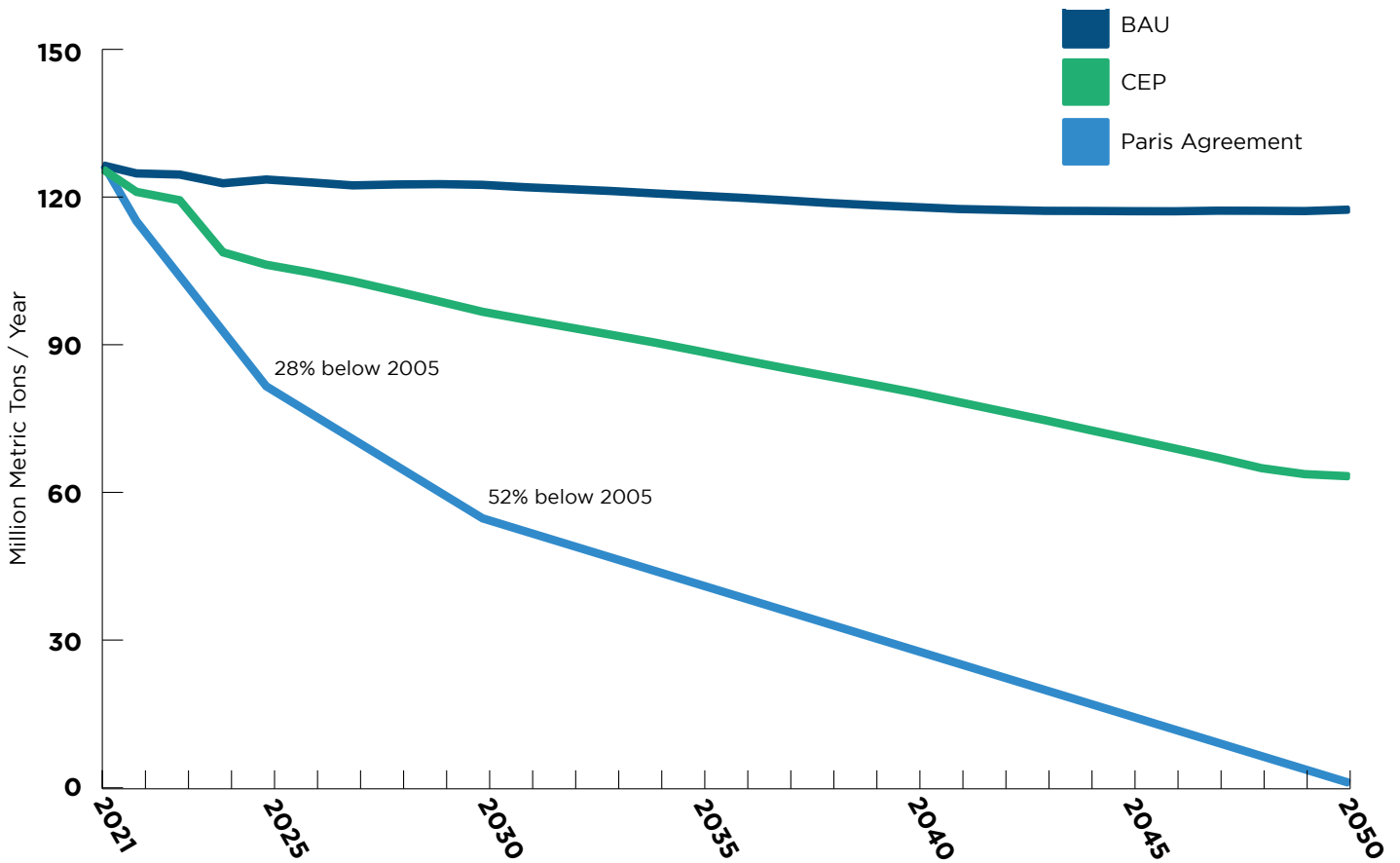
Figure 1 - Total U.S. Greenhouse Gas Emissions by Economic Sector (2019)³⁴



Wisconsin Economywide Emissions

The CEP considers Wisconsin’s carbon budget, the total allowable carbon emissions to prevent continued increased global temperatures, and strategies that will make considerable strides towards decarbonization. The modeled emissions reductions associated with the strategies included in the CEP provide a roadmap that accomplishes Wisconsin’s objective of achieving a carbon-neutral power sector and reducing a range of other energy-related emissions. In the figure below, the emissions under the blue line include those beyond the charge of the CEP as specified in Executive Order #38. Also included are energy-related emissions that have significant technical and implementation challenges (e.g., electrification of air travel and certain industrial processes, and behavior change). This is a Clean Energy Plan, which differs from a Climate Action Plan, in that it does not include strategies for non-energy-related GHG emissions reduction, carbon sequestration, and adaptation. Governor Evers convened a Task Force on Climate Change and is committed to implementing the recommendations in their Final Report, which are broader than those included in the Clean Energy Plan.³⁵

Figure 2 - Wisconsin Energy Emissions Reductions



The 2021 Wisconsin Greenhouse Gas Emissions Inventory Report, published by the Wisconsin Department of Natural Resources (DNR) provides a breakdown of Wisconsin emissions by economic sector.³⁶ Table 1 shows Wisconsin’s GHG emissions by sector for 1990, 2005, and 2018 (Figure 3 shows the values in percent by economic sector). The gross GHG emissions decreased by 9.5 percent from 2005 to 2018. The electricity sector showed the largest decrease in emissions from 2005 to 2018 (20.1 percent). During that period, industrial emissions decreased by 10.8 percent while transportation, natural gas and oil, and waste sectors showed modest decreases. Between 2005 and 2018, agricultural emissions increased by 21.3 percent (mostly methane and nitrous oxide), the highest increase in emissions among all sectors. The report shows that Wisconsin’s emissions reductions trends are not on track to meet statewide goals of fulfilling the Paris Agreement GHG reduction targets.

Land use, land-use change, and forestry (LULUCF) are also defined as GHG inventory sectors because these natural and working lands can add or remove carbon dioxide from the atmosphere and play a key role in the response to climate change. The

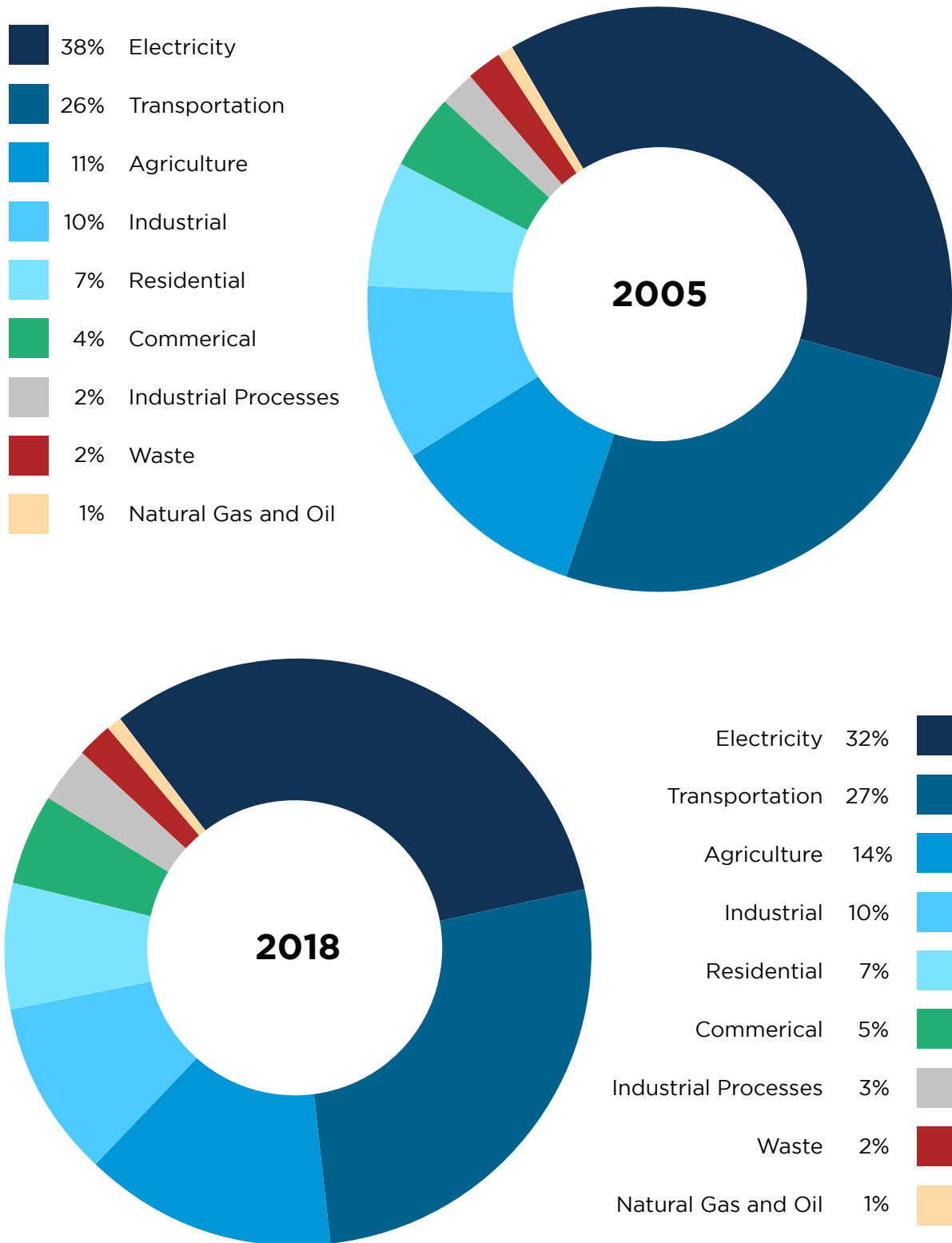
2021 Wisconsin Greenhouse Gas Emissions Inventory Report includes carbon storage estimates from natural and working lands. The LULUCF sector sequestered or stored 19.1 MMTCO₂E in 2018. Storing that amount of carbon is equivalent to removing the emissions from just over 4.1 million passenger vehicles driven on Wisconsin's roads over one year.

Table 1: Wisconsin GHG Emissions by Economic Sector (MMTCO₂E)

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

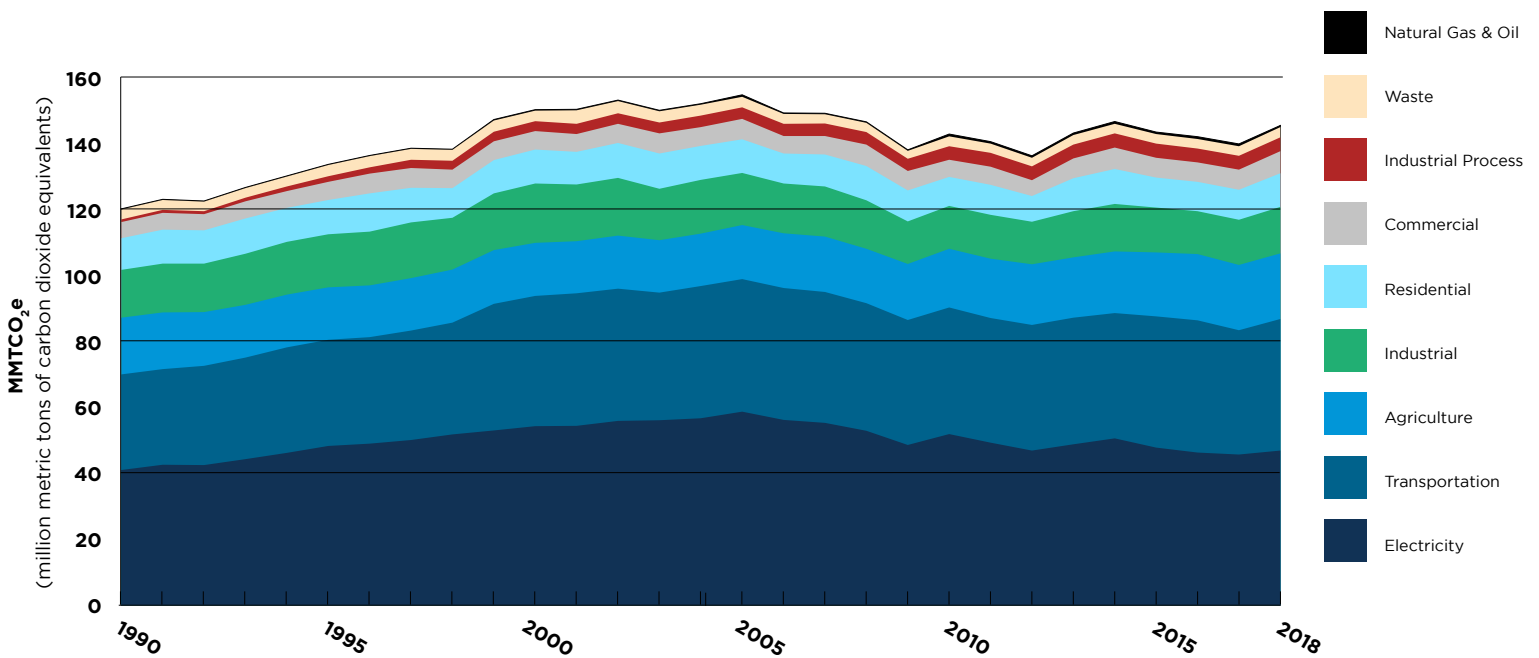
* Totals may not sum due to independent rounding.
Does not exceed 0.05 MMTCO₂E or 0.05 percent.

Figure 3 - 2005 and 2018 Wisconsin GHG Emissions by Economic Sector (Percent)



The figure below shows Wisconsin's emission trends from 1990 through 2018 by economic sector. Between 1990 and 2005, gross emissions in Wisconsin increased in all but three years. Many states, including Wisconsin, reached their emissions peak in 2005. From 2006 through 2012, GHG emissions trended downwards. Since 2013, emissions have trended upward.

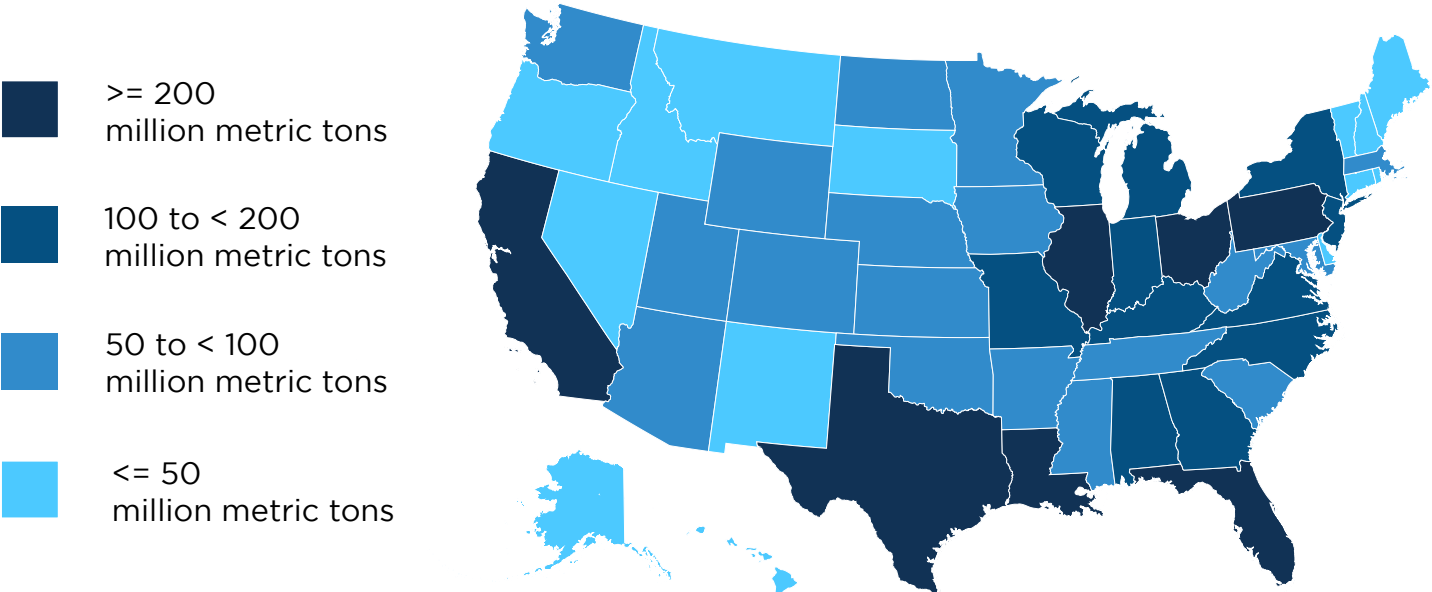
Figure 4 - Wisconsin GHG Emission Trends 1990-2018



Energy Sector Emissions

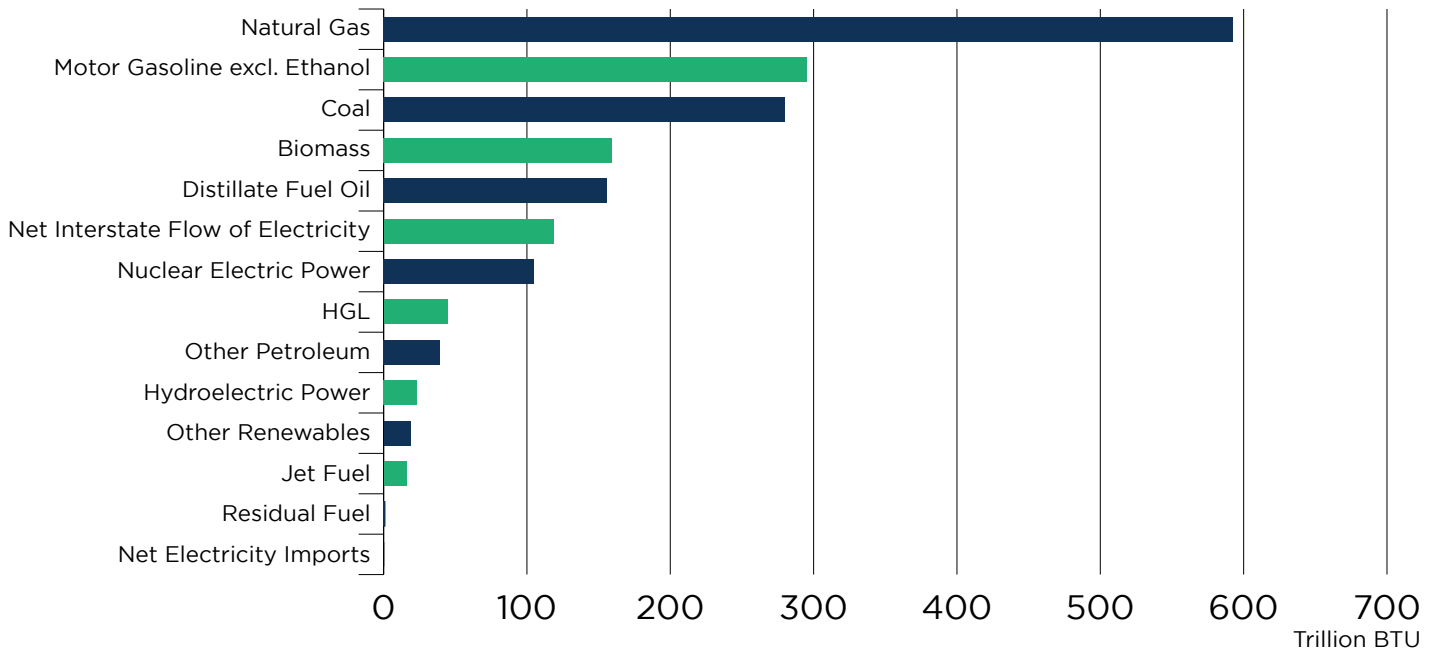
Midwest states (and rankings) including Iowa (25), Minnesota (21), Wisconsin (18), Missouri (12), Michigan (10), Indiana (8), Ohio (7), Illinois (6), rank in the top 25 states for highest energy-related CO₂ emissions in the country for a cumulative of 1,173.3 million metric tons, representing nearly a quarter U.S. total carbon emissions.

Figure 5 - U.S. Energy Sector CO₂ Emissions



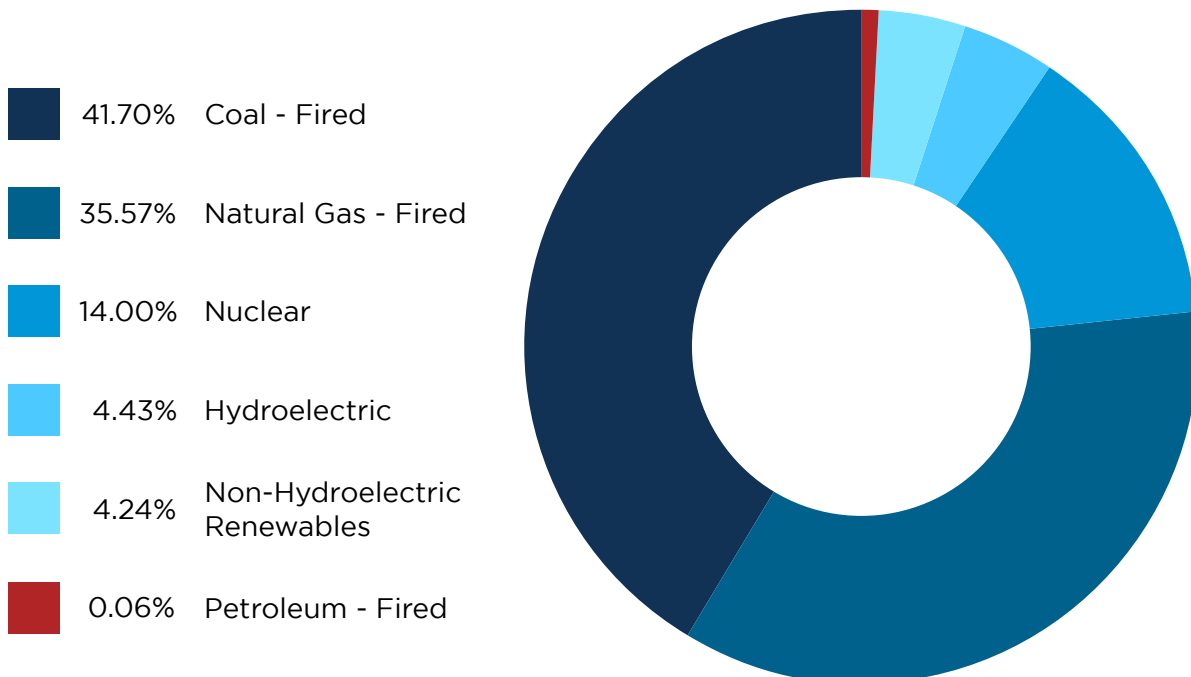
According to the EIA, the energy sector has the largest single source of GHG emissions through the burning of fossil fuels, including coal, oil, and gas. In 2019, burning fossil fuel for energy resulted in 92 percent of total U.S anthropogenic CO₂ being impacted by human activity. The state’s dependence on fossil fuels to meet its energy consumption needs contributes to regional, national, and global GHG emissions. Wisconsin’s 2019 energy consumption estimates below show a heavy reliance on coal, natural gas, and motor gasoline.

Figure 6 - Wisconsin Energy Consumption Estimates



The chart below shows the breakdown of Wisconsin’s 2019 electricity generation by fuel source, again showing a heavy reliance on coal and natural gas.

Figure 7 - Wisconsin Net Electricity by Source (Jun 2021)



Wisconsin Sectors

Power

The power sector is a professional industry that produces and distributes energy via power plants, transmission grids, etc. This industry is made up of electricity generators as well as combined heat and power (CHP) plants most of which sell electricity, or electricity and heat to the public.³⁷ In Wisconsin, electricity generation and imported energy, accounts for the largest share, at 32.2 percent, of GHG emissions in 2018.³⁸ As such, it is a critical focus on this sector in the push for clean energy and to address climate change impacts. The State of Wisconsin has a goal of 100 percent carbon-free electricity consumed by 2050. With increased electrification of buildings, transportation, and industry, decarbonization of the power sector will be necessary to support economywide reductions. In many ways, decarbonization of the power sector is less complicated than that of other sectors. Power sector emissions come from a relatively small, known set of sources, and the economics of pushing the power sector toward clean energy is easier to calculate. Encouragingly, there has been much movement in this regard.

According to the Midcontinent Power Sector Collaborative's (MPSC) *A Road Map to Decarbonization in the Midcontinent: Electricity Sector*, "The electricity sector is undergoing a significant change due to several market factors. Natural gas prices have been at historic lows and are expected to remain low. The costs of new solar and wind capacity have also continued to decline. Consumers—including many large business and government customers—are requesting low-or-zero carbon electricity. Investors are increasingly seeing financial and regulatory risk in burning fossil fuels without carbon capture ...".³⁹

Many utilities, including those in Wisconsin, set out substantial electricity carbon reduction goals, of which are 100 percent reductions by mid-century. Below are the goals of the largest investor-owned utilities (IOU) and other utilities located in Wisconsin:

Table 2: Wisconsin’s Utility Electric Generation Emission Reduction Goals

| Utility | Present Interim CO ₂ Reduction Goals | Present 2050 CO ₂ Reduction Goals |
|--|---|---|
| WEC Energy Group (WE Energies and WI Public Service) | 70% CO ₂ reduction by 2030 from 2005 levels | Net carbon neutral by 2050 from 2005 levels |
| Alliant Energy | 50% CO ₂ reduction by 2030 from 2005 levels | Net-zero CO ₂ emissions by 2050 |
| Xcel Energy | 80% CO ₂ reduction by 2030 from 2005 levels | 100% CO ₂ reduction by 2050 from 2005 levels |
| Madison Gas & Electric | At least 80% CO ₂ reduction by 2030 from 2005 levels | Net-zero CO ₂ emissions by 2050 |
| WPPI Energy | - | Targeting 100% CO ₂ emissions reductions by 2050 |
| Dairyland Power Cooperative | Reduce carbon intensity 50% by 2030 | - |

Regional Transmission:

Transmission serves as the “backbone of the clean energy grid,” enabling utility-scale solar and wind.⁴⁰ Wisconsin is part of the Midcontinent Independent System Operator (MISO), a non-profit, member-based Independent System Operator and Regional Transmission Organization responsible for balancing supply and demand for the wholesale power market. Wisconsin electricity providers participate in this market. MISO serves as the National Energy Regulatory Commission’s reliability coordinator which ensures electricity reliability in a 15-state footprint, including Wisconsin.

The Public Service Commission of Wisconsin (PSCW) and other electric system representatives work with the Organization of MISO States (OMS) to work with MISO and other states to fully participate in interregional processes and studies. The PSCW continues to collect information from utilities about distributed energy resources (DER) in Wisconsin. Working with OMS helps the state to better understand the increasing rate of DER and the potential impact on the electrical grid system. Since MISO is an independent agency, it is not under the direct control of Wisconsin or the other states within its footprint. The decisions made by MISO directly affect Wisconsin’s generation mix, transmission, and other clean energy issues.

Nuclear:

Currently, Wisconsin houses only one nuclear power plant, the Point Beach plant in Two Rivers. It has a nameplate capacity of 1,286 Megawatts (MW). Point Beach has two reactors that are licensed to operate until 2030 and 2033, respectively. In the short term, continuing to operate this plant substantially benefits Wisconsin's clean energy goals, as the plant comprises roughly 15 percent of the state's total electricity generation and roughly 63 percent of its clean energy generation in 2021.



Agricultural and Forestry

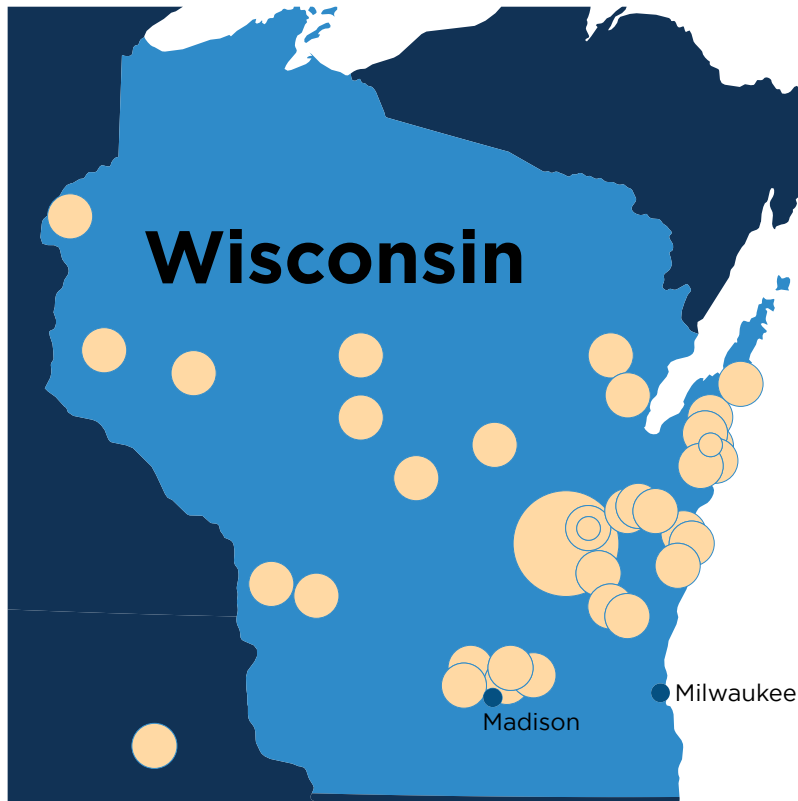
Agriculture is currently a net source of emissions, generating 14 percent of the total GHG emissions in Wisconsin, in 2018.⁴¹ Although the agriculture sector is a net source of emissions, farms hold great potential to generate negative emissions from

increased carbon sequestration and reduced emissions from operations through low-cost strategies, in addition to providing other critical societal benefits such as food, habitat, and economic growth. Additionally, Wisconsin's forests were a net sink of carbon (meaning it can absorb carbon from the atmosphere naturally). Combining LULUCF, these sectors sequestered 19.1 MMTCO₂E, in 2018.

Furthermore, biofuels from organic waste sources offer economic benefits to farmers and agribusiness, especially in Wisconsin, where agriculture and agribusiness are central to the state's culture and economy. The agriculture and forest products industries are vital to Wisconsin's economy contributing nearly \$130 billion annually. Clean Energy and carbon storage opportunities could help retain and grow jobs in the forest products industry, where recent years have seen a decline in growth and increased job loss. Reducing costs to these industries through a transition to clean energy can play an important role in their resilience.

According to Intergovernmental Panel on Climate Change, globally, over 100 years, methane emissions have a warming effect that is 28–34 times stronger than CO₂; over 20 years up to 86 times more potency than CO₂ and contribute to at least a quarter of gross warming.⁴² The *2021 Wisconsin Greenhouse Gas Emissions Inventory Report* shows between 2005 and 2018, the agricultural emissions increased by 21.3 percent (mostly methane and nitrous oxide releases from agricultural soils), the highest increase in emissions among all economic sectors. Wisconsin must look for opportunities to reduce methane emissions. An example of this is anaerobic digestion, which can convert the methane from manure into biogas for use as process heat or facility heating. Anaerobic digester facilities produce electricity using the biogas while a small percentage of these facilities have a cogeneration facility to produce heat and electricity together. According to the most recent biogas survey conducted by the PSCW, Office of Energy Innovation, the majority of the biodigesters in Wisconsin are installed in municipal wastewater treatment facilities (WWTFs) followed by dairy and agriculture sector-based biodigesters, food processing and industrial waste-based biodigesters, and landfills biogas systems. Anaerobic digesters utilize animal manure to generate methane that is used to create electricity and heat on the farm or for off-site use. The process can reduce odors, eliminate pathogens, and stabilize the nitrogen in the digested manure, creating multiple manure waste streams that can be more precisely utilized in the farm's crop and nutrient management systems to ensure efficient nutrient utilization while reducing the potential for water quality impacts. Locations of those facilities are highlighted in the figure below.

Figure 8 - Wisconsin Livestock Anaerobic Digesters

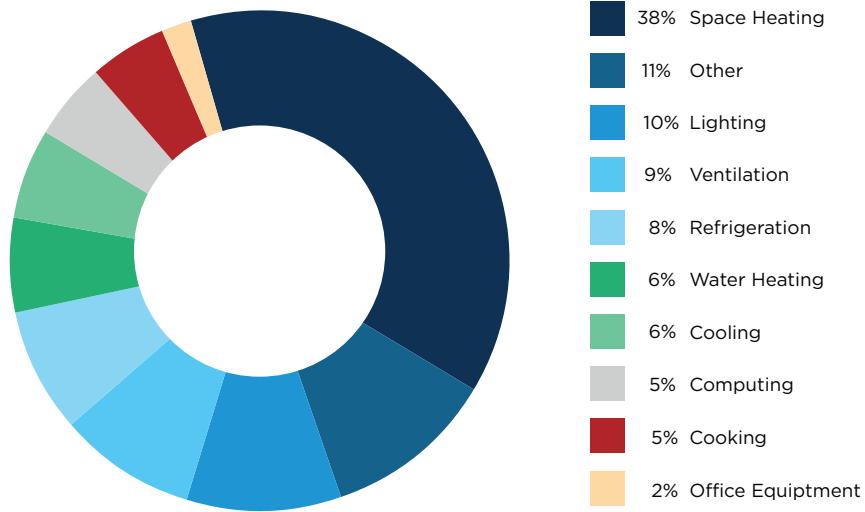


Buildings

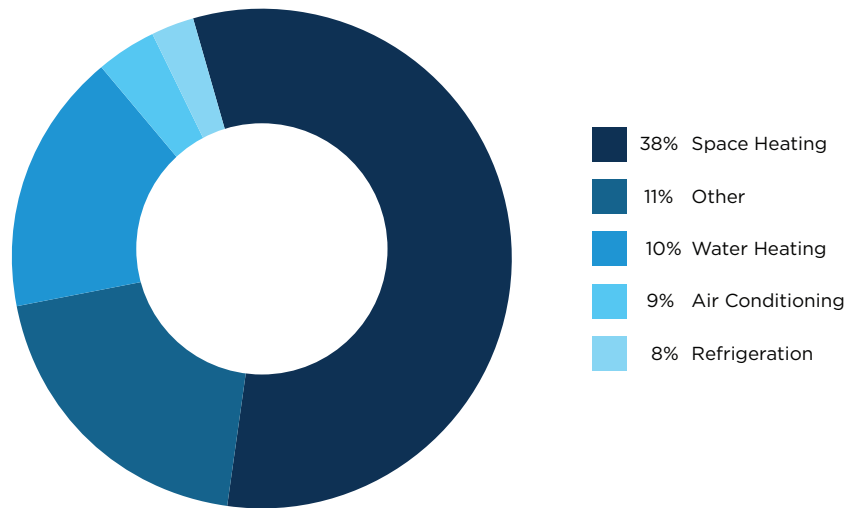
Direct emissions from commercial and residential buildings accounted for 11.6 percent of emissions in Wisconsin. Direct emissions in this sector are primarily the result of space heating and cooling, water heating, electronics, lighting, and other needs. These direct emissions are distinct from indirect emissions associated with electric generation needed to power buildings. Buildings are the fourth largest emitting sector in Wisconsin (after electric generation, transportation, agriculture).

Figure 9 - Wisconsin Residential and Commercial Energy Use and Heating

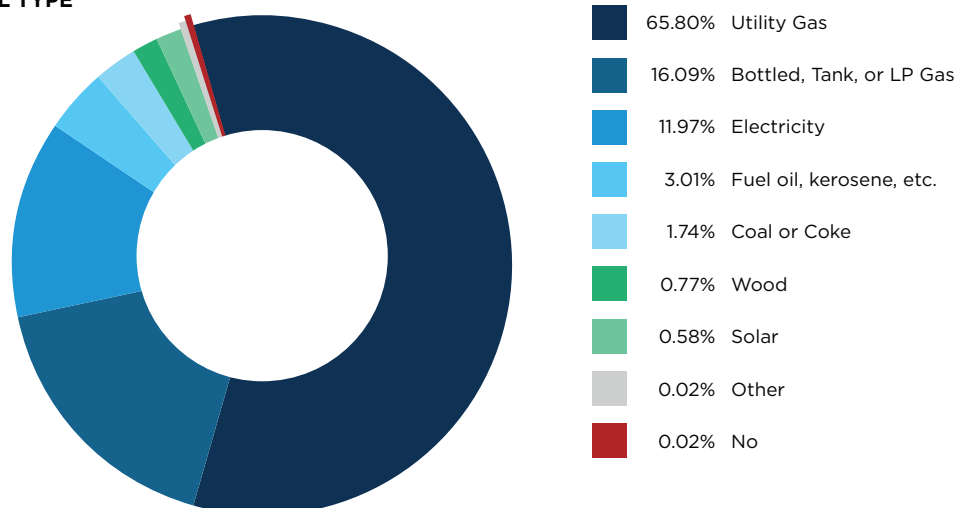
AVERAGE ENERGY CONSUMPTION BY END USE
COMMERCIAL



AVERAGE ENERGY CONSUMPTION BY END USE
RESIDENTIAL



RESIDENTIAL HEATING
BY FUEL TYPE



This significant portion of Wisconsin's emissions profile represents major opportunities to improve the state's energy end-use infrastructure. Pursuing opportunities in the commercial and residential sector (i.e., electrification) has the potential to reduce direct emissions subsequently reducing the impacts of climate change while supporting co-benefits like improved human health, economic development, equity, and resilience.

Industrial

According to the EIA, in 2019, Wisconsin's industrial sector, including agriculture and the energy-intensive manufacture of food and beverage products, accounted for the largest amount (32 percent) of the state's end-use energy consumption. Combining both the direct (on-site fossil fuel combustion) and indirect (off-site energy generation to power the buildings) emissions accounts for a significant GHG impact. For example, healthcare facilities, often classified as commercial and industrial, represent a large portion of buildings and roughly 10 percent of national GHG emissions.^{43,44}

In Wisconsin, direct emissions in the industrial sector were 12.5 percent, in 2018. Industrial GHG emissions have a direct impact on communities within proximity of a facility. Addressing GHG emissions in this sector will protect public health, ensure a just transition by creating good jobs for impacted workers and communities, and position Wisconsin as a leader in an innovative, low emitting manufacturing industry.



Transportation

Transportation sector emissions account for the second-largest share of GHG emissions in Wisconsin at 27 percent, in 2018. Emissions from the transportation sector are the direct output from the combustion of fossil fuels used to power vehicles. According to the MPSC report *A Roadmap to Decarbonization in the Midcontinent, Transportation Electrification*, "Carbon emissions in the transportation sector depend on the interplay of three primary factors: the carbon content of the fuel used to power vehicles, the efficiency of the vehicles, and how far the vehicles are driven, usually measured in vehicle miles traveled."

Cars, buses, trucks, off-road vehicles, commercial aircraft, boats, and rail all contribute to transportation end-use emissions. Strategies that avoid or reduce our fossil-fuel dependence are critical to creating a clean, resilient transportation system and directly addresses climate change in Wisconsin. Pursuing clean transportation solutions will result in economic, health, and social benefits including improved air quality, safer streets, local economic development, and improved access for low- and moderate-income communities.



COST OF INACTION

Health

Wisconsin needs to support the communities harmed and overburdened by the traditional energy system, and the system's correlated climate change impacts. Inequities in living conditions disproportionately place low-income communities and some communities of color at greater risk of the health impacts from climate change. Low-income communities and communities of color are more likely to be exposed to environmental toxins and poor air quality that increases the risk of respiratory illnesses and asthma exacerbation. Exposure to air pollution falls unequally on Black, Hispanic/Latino communities, and communities of color. The health outcomes of air pollution also affect Black Americans more, for whom rates of respiratory and cardiovascular illnesses are higher. Failure to address the health inequities associated with emissions results in missed opportunities to directly address the health of Wisconsin Indigenous, Black, Hispanic/Latino, Hmong American, Asian American, and other communities of color.

The University of Wisconsin-Madison, Center for Sustainability and the Global Environment (SAGE), Holloway Group conducted a preliminary screening on the air and health impacts of decarbonizing Wisconsin’s clean energy supply. The estimated emission changes across several sectors correspond to EPS modeling projections in which fossil fuel use declines from 83 percent down to 36 percent of supply through a suite of multi-sector policy options.⁴⁵ In addition to reducing CO₂ emissions, changes to the energy supply will also reduce particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), nitrogen oxides (NO_x), and sulfur oxide (SO_x) emissions. Figures 10 and 11 show the business as usual and CEP impacts of emissions reductions.

Figure 10 - NO_x and SO_x Emissions (Million Metric Tons)

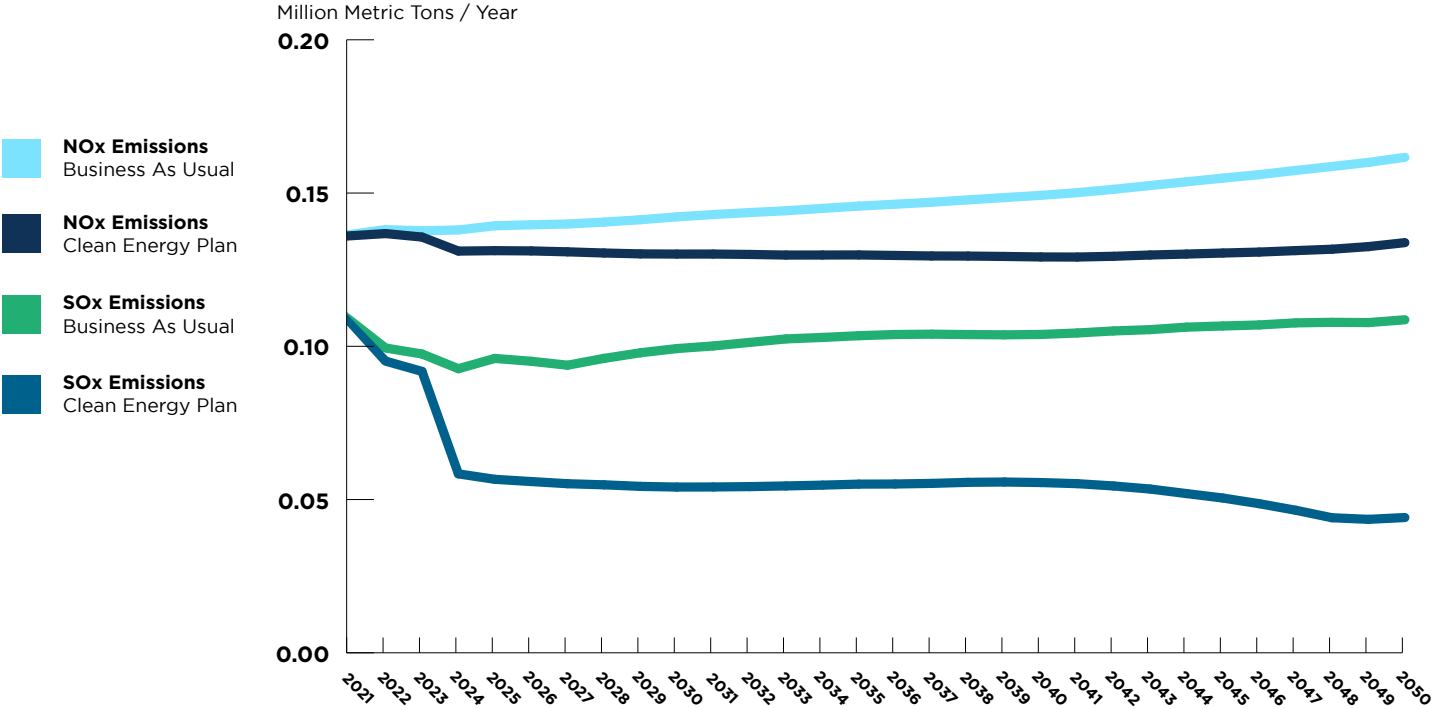
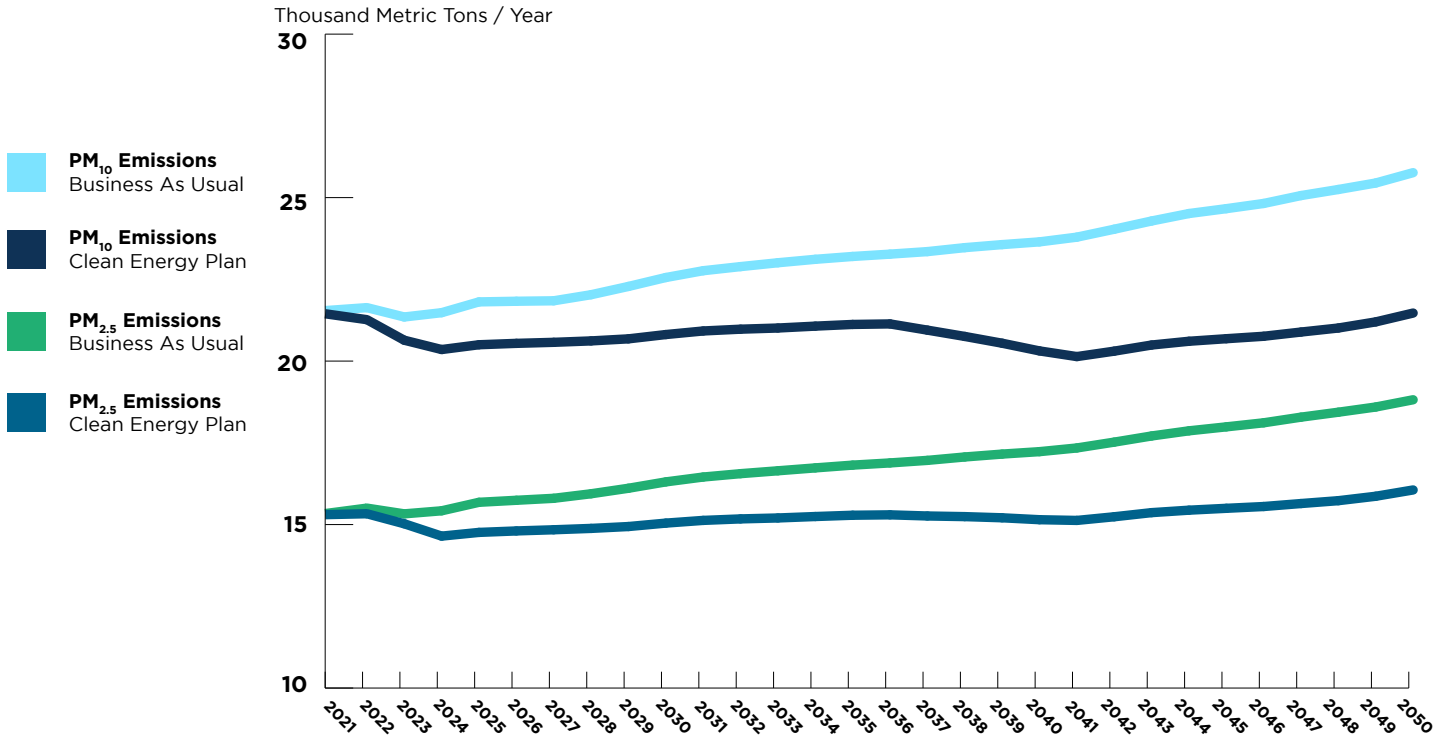
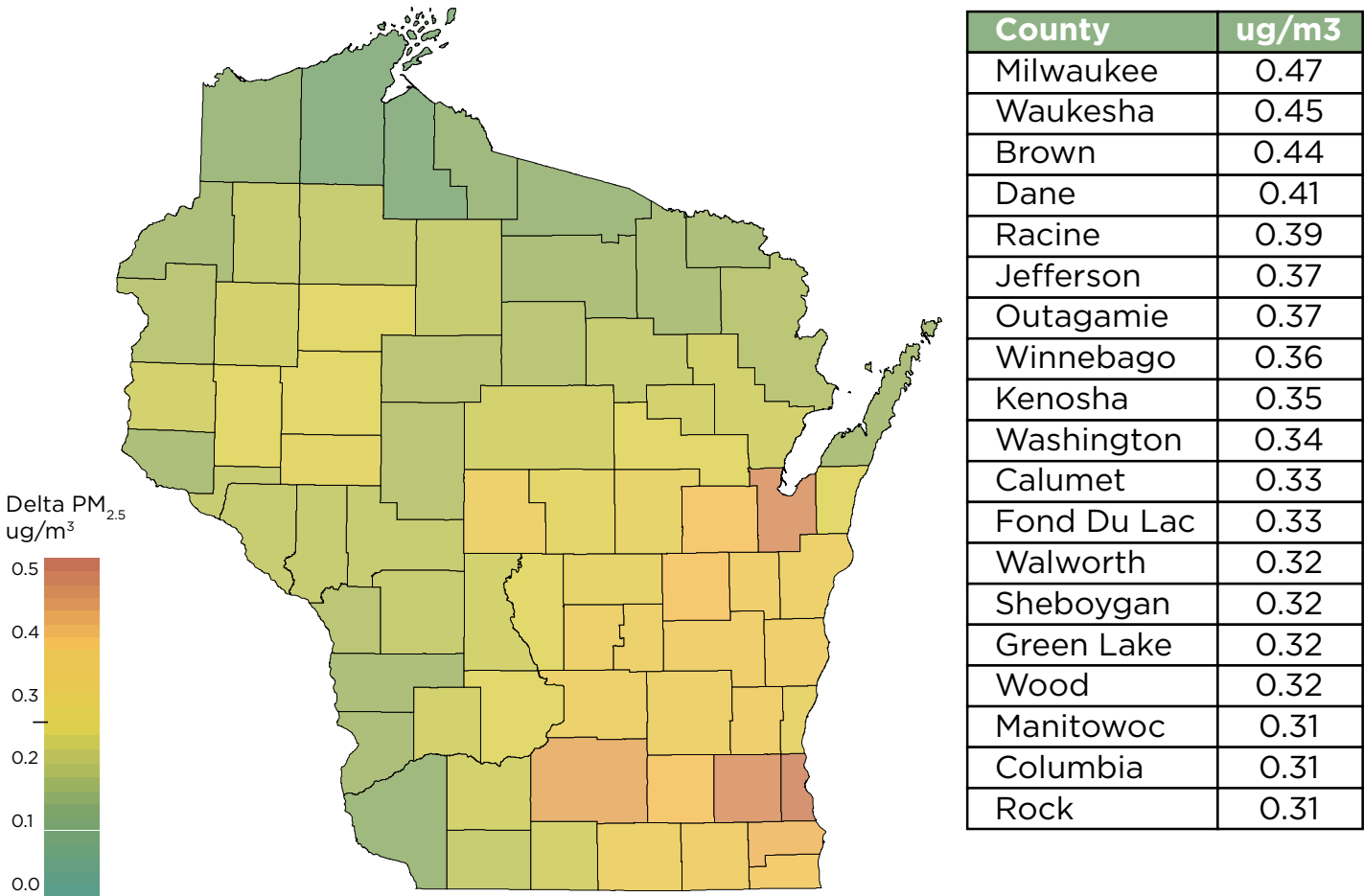


Figure 11 - PM_{2.5} and PM₁₀ Emissions (Thousand Metric Tons)



The 19 Wisconsin counties listed in the figure below were demonstrated to have the highest resulting reduction in PM_{2.5} pollution and are also home to 83 percent of Wisconsin’s people of color.⁴⁶ The estimation of benefits provided above should be considered preliminary and limited in scope.

Figure 12 - Estimated PM_{2.5} Concentration Improvements Resulting from 100% Clean Energy



U.S. EPA's COBRA Health Impacts Screening model estimates the potential air quality improvement and health benefits of reductions in emissions.⁴⁷ COBRA provides high and low estimates of premature death occurring in the modeled year and future years based on two epidemiological studies of the effect of PM_{2.5} on premature mortality. For the CEP, the COBRA-estimated premature mortality avoided was 102-231 deaths per year at full policy implementation. COBRA reported estimates for annual avoided hospital admissions, including for acute bronchitis (131), non-fatal heart attacks (9-11), other cardiovascular admissions (17), and asthma (36). Additional annual impacts estimated by COBRA include 11,900 avoided days of work lost to illness, 71,400 minor restricted activity days, and 6,570 instances of respiratory symptoms and asthma exacerbation.

The COBRA model reported annual financial benefits for Wisconsinites were \$78-\$247 million from avoided non-fatal health impacts and \$970 million to \$2.5 billion from avoided mortality. A simple extrapolation of these benefits assuming a linearly scaled implementation of energy system changes between 2023 and 2050 resulted in an estimated cumulative “cost of inaction” of between \$4.6-\$21 billion (net present value) using a 7 percent and 3 percent discount rate, respectively. The figure below shows the potential cumulative health benefits.

Figure 13 - Health Impact Benefits

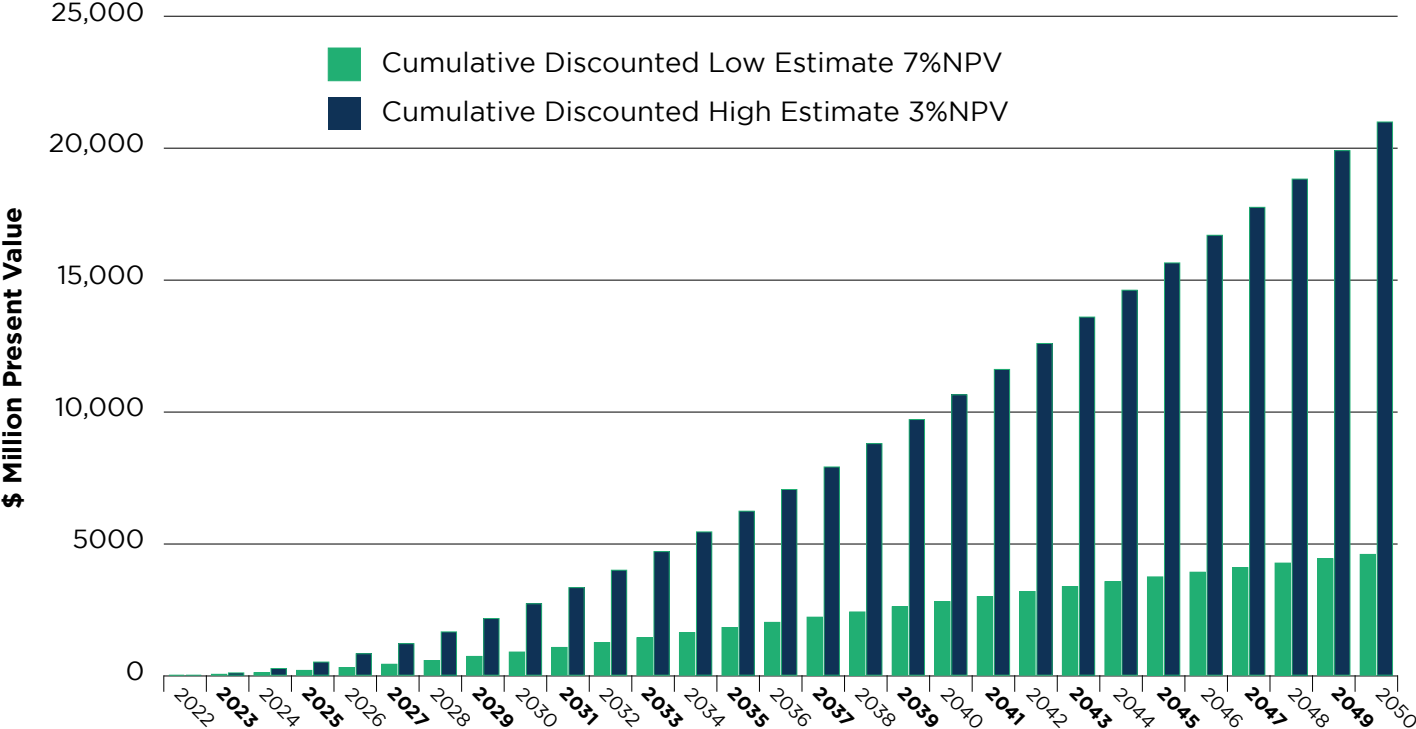


Table 3: Avoided Non-Fatal Health Impacts from One-year of Reduced Pollutant Exposure

| COBRA-Estimated Annual Health Benefit | Incidence | Benefits in Model Year (\$) | |
|--|-----------|-------------------------------|-----------------------------|
| | | 3% | 7% |
| Mortality | 102-231 | 1,084,277,426 - 2,454,767,230 | 965,748,653 - 2,186,422,117 |
| Nonfatal Heart Attacks | 9-81 | 1,431,565 - 13,250,705 | 1,390,717 - 12,872,614 |
| Hospital Admits, All Respiratory | 15 | 567,943 | 567,943 |
| Hospital Admits, Cardiovascular (except heart attacks) | 17 | 869,841 | 869,841 |
| Acute Bronchitis | 131 | 80,149 | 80,149 |
| Respiratory Symptoms | 4071 | 146,098 | 146,098 |
| Emergency Room Visits, Asthma | 36 | 20,363 | 20,363 |
| Minor Restricted Activity Days | 71403 | 6,194,927 | 6,194,927 |
| Work Loss Days | 11938 | 2,389,857 | 2,389,857 |
| Asthma Exacerbation | 2496 | 183,327 | 183,327 |

*MINOR RESTRICTED-ACTIVITY DAYS: Minor restricted-activity days (MRADs) occur when individuals reduce most usual daily activities and replace them with less-strenuous activities or rest, but do not miss work or school.

Cumulative benefits would decrease with consideration of the following:

- Exclusion of emission reductions that have already occurred since 2016, and
- Exclusion of future emission reductions caused by pre-existing plans or policies, such as scheduled retirement of existing power plants.

Cumulative benefits would increase with consideration of the following:

- Year-over-year analysis that accelerated emissions reductions from sectors that decrease faster rates than others (e.g., accelerated retirement of coal-fired generating resources),
- Population growth over the entire period of analysis, which would increase the number of persons would benefit from emissions reductions,
- Benefits accrued by the out-of-state population,

- Benefits resulting from reduced ozone formation, and
- Benefits resulting from reduced indoor air pollution from the electrification of home appliances and space- and water-heating equipment.

If Wisconsin does not make significant strides in reducing emissions the above cumulative health and economic impacts will not be realized; implementation of the CEP is vital.

Economy

Climate inaction in Wisconsin will have tremendous costs to our communities and economy – especially low-income communities and communities of color that face disparate impacts of climate change, our agricultural industries, statewide infrastructure, and our economy. The *2021 Wisconsin Initiative on Climate Change Impacts Assessment Report* concludes that extreme heat events will become more common as the climate warms. The reports show that the frequency of extreme heat events will increase by mid-century. For example, Green Bay has historically experienced about seven days per year when the daytime high temperature exceeds 90°F. By mid-century, Green Bay will likely experience 20 such days. Additionally, winter warming has been most pronounced in Northwest Wisconsin (+4-6 degrees F). Winter warming is also reflected in fewer extreme cold periods (below 0 degrees F). These cold-weather events have been getting less common, and this trend is predicted to continue.⁴⁸ In addition to warming, by the end of the century, Wisconsin residents will see an increase in energy burden, with a 15 percent net increase in their utility bills as we use more energy to cool indoor spaces in the summertime. Not only will unchecked warming lead to higher utility bills, but climate inaction will be costly for all aspects of Wisconsinites' lives.

Energy Expenses - Despite significant strides in the deployment of clean energy in Wisconsin, primarily through solar and wind development, Wisconsin continues to see significant energy end-use expenditures. Only a small percentage of the energy consumed in Wisconsin is produced in the state; therefore, most of the money Wisconsin spends on energy is sent out of state. This creates a significant annual spending deficit. In 2019, a study by the Center on Wisconsin Strategy concluded Wisconsin's energy spending deficit of \$14.4 billion, no substantial in-state fossil fuel resources, and continued reliance on fossil fuels is detrimental to the Wisconsin Economy⁴⁹. There is the need to invest in maximizing energy efficiency, invest in more clean energy in our state, and the infrastructure to also bring in cost-

effective renewable energy from outside of Wisconsin. Both in-state and out-of-state (transmission) clean energy resources are needed. The CEP aims to find the right balance by pursuing an “all-of-the-above” approach.

Figure 14 - Wisconsin End-Use Energy Expenditure, by Source (2019), Millions of Dollars

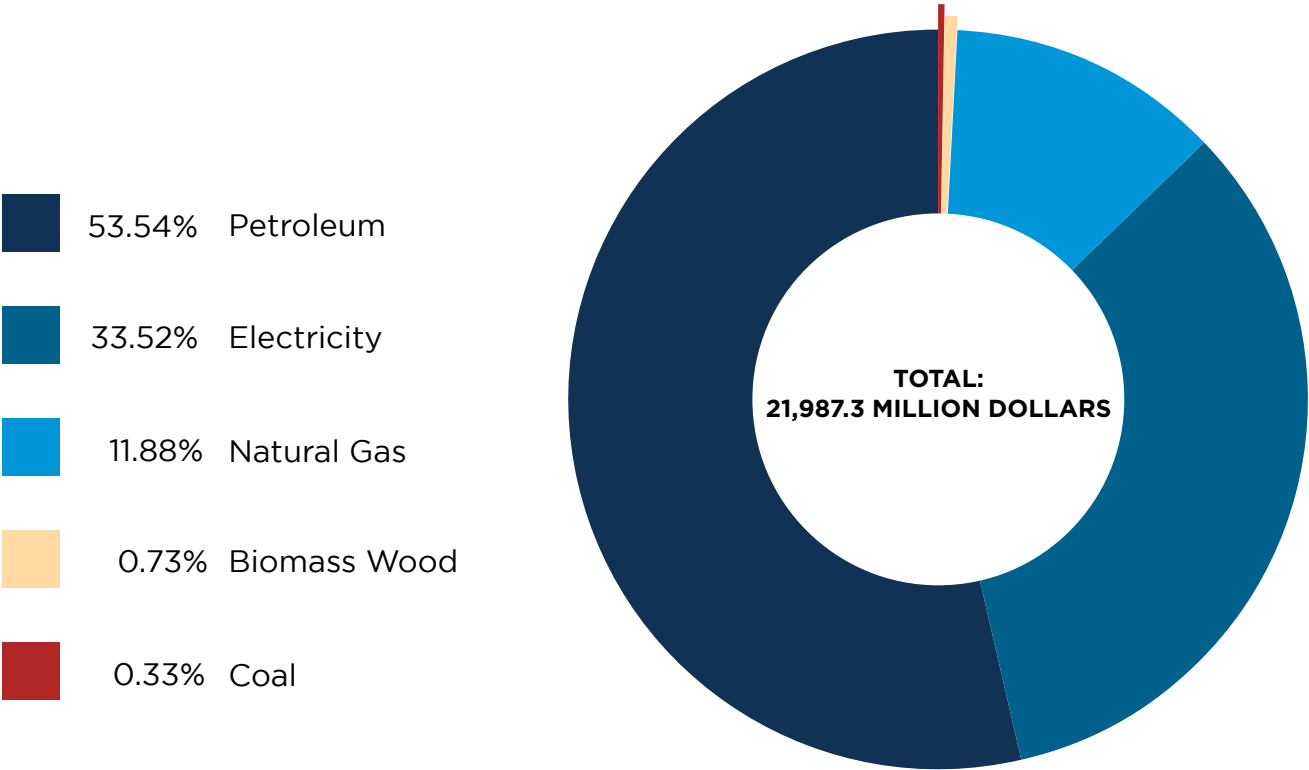
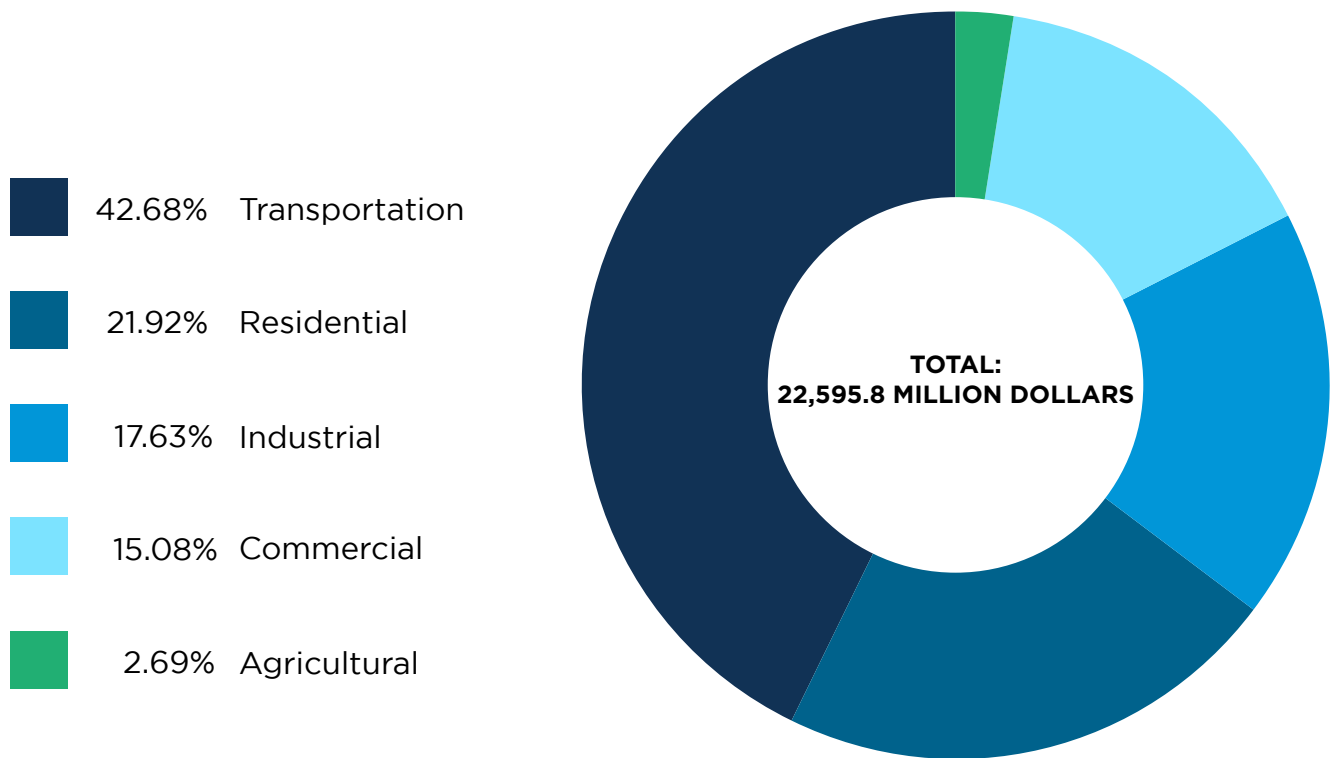


Figure 15 - Wisconsin End-Use Energy Expenditure, by Economic Sectors (2019),
Millions of Dollars



Agriculture, Forestry, and Tourism - While warmer temperatures may seem ideal in the wintertime, the stability of our environment is inextricably connected to the productivity of our agriculture. Agriculture is the center of much of Wisconsin's economic activity; Wisconsin produces a quarter of the country's cheese and is the second-largest producer of milk and butter. Warmer temperatures can reduce crop productivity and heat stress can decrease animals' ability to produce meat, milk, or eggs. Climate change in Wisconsin will also create more chances for intense rainfall events and drought periods, further stressing cropping systems and increasing the potential for erosion and nutrient losses from farm fields. Warmer weather will also impact forest health and productivity. Trees will require more water to take advantage

of longer growing seasons. Some tree species such as paper birch, balsam fir, black spruce, and aspen, will have reduced suitable habitat. There will be an increased risk of wildfire. Trees with shallow roots, such as sugar maple, may be more susceptible to root frost damage due to lower winter snowfalls. Forest will have more stress from forests pests and diseases. Changing weather patterns are also impacting the operability of timber harvests, shortening the winter season, and making it difficult to manage sites with wetter soils, which traditionally are harvested during frozen ground conditions.⁵⁰

In addition to being harmful to our agricultural and forestry sectors, warmer winters will decrease the economic activity from winter tourism due to the potential for reduced snowfall amounts. For example, Wisconsin (along with Minnesota and Michigan) leads the country in snowmobile registrations. The ski and snowmobile industries alone are worth an estimated \$2.1 billion in value-added to the Midwest's economy. As our winters continue to become warmer and shorter, Wisconsin residents will experience less value added to their economy through winter tourism.

Environmental Justice

Historically, Tribal Nations and Indigenous communities, Black, Hispanic/Latino, Hmong American, Asian American, other communities of color, people who have low incomes, people with disabilities, immigrants, women, senior residents, veterans, and rural communities have been left out of the conversation on transforming our country's energy system and transitioning to clean energy. In seeking to mitigate climate damage, these communities must be involved in decision-making on clean energy technologies, jobs, financial impacts, and health impacts. Wisconsin's population is made up of 80.9% White, 7.1% Hispanic/Latino, 6.7% African American, and 3.2% Asian American.⁵¹

People of color are more likely to live near highways, refineries, and airports, exposed to 50 percent higher rates of pollution than the general population, and, most strikingly, African Americans are exposed to 1.54 times more hazardous pollution than White Americans, regardless of income.⁵² People of color are also more likely to live in low-income communities that carry a higher risk of premature death from exposure to fine particulate pollution.⁵³ A recent report ranked Wisconsin the number one state in the country with the most people, 37 percent of the population, living near toxic release facilities.⁵⁴ Many of these communities are not aware of the impact that this release has on their health and economy.

Additionally, the American Lung Association publishes a State of the Air Report Card for States and Counties. Table 4 shows the summaries of Wisconsin’s Report Card for populations at risk based on age, illness, poverty, and persons of color.

Table 4: Wisconsin Populations at Risk⁵⁵

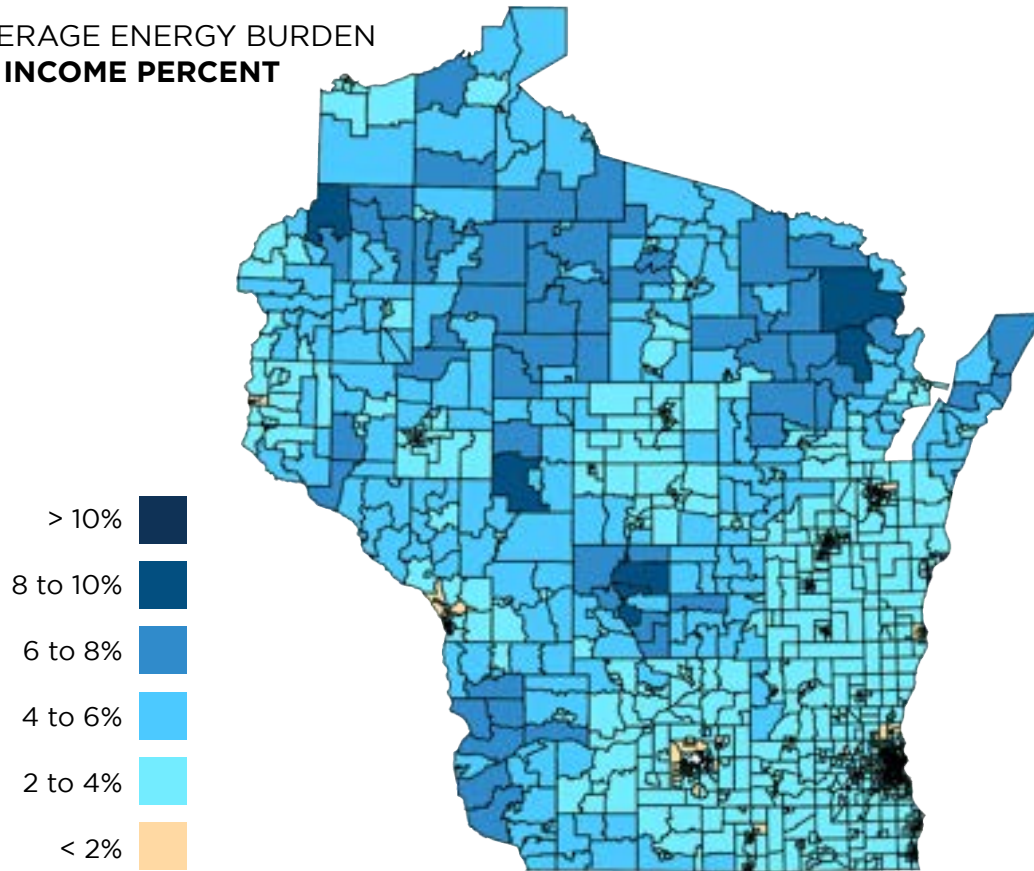
| Total Population | 5,822,424 |
|--|-----------|
| Under 18 | 1,266,597 |
| 65 and over | 1,107,243 |
| Pediatric Asthma | 53,807 |
| Adult Asthma | 463,997 |
| Chronic Obstructive Pulmonary Disease (COPD) | 256,176 |
| Lung Cancer | 3,267 |
| Heart Disease | 335,616 |
| Ever Smoked | 1,925,979 |
| Poverty | 591,405 |
| People of Color | 1,113,369 |

The development of the traditional energy system has focused on overall costs and emissions, leaving some residents behind and others suffering a disproportionate burden of the energy system. Energy burden is the amount of the total income in a household that is used to cover energy costs. The average Wisconsin household’s energy burden is outlined in the table below.

Table 5: Wisconsin Energy Burden

| | Wisconsin (Average) | County (Range) | Census Tract (Range) |
|------------------------------|---------------------|--------------------|----------------------|
| Annual Household Energy Cost | \$2,062 | \$1,534 to \$3,711 | \$619 to \$4,903 |
| Energy Burden | 3.7% | 2% to 7% | 1% to 10% |

**AVERAGE ENERGY BURDEN
BY INCOME PERCENT**



Different communities bear a heavier energy burden than others. To demonstrate this, the maps below, derived from data available from U.S. EPA's EJ Screen, illustrate the overlap between three metrics: traffic density, percent people of color, and populations with low incomes. Traffic density, the environmental index, is measured as the count of vehicles on roads within a certain distance of the neighborhood. Percent low-income and percent people of color represent the ratio of those groups to the total population in the neighborhood. These two demographic values are averaged to create one demographic index for each neighborhood. The percentiles in the maps ultimately illustrate how the combination of the demographic and environmental indices in each neighborhood rank compared to state averages. For example, a 95 percentile suggests that the neighborhood has a higher combined index than 95 percent of the neighborhoods in the state. Each major metropolitan shows neighborhoods with percentiles over 90, which illustrates that people with low incomes and people of color are often living near major highways in the state and facing the adverse air quality impacts from traffic.

Figure 16 - Example Air Quality Impacts from Traffic

Kenosha/Racine

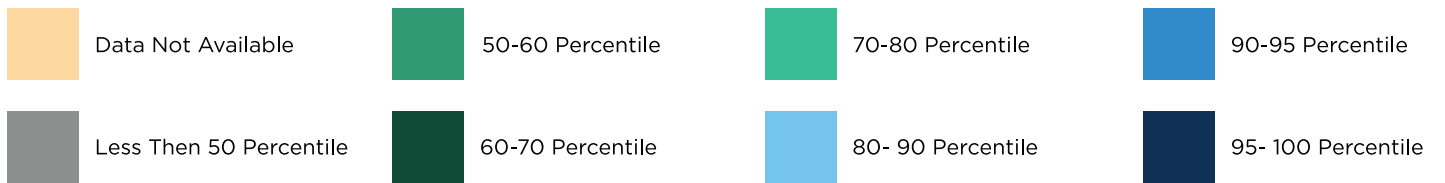
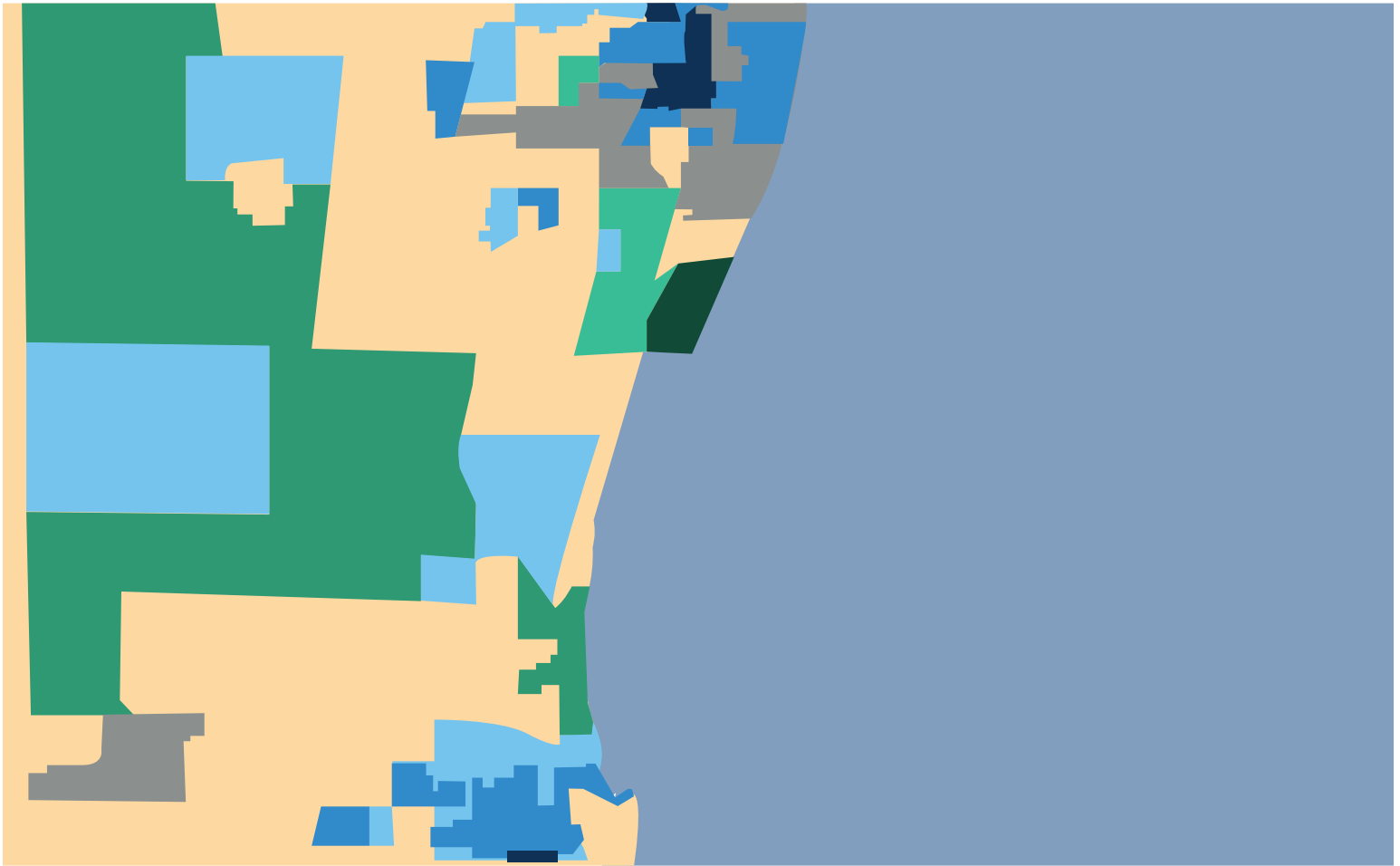
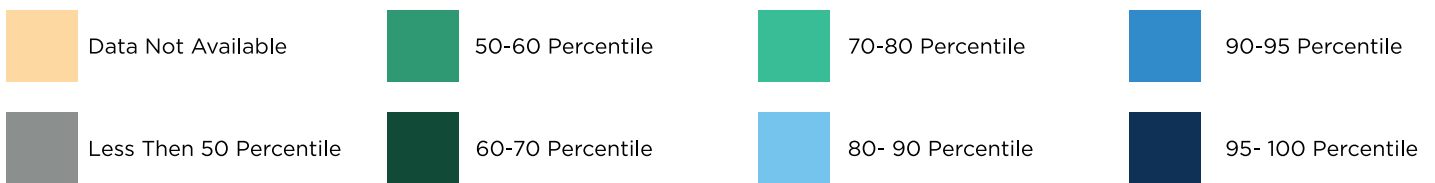
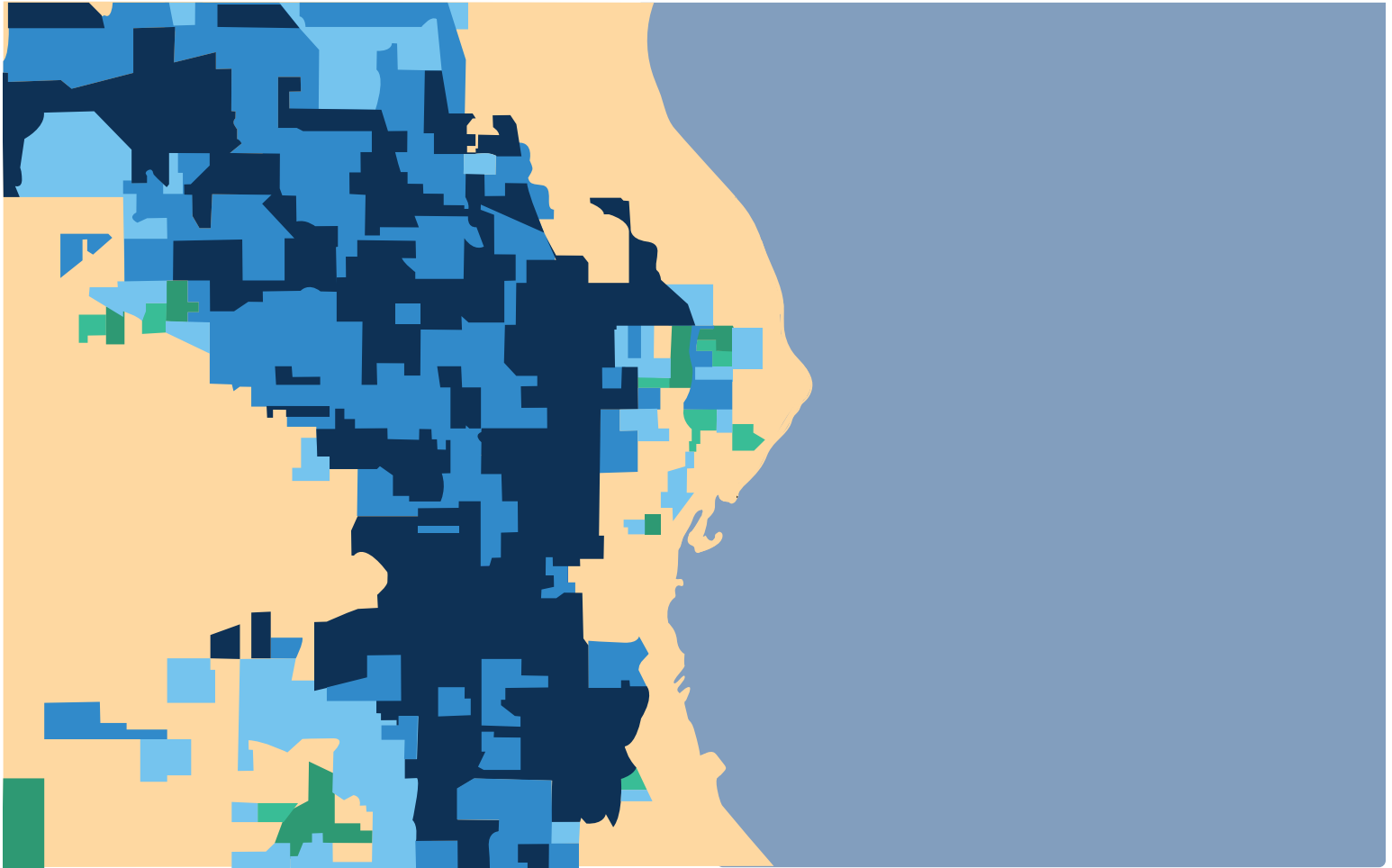


Figure 16 continued

Milwaukee



Inequities in living conditions disproportionately place low-income communities and some communities of color at greater risk of the health impacts from climate change. Low-income communities and communities of color are more likely to be exposed to environmental toxins and poor air quality that increases the risk of respiratory illnesses and asthma exacerbation. Low-income communities along with other populations in Wisconsin who are disproportionately impacted by air quality and climate change will benefit the most by the development of accurate metrics

and data which could support the development of new programs (e.g., via Focus on Energy®, or utility-sponsored programs). These programs could help shift or reduce the energy peak, align energy efficiency with carbon reduction goals, align energy consumption with zero-carbon generation, and improve the affordability of clean energy deployment.

Identification of GHG emissions sources and their accurate reporting will also provide important information regarding criteria pollutants and resultant negative health impacts. This should allow for better mitigation of negative health impacts in low-income, environmental justice, and other disproportionately impacted communities.



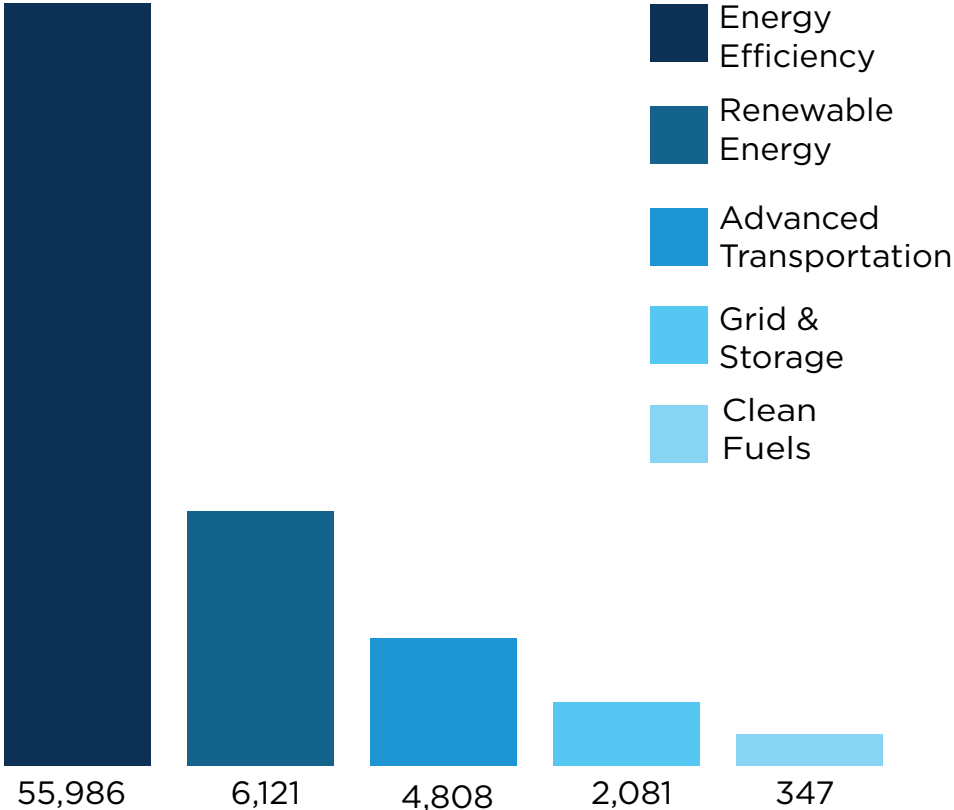
Workforce Development

Nationally, clean energy jobs continue to make up an increasing share of total energy sector employment.⁵⁶ Energy efficiency already employs more than one out of every three U.S. workers in the overall energy industry.⁵⁷ Wind service turbine technicians and solar photovoltaic installers are the number one and number three fastest-growing occupations.⁵⁸ Additionally, many jobs in the clean energy economy are available to workers with high school education, limited college, or an associate's degree—such as construction, electricians, maintenance. Compared to similarly educated peers in other industries, they tend to earn higher wages.⁵⁹ For instance, over two-thirds of clean energy jobs are in construction and manufacturing.⁶⁰

According to the *2021 Clean Jobs Midwest Report*, the Midwest is poised to see a substantial increase in its energy workforce.⁶¹ After a slight downturn in jobs during the pandemic, the Midwest is seeing an improvement; more than 22 percent of the

U.S. clean energy jobs are in the region. The Midwest report notes that clean energy companies employed 677,000 people, of which 69,343 of whom are in Wisconsin. These jobs are in energy efficiency (55,986), renewable energy (6,121), advanced transportation (4,808), grid and storage (2,801), and clean fuels (347). The fastest-growing sector is in advanced transportation, seeing more than 4 percent job growth. Small businesses made up 69 percent of the clean energy sector and in 2020, 12 percent of clean energy workers were veterans.

Figure 17 - Wisconsin Clean Energy Jobs



The report also notes that “States and municipalities across the Midwest can also expand clean energy jobs by enacting state policies that support renewable energy, energy efficiency, and electric vehicles. These policies can help create thousands of new jobs as the post-pandemic recovery kicks into gear. State lawmakers should also include equity, wage, and benefit considerations when they consider clean energy projects and policies.”

A significant benefit of Wisconsin's energy transition will be employment and business growth opportunities across the clean energy and energy efficiency sectors. As Wisconsin continues to recover from the effects caused by the COVID-19 pandemic, investing in a clean economy can spur sustained job creation and economic growth for the state. This CEP aims to ensure that Wisconsin business owners and employees have a lead role in building our clean energy infrastructure, installing energy efficiency equipment, and maintaining these technologies statewide. However, while demand for these employees in our state is growing rapidly, businesses are struggling to find trained professionals. The CEP will address this issue directly through targeted strategies.

Furthermore, Wisconsin has yet to achieve conditions that effectively support members of Tribal Nations, women, veterans, individuals with low incomes, Black, Hispanic/Latino, Hmong American, Asian American, and individuals from vulnerable communities to pursue employment and business ownership in this field. Wisconsin must achieve an inclusive and equitable clean energy workforce through a clean energy workforce development program to systematically train and prepare workers for the nation and state's transition to clean energy. Opportunities should include training, apprenticeships, and high-paying jobs for such workers. This also may include requirements such that businesses that benefit from state clean energy policies and incentives must have a workforce from the state and that is reflective of the populations specific to the regions of the state.

Just Transition

Wisconsin must address a just transition from traditional fossil fuel energy generation and use. For some years, coal plants around the country and in Wisconsin have been closing due to several factors, including the low cost of natural gas, the dramatic reduction in the cost of renewable generation, environmental regulation, and demand from customers for cleaner energy. None of those trends is likely to reverse and if federal and/or state policy should result in a price on carbon, more coal-fired power generation facilities will close.

While the Midwest has seen growth in clean energy jobs, many still do not offer the same level of economic security for families in these rural areas. Further, they are not often available in the same communities.

Utility jobs being displaced often offer some of the best wages, benefits, and working conditions in their area. Loss of these jobs can have a significant impact on the individual workers and their families. While the Midwest has seen growth in clean energy jobs, many still do not offer the same level of economic security for families in these rural areas. Further, they are not often available in the same communities. We must be intentional in ensuring family-sustaining jobs are made available—whether in the clean energy field or elsewhere—to the workforce in rural and mid-sized communities whose jobs may be displaced.

Additionally, the closing of these fossil fuel facilities results in a loss of jobs, both direct and indirect, in the host communities. Quite often, these plants are among the top, if not the single highest, taxpaying entities in their locations. As such, these municipalities and counties will see a significant loss of revenue. Closed coal-fired generation facilities will need to be appropriately restored for subsequent use and any environmental hazards will need to be remediated. This includes any coal ash ponds on the site. There are regulations for this cleanup. Issues surrounding demolition are sensitive with retired coal facilities, especially when the plant is in an urban area.



PATHWAYS AND STRATEGIES

Four key pathways emerged to create momentum towards a clean energy economy, these are:

- **Accelerate clean energy technology deployment**
- **Maximize energy efficiency**
- **Modernize buildings and industry**
- **Innovate transportation**

Below are additional ways the CEP ensures an inclusive transition:

- Prioritizing health equity, environmental justice, and equitable economic development,
- Fast-tracking workforce development and just transition, and
- Accelerating government-led efforts (Lead-by-Example).

For each of the pathways, strategies were identified as:

- *Immediate Action*: strategies that will be integrated into a work plan to commence work in the near term;
- *High-Impact*: those strategies that will result in the greatest GHG reductions, may

be implemented immediately or over a longer period, and may be informed by the work completed by the immediate action strategies; and

- *Future*: strategies that are important to cite, but do not fall into either the high-impact or immediate action designations and will be taken up later.

Additionally, where a strategy was recommended by the Governor’s Task Force on Climate Change (***GTFCC Rec - followed by the recommendation number***) or proposed as part of the 2021-2023 Executive Budget, those have been identified accordingly.

PRIORITIZE HEALTH EQUITY, ENVIRONMENTAL JUSTICE, AND EQUITABLE ECONOMIC DEVELOPMENT

The CEP delivers strategies to advance environmental justice and maximize equity of economic, health, and social benefits associated with the state's transition to clean energy. The following themes guided the development of strategies in this section:

Community Engagement and Partnership - As Wisconsin anticipates economic growth and health benefits from the clean energy transition, it is necessary to engage all Wisconsinites through multiple channels and pathways to hear their voices and ensure the benefits of this transition are felt by all.

An example of this is increasing collaboration between utilities and stakeholders, a recommendation from the Wisconsin Energy Distribution and Technology Initiative (WEDTI) Report. This is the product of a year-long effort "to explore changes happening to and within the electric energy sector, and to develop Wisconsin-specific approaches to addressing them, with a focus on technology deployment and innovation." The effort involved a "stakeholder group that represents a broad spectrum of interests in grid modernization and technology, including investor- and consumer-owned utilities, regulators, consumer advocates, environmental advocates, state and local governments, businesses, economic developers, and academic researchers."⁶²

Increased collaboration between utilities and stakeholders can help improve the decisions that are made as well as the efficiency of the processes before the PSCW. It is especially important on measures such as electric vehicle deployment and resource planning, among others. If voluntary measures do not result in the desired involvement of more stakeholders, the PSCW may prescribe additional measures to enhance collaboration.

The WEDTI report also indicates that effective collaboration should be a multi-directional, transparent conversation, with such conversations documented. In addition, efforts must be made such that people in low-income, environmental justice, and Tribal communities are meaningfully involved in conversations, processes, and decisions. Those involved in developing and implementing the recommendations in this report should lean on community leaders and community-based organizations.

They have strong relationships of trust with local communities to help engage individuals and families in conversations about what they want their energy future to look like.



Equity, Inclusion, and Environmental Justice - Historically, low-income communities, communities of color, and Tribal and Indigenous peoples have borne the most dramatic consequences from climate change, energy dependency, and energy unreliability. This trend has manifested in both the environmental degradation of many communities and, in many of those same communities facing a far greater energy burden than others, with higher rates of morbidity and mortality associated with air and water toxins, economic hardship, and social-emotional consequences. Voices from these communities, as well as women and veterans, have been left out of the conversation on transforming our country's energy system and transitioning to clean energy. The CEP aims to ensure the fair and meaningful involvement of all communities in the state.

Financing - Increased financing and flexibility options allows more residents to join the new clean energy economy. Developing innovative financing options will help to address any cost barriers, thus increasing affordability and enabling greater access to clean energy technologies by more Wisconsinites.

Jobs and Training - One of the greatest benefits of Wisconsin's clean energy transition will be the growth of clean energy jobs across renewable energy and energy efficiency, including, but not limited to, the manufacturing of clean energy products and installation of clean energy infrastructure. The state needs to address the expected decline of fossil fuel jobs, such as those at coal-fired power plants, and identify pathways to provide high-paying, family-sustaining jobs in the clean energy field for these workers. Wisconsin aims to maximize the clean energy opportunities

for the local workforce. Furthermore, the state must work to intentionally provide clean energy job opportunities for those excluded from the energy economy.



IMMEDIATE ACTION STRATEGIES

Launch an Equity First Program. This CEP has many goals and principles, but none is more important than ensuring that the strategies employed to transition Wisconsin to a clean energy economy put equity first. We know that this CEP must be intentional, ensuring that the economic, health, environmental, and security benefits of clean energy accrue to communities disproportionately impacted by climate change. Therefore, this CEP calls for a novel, comprehensive, and holistic statewide program to deliver the broadest range of clean energy technologies and services to the homes and businesses of those that need it most. The program will:

1. Establish vitally needed program definitions, goals, evaluation, measurement, and verification practices in consultation with communities of color leaders, industry leaders, and the U.S. Department of Energy's (DOE) Office of Energy Justice Policy and Analysis.
2. Provide a holistic approach to deliver the widest variety of clean energy technologies and services including energy efficiency, renewable energy generation, low-to-no-carbon transportation options, clean infrastructure, and others.
3. When delivering technologies and services, work to ensure that to the greatest extent possible the jobs created because of this program are jobs created in the communities being served.
4. Use the clean energy resources delivered through this program to enhance more basic and critical services such as health care, employment, safety, healthy food, etc.
5. Engage with community members and local leaders in program design and implementation.
6. Be supported by all existing clean energy program providers in the state including utilities, other clean energy business providers, other programs (i.e., weatherization, Focus on Energy® program), local government, and local human service providers.

Prioritize engagement and environmental justice for all applicable renewable energy, energy efficiency, electrification, and clean transportation policies and projects as part of the CEP.

To establish a just and equitable energy transition, the OSCE will measure each strategy in the CEP against a set of guiding principles from human rights and health advocacy organizations, including how it addresses the needs of communities impacted by climate change. The CEP takes into consideration these principles, along with additional health and justice principles, to:

1. Refrain from exacerbating energy burden, including community design that promotes health and resilience and reduces energy demand and burden.
2. Refrain from exacerbating existing health inequities or transferring health burdens to other populations or locations during the clean energy transition.
3. Ensure equal access to income, employment, and business growth opportunities.
4. Help stabilize populations affected by investments in the built environment (gentrification and displacement) and avoid exacerbating these risks.
5. Mitigate the health risks associated with substandard housing, industry, transportation, and exposure to pollutants.
6. Mitigate environmental risks based on geographic location.
7. Transition to clean energy sources quickly to improve health outcomes.
8. Reduce the risks of urban heat island effects (e.g., risks of death and other impacts of extreme heat).
9. Quantify health and work loss costs of continued fossil fuel use and health savings under clean energy scenarios in all fiscal analyses.
10. Identify engagement planning and resources to support meaningful engagement of communities to reflect the unique perspectives, priorities, and expertise of affected people.

OSCE will evaluate and continue to gather data and metrics to evaluate each strategy over a defined cadence (months, quarters, or years depending on the strategy) following implementation.

Develop, coordinate, and promote robust clean energy education and outreach efforts across the state.

OSCE will work with stakeholders to deploy an energy education campaign to ensure that everyone, including businesses, farmers, local governments, students, communities of color, Tribal Nations, and low-income communities, has access to information about clean energy benefits, opportunities, and employment.

Invoke Aarhus Convention at a state level to create inclusive stakeholder input practices.

State agencies should address:

- Access to environmental information: the right of residents to receive

environmental information that is held by public authorities.

- Public participation in decision-making: the right of residents to participate in preparing plans, policies, and legislation that may affect the environment.
- Access to justice in environmental matters: the right of the residents to have access to review providers when their rights concerning information or public participation have been violated.⁶³

Utilize the Wisconsin Environmental Equity Tool (WEET) in ongoing education, program, and policy development related to the clean energy transition.

State agencies will use WEET, a mapping tool currently under development, to fully understand real-world experiences, especially in Wisconsin's communities of color, low-income communities, rural communities, Tribal Nations, and immigrant communities. These communities have been identified as being overburdened with the greatest environmental and health consequences and inequities. This tool will be used to identify priority geographic areas where the state can focus local and state programs and policies to advance environmental equity. The tool can also be used to inform funding priorities and increase outreach and awareness in impacted communities.



FUTURE STRATEGIES

Create an Office of Environmental Justice. The state should pursue creating an Office of Environmental Justice (OEJ) that will facilitate collaboration across state agencies and engage with environmental justice advocates, communities of color, Tribal Nations, and populations with low incomes. The OEJ will design and help implement clean energy and climate policies that reduce emissions and pollutants and address the cumulative and deadly impact of their concentration within those communities. OEJ will secure funding to assist municipalities and Tribal Nations to develop plans to become carbon-free by 2050 or sooner. *(2021-2023 Executive Budget, GTFCC Rec #1)*

FAST TRACK WORKFORCE DEVELOPMENT AND JUST TRANSITION

A significant benefit of Wisconsin's energy transition will be employment and business growth opportunities in clean energy and energy efficiency. While this transition holds tremendous economic opportunity for Wisconsin families and communities, there are outstanding issues that will need to be addressed to fully realize the potential:

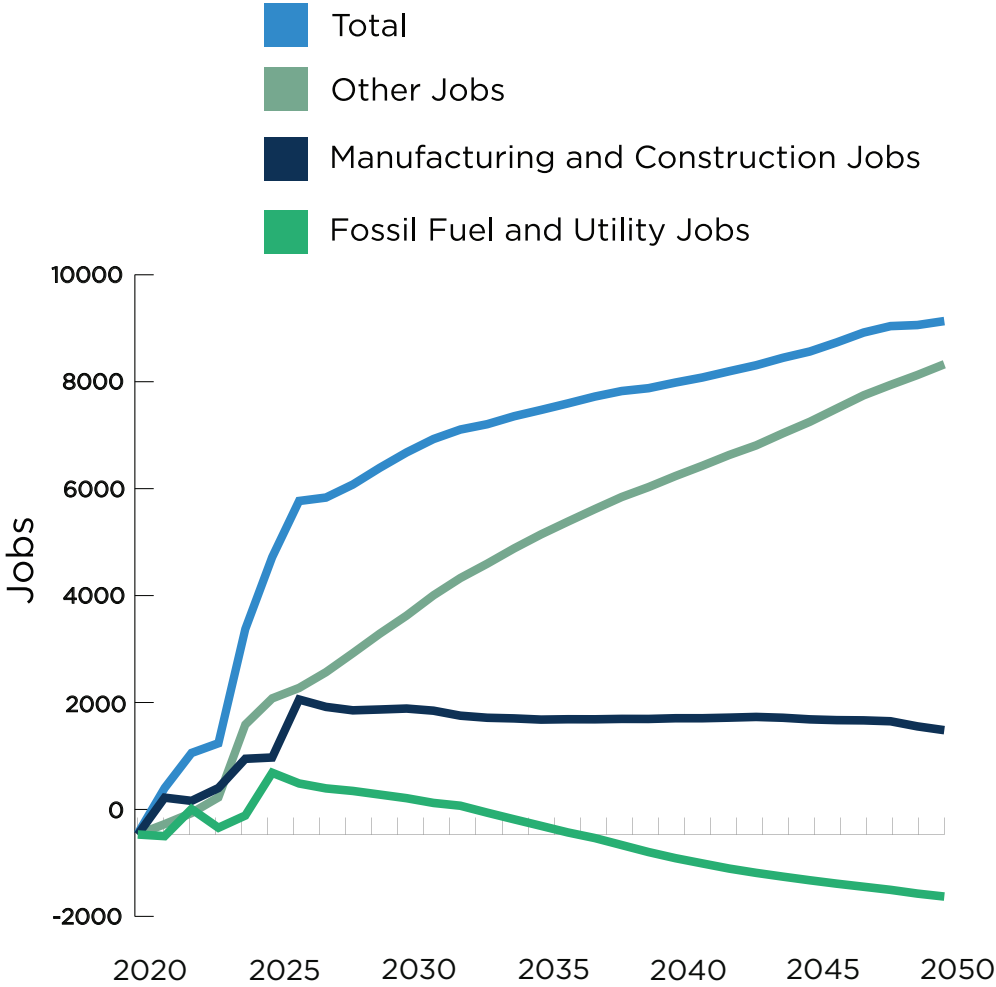
- As demand for these employees in our state is growing rapidly, businesses are struggling to find trained professionals;
- Wisconsin has yet to achieve conditions that effectively support members of Tribal Nations, women, veterans, individuals with low incomes, Black, Hispanic/Latino, Hmong American, Asian American, and individuals from vulnerable communities to pursue employment and business ownership in this field;
- People of color are underrepresented in the energy industry (including renewable energy and energy efficiency careers);
- Wisconsin's clean energy transition may lean on out-of-state workers and fail to benefit Wisconsin communities in the way we hope.

The State needs a systematic approach to clean energy workforce development and an intentional effort to employ Wisconsin workers and businesses. CEP aims to ensure that as Wisconsinites continue to account for efficiency and conservation and displace fossil fuels with clean energy, they are also the business owners and employees building our clean energy infrastructure and energy efficiency equipment and installing and maintaining these technologies statewide. To have an inclusive and equitable clean energy workforce, the CEP focuses on strategies to train and prepare workers for the national and state's transition to clean energy. The strategies below also aim to engage the fossil fuels workforce and ensure that individuals whose jobs are displaced are well-positioned for clean energy jobs, thus achieving a just transition.

The figure below illustrates the estimated change in jobs based on recommendations in the CEP. A total of 6,440 new jobs are estimated annually by 2030, 7,616 annually by 2040, and 8,651 annually by 2050. Cumulatively, new job estimates total 41,678 by 2030, 113,542 by 2040, and 195,679 by 2050. Cumulative compensation is estimated to increase by \$2.74 billion by 2030, \$6.36 billion by 2040, and \$8.72 billion by 2050. Compensation estimates are in 2019 dollars. Between now and

2050, an average annual increase of \$1.3 billion in the gross domestic product (GDP) is estimated.

Figure 18 - Workforce Job Growth





IMMEDIATE ACTION STRATEGIES

Launch a clean energy job inventory and outreach program. The state will identify clean energy job classification(s), establish clean energy apprenticeship tracks, and work with workforce training organizations, community-based organizations, and technical colleges to develop pathways into the industry. This program should map out the businesses that comprise the clean energy industry in Wisconsin, many of which are small and perhaps not part of professional associations. The program should support this sector through a clean energy small business incubator program and facilitate the creation or joining of associations. This mapping should not only identify clean energy opportunities (jobs, businesses, and startups) but also make suggestions on how to market them to underrepresented communities.

Support a Clean Energy Workforce Advisory Council. OSCE will support a Clean Energy Workforce Advisory Council that will consist of leaders from employers, utilities, labor unions, technical colleges, the University of Wisconsin System, University of Wisconsin - Extension, and apprenticeship programs. This council will be tasked with creating a strategic venue for interaction, training programs, and curricula driven by the industry's priority workforce needs. (*GTFCC Rec #30*). The work for this council may include:

1. The creation of clean energy certificate curriculums and diploma pathways.
2. Requesting companies that create Clean Energy Registered Apprenticeships to make systematic efforts to source apprentices from the dislocated fossil fuel workforce and communities disproportionately impacted by climate change.
3. Considering potential coordination with the agencies, businesses, and training organizations.

Support communities and workers who will experience power generation plant closures. The state will increase access to technical assistance and resources for communities experiencing a power generation plant closure, including:

1. Designating a state official to coordinate plans and programs with state agencies so communities have one place to start getting information.
2. Engaging state, local, and federal agencies and stakeholders (associations of local governments and school districts, residents near the existing plants, and

local businesses) to create a Wisconsin Just Transition Plan via a multi-faceted approach:

- Address and track issues for workers, the tax base, redevelopment of the sites, and other issues identified by the community, **(GTFCC Rec #31)**
 - Work with utility companies to identify or estimate the timing and location of facility closures and job layoffs in fossil fuel-related industries and their impact on affected workers, businesses, and communities, and
 - Provide the plan and subsequent updates for consideration by the governor and legislature.
3. Provide technical assistance to help communities:
- Design tax credits or other incentives to bring redevelopment to the sites, including renewable energy, which can take advantage of existing interconnection rights to transmission,
 - Explore whether Wisconsin law will allow for a gradual reduction in property tax revenue after the closure of a plant, rather than a dramatic drop-off from the year of closure to the following year, and
 - Adopt a displaced workers program and a bill of rights that will govern the opportunities available to employees of coal facilities, including any incentives for other employers to hire displaced workers.

While this strategy refers to coal plants, as they are likely to see near-term closures, the same goals apply if the remaining nuclear plant or other generation plants in Wisconsin close.

Establish and fund a clean energy training and reemployment program. This program would support affected workers and workers new to the clean energy workforce. Connect these affected workers with hiring employers who will utilize established apprenticeship and technical college programs to deliver this training. Establish regional clean energy workforce development program partnerships. Starting with an initial pilot in south-central Wisconsin that puts individuals in these communities to work on local clean energy projects. The state will work with potential regional partners technical colleges, unions, and community service organizations that have existing clean energy curriculum/program offerings already available and connect them with the clean energy industry job providers identified in the first immediate strategy item above. **(GTFCC Rec #31)**

Support a clean energy and small business incubator. Provide business development guidance, mentorship, and expertise to Wisconsin small businesses in

the clean energy and energy efficiency space, including youth and individuals from communities impacted by climate change.

1. Funding and attention may also be directed to Wisconsin communities that may be hit hardest economically from the transition away from fossil fuels.
2. Establishing a clean energy incubator for small businesses should be especially targeted at communities impacted by the transition away from fossil fuels and emphasize the hiring of workers from a project's local community.
3. Explore opportunities to encourage participation by Wisconsin clean energy businesses owned by individuals from communities disproportionately impacted by climate change.

Increase engagement and collaboration with labor unions. Work with labor unions to preserve and create high-quality local jobs and train the workforce of the future. Encourage clean energy developers to hire Wisconsin workers for projects. Increase state and local actions to promote good union jobs in proliferating clean energy industries. This should also include leveraging existing training programs and exploring potential state policy, such as labor agreements (project labor, community benefits, community workforce, local hire), prevailing wage, organizing rights, and targeted hires.⁶⁴

Ensure the clean energy transition supports family-supporting wages. Ensure jobs created include workers' rights, such as paid family leave, sick days, health insurance, and a fair wage. Many jobs in the clean energy economy are accessible to workers with high school education, limited college, or an associate degree (e.g., construction, electricians, maintenance). Compared to similarly educated peers in other industries, employees with jobs in energy tend to earn higher wages. As new jobs are created as part of the clean energy transition these jobs must maintain comparable higher wages.⁶⁵ (*GTFCC Rec #31*)

Launch a Clean Energy Reentry Pilot Program. OSCE will work with the Department of Workforce Development (DWD) and DOC to accelerate opportunities for incarcerated individuals to develop the knowledge and skills necessary to work in clean energy sectors upon release.

Support the creation of a certified training program for digester operators. Support and work with Wisconsin digester operators to develop a certified training program (e.g., American Biogas Council program) that would be rolled out through Wisconsin's technical colleges. Until there are enough people trained in how to run

these facilities, building the infrastructure is not sustainable. Lack of training leads to improper maintenance and can result in engineering failures.

Expand Research and Development (R&D) Tax Credit. Legislation should be advanced to amend the existing language to include emerging clean energy technologies, including but not limited to, energy storage systems and energy management that support the integration of renewable energy (including solar, wind, and biofuels). Amending this language will create more job opportunities by incentivizing the deployment of clean energy technology.



FUTURE STRATEGIES

Support Clean Jobs Training Grants. Provide additional funding through a new program at the DWD to support Wisconsin in transitioning to clean energy, reduce inequities, and create good jobs for employers to train workers for clean jobs throughout the state. This will encourage individuals to follow conservation and environmental career paths with jobs. Consider requiring employers that apply for this funding to employ a large percentage, such as 50 percent, of their workers from local communities. Also, consider requiring that employers that apply for this funding pay the prevailing industry (up to a determined size-limit) wage to all employees. This will ensure that Wisconsin clean energy businesses are providing family-sustaining jobs. *(GTFCC Rec #33, 2021- 2023 Executive Budget)*

Increase Focus on Energy® Funding. Increasing Focus on Energy® funding can support job creation over and above the jobs created at existing budget levels.⁶⁶ Also, explore how all businesses receiving assistance or benefits (trade allies and implementers) from Focus on Energy® could pay the prevailing industry wage to their employees.

Support Transit for Job Access and Reverse Commute Program funding. Provide funding for the coordination of the Transit for Job Access and Reverse Commute program to expand the eligibility of applicants of the program to more highly populated areas of the state and ensure individuals with low incomes have access

to good-paying clean energy and energy efficiency jobs. *(2021- 2023 Executive Budget)*

Support clean energy and energy efficiency job creation. Create new jobs in the conservation field and prepare individuals for work within the clean energy sector. *(GTFCC Rec #33)*

Expand agriculture clean energy workforce development. Agencies will work with the Wisconsin Agricultural Education and Workforce Development Council to seek advice and counsel on potential opportunities for agricultural education and workforce development related to the clean energy transition.



ACCELERATE GOVERNMENT LED EFFORTS

Drawing from the lived experiences, expertise, and knowledge of Tribal Nations, local government representatives, and state agency employees, governments can be leaders in efforts to reduce emissions, conserve energy, and transition to new technologies. These efforts are often referred to as “Lead-by-Example” where government entities analyze and transition their facilities and fleets to realize substantial cost savings, reduce GHG emissions, improve energy supply, build resilience, and procure more sustainable products.⁶⁷ Lead-by-Example also offers increased public awareness of the costs and benefits of clean energy technologies, while also providing transparency on the government’s internal goals and activities to address climate change and transition to clean energy. This CEP outlines strategies to elevate and support these efforts.

On April 10, 2019, with the issuance of Executive Order #18, Governor Tony Evers affirmed the intergovernmental relationship between the State of Wisconsin ensuring each state agency consult with Tribal governments on matters that may indirectly impact their members. To support this relationship, the CEP aims to

support Tribal Nations and communities in their independent development and oversight of clean energy planning and projects on their lands. The strategies are centered on environmental justice in that it elevates Tribal Nations in making their own decisions about their energy planning and needs, and it aims to support them through increased inter-government communication and grant assistance. Tribal Nations are governments, not end-users. Transmission planning, distribution networks, communication lines, and pipelines, above and below ground, impact political borders. As sovereign governments recognized by the U.S. Congress, Tribal Nations must be allowed to carry forward their strategic plans and needs without process requirements from the Wisconsin state government. Tailoring plans and projects to meet these requirements can ultimately render programs, projects, or initiatives ineffective. Following the federal administration's lead, the state will support government-to-government engagement, to "...strengthen Tribal Sovereignty and advance Tribal self-determination." The strategies outlined below will elevate and support Tribal Nations in their clean energy journeys through increased collaboration, communication, and representation.

To support this relationship, the CEP aims to support Tribal Nations and communities in their independent development and oversight of clean energy planning and projects on their lands.

The CEP will also help to accelerate local government efforts to deploy and implement energy efficiency, renewable energy, and climate action. Many Wisconsin cities and communities have already proactively developed climate action and clean energy plans and strategies. These communities, as well as many others earlier in their sustainability journeys, are ready for more ambitious climate action. The CEP anticipates establishing active collaboration to support local governments enacting climate policies as quickly as possible, allowing local communities to start experiencing the economic, health, and environmental impacts of clean energy and emissions reductions. Additionally, climate and clean energy strategies on the local level elevates environmental justice indirectly in that it seeks to reduce the community burden of transitioning to clean energy and energy efficiency, helping to conserve community resources. Local government climate efforts will help to align communities with Wisconsin's statewide environmental justice, climate, and clean energy goals.

Furthermore, State of Wisconsin agencies, including the University of Wisconsin (UW) system, need to be environmental stewards by deploying and implementing energy efficiency, renewable energy, building resilience, and reducing emissions within our facilities and vehicles. The CEP will ensure that all State of Wisconsin agencies are collaboratively working toward achieving statewide emissions goals by setting a baseline, tracking energy use and GHG reductions, and setting reduction goals. Implementation of state government strategies has a positive effect on communities through emissions reductions and may encourage others to lower their emissions. The positive impacts of this policy on communities would likely be greatest if the state made sure to implement the policy in areas where the state has operations. Benefits to state employees and the broader community will be felt through less pollution from vehicle and building use. Purchasing policies could intentionally address emissions in communities – for example, by contracting with persons of color, rural, women, and veteran-owned businesses. With shared purchasing options, the state can pave a path for municipalities to enable them to save energy costs over time, which can be directed to other community needs. This could also increase resilience to climate impacts such as flooding which often disproportionately impact lower-income neighborhoods and individuals.



IMMEDIATE ACTION STRATEGIES

TRIBAL NATIONS

Launch a Tribal Relations Pilot Project. DNR will launch this pilot to be used as a tool to conduct regular, meaningful, and robust consultations with Tribal Nations on energy and environmental policy issues. This pilot will involve agencies, the federally and state-recognized Tribes, and related associations to help to coordinate this communication and representation. This will ensure the consultation process includes both high-level decision-makers within agencies and technical staff from agencies. *(2021-2023 Executive Budget, GTFCC Rec #2)*

Increase Tribal representation and consultation on any state or regional commission or board, and multi-year energy planning efforts. Representation is required if the action will have a direct or indirect impact on Tribal land or energy management operations. This may include regional commissions that impact transmission planning, distribution needs, interconnection standards, and other decisions that affect Tribal energy sovereignty. This will also include establishing direct lines of communication between Tribes and IOU and ensuring Tribal representation on PSCW task forces and committees (i.e., Midwest Tribal Energy Resources Association, MTERA, representation on Interconnection Rulemaking Committee).⁶⁸

Establish Carbon-Free by 2050 Technical Assistance Grant Program. Establish a technical assistance grant program to assist Tribal Nations to develop plans to be carbon-free by 2050. Such technical grants to Tribal Nations must respect their sovereignty and allow for flexibility, avoiding unnecessary bureaucratic requirements. MTERA should be utilized for its depth of knowledge regarding the capabilities, capacity, and needs of Tribes in their energy transitions. *(2021-2023 Executive Budget)*

LOCAL GOVERNMENTS

Increase local government coordination and communication with local government efforts/programs OSCE will work to coordinate increased engagement and support for local government efforts (i.e., Wisconsin Local Government Climate Coalition, Green Tier Legacy Communities, Energy Independent Communities, Sustainability Offices, and Climate and Sustainability Collaboratives) to ensure alignment and support of local clean energy efforts.

Create model template policies, including resolutions and ordinances, that can be adopted by local governments to move forward with common clean energy and climate goals aligned with statewide efforts. These template policies may reference relevant utility goals tailored to the location of the adoptive community, county, or school district, in such a way that signals concerted action to elected officials. Additionally, such policies should align with the environmental justice and equity principles outlined in the CEP. Wisconsin will consider making certain funds available to communities that adopt this resolution while publicly recognizing them as “Climate Communities.” This funding may also foster healthy competition among

Wisconsin communities, similar to the 25x25 Energy Independent Community Initiative.⁶⁹ Funds designated for “climate communities” may also be contingent on appropriate environmental justice qualifications demonstrated by recipient communities.

Dedicate resources to technical/financial assistance and provide access to data to support the development of community CEPs, climate action plans, and conservation and resilience efforts. Wisconsin must address the legitimate barriers for local governments, otherwise unable to make climate and clean energy commitments without the necessary technical and financial resources. This strategy includes:

1. Dedicated funding for Climate Change Local Planning and a legislative amendment to Wis Stat. s. 66.001 to add “climate change element” to comprehensive planning.⁷⁰
2. OSCE will coordinate the development and deployment of technical assistance (staffing assistance, webinars, learning labs, and CEP templates) and financial resources (securing grants, exploring potential tax incentives, and other financing mechanisms) to local government. This may also include uniform software and other tools to local and Tribal governments for consistent, comparable GHG emissions inventory and tracking across units of government.
3. Direct funding to assist local governments to develop a plan to be carbon-free by 2050. **(2021-2023 Executive Budget)**

STATE GOVERNMENT

Through state government Lead-by-Example work, state agency leadership aim to:

- Contribute to the fulfillment of carbon reduction goals of the new U.S. nationally determined contribution (NDC) as part of the Paris Agreement (50-52 percent economywide net GHG emissions reductions below 2005 levels by 2030);
- Develop energy efficiency, sustainability, and renewable energy standards for all new and existing state facilities, office buildings, and complexes;
- Accelerating new and existing policies to reduce carbon pollution and promote clean energy deployment at the state level; and
- Focus on priority areas and practices, such as environmental justice, energy consumption reduction, sustainable procurement, transitioning the fleet to clean fuels and zero-emission vehicles, reducing solid waste, and reducing water consumption. **(GTFCC Rec #11)**

Identify state agency data available, then organize and further analyze the data to help inform decision making and goal setting.

1. Develop an internal tracking system and comprehensive online dashboard to track state agency energy use, establish and track agency GHG reduction goals and provide transparency on agency progress. Have all agencies track both energy usage and GHG emissions and set reasonable goals for the reduction of energy usage and GHG emissions. Track energy and carbon performance and benchmark all existing state buildings and leaseholds. Benchmarking serves as a mechanism to measure the energy performance of a single building over time, relative to other similar buildings, or modeled simulations of a reference building built to a specific standard (such as an energy code). Benchmarking is useful for state and local government property owners and facility operators, managers, and designers. It facilitates energy accounting, comparing a facility's energy use to similar facilities to assess opportunities for improvement and quantifying/verifying energy savings.
2. Share its benchmarking methods with interested local communities, potentially through the Green Tier Legacy Communities program or another mechanism.
3. Set specific energy efficiency goals for its buildings, such as meeting ENERGY STAR® Performance levels by 2027.
4. Explore incentives to measure actual building energy use. Many state buildings are heated by central plants, this will require an investment in metering and the human resources to maintain and utilize the metering.

Increase federal collaboration and technical assistance.

1. Join the U.S. DOE's Better Buildings Accelerators to help document and share its data. Under this program, leading businesses, manufacturers, cities, states, universities, and school districts commit to improving the efficiency of their portfolio of buildings by at least 20 percent over 10 years and share their strategies and results.
2. Participate in the Sustainable Corrections Infrastructure Partnership (SCIP) Accelerator to assess and addresses the resiliency of the state correctional facility infrastructure.

Work to transition the State's vehicle fleet to clean fuels and zero-emission vehicles (ZEV). The Wisconsin Department of Administration (DOA) encourages state employees operating state-owned or leased motor vehicles to use alternative fuels whenever feasible and cost-effective. DOA will work to replace state fleet vehicles

and off-road equipment with those that can utilize lower-emitting fuels or low- to no- emissions.⁷¹ Consider not only the purchase price (reduced by any available incentives) but also projected operating cost savings (e.g., from using electricity instead of fossil fuels, reduced maintenance costs, and reduction of carbon and other emissions) applying a reasonable cost for carbon and other pollutants reflecting their impacts. Also, explore options to build electric vehicle infrastructure at state parks and state-owned land.

Reduce energy consumption and GHG emissions.

1. Implement a more efficient footprint across state agencies.⁷²
2. Incorporate renewable energy generation into all new construction and increasing the amount of renewable energy the and UW System purchase to achieve 100 percent carbon-free energy before 2050. Alternatively, DOA could analyze and establish more aggressive percentage goals of clean energy by 2030 and 2050 for state operations, taking into consideration the interdependency of the goal with the Building Commission and Budget processes.
3. Consider including carbon footprint reductions and not just energy use reduction, in state performance contracts.
4. Explore Virtual Power Purchase Agreements for state agencies or off-site group buys.
5. State agencies to reinvest energy efficiency cost savings to fund additional energy efficiency and clean energy investments.
6. Identify state-owned land assets that could host a large renewable energy project.
7. Support the development of energy management plans at UW System institutions.

Prioritize environmental justice. Work with agency leaders across the enterprise to measure and verify environmental justice-related actions in programs and policies. Consider a life cycle analysis policy for purchasing and developments that considers impacts on environmental justice communities. (*GTFCC Rec #3*)

Reduce water consumption. Collect baseline data and set targets to reduce water consumption in State facilities. Additionally, work with local governments on water conservation through water and wastewater loan programs.

Expand green/clean procurement and reduce embodied carbon for goods and services: the DOA State Bureau of Procurement will develop a plan to expand the use of green/clean procurement practices and reduce embodied carbon and submit the plan to the governor. (*2021-2023 Executive Budget*) Additionally, conduct

outreach to local governments to increased shared purchasing to realize economies of scale.

Support clean energy and energy efficiency projects via State Agency

Performance Contracting and other financing options:

1. Utilize \$25 million of State bonding for 2021-23 energy conservation projects. These funds would be used for energy conservation projects to help state agencies and UW System institutions meet their energy reduction goals and reduce utility costs. Renewable projects including solar, wind, standby generators, or geothermal enhancements to state facilities will be prioritized. The achieved savings from the reduction in utility costs are used to pay the debt service payments on the bonds. *(2021-2023 Executive Budget)*
2. After the state has identified the highest priority energy efficiency upgrades and renewable generation projects within state facilities to be completed with the \$25 million in bonding, DOA Division of Facilities Development (DFD) in collaboration with the UW System institutions, other state agencies, OSCE, and other experts, will review all state facilities for clean energy project opportunities to be completed with private sector funding (i.e., performance contracting). In addition to deep efficiency retrofits and renewable generation, the review will emphasize opportunities for geothermal heating and cooling and energy storage for renewable generation firming and peak load reduction.
3. OSCE to work with local units of government to identify private sector funding opportunities within local government facilities. The DFD will apply 20-year financing terms to these clean energy projects (provided components with a useful life of fewer than 20 years are replaced during the term). *(2021-2023 Executive Budget)*
4. OSCE to work with state agencies to set and take steps each year to meet energy/carbon reduction goals consistent with the most stringent Wisconsin public utility plan. The State's plan would include vehicles and equipment, energy and water usage, procurement, solid waste, and GHG. The State would share goals and plans with local communities through Green Tier Legacy Communities or other programs and would use funding from Focus on Energy® and utility incentives to the available extent, as well as on-bill financing and/or other available low-cost financing methods to reduce costs and pay for projects out of energy savings.



ACCELERATE CLEAN ENERGY TECHNOLOGY DEPLOYMENT

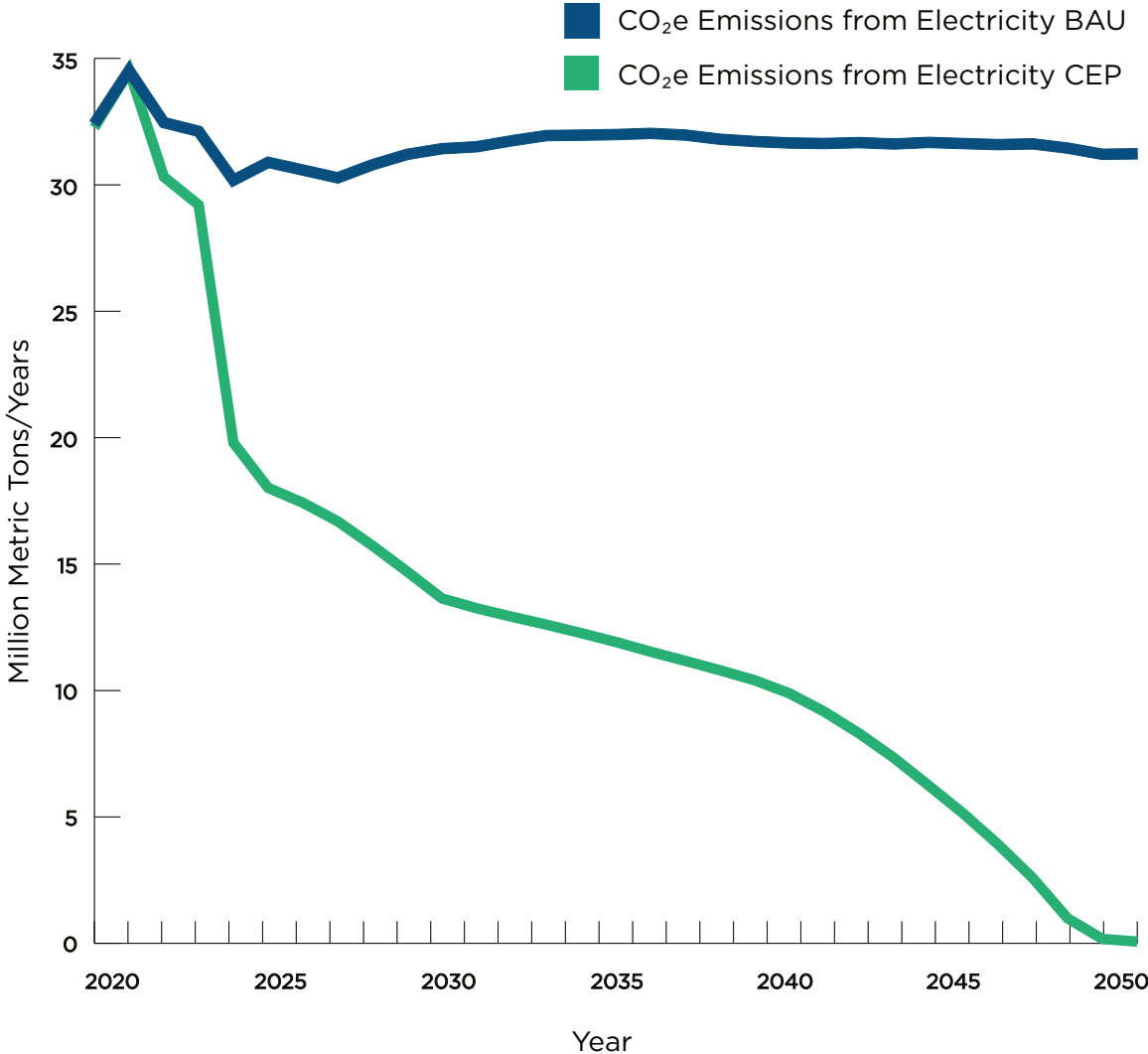
In Wisconsin, the power sector accounts for the largest share of GHG emissions, 32.2 percent in 2018. As such, it is a critical focus in the push for clean energy. Dangerous criteria pollutant emissions (PM_{2.5}, NO_x, SO_x, mercury, and others) from coal-fired power plants and the location of these plants often close to population centers, emphasized the need to accelerate the decarbonization of the power sector resulting in substantial public health benefits, such as cleaner air, safer drinking water, food security, and fewer serious medical problems associated with air toxins. By focusing on equity, these benefits will be felt especially by low-income and environmental justice communities most affected by the traditional energy economy. The decarbonization of the power sector will be necessary to achieve reductions in other sectors, such as buildings, transportation, and industry. Many industries within Wisconsin's power sector have taken on this challenge and have robust reduction goals.

We must accelerate Wisconsin's transition to clean energy to minimize economic, health, and environmental damages, as well as lives lost to climate change impacts.

The deployment of clean energy requires a multi-faceted effort from multiple stakeholders. Wisconsin utilities, renewable energy developers, governments, and other actors are prioritizing this transition.

The CEP takes all the above approaches in the transition to clean energy in the power sector. To successfully reach the goal of 100 percent carbon-free electricity consumed by mid-century, there should be a rapid and dramatic proliferation of clean energy. The strategies included in the CEP provide a roadmap that accomplishes Wisconsin's objective of achieving a carbon-neutral power sector and reducing a range of other energy-related emissions, see figure below.

Figure 19 - CO₂ Emissions from Electricity



The CEP expects the deployment of greater amounts of wind and solar while also expediting the growth of energy storage; technologies such as renewable natural gas, geothermal, and hydrogen; as well as technologies yet to be commercialized. The ramp-up of renewable energy will include various forms from large utility-scale projects to community solar and small distributed generation, such as rooftop solar. It will also be necessary to enable the interconnection of these resources with the grid. Furthermore, we must ensure adequate siting of renewable energy projects while still protecting the rights of property owners. The clean energy equation may also include advanced nuclear power, carbon capture and storage, agricultural and forestry concerns, industrial decarbonization for high-emitting industries, integrated demand-side management to optimize the use of power on the distribution grid, and market improvements through MISO, which balances supply and demand in Wisconsin and many other states.

Utilities play a key role in the deployment of renewables and can provide transparency through resource planning. Transparency in analysis and discussion of utility resource decisions helps to assess progress in reducing carbon emissions as well as the impacts on reliability, affordability, and resource adequacy. Utilities' generation resource decisions should include an evaluation of the CEP's carbon reduction goals against potential investments in carbon-emitting resources. The likelihood that substantial decarbonization of the power sector will be required by mid-century will be important to ensure that investments move Wisconsin toward its clean energy goals and do not create stranded assets. The figures below show the carbon emission reduction and resource mix, respectively, based on the impact of measurable strategies from the CEP in the power sector, with scenarios including predominately wind (Figure 20) and predominately solar (Figure 21) as the renewable energy deployed.

Figure 20 - Electricity Generation by Source (Primary Wind)

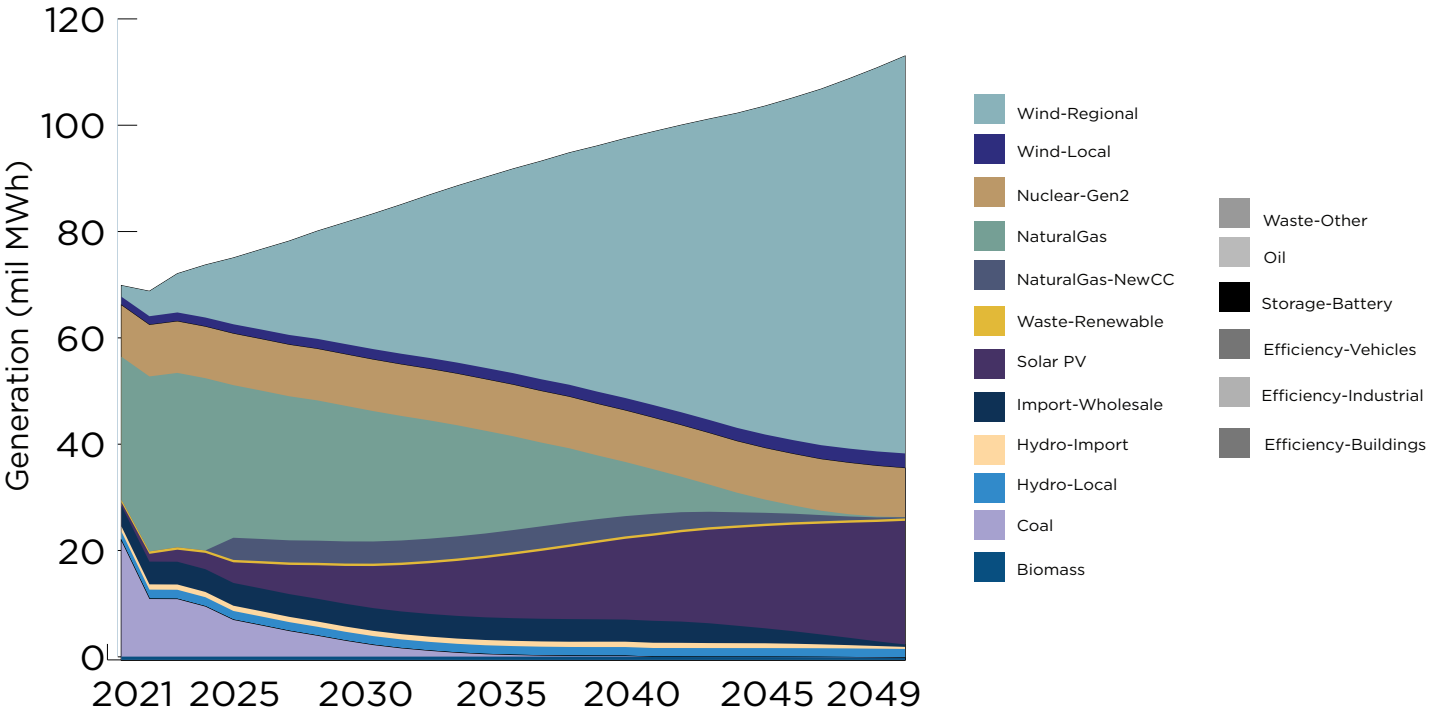
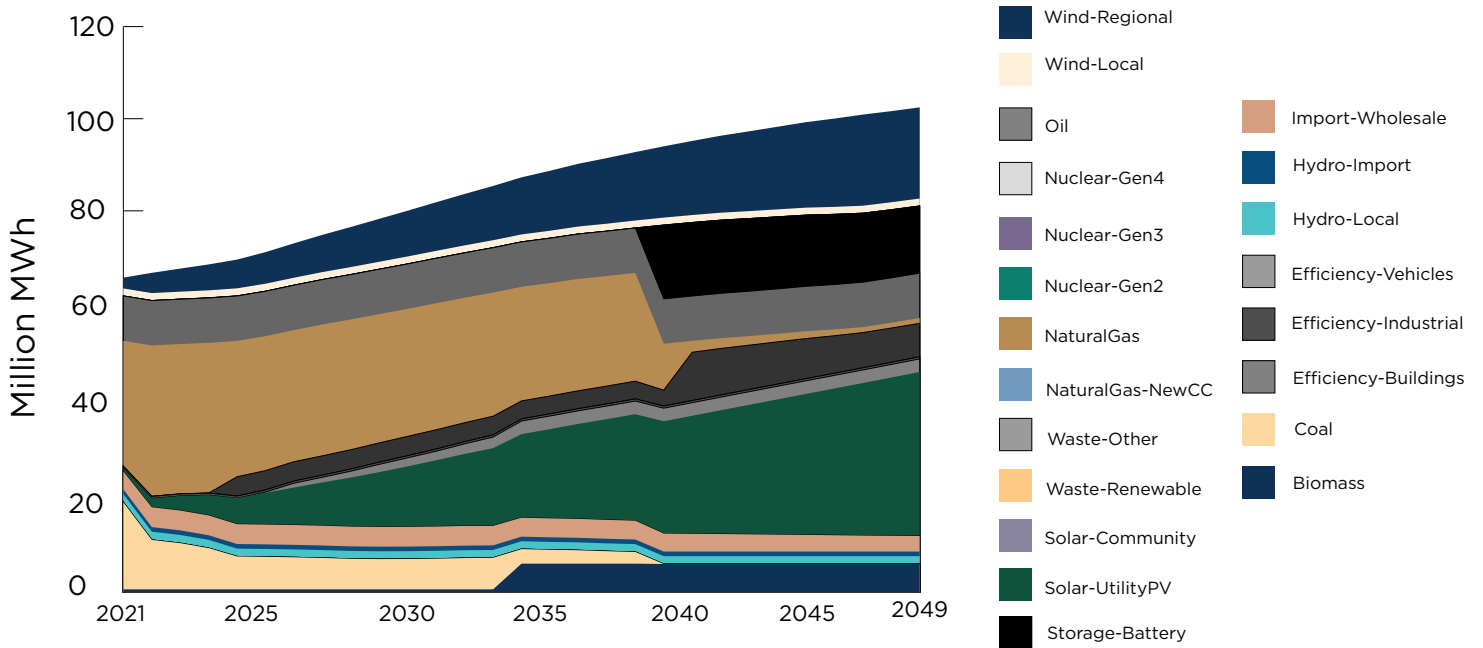


Figure 21 - Electricity Generation by Source (Primary Solar)



Agriculture - As we move to a greater reliance on renewable energy, agricultural lands become critical locations for renewable energy projects. As such, it will become increasingly important to maintain a balance between the use of agricultural lands for food production and clean energy strategies. Policies and programs must guide land-use decisions and ensure that rural Wisconsin residents and businesses receive the economic, health, equity, and job creation benefits of the clean energy transition.

Energy Storage - Access to technology also plays a key role. For example, as renewable energy grows in Wisconsin’s generation mix, energy storage becomes increasingly critical. Unlike a power plant fueled by gas, coal, or nuclear energy, the availability of wind and solar resources is intermittent. As more renewable energy enters the system, the state will need storage to carry us through periods of extreme heat or cold, when greater energy resources are needed at a given point in time, or when baseload plants are offline. Energy storage, both short- and long-term, provides a variety of benefits to the energy system. Short-term storage (a few hours) bridges the energy availability gap during the night (for solar) or periods of calm (for wind). In addition, storage can assist grid operators to control load management and optimize the grid as stored energy can be utilized during peak periods. Additional technological advances will accelerate the deployment of long-term energy storage.

The development of more and better uses for energy storage will provide several benefits to disproportionately impacted communities, including using storage to replace power plants. Additionally, many utility customers will experience reduced costs by utilizing storage resources at peak times.

Financing - Another area of focus is access to financing and increasing affordability. The financing opportunities in this pathway aim to lessen the energy burden on low- and middle-income communities and communities disproportionately impacted by climate change by reducing the often-high up-front costs associated with clean energy projects and access. These communities have not been positioned to benefit from these investments because of decisions made by other people, sectors, and systems. By including these communities in Wisconsin's clean economy and creating the conditions for ownership or power over how they receive their energy, the strategies advance environmental justice as it relates to climate change. Low-income and the most vulnerable Wisconsin communities must be allowed to benefit from these projects. These should also not be limited to urban areas but also rural areas that will also face energy challenges as the climate crisis worsens. Also, while it is assumed that the strategies should have a beneficial impact on these communities, it will be important to consult with these communities during the development and implementation of the specifics of the low-cost financing programs. This will ensure that the financing programs are accessible to them and help them to effectively reduce their energy usage. It is also important to make sure that there is effective outreach regarding the availability of low-cost debt financing to these communities and their members through avenues of communication that they regularly use.

Table 6: Summary of Strategies to Accelerate Clean Energy Technology Deployment

| Immediate Action Strategies | High-Impact Strategies |
|--|--|
| Analyze, update, and apply the social cost of carbon | Analyze, update, and apply the social cost of carbon |
| Explore a flexible, market-based program to reduce GHG emissions in the power sector | Explore a flexible, market-based program to reduce GHG emissions in the power sector |
| Expedite utility-scale renewables | Expedite utility-scale renewables |
| Support the deployment of energy storage and demand response | Set new generation emission goals and start planning to help achieve these goals |
| Update interconnection standards rule | Adopt a Clean Energy Standard (CES) |
| Develop Performance-Based Regulation (PBR), to better align utility performance with the State’s goals | |
| Launch a voluntary, utility-driven collaboration process. | |
| Explore, deploy, and share information on innovative project financing options | |
| Evaluate Models for a Wisconsin Green Bank | |
| Expand Commercial Property Assessed Clean Energy (C-PACE) Financing | |
| Expand Focus on Energy® Incentives | |
| Support investments in infrastructure that can facilitate plants with carbon capture in later years | |
| Create a Green Grant and Loan program | |
| Leverage federal funding for a clean energy grant program | |
| Incentivize tax credit developers that incorporate energy efficiency and sustainability into the construction and rehabilitation of affordable housing developments. | |
| Maximize the co-benefits and financial value associated with agriculture clean energy projects | |
| Address Agriculture Renewable Energy Siting | |
| Work to increase MISO focus on state clean energy projects and goals | |
| Expand community solar | |
| Initiate and expedite innovation, research, and business development for renewable energy, energy efficiency, clean energy technologies, and sustainable practices. | |



HIGH-IMPACT STRATEGIES

Set new generation emission goals and start planning to help achieve these goals. As defined in Executive Order #38, the State of Wisconsin has an established goal of reaching 100 percent carbon-free electricity consumed by 2050, of which the CEP creates pathways to achieve. Because the CEP has an iterative planning process, we not only can outline how we will reach the established goals but also have the flexibility to update the goal and plan into the future. In the assessment of the path forward for the CEP, and recognizing the interim goals announced by utilities and the updated U.S. NDC for the Paris Agreement, the state should consider updating the electricity GHG emission goals for the power sector that includes interim targets.

Table 7: Carbon Emissions Reduction Goals Summary

| Utility | Present Interim CO₂ Reduction Goals | Present 2050 CO₂ Reduction Goals |
|--|---|--|
| WEC Energy Group (WE Energies and WI Public Service) | 70% CO ₂ reduction by 2030 from 2005 levels | Net carbon neutral by 2050 from 2005 levels |
| Alliant Energy | 50% CO ₂ reduction by 2030 from 2005 levels | Net-zero CO ₂ emissions by 2050 |
| Xcel Energy | 80% CO ₂ reduction by 2030 from 2005 levels | 100% CO ₂ reduction by 2050 from 2005 levels |
| Madison Gas & Electric | At least 80% CO ₂ reduction by 2030 from 2005 levels | Net-zero CO ₂ emissions by 2050 |
| WPPI Energy | - | Targeting 100% CO ₂ emissions reductions by 2050 |
| Dairyland Power Cooperative | Reduce carbon intensity 50% by 2030 | |
| U.S. NDC | reduce collective net GHG emissions at least 50-52% below 2005 levels by 2030 | Collectively achieve overall net-zero GHG as soon as practicable, and no later than 2050 |
| State of Wisconsin | - | 100% carbon-free electricity consumed by 2050 |

Below are potential updates to the goals:

1. By 2030, reduce net carbon emissions from the power sector to at least 60 percent below 2005 levels.
2. By 2050, reduce net carbon emissions from the power sector to 100 percent below 2005 levels. (**GTFCC Rec #13**)

To do this the state must consider the following:

1. Planning, measuring, verifying, and reporting on how the balance between carbon produced and taken out of the atmosphere (net-carbon) will work to reach the interim and final targets. This is currently done throughout the CEP for the 100 percent carbon-free electricity consumed goal; the new interim goals and Wisconsin's contribution to the Paris Agreement should also be quantified;
2. Utilities may need the flexibility to maintain reliable, resilient, and cost-effective infrastructure;
3. As a subset of new goals setting, planning and analysis can be focused on the following to help achieve the goals, through:
 - a. Alignment with PSCW's process and decisions related to the Roadmap to Zero Carbon Investigation (*PSCW Docket 5-EI-158*): collect more information on utility resource planning analysis and decisions and explore incorporating independent statewide resource planning analysis in the Strategic Energy Assessment, SEA (*PSCW Docket 5-ES-111*) to support a more comprehensive understanding of utility resource decisions and to support greater transparency and engagement for the PSCW and stakeholders; and ^{73,74}
 - b. Develop an Integrated Resource Plan (IRP) process. As Wisconsin moves toward its clean energy goals, it will be necessary to have a better idea of how the mix of power generation reflects these goals. Thus, an IRP process will need to be developed to understand the correct path to achieve GHG reductions. This will require all Wisconsin utilities to file a plan on a regular schedule (at a defined cadence) after appropriate stakeholder processes. Such plans should indicate the utility resource mix both in the near term and any plans they have developed for a longer time frame. Any IRP filed under this strategy should include, but not be limited to, the following:
 - i. All forms of generation, including fossil, wind, solar, hydro, geothermal, nuclear, and any plants that have carbon capture technology;
 - ii. Storage capacity;
 - iii. Energy efficiency from all customer classes; and
 - iv. Distributed generation, including demand response and other grid optimization programs.

This IRP process should recognize that the best choices given current costs and

technologies may not be the best choices in 2030 based on advancements in technology and lower costs.

Resources delineated under these plans should include, but not be limited to, information on the following characteristics of the sources:

- Capacity;
- Anticipated operational percentage of capacity;
- Criteria pollutant and GHG emission data; and
- Dates through which a facility is permitted to operate and location, including health and economic data.

Adopt a Clean Energy Standard (CES): The CES would designate the percentage of generation supply for each utility that would have to come from clean energy (zero carbon) sources. The CES would need to increase in increments to meet the 60 percent by 2030 and 100 percent clean energy goal by 2050. The CES requirement could be implemented in conjunction with an IRP, or a Renewable Portfolio Standard (RPS) could be a carve-out in the CES and could also be designated to increase at specified time intervals. The RPS could also designate the percentage of renewable energy that Wisconsin's utilities are mandated to produce. As such, utilities are incentivized to either increase their renewable energy generation or encourage their customers to add renewable energy generation and sell their excess generation to the grid. *(GTFCC Rec #13)*





IMMEDIATE ACTION STRATEGIES

{High-Impact Strategy} Analyze, update, and apply the social cost of carbon.

In consultation with the DNR, the PSCW should reevaluate the appropriate social cost of carbon every two years and report the findings in a biennial report. This evaluation may consider any federal cost of carbon metrics, with the starting point of the review being the recently published central scenario of \$51/ton. Legislation is needed to authorize the PSCW to consider the social cost of carbon when evaluating construction certifications and all other resource allocation decisions *(2021-2023 Executive Budget, GTFCC Rec #16)*

{High-Impact Strategy} Explore a flexible, market-based program to reduce GHG emissions in the power sector.

While coal plants continue to retire across Wisconsin, the state may still need to take more expeditious action by developing a market-based program to reduce GHG. This program could be created unilaterally, in conjunction with other states, or participating in an existing program. The state should also explore other measures that could have a similar effect, such as establishing a carbon price in Wisconsin or developing a Clean Energy Standard (CES). This strategy is not mutually exclusive from the CES. The goal of this program would be to set either a cap on or a cost of carbon that could be factored into resource decisions.

1. Pursue creating a pilot program that studies the feasibility of a carbon market. *(2021-2023 Executive Budget, GTFCC Rec #22, 35)*
2. Work with UW System institutions to explore internal carbon price research and implementation.
3. Monitor federal initiatives that may address policies to monetize carbon-related impacts. Wisconsin must align with any federal regulation that emerges and/or that it develops/participates in a voluntary registry wherein GHG reductions from outside the electric utility sector are tracked and used to comply with state CES requirements.
4. Work with other states to better understand potential impacts from various forms of carbon pricing systems for the state of Wisconsin. It should examine various forms of carbon regulation programs for the following scenarios: the Midwest,

- joining an existing program, or instituting a price on carbon at the state level.
5. Partner with a voluntary, large Wisconsin-based emitter to test a carbon pricing pilot, creating a model for other large emitters. *(GTFCC Rec #35)*

Support the deployment of energy storage and demand response. Energy storage and demand response ensure grid optimization and modernization, as well as the ability to dispatch resources to shift and shape load to reduce the effects of peak usage periods. This is important because peak usage periods force utilization of power plants, which are generally more environmentally damaging and are more costly. If additional renewable resources can be paired with energy storage, they can help to reduce peak loads and reduce the intermittency of renewable energy. In addition, several devices may be utilized such that they are adding load only at non-peak hours.

1. Explore storage options through existing utility applications to the PSCW.
2. Consider storage as part of a utility generation mix. PSCW will include this in the scope of the modeling and analysis as part of the SEA. (If authorized for a traditional IRP, PSCW could include storage as a consideration in those analyses.)
3. Tie to performance-based regulation, by establishing programs at the PSCW to incentivize load management or demand response, including tariffs to incentivize stationary and mobile battery load management. *(GTFCC Rec # 9)*
4. Utilities are accountable to break down costs for capacity and transmission (MISO-related) on customer bills such that customers can reduce these costs with storage.
5. Focus on tariff development to maintain flexibility in exactly how storage deployment can reduce costs and how they allow the use of additional products/devices (water heaters/vehicles, smart thermostats) in the optimization of the grid.

Update interconnection standards rule. Interconnection standards have not been updated in Wisconsin since 2004, and as such, do not reflect developments in technology and energy storage markets. The Wisconsin Distributed Resources Collaborative and the PSCW will address existing interconnection concerns and should specifically address energy storage. Updating the standards rule will be a key enabler for individuals and small businesses (supply and owning systems) to increase small-scale renewables in Wisconsin. Work on this is underway at the PSCW (*PSCW Docket 1-AC-256*). *(GTFCC Rec # 15)*

Develop Performance-Based Regulation (PBR), to better align utility

performance with the State's goals. Develop a comprehensive, multi-step process to implement PBR in Wisconsin. The PSCW conducted early stakeholder engagement to facilitate greater understanding and input on issues related to performance-based regulation, including regulatory options related to customer affordability. PSCW will continue with this deliberate, process-driven path, along with stakeholders, utilities, to help design and implement the metrics that are most helpful in driving behavior. Ideally, the system of PBR developed by the PSCW would benefit all utility customers; in addition, the decarbonization metrics could also serve to assist customers with low incomes and environmental justice communities. In addition, metrics on items such as disconnections for nonpayment as indicators of energy burden can drive proactive affordability and arrears management (*PSCW Docket 5-EI-158*). Work on this effort may include:

1. An inventory of all current requirements of the utilities to measure portions of their performance;
2. Establishment of goals that need to be attained (can be statutory, regulatory, or policy);
3. Determine whether current measurements are necessary, as well as strategies as to which other data needs to be measured (metrics), based on the goals to be reached:
 - a. A period of measurement of the desired metrics,
 - b. Establishment of baseline for each metric,
 - c. Determination of whether the attainment of the metrics or non-attainment of the metrics will result in financial reward or penalty for the utility, as measured in Performance Incentive Mechanisms (PIMs) (e.g., return on equity rewards/penalties), and
 - d. A process to periodically review the metrics, and establishment of new metrics; and
4. At a minimum, the PSCW considers reliability, either in frequency or duration of outages, interconnection of distributed generation, grid optimization, energy efficiency, and equity/affordability as topics to whether performance-based metrics should be developed.

Launch a voluntary, utility-driven collaboration process. Utilities would voluntarily collaborate with stakeholders on developing their distribution planning and grid modernization visions, plans, and investments. The collaborations contemplated by this strategy should ensure that environmental justice communities, frontline

communities, customers with low incomes, and other underrepresented communities are present during all meetings and their contributions are reported as part of the submission to the PSCW. Consider membership for individuals with low incomes on any associated boards. Investigating and adopting models like the Minneapolis Clean Energy Partnership model and tripartite makeup of Community Action agency boards to further environmental justice goals, prioritize clean energy investment in communities disproportionately impacted by climate change, and ensure environmental justice community voices are part of the decision-making process on clean energy investment.⁷⁵ The collaboration should include:

1. A multi-directional conversation, wherein all parties come to the table seeking to understand other perspectives, desires, and capabilities;
2. Honesty and transparency to support understanding;
3. Using resources as efficiently as possible, utilities should start any conversation by asking stakeholders what they wish to discuss and be transparent about their willingness and ability to discuss those items; and
4. Document the process and outcomes and do not bind any participating party to a position in any formal regulatory process without its consent.

Utilities submit a concise (e.g., 5-10 page) report to the PSCW summarizing key discussion items and any outcomes by September 1, 2022.

Explore, deploy, and share information on innovative project financing options.

State agencies will leverage federal dollars, explore innovative financing, and provide a clearinghouse and outreach for up-to-date information on project options. This effort will aim to increase access to funds to support energy efficiency, renewable energy, clean energy, and future technology for projects for residential, commercial, and governmental customers. While energy efficiency upgrades and renewable energy deliver significant dollar savings to customers, many Wisconsinites are currently excluded from these opportunities. To achieve an equitable transition to clean energy, Wisconsin must provide all individuals, families, and communities with reasonable, common-sense financing options.

Evaluate Models for a Wisconsin Green Bank. OSCE and WEDC will assess various public, private, nonprofit, and hybrid models of green banks to determine the best structure for Wisconsin. The Wisconsin Green Bank may coordinate with PACE Wisconsin to fund clean energy-related projects where financing is needed, including worker training and equitable clean energy buildout in vulnerable communities. Furthermore, Wisconsin should prepare for potential green bank funding from the federal government. The Wisconsin Green Bank should prioritize communities

disproportionately impacted by climate change throughout the planning and implementation process. *(2021-2023 Executive Budget, GTFCC Rec # 10)*⁷⁶

Expand Commercial Property Assessed Clean Energy (C-PACE) Financing. A model ordinance exists for counties to establish a Commercial Property Assessed Clean Energy (C-PACE) financing program. Encourage all counties to review existing ordinances and implement C-PACE ordinances for commercial properties and provide information, through targeted education materials and media, about C-PACE to businesses that will likely benefit. Encourage counties to explore creative financing for C-PACE such as tax incremental financing programs. Find areas where programs can complement each other (see Government Led Efforts). (Note: Commercial properties are not the only property type eligible for PACE in Wisconsin, so C-PACE is used to specify commercial properties rather than the general PACE program.) PSCW may direct the Focus on Energy® program to allocate funds to market C-PACE programs across the state. *(2021-2023 Executive Budget, GTFCC Rec # 10)*

Expand Focus on Energy® Incentives.

1. In November 2021, the PSCW transitioned the Focus on Energy® Renewable Energy Competitive Incentive Program (RECIP) into a customer incentive approach currently used with core energy efficiency programs. The customer may benefit in some instances more from a comparable renewable source than an energy-efficient option. In addition to reviewing alignment with carbon emissions, and electrification, CHP projects should be reviewed as well. These projects may be considered for a Focus on Energy® incentive if the overall impact compared to delivered electricity shows a reduction in carbon emissions.
2. Prioritizing health criteria for incentives for renters as well as property owners working on behalf of their tenants (e.g., patients with asthma, COPD, etc. for weatherization, energy efficiency, ventilation upgrades).
3. Allow incentives for renters of residential and commercial properties through universal green leasing clauses.
4. Identify and remove application barriers for participants with low incomes.
5. Increase/add incentives for electric appliances (stoves, tankless water heater, clothes dryers, air heat pumps)

The Focus on Energy® program Quadrennial Planning Process IV has begun, and PSCW will take up many of these issues outlined above. There will be public comment periods for these suggestions to be developed and raised *(PSCW Docket 5-FE-104)*.⁷⁷

Support investments in infrastructure that can facilitate plants with carbon capture in later years. OSCE will work across agencies to take advantage of federal tax credits and funding to develop infrastructure that can facilitate plants with carbon capture in later years, such as for ethanol industrial and natural gas. These plants can count carbon capture as a resource in resource planning discussions with PSCW.

Create a Green Grant and Loan program. Utilize the WEDC Business Development Credit program to support Wisconsin businesses that focus on zero-waste, energy efficiency technology, and green/clean energy technology and businesses. As part of the program, encourage participation by people of color, rural, women, and veteran-owned businesses. Also, designate a subset to start-ups investing in new technologies. Funding may target: 1) development of renewable energy businesses, and 2) business investment in renewable energy systems. The program would not incentivize investments in energy efficiency improvements. *(GTFCC Rec # 34)*

Leverage federal funding for a clean energy grant program. Leverage federal funding to create a competitive grant program to allocate private sector funding for clean energy projects. The OSCE will collaborate with agencies to ensure that all grants result in leveraging private sector funds that are at least three times the amount of the grant.

Incentivize tax credit developers that incorporate energy efficiency and sustainability into the construction and rehabilitation of affordable housing developments. Wisconsin Housing and Economic Development Authority (WHEDA) is the sole administrator for federal Housing Tax Credits in Wisconsin since the program was established in 1986. WHEDA implemented Wisconsin's state Housing Tax Credits program in 2018. Since 1986, WHEDA has awarded more than \$445 million in affordable Housing Tax Credits, resulting in the development and rehabilitation of more than 53,000 units of rental housing for families with low to moderate incomes, seniors, and vulnerable community members. Tax credits encourage developers to create affordable housing by offering a dollar-for-dollar reduction of income taxes owed by owners/investors in qualified projects for tenants whose incomes are at or below 60 percent of county median income. Higher scores could be considered for affordable housing developments that promote sustainability through energy conservation, energy efficiency, connections to transportation linkages, and other environmental considerations with other suggestions during WHEDA's request for feedback.

Maximize the co-benefits and financial value associated with agriculture clean energy projects.

Maximize the co-benefits and financial value associated with agriculture clean energy projects by taking the following steps:

1. Enhance the existing Wisconsin nutrient trading program and encourage on-farm renewable energy production to help protect ground and surface water quality:
 - a. UW-Extension - Develop outreach materials to help implement the goals of improving water quality through agricultural biodigestion (focus on existing) and on-farm solar projects. For example:
 - i. Focus on the potential for valuable nutrient reduction credits for ground-mount solar, combined with grasses/prairies/pastures and biodigestion of manure or food waste, and
 - ii. Provide information regarding how to prioritize areas for solar generation or nutrient reduction through biodigestion (e.g., generate maps identifying fields/areas with the greatest potential for high erosion or nutrient runoff rates). This work could be based on existing evaluations of slope and sensitive soil data, nutrient-impacted water bodies for Total Daily Maximum Load allocations, and other available information;
 - b. DNR - expand the use of the water pollution credit program to encourage agriculture clean energy use projects and inform potential purchasers of the credits. DNR develop the regulatory lanes/verification for the use of credits in their Wisconsin Pollutant Discharge Elimination System (WPDES) program permit (Total Maximum Daily Loads, adaptive management, nutrient trading, etc.), and determine what is acceptable to demonstrate a reduction has been made. This could include wastewater dischargers needing credits, counties that receive payments from wastewater dischargers operating under temporary variances, and lake districts and associations that want to protect and enhance the quality of their lakes. These landowners and developers can enter transactions to sell any generated credits:
 - i. Modify, where appropriate, the implementation of the nutrient reduction credit program to make it easier for solar and biodigestion projects to receive and sell credits, and
 - ii. Integrate the above with the Water Quality Trading Clearinghouse allowed under 2019 Wisconsin Act 151 when it is implemented (**GTFCC Tier 2 #52**); and
 - c. Department of Agriculture, Trade and Consumer Protection (DATCP) helps farmers understand how to incorporate acceptable activities into their practices, via County Conservationists or UW-Extension educators.
2. DNR should explore ways to expand the use of solar and other clean energy in

environmental remediation and redevelopment projects, using a scoring system with additional bonus points for every 50 kilowatts (kW) of clean energy per acre of brownfield remediation. *(GTFCC Tier 2 #52)*

Address Agriculture Renewable Energy Siting.

1. Conduct thorough analysis on the costs, benefits, co-benefits, and tradeoffs of siting renewable energy projects on the spectrum of working lands, such as prime farmland, marginal land classifications, or lands requiring significant irrigation.
2. Conduct education with rural communities and agricultural producers on the costs, benefits, co-benefits, and tradeoffs of renewable energy projects on agricultural lands and how land-use planning can assist in sound long-term land use and community planning. Make renewable siting more predictable for developers and landowners.
3. Compile collection/portfolio on-farm renewable energy success stories to highlight the benefits clean energy projects can provide to agricultural operations and rural communities. This collection can be featured on the OSCE website or in other web/print contexts.
4. Incentivize identification of long-term appropriate use of land to produce energy at the local level, through additional land-use planning efforts.
 - a. Increase technical and financial support to local units of government to educate landowners about the benefits of the Farmland Preservation Program (FPP) and Conservation Reserve Enhancement Program (CREP), and resources to assist landowners to participate, and
 - b. Increase support to local units of government to conduct farmland preservation planning activities. *(GTFCC Rec #23)*

Work to increase MISO focus on state clean energy projects and goals. The state will focus on interaction with the regional transmission organization, MISO, and an improved governance structure that places more emphasis on how State plans will support Wisconsin's decarbonization goals. *(GTFCC Tier 2 #51)* This may also help to remove barriers to undergrounding high voltage, direct currents in right-of-ways: highways, rail, etc.⁷⁸

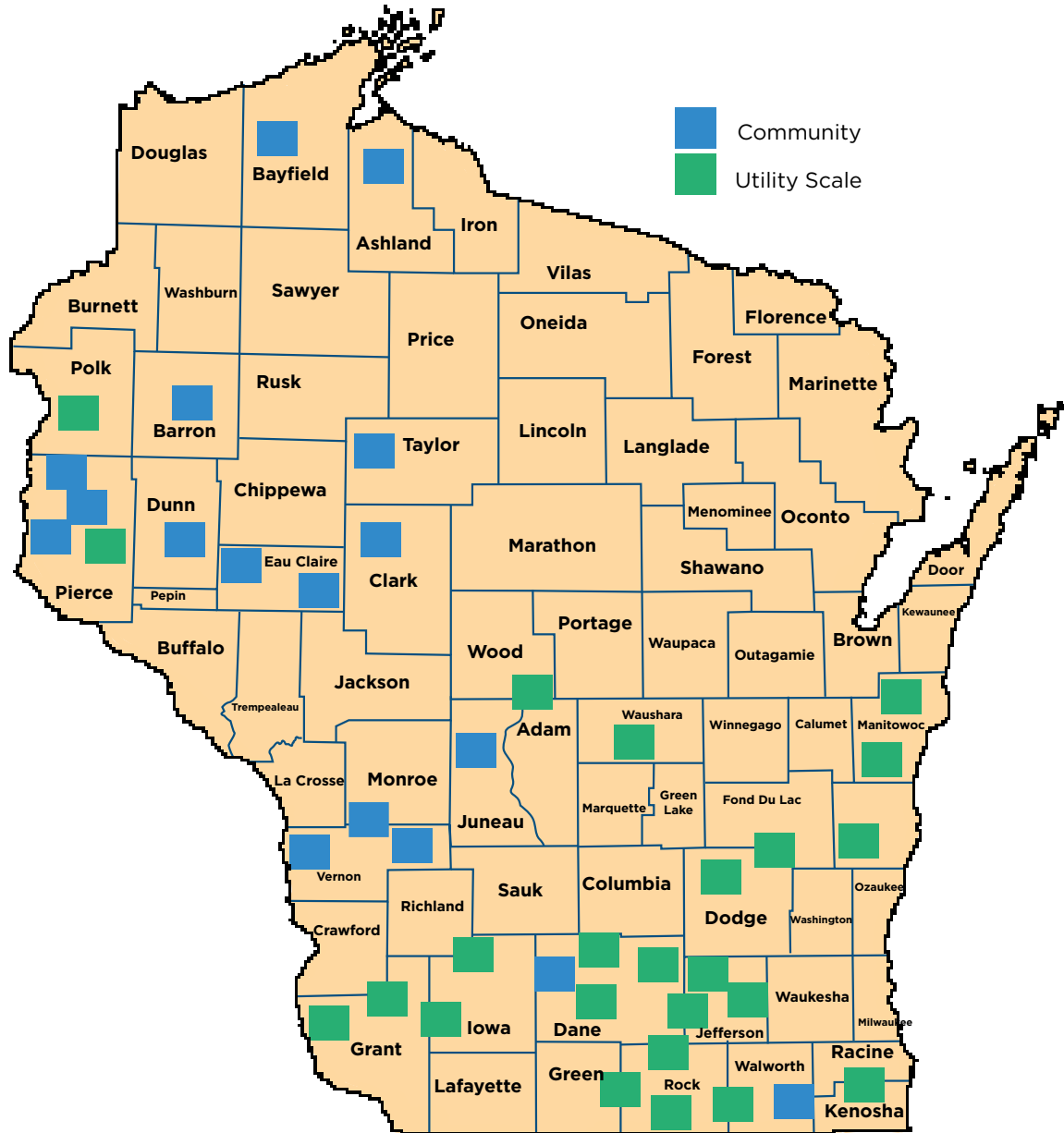
1. Recommend a push for governance changes to give states and the Organization of MISO States a bigger voice. Traditionally, states have had less influence on the planning and distribution processes at MISO. As states, including Wisconsin, seek to align their clean energy goals with transmission planning processes and rules, state leadership within MISO will be increasingly important.
2. Improve visibility and dispatch of distributed energy resources (DERs): The

existing information from MISO regarding visibility and dispatch of DERs does not currently enable developers, utilities, and stakeholders to fully understand the potential of DERs. This strategy recommends, through MISO's existing engagement processes, to improve the quality of information that DER operators have access to about MISO markets, including real-time load.

3. Through MISO's existing stakeholder engagement processes, improve the quality of information that MISO has about registered DERs to enable the following:
 - a. More targeted dispatch, including the amount of DERs dispatched and lead time for dispatching it, and
 - b. Improved capabilities to project future DER adoption.
4. Enhance transmission and distribution planning. Make enhancements in MISO's data use and analytical tools to better enable planners to understand the potential impact on the transmission system from DERs and to identify any potential enhancements that need to be made to the transmission system to support DER adoption. Understand what transmission needs and constraints can be solved by:
 - a. DERs,
 - b. Distribution grid solutions,
 - c. Generators paired with storage to alleviate constraints at peak wind and/or peak solar hours, and
 - d. Storage as a transmission asset, with or without renewables.

{High-Impact} Expedite utility-scale renewables. Utility-scale renewable generation plays a disproportionately large role in decarbonization, as it is very cost-effective, helps reduce the energy burden for all customers, and reduces emissions from fossil plants at a pace that distributed generation cannot match. Utilities will expedite utility-scale solar with minimal siting impacts and support local jobs.

Figure 22 - Wisconsin Solar Generation Projects
 (by locations)



Expand community solar. Community solar development in Wisconsin lags many other Midwestern states. Solar photovoltaic installation inequity exists in Wisconsin, as it does across the nation. Most community solar projects are deployed in higher-income communities and most participants are higher-income households or businesses, regardless of location. The state aims to increase the rate of development of community solar and particularly projects aimed at and tailored to low-income communities, communities disproportionately impacted by climate change, and other vulnerable communities. More equitable net metering and third-party policies will create opportunities for more customers with low incomes, Wisconsin families, and businesses in communities of color to enjoy the economic benefits of solar. Community solar projects should also be expedited with minimal siting impacts and support local jobs through the following actions:

1. IOUs should develop comprehensive community solar plans in collaboration with stakeholders and the PSCW. Community solar provides the opportunity for households and businesses to take advantage of solar power if their facilities are not conducive to installation. These plans should emphasize providing opportunities for low- and moderate-income customers and communities of color, competitive rates (customer savings), and avoiding cross-subsidization/cost shifts to non-participants. Municipal utilities and rural electric cooperatives will be encouraged to offer community solar options to their customers as well (*GTFCC Rec #14*);
2. Review and consider new green tariff models (i.e., from other states as well as the Madison Gas & Electric model) (*GTFCC Rec #14*);
3. Facilitate community solar/renewable energy sponsored by local communities and Tribal Nations to support work toward their clean energy goals (*GTFCC Rec #14*); and
4. Monitor Wisconsin Inclusive Solar Community Offering (WISCO). Monitor current pilot projects that are underway to support low- to moderate-income community solar projects, led by PSCW's Office of Energy Innovation (OEI), electric cooperatives, and community action program agencies with technical support from the National Association of State Energy Officials (NASEO) and National Energy Assistance Directors' Association (NEADA). These programs will help to define funding and incentives to reduce customer costs with no or very minimal up-front investment.

Initiate and expedite innovation, research, and business development for renewable energy, energy efficiency, clean energy technologies, and sustainable practices. Studies on meeting clean energy goals routinely state that the development of advanced clean energy technologies is crucial to reaching these

long-term goals. Recognizing the concerns of utilities, which have indicated that the last few percentages before reaching clean energy targets may be very difficult or expensive to achieve without the development of new technologies, the following strategies are designed to both foster advanced technology development and to support Wisconsin businesses in performing the work to develop these technologies.

1. Incentivize R&D and deployment of key low- or zero-carbon technologies. Several technologies (large-scale energy storage, carbon capture, renewables, advanced nuclear, hydrogen, and other zero-carbon fuels) will play a role in the transition to 100 percent clean energy. This strategy calls for incentivizing research and development of these technologies in Wisconsin.
2. Establish an Innovative Technologies Initiative. Build resilience of the energy distribution system by exploring administrative and legislative avenues to support local resilience through pilot programs and incentives. Supporting the expansion of PSCW OEI grant programs to help local communities develop critical clean energy infrastructure, such as microgrids. (GTFCC REC #6, 2021-2023 Executive Budget)
3. Support an R&D Grant Program. Support research in renewable and clean energy research. *(2021-2023 Executive Budget)*
4. Focus on Energy® supports energy efficiency and renewable energy research through the Environmental and Economic Research and Development Program (EERD). Focus on Energy® R&D funding should be increased to fund research that has an impact on current offerings and explores opportunities for innovation through new programs and technologies. PSCW will address this in the Quadrennial Planning Process IV.



FUTURE STRATEGIES

Deploy voluntary on-bill financing options. Utilities should provide voluntary on-bill financing options to offer a no-interest payment plan for energy improvement projects to residents with low to moderate incomes, and residential and governmental customers unable to benefit from C-PACE. This financing will be available for remaining costs after applying available incentives, including utility incentives, tax credits, and federal grants. The utility may recover the costs of such an energy improvement through a surcharge periodically placed on the customer’s

account. Utilities should look for other available programs and identify synergies between programs (code violations, CHP). *(2021-2023 Executive Budget, GTFCC Rec # 10)*

Expand Business Development Credit for renewable energy and energy efficiency projects. Modify existing WEDC business tax incentive programs or develop a dedicated new program to provide an incentive at a determined percentage of expenditures on such projects.

Create a new anaerobic digester planning grant. DATCP provides planning grants for establishing regional biodigesters in the state to produce renewable natural gas (RNG) and/or biogas-generated electricity. *(2021-2023 Executive Budget)*

Phase-out natural gas generation, moving homes and businesses to electric (target 2045). Utilization of natural gas capacity without carbon capture will likely plunge after 2040, even in the low-gas-price scenarios, due to carbon reduction goals. Wisconsin should focus on gas with carbon capture or transition facilities to hydrogen/liquified natural gas peaker/RNG if those methods can be shown to achieve similar GHG reductions. *(GTFCC Tier 2 #47)*

Securitization of retiring power plants. Expand the types of remaining costs incurred by retiring power plants that can be securitized using environmental trust bonds, which can result in cost-savings for customers. Allow utilities to securitize the remaining unpaid balance of a retiring power plant, in addition to the currently allowed unpaid balance of pollution control equipment. *(2021-2023 Executive Budget, GTFCC Tier 2 #50)*

Evaluate existing nuclear as part of the clean energy portfolio and explore new nuclear. There is currently one operating nuclear plant in Wisconsin, and it may not continue to operate past 2030. In addition, it will be necessary to evaluate the opportunity for any new nuclear projects or small modular nuclear. Nuclear plants have no GHG or criteria pollutant emissions, but we will need to take care with issues of nuclear waste storage and its impact on communities. In addition, the costs of nuclear power will need to be weighed concerning their impact on customers with low incomes as well as non-customer communities. For a variety of reasons, namely cost and issues of nuclear waste disposal, it is unlikely that additional conventional nuclear plants will be built in Wisconsin. However, since the CEP is pursuing an all-of-the-above approach to clean energy transitions, it is possible that advanced nuclear

technologies may become economically and environmentally viable. If this happens, Wisconsin must be able to take advantage of nuclear as a potential clean energy source.

Expand tariffs to prioritize environmental justice impacts. In Wisconsin, utilities and the PSCW have successfully tailored tariffs for individual customers that want their electricity generated from renewable resources. These tariffs have resulted in significant renewable generation projects (e.g., Dane County Airport 9 MW solar array) for both governments and businesses. Utilities and the PSCW review these tariff order points and ensure that tailored tariffs are also available to Native Nations' campuses and businesses, businesses owned by people of color, and businesses and nonprofit organizations that provide services to communities.

Create consistency in utility net metering and parallel generation policies that removes solar development barriers and accelerate solar adoption. This change may include setting a statewide net metering ceiling somewhere between 300 kW and 1 MW, potential annual true-ups, and allowing customers to aggregate load. In expanding rules, the PSCW must further study rate structure impacts on non-participating customers and manage the impact on non-participating customers (*PSCW Docket 5-EI-157*).⁷⁹

Clarify Third-party Ownership (TPO) of solar. In other states, TPO has drastically expanded and accelerated customer-sited solar. Clarifying third-party-owned solar arrays and solar with energy storage as legal will accelerate solar development in Wisconsin. (*GTFCC Tier 2 Rec #49*)

Analyze co-benefits of solar and water quality and quantity. The OSCE, DNR, PSCW, and DATCP will collaboratively analyze solar farm impacts on, and benefits to, stormwater runoff and water quality and quantity. This will ensure solar farm development maximizes water quality benefits and flood mitigation.

Update statutes to include energy storage to be exempt from sales tax.

Legislation was enacted in 2007 (Wis. Stat. § 77.54(56)) to exempt from sales tax products whose power source is wind and solar: "(a) The sales price from the sale of and the storage, use, or other consumption of a product whose power source is wind energy, direct radiant energy received from the sun...". Update Wis. Stat. § 77.54(56) to include energy storage.



MAXIMIZE ENERGY EFFICIENCY

To simultaneously meet the state’s clean energy goals, economic goals, and carbon goals, Wisconsin needs to drastically increase energy efficiency, which will require a major ramp-up in investment. Not only are drastically higher levels of energy efficiency critical to reaching these goals, but they are also necessary to keep costs as low as possible in a future where energy needs are met with high levels of clean/renewable energy generation. Energy efficiency is also one of the few tools that individual households if given the opportunity, can use to directly reduce their energy bills and energy burden.

Encouragingly, strategies from key groups and stakeholders in the energy efficiency space are already aligned on several priorities and next steps. The MPSC *Roadmap to Decarbonization - Electricity* recommends that a decarbonization effort “Invest in all cost-effective energy efficiency.”⁸⁰ The WEDTI report recommends “...increased utility contributions to Focus on Energy®...” and “...expansion of utility voluntary programs...”⁸¹ Further, the GTFCC Report recommends, “...an energy use reduction goal or standard,” as well as to “expand Wisconsin’s Focus on Energy® funding.”⁸²

On November 19, 2021, the National Association of Regulatory Utility Commissioners (NARUC) Board of Directors adopted a resolution for *Increasing the Role of Energy Efficiency in Achieving Cost-Effective Energy Supply and Decarbonization*. This resolution was sponsored by Wisconsin's PSCW Commissioner Huebner. By sponsoring, Wisconsin led the drafting, introduced to NARUC's Committee on Energy Resources and the Environment, secured the committee's full sponsorship, and presented to the NARUC Board for final approval. Through this resolution, NARUC member States commit to consider the following principles:

1. Utilities and States should take action to maximize the impacts of energy efficiency programs for controlling energy costs and rates, and, where applicable, cost-effectively achieving decarbonization;
2. States should leverage utilities' relationships with their customers to help effectively implement energy efficiency programs and achieve maximum impacts;
3. Planning frameworks and modeling tools should be designed to reflect research findings on energy efficiency costs and decarbonization impacts and ensure energy efficiency opportunities are accurately and appropriately considered in utility and commission decisions related to resource planning; and
4. Utilities should explore options to provide customers with real-time consumption data, which can help encourage behavior-based savings and encourage deeper participation in energy efficiency offerings.⁸³

Every dollar invested in Focus on Energy® projects returns \$5.16 in benefits to Wisconsin.

Today, most of Wisconsin's energy efficiency (reduced energy demand) is achieved through the statewide Focus on Energy® program. Focus on Energy® is Wisconsin's statewide energy efficiency and renewable energy program funded by Wisconsin's investor-owned energy utilities and participating municipal and electric cooperative utilities. Focus on Energy®'s budget is approximately \$95 million annually and can go towards cost-effective energy efficiency and renewable energy projects. The dollars saved, through reduced energy waste, circulate back into Wisconsin's economy. Every dollar invested in Focus on Energy® projects returns \$5.16 in benefits to Wisconsin. Utilities are also allowed to conduct their voluntary energy efficiency programs beyond those funded through Focus on Energy®. Current law also allows large customers, over 1,000 monthly kWh or 10,000 dekatherms of natural gas, to participate in self-directed energy efficiency programs.⁸⁴ While there are successful energy efficiency programs, there is still room to realize the full potential of these programs to see dramatic increases in efficiency statewide.

It is also important to recognize the challenge in preparing homes for energy conservation measures; work is often required to address deficiencies that prevent the installation of these measures. This results in Weatherization Assistance Program deferrals for needed work that the homeowner cannot afford to address and that the program cannot provide. Energy conservation programs need to design and implement programs dedicated to supporting those who cannot afford these costs, especially in low-income communities and communities disproportionately impacted by climate change. It will be critical for the energy efficiency program administrators to collaborate closely with the statewide weatherization network in the state. Energy efficiency is one of the only strategies that holds the potential to decrease energy burdens among homeowners, renters, and businesses.



The following figures show business as usual building energy use by energy source compared to the building energy use by energy source factoring in the CEP strategies. It is important to note, the interplay of efficiency and other building strategies can complement each other to realize more emissions reductions.

Figure 23: Building Energy Use Business as Usual versus CEP Impact

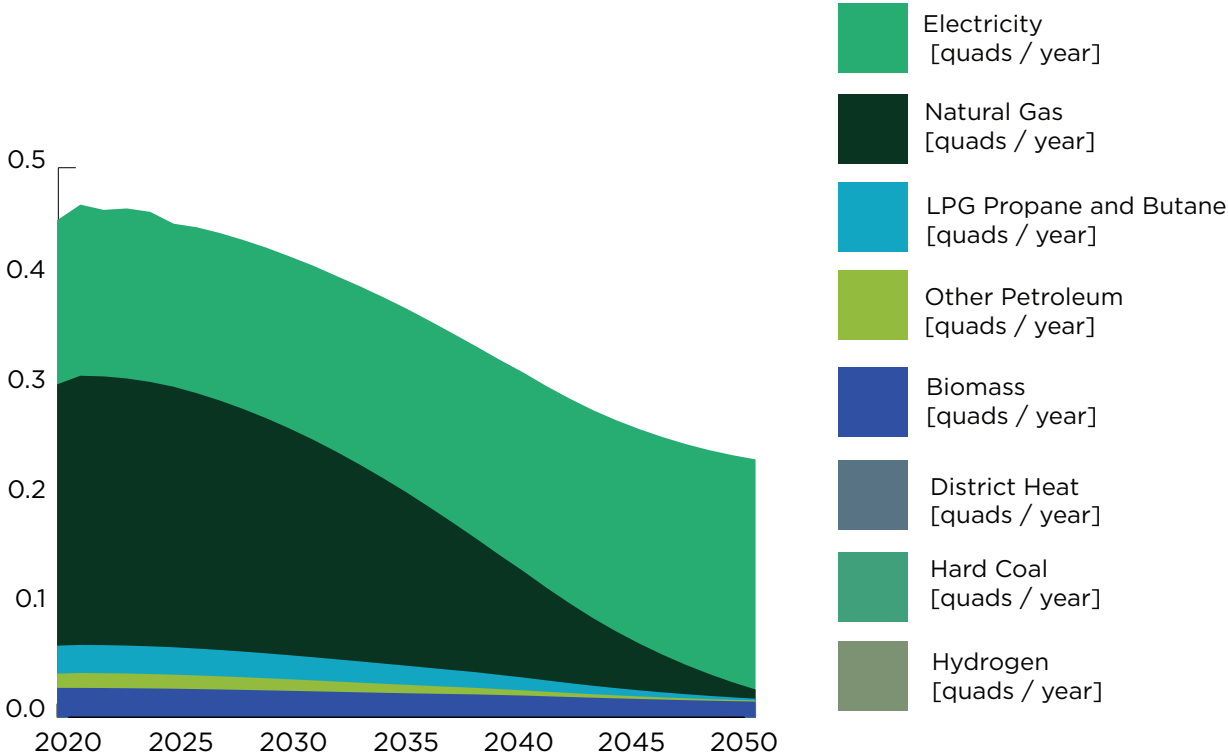
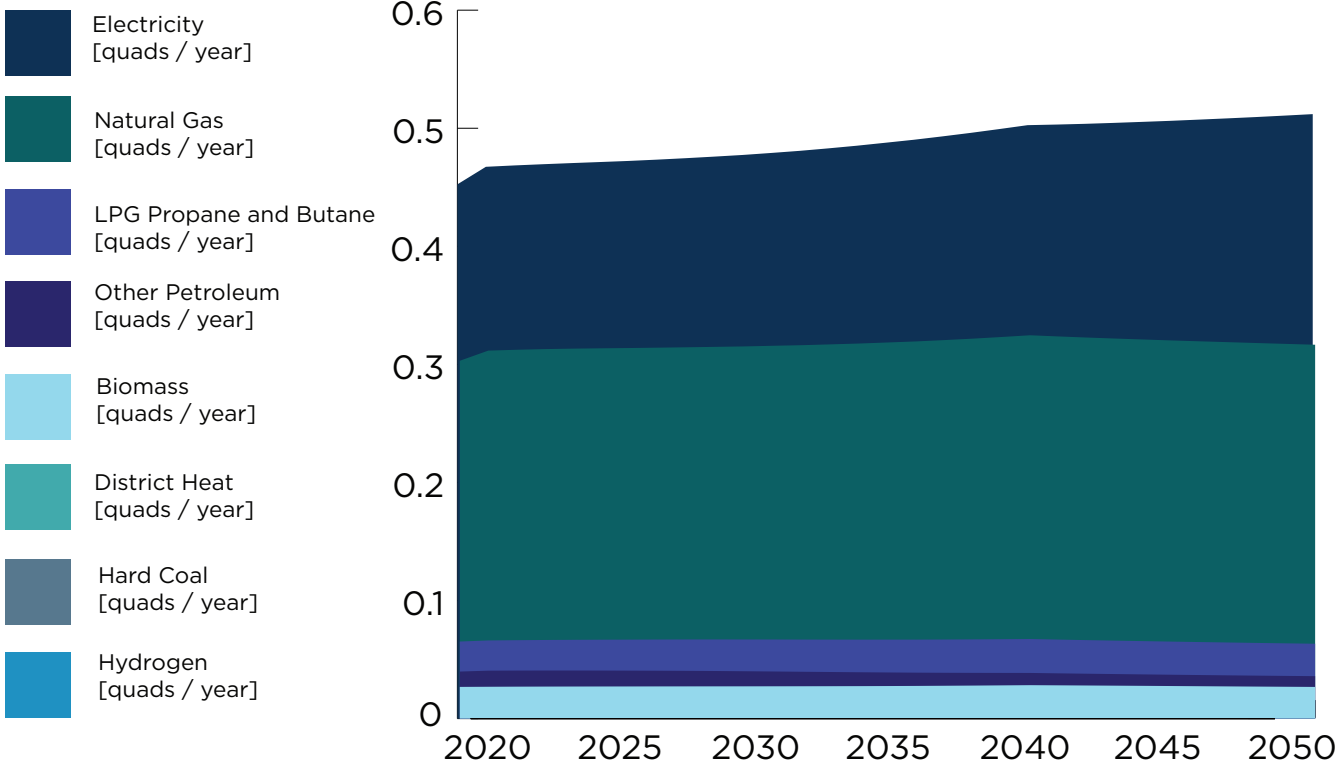


Table 8: Summary of Priority Strategies to Maximize Energy Efficiency

| Immediate Action Strategies | High-Impact Strategies |
|---|---|
| Economywide investments in energy efficiency | Economywide investments in energy efficiency |
| Set an energy use reduction goal | Set an energy use reduction goal |
| Improve Wisconsin GHG emissions data collection | Set an Energy Efficiency Resource Standard (EERS) |
| Reduce agriculture energy use | Increase Focus on Energy® program funding |
| Promote creative financing options and additional energy efficiency measures for customers with low incomes | Increased utility investments in energy efficiency (via voluntary programs) |
| Pursue a healthy whole-home approach | Support commercial and industrial energy efficiency |
| Strengthen the Focus on Energy® program | |
| Leverage federal funding for energy efficiency grant program | |
| Support energy efficiency improvements through the WHEDA Foundation Annual Housing Grant Program | |
| Empower schools to fund or implement energy efficiency programs | |



HIGH-IMPACT STRATEGIES

Set an Energy Efficiency Resource Standard (EERS). In lieu of setting an energy use reduction goal (see immediate strategy below), legislation is needed to establish a phased-in EERS for the state of 2.5 percent for net electric energy use reduction and 2.0 percent net natural gas reduction, annually. The EERS should be paired with commensurate rate-of-return authorization for utility increased energy efficiency investments. The EERS would establish a requirement for utilities to achieve the delta between the Focus on Energy® efficiency achievement plus private sector (e.g., performance contracting) and the EERS standard above.

Increase Focus on Energy® program funding. Increase Focus on Energy® program and utility incentive funding to double the required utility contribution from 1.2 percent to 2.4 percent of annual operating revenues, which would generate an additional \$100 million in annual funding for the program and ensure that this increase not be passed along to ratepayers. Currently, every dollar invested in Focus on Energy® projects returns \$5.16 in benefits to Wisconsin. *(2021-2023 Executive Budget, GTFCC Rec #8)*

Increased utility investments in energy efficiency (via voluntary programs).

Expand utility voluntary programs to maximize energy efficiency, focus on customer services and benefits.

Support commercial and industrial energy efficiency. Maximize opportunities to provide cost-effective industrial efficiency. Support existing programs offered by Focus on Energy®, The Wisconsin Sustainable Business Council, Wisconsin Manufacturing Extension partnership, and UW Industrial Assessment Center, among others. Support financing options to ensure energy efficiency projects are feasible. A big barrier in industrial facilities is their limited budget, but they are also constrained on how much they can borrow from their bank. Provide grants or creative lending approaches to help the industry overcome this constraint (i.e., energy efficiency loan is a secondary position to bank loans, capital leasing).



IMMEDIATE ACTION STRATEGIES

{High-Impact} Economywide investments in energy efficiency. To accomplish impactful emissions reduction via energy efficiency, investment is needed across the board: more incentives for IOUs to make major investments in energy efficiency; policies to increase private sector energy efficiency (e.g., performance contracting) investments; and increased funding for the Focus on Energy® program. Increasing available funding along with exploring goals for Focus on Energy® that include emission reductions and equity/justice metrics hold the greatest environmental justice potential. Expanding energy efficiency efforts in Wisconsin, for example, establishing an energy efficiency resource standard, and giving utilities incentives to contribute to meeting the standard, will allow the state to accelerate energy efficiency for our most vulnerable communities.

{High-Impact} Set an energy use reduction goal. The current Focus on Energy® Program statutory parameters are set on spending levels (not achievements) where 1.2 percent of a participating IOU's annual operating revenues derived from retail sales fund the utility's programs. Wisconsin energy use reductions for electricity and natural gas are substantially below those in neighboring states, and enhanced energy efficiency goals should be required for utilities.⁸⁵ **(GTFCC Rec #7)**

Improve Wisconsin GHG emissions data collection. Multiple agencies currently track GHG emissions (i.e., statewide for *DNR Wisconsin Greenhouse Gas Emissions Inventory Report*; power sector for the PSCW SEA). Tracking GHG emissions can help measure the impact of emission reduction strategies. The State should support coordinated, consistent GHG emissions tracking to help inform agencies and decision-makers evaluating Wisconsin's progress towards meeting its GHG emission reduction goals. The following strategies are designed to improve GHG emissions data collection:

1. Direct agencies to work collaboratively to update the *Wisconsin Greenhouse Gas Emissions Inventory Report* to accurately report emissions and monitor progress toward carbon reduction efforts;
2. Develop methods for implementing the data collection, to the extent they do not currently exist;
3. Create breakdown data for state operations to support the State Lead-by-Example efforts; and
4. Ensure a breakdown of GHG emissions based on established environmental justice metrics. The State should use U.S. EPA data until the Wisconsin Environmental Equity Tool is available. **(GTFCC Rec #5)**

Reduce agriculture energy use.

1. Increase collaboration with current fuel providers and increase efficiency in sectors that utilize high carbon fuels. PSCW, Focus on Energy® program, propane distributors, and fuel-oil distributors will discuss ways to increase the efficiency of high-carbon fuel to reduce the amount of use in Wisconsin and ensure these industries are supported as the state transitions to low-carbon energy sources.
2. Reduce the amount of energy used in the agriculture sector by focusing on heaters, grain dryers, energy-efficient equipment, and moving away from fossil fuels. Structure a program like the Focus on Energy® and PSCW OEI propane offering. Pursue a whole-farm approach including buildings and farmhouses.
3. Transition from fossil fuel use in on-road, off-road, and other forms of transporting goods.

Promote creative financing options and additional energy efficiency

measures for customers with low incomes. Low-income households spend a disproportionately high percentage of their household income on energy. At the same time, they are more likely to live in older, less efficient homes. Extreme heat in the summer and cold in the winter caused by climate change exacerbate their energy burdens. Promoting creative financing options and additional energy efficiency measures will help reduce energy bills and reduce health care costs due to pollution caused by fossil fuel generation.

1. Provide incentives for high-performing utility programs. The PSCW should establish performance incentives for utilities whose energy efficiency and renewable energy programs produce significantly increased savings for their customers. Explored further via the PBR workshop under the Roadmap to Zero Carbon Investigation. These incentives should guarantee financial recovery for utilities, even if the program does not deliver an initially positive cost-benefit analysis, for the sake of supporting innovation.
2. Dedicated Focus on Energy® funding for customers with low incomes. In partnership with the DOA Weatherization Assistance Program and Wisconsin Community Action Program Association, and other non-profit housing authorities, the PSCW should reserve a portion of the additional Focus on Energy® funds to develop a customer-with-low-incomes track that offers enhanced incentives for eligible customers. The PSCW has found it reasonable to consider energy efficiency issues raised in the Roadmap to Zero Carbon Investigation docket as part of the Quadrennial Planning Process IV (*PSCW Docket 5-FE-104*), including deploying programs and offerings for customers with low incomes. **(2021-2023 Executive Budget)**
3. Create a study/assessment of best practices for reducing renter energy burdens for those with low and moderate incomes. PSCW should assess the low- and moderate-income rental market in Wisconsin and best management practices for adopting innovative offerings for these customers. The PSCW recently mandated that utilities report energy burden data. This data should now be analyzed to identify best practices to reduce energy burdens. PSCW has found it reasonable for Commission staff to conduct further analysis on customer affordability and include affordability as a topic in its workshop on performance-based regulation.

Pursue a healthy whole-home approach. Create a collaborative grant program, leveraging multiple programs, to work in conjunction with the Weatherization Assistance Program and Focus on Energy® program that would make a home

weatherization ready. This could include needed repairs, other healthy home measures such as grab bars, carbon monoxide detectors, and child-proof measures, among others. Work with the Department of Health Services, WEDC, and DOA Community Development Block Grant programs and Weatherization Assistance Programs to fund renewable energy and maximum energy efficiency in new and rehabilitated units to reduce energy usage and costs.

Strengthen the Focus on Energy® program.

1. Encourage a collaborative process, by increasing public engagement in the Quadrennial Planning Process IV, to expand the program's administration, program design, allocation, implementation, and evaluation on desired outcomes including equity, justice, economic benefits, health benefits, and environmental benefits. These outcomes should be incorporated into the cost-effectiveness test for the program and the cost-benefit analysis for the program's evaluation.
2. Focus on Energy® program administrators collaborate closely with the statewide Weatherization network to ensure maximizing the benefits of programs. Those who qualify for the statewide program administered by the DOA Division of Energy Housing and Community Resources should take advantage of weatherization. PSCW recently approved the issue as part of the scope of the Quadrennial Planning Process IV.
3. In addition to kilowatt-hour (kWh) and therm goals, the program should have goals for emission reductions, and consider setting a minimum allocation of the residential program budget (e.g., WEDTI recommendation of 20 percent), market transformation, and ensuring economic benefits such as job creation are available to for low-income and vulnerable communities, and communities disproportionately impacted by climate change. PSCW has found it reasonable to consider these issues raised in the Roadmap to Zero Carbon Investigation docket as part of the Quadrennial Planning Process IV. **(GTFCC Rec #8)**
4. Develop programs within the Focus on Energy® program scope aimed at facilitating a logical transition to energy-efficient electric appliances and equipment where feasible. PSCW has found it reasonable to consider electrification raised in Roadmap to Zero Carbon Investigation docket as part of the Quadrennial Planning Process IV. The PSCW recently approved this issue as part of the scope of the Quadrennial Planning Process IV. **(GTFCC Rec #8)**
5. Provide education and outreach regarding goals and benefits of policies, including electrification and other carbon-reducing activities. **(GTFCC Rec #8)**

Leverage federal funding for energy efficiency grant program. Leverage federal funding to create a competitive grant program to allocate private sector funding for energy-efficiency projects in communities disproportionately impacted by climate change. Support developing such a program and ensure that all grants result in leveraging private sector funds, and complementing Focus on Energy® funding.

Support energy efficiency improvements through the WHEDA Foundation Annual Housing Grant Program. Eligible housing providers are awarded grants through an Annual Housing Grant Program competition. Grant funds support the development or improvement of housing facilities in Wisconsin for individuals with low incomes and with special needs. Eligible uses of grant funds may include energy-efficient improvements such as installation of new doors and windows, HVAC systems, ENERGY STAR® appliances, and other energy saving facility enhancements. Outreach for this program should be leveraged with other programs (i.e., Weatherization, Focus on Energy®, Low Income Home Energy Assistance Program, etc.).

Empower schools to fund or implement energy efficiency programs. The Governor proposed providing \$10 million annually for grants to school districts to conduct energy efficiency school building projects, with priority for heating, ventilation, and air conditioning system projects. Since this funding did not pass the budget process, the State will continue to look for financing options, and will also encourage school districts to develop and pass referendums that schools can go through to engage energy efficiency projects within their system. *(2021-2023 Executive Budget, GTFCC Rec #36)*



FUTURE STRATEGIES

Create Voluntary On-Bill Tariff programs. Utilities should ensure that customers with low incomes, multifamily customers, and renters have access to opt-in financing options for energy efficiency projects. Like PACE programs, these will allow the customer to pay for energy-saving upgrades incrementally over time on their monthly bills.

Explore state appliance and equipment energy and water efficiency standards.

As laid out in the 2021 model state appliance standards legislation prepared by the Appliance Standards Awareness Project, appliance standards should include all of the appliances and equipment that hold the potential for significant energy or water savings but are not addressed by national standards.⁸⁶ A requirement could be phased in and include financial support to include commercial dishwashers, commercial fryers, commercial hot-food holding cabinets, commercial ovens, commercial steam cookers, computers, computer monitors, faucets, gas fireplaces, high color rendering index/cold temperature/impact-resistant fluorescent lamps, portable electric spas, residential ventilating fans, showerheads, and others.

Department of Safety and Professional Services (DPS) to develop and administer a voluntary commercial building energy benchmarking program.

Commercial building owners can submit and disclose their buildings' measured energy consumption to other building owners or to the public. DOA's OSCE will provide technical support resources and services to commercial building owners, market the benchmarking program to building owners, and establish a recognition and award program for those building owners who participate.



MODERNIZE BUILDINGS AND INDUSTRY

Buildings - Direct emissions from commercial and residential buildings accounted for 16.8 percent of emissions in Wisconsin. Commercial buildings use 36 percent of all energy in the U.S. today. Depending on construction and use, buildings have typical lifespans of 50 to 60 years, but some for upwards of 100 years. Therefore, building codes that ensure the highest level of efficiency and reduced carbon intensity (CI) are critical as their impact is long-lasting. Building codes can effectively drive emissions reductions in both new and substantially renovated buildings. For many buildings, electrification through heat pump technology or reductions from end-use natural gas decarbonization serve as promising strategies.

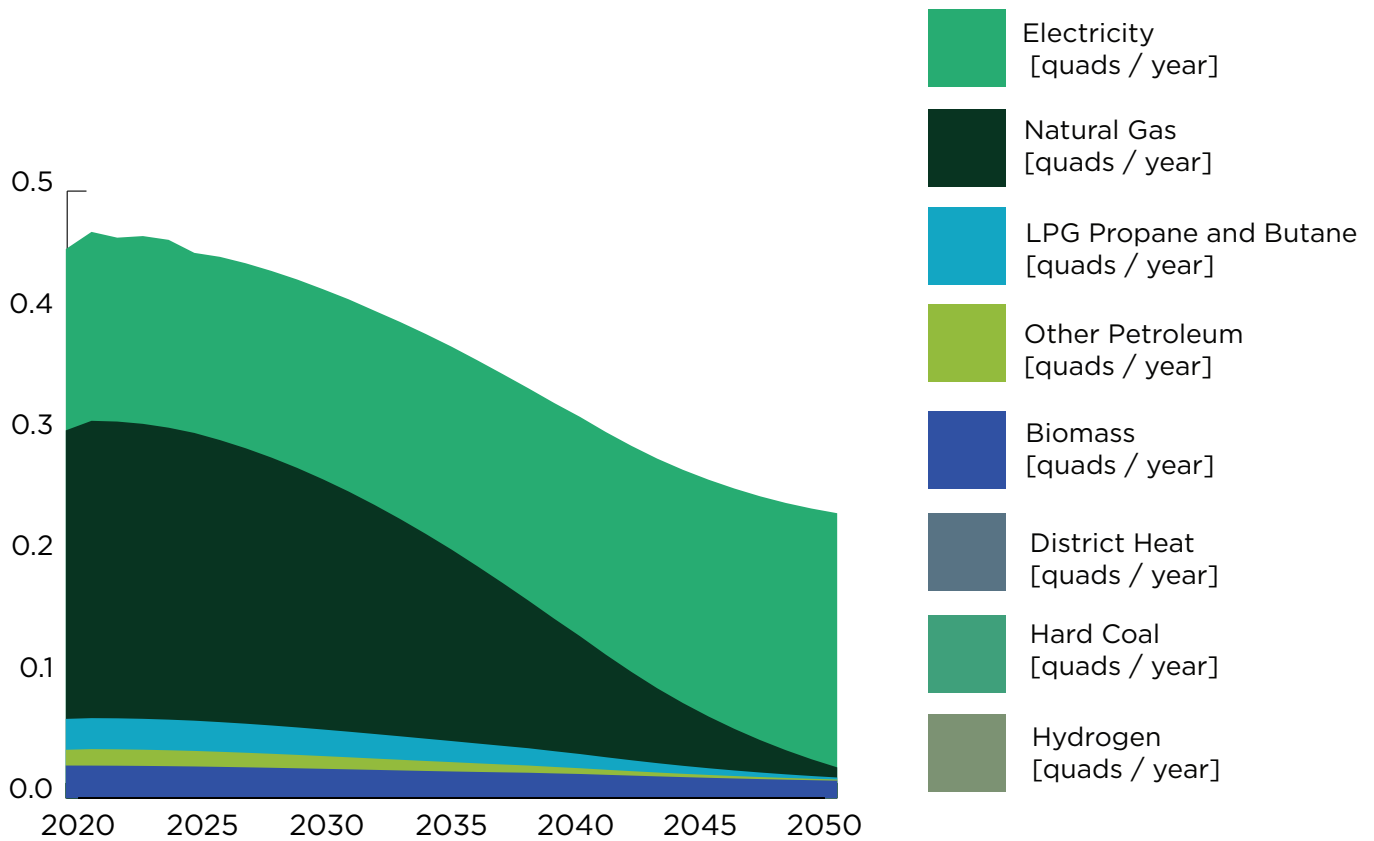
As the MPSC highlighted in their *A Roadmap to Decarbonization in the Midcontinent - Buildings*, "Decarbonization of buildings will require making buildings more energy efficient and replacing fossil fuels currently used for space and water heating with

very-low-and-zero-carbon electricity, as well as pursuing very-low and zero-carbon alternative fuels such as renewable natural gas and hydrogen.”

Because the electrification of buildings, energy storage, and energy efficiency projects and practices have the potential to substantially reduce utility bills and increase energy reliability, these strategies hold tremendous promise for increasing equity and decreasing the high energy burdens experienced by low-income households, communities disproportionately impacted by climate change, and Tribal Nations. Small business owners have the most to gain from greener, cleaner buildings. BlocPower estimates that 5 million U.S. SME (small and mid-size enterprises) buildings are outdated and inefficient, meaning they consume 40 to 75 percent more energy than necessary. As a result, the energy bills from such buildings can cost up to 30 percent of an SME’s annual budget.^{87,88} In turn, this unnecessarily high energy demand strains the energy grid, and many people also experience adverse health symptoms within these buildings.

Building energy use by energy source is estimated in the figure below. Estimated energy use reduces to approximately .42 quads per year in 2030, approximately .31 quads per year in 2040, and approximately .22 quads per year in 2050. Electricity accounts for an estimated 39 percent of building energy use in 2030, 60 percent in 2040, and 95 percent in 2050 because of the policies and programs of the draft Clean Energy Plan.

Figure 24 - Building Energy Use by Energy Source



Industry - Wisconsin, direct emissions in the industrial sector were 18.2 percent, in 2018. More energy efficient buildings lead to lower building energy costs and reduces harmful emissions. Better energy management by industrial businesses will reduce overall energy usage, potentially at peak times, thus reducing costs of the system to all customers. Individuals with lower incomes are more likely to live in neighborhoods that are susceptible to climate-related disasters and are also often living near industrial areas and hazardous waste sites.

To the extent that renewable thermal technologies are or become cost-saving measures, such installations should be targeted in low-income communities. The rural, low-income clean heating fund will reduce the heating cost burden for rural residents with low incomes and safeguard them from heating fuel price volatility.

Electrification - As we decarbonize the electric grid, electrification across industries and sectors, notably transportation and buildings, will become more environmentally beneficial. Such electrification will reduce emissions from the transportation and buildings sectors and help Wisconsin achieve its clean energy goals.

As the state implements electrification strategies, it becomes necessary to strengthen and grow the distribution grid to handle the increased load. Therefore, distribution planning becomes even more essential. Additionally, electrification of the buildings sector should be conducted in such a way that minimizes stranded assets from the natural gas distribution network. Doing so prevents or minimizes additional costs to Wisconsin residents, especially those in low-income communities.

As technology develops, electrification also allows utilities to shape load to optimize the distribution system. Electrification creates significant health benefits, such as, removing vehicles that contribute to criteria pollutant emissions. These emissions have a disproportionate impact on low-income and environmental justice communities.

Table 9: Priority Strategies to Modernize Buildings and Industry

| Immediate Action Strategies | High-Impact Strategies |
|--|---------------------------------------|
| Develop Low Carbon Building Materials Procurement Policies | Adopt a Renewable Thermal Standard |
| Support Wisconsin wood product utilization and protect Wisconsin forests | Deploy rapid building electrification |
| Update building codes | Make WI a leader on Building Codes |
| Support high-value conservation | |
| Increase outreach and support deployment of air-source heat pumps | |
| Create a plan to adopt net carbon zero thermal solutions to scale up renewable heating and cooling in the industrial and building sector | |
| Support independent energy audits for businesses | |
| Create an industrial focused recognition program | |



HIGH-IMPACT STRATEGIES

Adopt a Renewable Thermal Standard (RTS). State policies played a critical role in helping to develop markets for renewable electricity systems; 35 states have some form of RPS or CES. Clean/renewable thermal (heating) energy policies are not nearly as robust, but 14 states now have some form of a RTS, or at least recognize renewable thermal technologies within their RPS. 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 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 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, 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 Midwest-Renewable Energy Tracking System (M-RETS) which deployed a renewable thermal tracking system in 2019 and is already equipped to accommodate this policy in Wisconsin.

Deploy rapid building electrification. While utilities and self-generating customers are transitioning electricity generation in Wisconsin to zero-emission renewables, we need to simultaneously electrify building heating load as much and as quickly as possible. This will help us meet the environmental, health, security, equity, resilience, and economic goals of this CEP. Ensure that the timeline for the electrification of buildings follows closely behind the cleaning (transition to renewables) of the grid.

Make WI a leader on building codes. The current commercial building codes are several years behind. Revisions should not only catch up but should be made with the input of an advisory council. This is to address environmental issues such as, enabling adoption of stretch codes and adopting codes that require electric vehicle and solar-ready standards for commercial, residential, and multifamily new construction. The process should meet and wherever practical exceed the standards of the most recent International Energy Conservation Code (IECC).

Table 10: Current Building Code Status in Midwest States

| State | Current State Code | |
|-----------|---|---------------------------|
| | Commercial | Residential |
| Wisconsin | 2015 IECC and ASHRAE 90.1-2013 with amendments | 2009 IECC with amendments |
| Minnesota | 2018 IECC and ASHRAE 90.1 -2016 with amendments | 2012 IECC with amendments |
| Illinois | 2018 IECC with amendments | 2018 IECC with amendments |
| Michigan | 2015 IECC and ASHRAE 90.1-2013 | 2015 IECC with amendments |
| Iowa | 2012 IECC | 2012 IECC with amendments |



IMMEDIATE ACTION STRATEGIES

Develop Low Carbon Building Materials Procurement Policies. The state will aim to reduce the embodied energy within its building material by researching policies designed to lower carbon - from construction materials. The state will conduct a study to investigate and suggest options to consider carbon emissions in infrastructure project development and material procurement. Recommend a standardized method to evaluate and report embodied carbon emissions from the most used construction material in Wisconsin and create Environmental Product Declarations or project development and bid evaluation. This may include energy required for the extraction, processing, production, and transport of materials to the building site. To do this, analysis will need to be conducted on the materials and current governance on procurement for the state.

Support Wisconsin wood product utilization and protect Wisconsin forests.

Expand opportunities to utilize sustainable Wisconsin wood products including increased investments in research, development and commercializing of mass timber, cross laminated timber, biochar, and other technologies to store carbon. Generate renewable thermal energy (woody biomass) to offset fossil fuel and protect Wisconsin forests as carbon sinks.

1. DNR to expand existing programs aimed at tracking carbon storage in Wisconsin forests, promoting reforestation and afforestation, and managing forests for carbon sequestration. DNR may also develop and implement a campaign on the benefits of using Wisconsin wood products to store carbon.
2. Support the use of woody biomass (e.g., dead wood, manufacturing waste, and forest residues, etc.) to displace the use of coal, propane and/or fuel oil for purposes such as space heating, hot water, and industrial processes, such as district or CHP, and community-scale heating programs for hospitals and schools. Assess existing safeguards to ensure that Wisconsin's woody biomass use for energy feedstocks in no way incentivizes deforestation, rather incentivizes forest management for carbon storage. Review emission policies, standards, and controls to protect health from emissions.
3. DSPS to update building codes to allow for mass timber construction. This action will encourage long-term carbon storage while establishing market potential for manufacturing with Wisconsin wood.

Update building codes.

1. Implement guidelines to ensure building codes are up to date that consider the State's carbon-reduction goals. (Wis. Admin. Code SPS Ch. 363)⁸⁹
2. Transitioning from the current Wisconsin Uniform Dwelling Code to the IECC 2021 residential codes.

Support high-value conservation - High-value conservation (Exergy) is like energy efficiency but goes significantly beyond it, taking a holistic, systemic approach that includes electrical energy, thermal, chemical, and material inputs and outputs. High-value conservation applied in large industrial and institutional settings has the potential to reduce energy costs and energy consumption from 30 percent to 90 percent. To support this, the state will analyze the potential district heating and cooling systems to use waste heat generated by utility power plants, industries, and institutions that can help develop subsequent tools for high-value conservation planning. Additionally, the state will work with stakeholders to create an Exergy Education Pipeline to provide continuing education programs for existing engineers, planners, architects and building managers involved with energy, heating, and cooling systems.

Increase outreach and support deployment of air-source heat pumps. Air-source heat pumps (ASHP) are highly efficient for heating and cooling homes. For example, ASHP deliver up to four times more heating energy than the electricity it consumes.⁹⁰

ASHPs can be economic today in Wisconsin, particularly for homes that currently use natural gas, propane, fuel oil, or electric resistance heat. Still, like many clean energy technologies, an understanding of the technology and upfront costs of installation can be significant barriers, especially for low- and moderate-income homes.

1. State to work with stakeholders to increase outreach to educate consumers on heating and cooling technology options. This should include information on health/indoor air quality benefits of removing combustion from homes and businesses.
2. Explore participating in or closely monitoring U.S. DOE Cold Climate Heat Pump Technology Challenge aimed to, “develop affordable and efficient heat pumps for any building owner in any climate.”⁹¹
3. Establish a fund to subsidize the installation of ASHPs in low- to moderate-income rural households that currently heat with propane and fuel oil. This strategy is also a recommendation from the MPSC *Decarbonization Roadmap – Buildings*. This program could start as an add-on to the existing PSCW Rural Propane Program delivered through the Focus on Energy® program. PSCW may consider this electrification technology, raised in the Roadmap to Zero Carbon Investigation docket, as part of the Quadrennial Planning Process IV.

Create a plan to adopt net carbon zero thermal solutions to scale up renewable heating and cooling in the industrial and building sectors. PSCW and Focus on Energy® (through EERD) to analyze CHP and waste heat to power (WHP) and develop a report on efficiency gains. Depending on the results:

1. Create a standalone Commercial and Industrial Customer Generation Incentive Program. This will depend on the potential for annually increasing carbon reduction targets, specifically for new CHP and WHP generation. Incentives for these new CHP and WHP generation resources should be rate-based like other utility generation resources, rather than funded by adders to ratepayers’ bills.⁹²
2. Incentivize the use of renewable thermal energy. Support the use of woody biomass and renewable natural gas for functions like space heating, hot water, and industrial process heat. This includes district or CHP, and community-scale heating programs for hospitals and schools.

Support independent energy audits for businesses. Encouraging businesses to join DNR Green Tier Legacy Communities, Wisconsin Sustainable Business Council’s Green Master’s Program, or a sector-specific business sustainability program (e.g., Sustainable Green Printing Partnership) that can help drive continuous improvement and energy and cost savings to help meet clean energy and energy efficiency goals.

Create an industrial focused recognition program. Highlight industries that are working toward carbon reductions and highlight the associated community impact benefit (i.e., models like the Focus on Energy® Efficiency Awards or Department of Administration Equity Awards).



FUTURE STRATEGIES

Net-zero buildings. Explore setting a commitment that all new commercial building construction is net-zero electric by a target date.

Building code updates.

1. Enable adoption of stretch codes by repealing 2013 Act 270, thereby allowing local control over building codes, including residential.
2. Adopt building codes that require electric vehicle- and solar-ready standards for commercial, residential, and multifamily new constructions.
3. Transition building codes over time to net-zero energy commercial buildings.

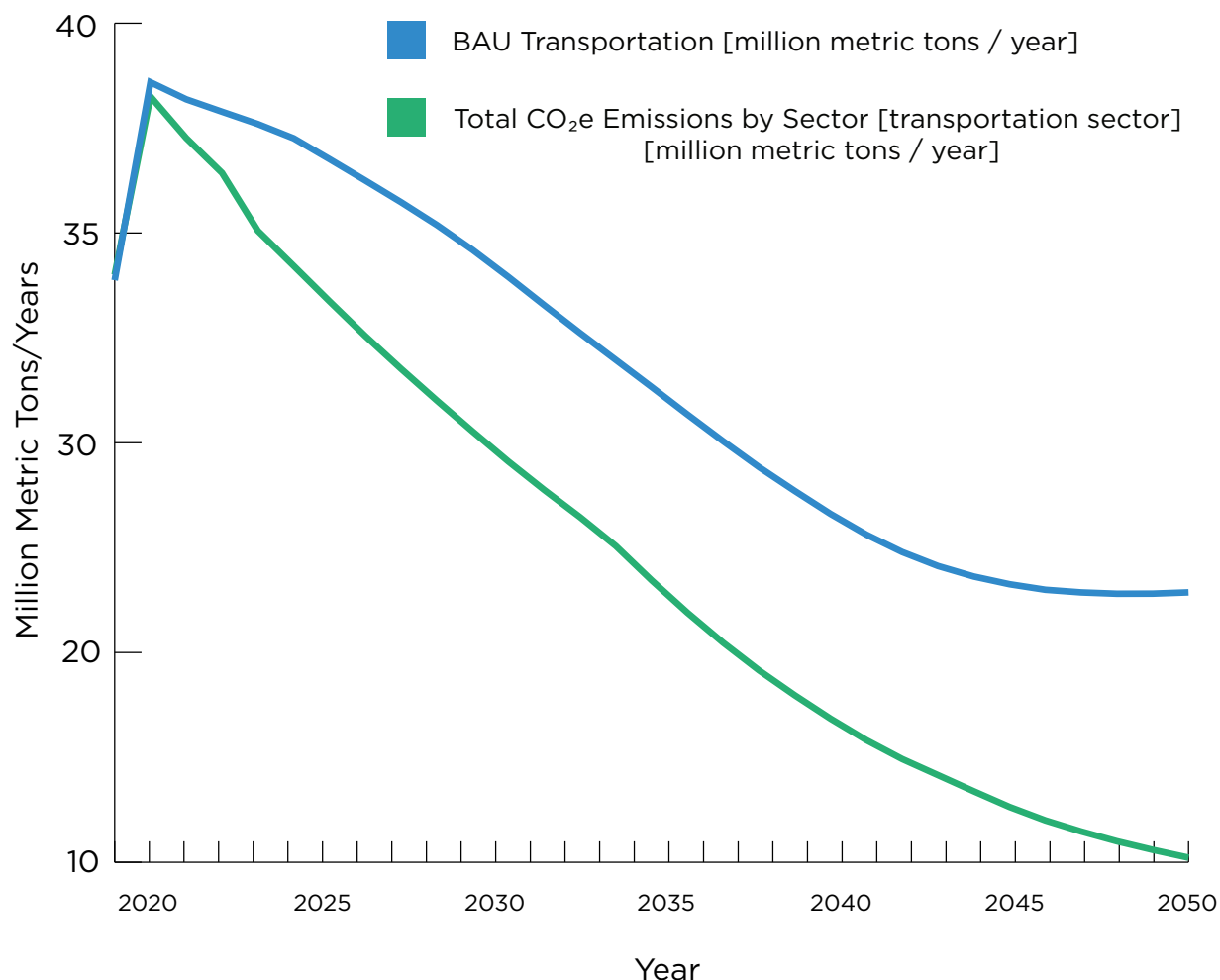
Improve the energy performance and strengthen the cost-competitiveness of Wisconsin's industrial sector. The following strategies are designed to improve energy performance and strengthen the cost-competitiveness of Wisconsin's industrial sector.

1. Wisconsin aims to join a Regional Hydrogen Hub.⁹³
2. Support ISO 50001 energy efficiency protocols, which:
 - a. Are based on the management system model of continual improvement, enabling organizations to integrate energy management into their overall efforts to improve quality and environmental management. As with other ISO management system standards, certification to ISO 50001 is not obligatory. Some organizations implement the standard solely for the energy and cost; and
 - b. Provide a framework of requirements for organizations to:
 - i. Develop a policy for more efficient use of energy,
 - ii. Fix targets and objectives to meet the policy,

- iii. Use data to better understand and make decisions about energy use, measure the results, and
- iv. Review the effectiveness of the policy and continually improve energy management.

According to the MPSC *A Roadmap to Decarbonization in the Midcontinent - Transportation Electrification*, "Carbon emissions in the transportation sector depend on the interplay of three primary factors: the carbon content of the fuel used to power vehicles, the efficiency of the vehicles, and how far the vehicles are driven, usually measured in vehicle miles traveled." Policies to decarbonize the transportation sector should focus on decreasing the carbon content of the fuel that powers vehicles, improving the efficiency of vehicles to emphasize ZEV operation in the state. The figure below shows the impacts of the strategies of the CEP on CO₂ emissions in the transportation sector.

Figure 25 - CO₂ Emissions for Transportation



From an emissions standpoint, electric vehicles (EVs) are superior to traditional vehicles with internal combustion engines that burn gasoline or diesel fuel. As the generation mix of the electricity powering EVs gets cleaner, the difference in emissions between EVs and traditional vehicles will be even more pronounced. The

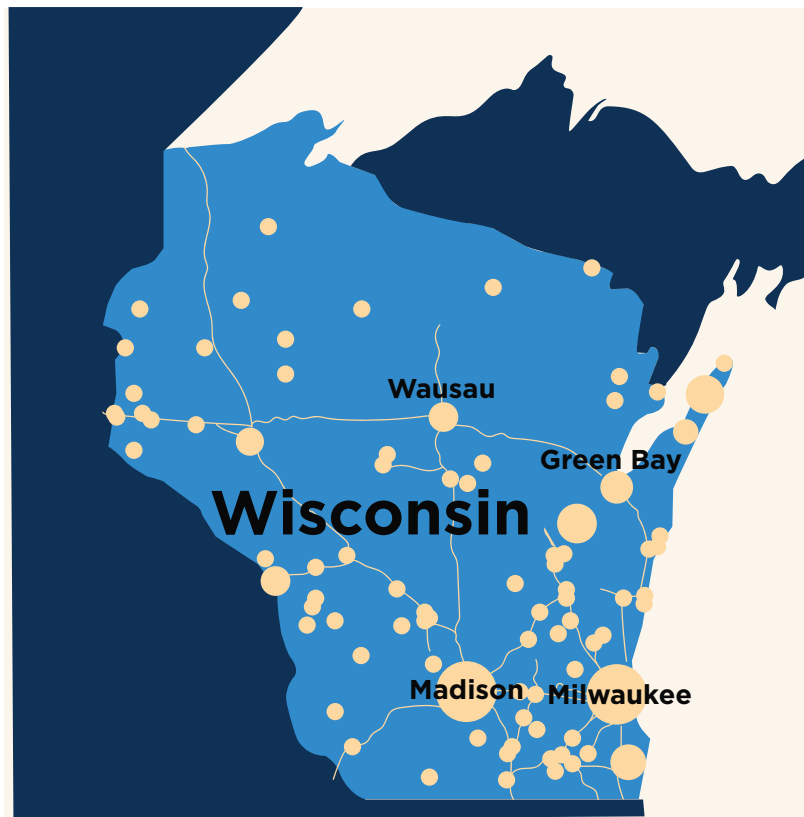
percentage of electric vehicles is growing, though not at the levels required to substantially reduce emissions from the transportation sector. A multifaceted series of strategies are necessary for rapid decarbonization in this sector.

Table 11 - EV Penetration in Midwest ⁹⁵

| State | EV Sales 2011-2020 |
|--------------|--------------------|
| Illinois | 26,575 |
| Ohio | 15,197 |
| Minnesota | 9,483 |
| Michigan | 7,652 |
| Wisconsin | 7,464 |
| Missouri | 6,927 |
| Indiana | 6,374 |
| Kansas | 2,740 |
| Iowa | 2,005 |
| South Dakota | 341 |
| North Dakota | 240 |

Figure 26 - Wisconsin Electric Vehicle Infrastructure

*Direct Current Fast Charging (DCFC) and Level 2⁹⁶



To support EV transition statewide, Wisconsin must ensure that EV charging infrastructure is widely available for all types of vehicles and that such infrastructure reaches lower-income and environmental justice communities. Meanwhile, the state should explore efforts to enact a low-carbon fuel standard, both to spur electric vehicle adoption and to provide a lower-carbon fuel for internal combustion engines for as long as they are part of the vehicle mix. According to the Great Plains Institute's *A Clean Fuels Policy for the Midwest: A White Paper from the Midwest Clean Fuels Policy Initiative*, many Midwest states have existing policies and regulations that provide a baseline for Clean Fuels Policy development, including Minnesota, Illinois, Missouri, Nebraska, North Dakota, Ohio, Indiana, Iowa, Kansas, Michigan, South Dakota, and Wisconsin.⁹⁷ The transportation sector has a lot of room for growth when it comes to transitioning to low- to no-emissions fuels. Other states and countries have established clean fuels programs or low carbon fuels standards, including Oregon, California, New York, Canada, and the United Kingdom. The Great Plains Institute recently published a whitepaper, *A Clean Fuels Policy for the Midwest*, that noted a well-designed clean fuels policy can contribute considerably to the economy



In addition to implementing ZEV efforts, Wisconsin will contribute to decarbonization by supporting the development strategies that encourage reducing vehicle miles traveled, using public transit, ridesharing, and applying planning strategies that reduce the need for personally operated vehicles. Additionally, these practices have numerous equity and public health benefits including but not limited to greater access to employment opportunities, cost savings, and health benefits associated with active transportation and lower criteria pollutant emissions.

To meet Wisconsin’s goal to transition most vehicles to be EVs in the next two decades, the following strategies need to be implemented before 2030.

Complete Streets: In 2009, the Wisconsin State Legislature passed a Complete Streets law which in part stated that the Wisconsin Department of Transportation (WisDOT) shall refuse to provide any state and federal funds to highway reconstruction projects that don’t include bicycle and pedestrian ways such as sidewalks and/or marked or unmarked bike lanes. The passing of a statewide Complete Streets law prompted many cities and regions across the state to adopt complementary Complete Streets policies to best coordinate the development of safe street networks within their respective communities. In 2015, the governor’s administration repealed the Complete Streets law through 2015 Wis. Act 55, stating that the move was designed to “reduce the regulatory burden on the Department of Transportation,” alleging that the law would put a \$7 million hole in the state budget over a two-year period. Conversely, the Wisconsin Bike Fed, along with its partners and local government leaders across the state, saw it differently, citing cost savings.⁹⁸

Eminent Domain: Eminent domain authority is established in the Wisconsin Constitution under Article 1, Section 13. This allows private property to be taken by the state or local governments, so long as the property is taken for public use and the owner is justly compensated. Wisconsin law further establishes a detailed process of property appraisal, negotiations, payment, and contesting the use of eminent domain. In 2017, Wis. Act 59 of Wisconsin’s budget bill amended Wisconsin’s statutes Chapter 27 to prohibit the use of eminent domain to establish or extend recreational trails, bicycle ways, bicycle lanes, or pedestrian ways. This change is proving very detrimental to entities seeking to improve transportation options for their constituents and for those wishing to provide alternative transportation methods to help reduce carbon emissions. Wisconsin’s current eminent domain statute is holding up more than twenty projects across the state that would improve recreation and transportation options. Millions of federal dollars are being left unspent while the health of the planet is at stake.⁹⁹

Table 12 - Summary Priority Strategies to Innovate Transportation

| Immediate Action Strategies | High-Impact Strategies |
|---|--|
| Explore efforts to enact a low-carbon fuel standard | Decarbonize the transportation sector via EV and infrastructure deployment |
| Accelerates EV adoption and carbon reduction while fueling the development of Wisconsin’s EV and electric vehicle charging station (EVCS) equipment manufacturing | Explore enacting a Low Carbon Fuel Standard |
| Support the transition to Electric Vehicles (EV) statewide | Implement sustainable land use planning and transportation demand management (TDM) |
| Ensure that electric charging infrastructure is widely available for all types of vehicles and that it reaches rural, low-income, and communities of color | |
| Increase economic development opportunities | |



HIGH-IMPACT STRATEGIES

Decarbonize the transportation sector via EV and infrastructure deployment.

Vehicle electrification is a key solution for decarbonizing the transportation sector and will synergize with the decarbonization of the electric grid.

Explore enacting a Low Carbon Fuel Standard. A low carbon fuel standard will spur electric vehicle adoption and provide a lower carbon fuel for internal combustion engines for as long as they are part of the vehicle mix. Activate existing technologies (e.g., low- no-emitting fuels), resources, and programs in the transportation sector to realize immediate and long-term emissions reductions. *(GTFCC Tier 2 #54)*

Implement sustainable land use planning and transportation demand management (TDM). State agencies collaborate with local government officials to expand options for people to move around communities in ways that support less driving, a reduction of GHG emissions, and improved air quality. The following strategies intend to build on and enhance the planning efforts of the WisDOT, Metropolitan Planning Organizations, and Regional Planning Commissions. This should include:

1. Support local government efforts to implement sustainable land use planning and broadband.
2. Increase WisDOT engagement with communities through conversations, listening sessions, and/or community events to better understand how specific communities prefer to move around/travel, with an emphasis on socioeconomic, environmental justice, and equity strategies in support of communities of color and low-income communities.
3. Review and expand the state's TDM strategies to support expanded multimodal options for communities and connect communities in ways that support less driving, a reduction of GHG emissions, and improved air quality. These strategies should improve system-wide efficiencies, such as mass transit, ride sharing/pooling, high-occupancy vehicle lanes in high-congestion areas, and similar measures.
4. Support municipalities and regions to effectively coordinate and fund local transportation systems with a focus on opportunities to better facilitate connections between unemployed or underemployed workers with available jobs.

5. Support the development of regional public transit plans and coordinate with local government and regional planning stakeholders to evaluate regional transit needs, including passenger and commuter rail opportunities.
6. Explore various funding mechanisms for public infrastructure. Explore public, private, and hybrid funding models, as well as funding for workforce outreach and development. Continue to research and apply for federal funding to support multimodal mobility opportunities for users.
7. Promote the construction and use of passenger and commuter rail as well as other long-distance public transit. *(GTFCC Rec #18)*
8. Continue to develop and implement WisDOT's long-range modal and multimodal transportation plans.
9. Support active transportation to reduce air pollution and GHG emissions. Active transportation benefits all, promotes connection, multimodal options, and creates healthy livable communities.
 - a. Restore a complete streets program. This policy will promote safety features for pedestrians, bicyclists, and transit on roadway projects that receive state funding.
 - b. Authorize local units of government to use eminent domain to purchase land for the construction of non-motorized paths. Restore eminent domain acquisition authorization for pedestrian and bike trails located in the best interests of the public.
 - c. Increase state funding for the Transportation Alternatives Program and direct a portion of funds to under-resourced communities and environmental justice communities.
 - d. Provide funding for bicycle programs and bike infrastructure in low-income communities. *(2021-2023 Executive Budget, GTFCC Rec #20)*



IMMEDIATE ACTION STRATEGIES

Accelerate EV adoption and carbon reduction while fueling the development of Wisconsin's EV and electric vehicle charging station (EVCS) equipment manufacturing. Supported by the Economic Development Agency's American Rescue Plan Act funding, WEDC, WisDOT, and OSCE will craft a statewide strategy

that accelerates EV adoption and carbon reduction while fueling the development of Wisconsin's EV and EVCS manufacturing. This planning effort will involve two distinct but connected paths. First, will be an economic development and supply chain analysis. Second, will be an electrification transportation and infrastructure planning study effort. Both tracks will help Wisconsin create a thoughtful framework to build out EV infrastructure. At the same time, the effort will engage the state's research institutions, legacy businesses, entrepreneurs, and financial institutions to design a strategy to grow Wisconsin's private sector EV and EVCS manufacturing capacity and capability.

Support the transition to Electric Vehicles (EV) statewide. *(The goals/action items here will be updated to reflect the outcomes/findings of the above planning effort.)*

Support hybrid-electric vehicles, plug-in electric vehicles, and battery electric vehicles by deploying a broad and comprehensive suite of market-facing policies to build market demand, facilitate EV charging, and create a positive experience for EV drivers through the following strategies¹⁰⁰: **(GTFCC Rec #19)**

1. OSCE to serve on behalf of state agencies, on the Task Force for regional EV deployment efforts, Regional Electric Vehicle Midwest (REV Midwest) Coalition. REV Midwest is a bipartisan effort in partnership with Illinois, Minnesota, Michigan, Indiana, and Wisconsin that creates a regional framework to accelerate vehicle electrification in the Midwest.¹⁰¹
2. Ensure State agency coordination and collaboration.
3. Consider consumer protection issues for consumer engagement with this point of sale.
4. Increase demand by expanding access and awareness:
 - a. Create incentives (financial and non-financial, feebate¹⁰²).
 - b. Explore funding to subsidized used, community-owned ZEV rideshare or ZEV mobility as an amenity in low-income, rural, and communities disproportionately impacted by climate change.
 - c. Address direct sales^{103,104} of EVs by their manufacturer.
 - d. Address \$100 hybrid EV/EV surcharge¹⁰⁵.
 - e. Support/increase consumer-facing education.
 - f. Facilitate large-scale public (government) procurement:
 - i. Education for employees (decision-makers and drivers).
 - ii. ZEV-focused shared contracting (state/local government).
 - iii. Encourage "EV First" procurement.
 - g. Focus on the facilitation of heavy-duty and medium-duty procurement:
 - i. Explore and implement innovative financing options.
 - ii. Education for employees (decision-makers and drivers).
 - iii. Implement expansive stakeholder outreach to associations, trucking firms,

- businesses, etc., to understand issues and opportunities (where possible, leverage existing outreach efforts).
- h. Focus on transit and improve public transportation. Increase the percentage of EV fleet purchases.
 - a. Secure more federal funding to support capital costs (Congestion Mitigation Air Quality Program, CMAQ; Diesel Emission Reduction Act, DERA, etc.).
 - b. Support electrifying micro-mobility (electric bikes).

Ensure that electric charging infrastructure and federal funding to support infrastructure buildout is widely available for all types of vehicles and that it reaches rural, low-income, and communities of color. *(The goals/action items here will be updated to reflect the outcomes/findings of the above planning effort).*

Support EV infrastructure by deploying a broad and comprehensive suite of market-facing policies to build market demand, expand EV charging, and create a positive experience for EV drivers through the following strategies: **(GTFCC Rec #19)**

1. Ensure State agency coordination and collaboration.
2. Considering consumer protection issues for consumer engagement with this point of sale.
3. PSCW continues to encourage utilities to submit transportation electrification plans (*PSCW Docket 5-EI-156*).¹⁰⁶ Support the utilities' plan to upgrade the grid, rates, and programs to engage their customers, especially for smart charging. Utilities should file EV pilots including in rate cases where appropriate.
4. Streamline interconnections, permitting, and compliance for EV charging for the reduction of soft costs¹⁰⁷.
5. Update building codes to ensure new constructions are EV-ready.
6. Work with existing retailers to ensure the transition to electrification, such as truck stop options for mega chargers direct current fast charging (DCFC) infrastructure.
7. Target charging at multi-unit dwellings, workplaces, and public interest destinations.
8. Modify current law to exempt a nonutility that supplies electricity through an electric vehicle charging station from the definition of a public utility.
9. Designate corridors to increase public EV charging infrastructure and roadside signage.
10. Provide private market incentives for grid areas not covered by the state property locations, particularly rural and lower-income areas.
11. Identify and ensure awareness and understanding of state statute provisions/requirements.
12. Evaluate options to use available funding (federal and state) to address immediate

- needs (e.g., creation of grant programs) and define sustainable long-term strategies (e.g., self-funded short- and long-term funding options).
13. Ensure coordinated and comprehensive stakeholder (e.g., retailers, freight, manufacturing, technology) and public outreach.
 14. Identify risks and responsive strategies.
 15. Implement identified strategies and actions to deploy electrification for urban, rural, and vulnerable populations. *(GTFCC Rec #19)*
 16. Plan and develop a statewide EV charging grid that provides the minimum necessary coverage.
 17. Support charging station availability on state agency/UW System campus properties. Provide private market incentives for grid areas not covered by the state property locations, particularly rural and lower-income areas.

Increase economic development opportunities. *(The goals/action items here will be updated to reflect the outcomes/findings of the above planning effort.)*

1. Streamline siting of EV production facilities and supply parts for EVs and EVCS, supported through tax credits or other business financing/economic development tools.
2. Establish pathways to building a diverse workforce to support the growth of the EV market.



FUTURE STRATEGIES

Support additional technologies, resources, and programs in the transportation sector to realize immediate and long-term emissions reductions. Support additional transportation-related programs, i.e., Diesel Emission Reductions Technology program and Air Quality Improvement Programs.¹⁰⁸ *(GTFCC Tier 2 #54)*

Improve interconnection to the gas pipeline network. The state will provide cost relief for RNG developers to interconnect to the gas pipeline network by allowing a gas utility to rate-base the procurement and installation of utility infrastructure necessary to achieve interconnection between the natural gas transmission and distribution pipeline network, up to, and including, the point of receipt. Alternatively,

an interconnection grant program could be created for RNG developers.

Direct funding and resources to transition to electric vehicles (EV) statewide.

Facilitate EV charging infrastructure.

1. Transportation fund supported bonding to build electric vehicle charging infrastructure. *(2021-2023 Executive Budget)*
2. Allocate Volkswagen settlement funds and additional funds from bonding, for electric vehicle charging infrastructure across the state. *(2021-2023 Executive Budget)*
3. Modify current law to exempt a nonutility that supplies electricity through an electric vehicle charging station from the definition of a public utility. *(2021-2023 Executive Budget)*

NEXT STEPS - A FRAMEWORK FOR ONGOING CLEAN ENERGY PLANNING

Wisconsin's CEP is one of many necessary steps toward meeting the state's carbon-free power and climate goals and staying within our carbon budget. The preceding strategies compose the first phase of what will be a living document and process for equitable, inclusive, and impactful clean energy planning and implementation.

Figure 27 - First-Year Planning Timeline

**Serves as a model for annual planning*



The framework for moving the CEP and its implementation forward is composed of three key elements, a summary of which follows:

1. Engage Wisconsinites in our shared clean energy progress by collecting public input and sharing progress transparently. Two-way information sharing is critically important to this effort and OSCE will continuously improve access for all to information about the CEP, public participation in the process of creating and iterating on decision-making relative to the CEP, and access to justice related to the CEP. As a living document and process, the strategies, goals, and analyses will evolve and be informed by new research, emerging technologies, and lived experience. The OSCE will maintain and promote a website where the status of each CEP strategy is updated at least quarterly with relevant, supporting analysis and information. As COVID-19 risks are mitigated, in-person, public meetings will also be possible for collecting public input and reporting progress toward current CEP goals.
2. Measurement and Verification (M&V):
 - a. Measure the results of CEP implementation to understand the status of each strategy and progress toward goals. OSCE will create a work plan derived from this initial CEP that identifies each strategy, goal, responsible actors, timelines, and metrics for assessing progress. The work plan will be used to manage implementation and record progress, as well as specify barriers and dependencies. This status reporting will be used alongside Wisconsin's carbon budget and downscaled commitments to current or future Paris Agreement commitments to assess the state's progress vis-a-vis top-line climate goals the CEP exists to support.
 - b. Work with stakeholders and agency partners. OSCE will identify data availability and analysis gaps and collaborate to secure needed information, whether existing in state agencies or requiring new, primary data collection efforts.
 - c. The PSCW OEI is expected to be a key partner in this effort based on the significant variety and amount of information it houses and has access to, and funding to enable supplementary projects. Collecting the right information is critical to understanding how well Wisconsin is meeting its equitable clean energy goals; therefore, it is critical to invest in this effort to make the best information available.
3. Provide an annual report to provide ongoing data collection, synthesis, and analysis that is accurate and relevant to understanding Wisconsin's evolving clean energy ecosystem and CEP implementation progress. The OSCE will create and share publicly an annual report describing the CEP outcomes and post corresponding analysis and modeling results for the public to view.



CONCLUSION

The United Nations Intergovernmental Panel on Climate Change *Sixth Assessment Report - Impacts, Adaptation and Vulnerability* makes it very clear that the time is now to act on measures to protect our planet from the impacts of GHG emissions.¹⁰⁹ The Wisconsin CEP illustrates that there are a myriad of measures that can be adopted in Wisconsin to address the impacts of climate change while at the same time improving the economy of the state and providing all Wisconsin residents the ability to take advantage of the new energy economy.

The good news is that there is a strong understanding of what needs to be done and the work that has preceded this CEP has laid a solid foundation for moving forward to a vibrant and equitable clean energy future. It is an exciting time to be planning Wisconsin's clean energy future, as consumers, companies, and utilities are expressing their desire to see Wisconsin do its part to bring economic development, clean energy, jobs, and environmental equity to Wisconsin.

The CEP is a living document designed to be comprehensive yet flexible and able to adapt to technological, market, and attitudinal changes. It builds on a variety of past work and has considered the thoughts, plans, and suggestions of people and entities throughout Wisconsin, including utilities, private industry, frontline communities, Tribes, government, academia, environmental not-for-profits, and many more. In developing a clean energy pathway the CEP also illustrates the additional benefits of healthier communities that experience a reduction in criteria pollutants. That in turn provides improved economic and employment benefits for Wisconsin residents and employers.

In short, Wisconsin can and should do its part to reduce the impacts of pollution in the energy system. In so doing, the CEP shows that Wisconsin will maximize the benefits of moving to a clean energy economy.

APPENDICES

I. GLOSSARY OF TERMS

Air-source heat pumps: A technology that allows for energy-efficient heating and cooling. Heat pumps transfer heat absorbed from the outside air to an indoor space instead of burning non-renewable energy sources for heating and cooling. Heat pumps can deliver up to three times more heat energy than the electrical energy it consumes.

Anthropogenic: Referring to environmental change caused by human activity.

British Thermal Unit: The quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit. Used as a measure of the heat content of energy sources.

Carbon budget: The amount of greenhouse gas that can be emitted to stay within a given level of global warming. Exceeding the carbon budget means global temperatures will become higher.

Carbon intensity: The amount of carbon by weight emitted per unit of energy consumed ($\text{CO}_2/\text{energy}$ or CO_2/Btu).

Climate change: Substantial shifts in global temperatures and weather patterns that occur over several decades or longer caused by human activity.

Community benefits agreement: An enforceable contract signed by a community group and a developer which ensures that a proposed development project has local support, maximizes local investment, and provides equal opportunity to residents.

Community workforce agreement: An enforceable contract to ensure job quality standards and outline a plan for recruiting and hiring workers with low incomes onto publicly funded construction projects.

Conservation: To prevent the wasteful use of a natural resource.

Demand response: A change in the power consumption of an electric utility

customer to accommodate the high demand for power. In demand responses, voluntary rationing is accomplished by price incentives. Utilities will offer lower net unit pricing in exchange for reduced power consumption during peak periods.

Digester: A system that breaks down organic waste such as food scraps or manure to produce a form of renewable energy known as biogas or renewable natural gas.

Distributed energy resources: Electricity generation that comes from multiple, smaller sources. Examples include rooftop solar photovoltaic units, wind generating units, and battery storage.

Economywide: Encompassing the full scope of production, distribution, trade, and end-of-life.

Energy burden: Percentage of total household income spent on energy costs (electricity, home heating, and transportation). Low-income households spend 8.6 percent of their yearly income on energy costs while non-low-income households spend an estimated 3 percent of household income on energy costs.

Energy efficiency: A program for reducing the usage or increasing the efficiency of the usage of energy by a customer or member of an energy utility, municipal utility, or retail electric cooperative.

Energy management: The process of monitoring, controlling, and reducing energy use. Typically involves tracking energy use, identifying needs for efficiency, and improving and verifying energy savings.

Energy storage: Technology, such as batteries, that captures and saves energy produced at one time for later use. Beneficial for improving the reliability, resiliency, and efficiency of renewable energy sources.

Environmental justice: The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with the respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (U.S. EPA).

Equitable economic development: Reducing barriers and expanding economic opportunity for individuals with low incomes, veterans, members of Tribal Nations,

Black, Hispanic/Latino, Hmong American, Asian American, and other vulnerable communities in the workforce.

Exergy: The maximum useful work which can be extracted from a system as it reversibly comes into equilibrium with its environment.

Focus on Energy®: Wisconsin's energy efficiency and renewable resource program. In a partnership with 107 Wisconsin electric and natural gas utilities, Focus on Energy® provides information, resources, and incentives for all Wisconsinites to implement energy efficiency and renewable energy projects.

Fossil fuel: Petroleum, coal, natural gas, or heavy oil. Formed from decayed plants and animals that were exposed to heat and pressure under the earth's crust for millions of years.

Frontline communities: Groups of people who disproportionately experience environmental harms and risk. Frontline communities include members of Tribal Nations, Black, Hispanic/Latino, Hmong American, Asian American, other communities of color, people who have low incomes, people who are homeless, people with disabilities, immigrants, women, senior residents, and veterans.

Greenhouse gas: A gas that absorbs radiation from the sun to trap heat in the atmosphere. The increased concentration in the atmosphere contributes to global warming. Greenhouse gases include carbon dioxide (CO₂), methane (CH₄), ozone (O₃), nitrous oxide (N₂O), perfluorinated compounds (PFCs), and hydrochlorofluorocarbons (HFCs).

Just transition: Moving to an environmentally stable economy while prioritizing equal opportunity workforce development. Includes ensuring economic security for those whose jobs are displaced by phasing out coal and natural gas usage.

Kilowatt: A measurement of electric power equivalent to 1,000 watts.

Kilowatt-hour: A measurement of electric power equivalent to the power consumption of 1,000 watts per hour.

Lead-by-Example: The Office of Sustainability and Clean Energy launched State Lead-by-Example as an implementation initiative to ensure that all Wisconsin

agencies are collaboratively working towards meeting statewide emissions goals. This is done by setting a baseline then tracking their energy use, greenhouse gas reductions, and setting reduction goals.

Local hire: The requirement or goal to recruit a given percentage of employees from the area close to the development project.

Low-income: Populations characterized by limited economic resources. The U.S. Department of Health and Human Services defines an individual with low income as an individual whose family income is at or below 150 percent of the U.S. poverty line. A family of four in Wisconsin is considered low-income if annual earnings are less than \$53,000.

Megawatt: Measurement of electric power equivalent to one million watts.

Midcontinent Independent System Operator: A private entity responsible for balancing supply and demand for the wholesale power market. Decisions made by MISO affect Wisconsin's generation mix, transmission, and other clean energy issues.

Million Metric tons of Carbon Dioxide equivalent: A unit of measurement indicating the amount of any greenhouse gas whose global warming impact is standardized to the impact of a million metric tons of carbon dioxide.

Nationally determined contribution: A set of targets, measures, and policies for reducing a country's pollution, established as part of the Paris Agreement. The U.S. set a target of reducing greenhouse gas emissions by 50-52 percent below 2005 levels by 2030.

Net carbon emissions: The difference between emissions produced and emissions taken out of the atmosphere.

Net greenhouse gas emissions: The difference between greenhouse gas emissions produced and greenhouse gas emissions taken out of the atmosphere.

Organizing rights: The freedom for workers to collectively bargain with their employer to improve wages or working conditions.

Paris Agreement: An international treaty on climate change and global warming

covering mitigation, adaptation, and finance. Ratified by 196 parties in 2015, it establishes a global framework to limit global warming to below 2 degrees Celsius.

Peak periods: An amount of time when there is a higher demand for electricity than average.

Peaker plants: Fossil fuel power plants that only run when there is high demand.

Power sector: Professional industry that produces and distributes energy via power plants and transmission grids.

Prevailing wage: An established rate of pay for employees of contractors and vendors engaged in public works contracts, such as highway maintenance or public park construction.

Project labor agreement: Requires the government only award public construction contracts to unionized firms.

Reverse commute: Refers to the round trip from housing in an urban area to employment in a suburban area. A reverse commute service transports residents of urban areas to suburban employment opportunities.

Sinks: Any process, activity, or mechanism which removes a greenhouse gas from the atmosphere.

Sustainable: To create and maintain conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations (US EPA).

Targeted hires: Policies that are intended to ensure that a fair share of jobs created by public dollars benefit those with the greatest need.

Therm: A unit of heat energy that is approximately the equivalent of burning 100 cubic feet of natural gas.

II. STAKEHOLDER ENGAGEMENT

In developing the CEP, the OSCE outlined a comprehensive process to gather the voices of Wisconsinites and ensure that this plan reflects the values of our state. Below is a snapshot of those who provide their ideas and thoughts on how to move towards a clean energy economy.

Organizations

1000 Friends of Wisconsin
350 Madison
350 Stevens Point
Advocate Aurora Health
Alliant Energy
American Federation of Labor and Congress of Industrial Organizations
American Lung Association
Anguil Environmental Systems
Aptim
Bad River Natural Resources Department
Bayfield County
BlueGreen Alliance
Centro Hispano
ChargePoint, Inc.
Charging Cycles
Citizens' Climate Lobby
Citizens Utility Board
City of Eau Claire
City of Janesville
City of Milwaukee
Clean Wisconsin
CleanTech Partners
Climate Alliance for the Common Good
Congregations United to Serve Humanity

Congressman Ron Kind's District Office
Cream City Conservation & Consulting LLC
Dairyland Energy Solutions
Dairyland Power Cooperative
Dane County Office of Energy and Climate Change
Dane County Youth Environmental Committee
Dimension Renewable Energy
EnTech Solutions
Ethos Green Power Cooperative
Eudai Energy, LLC
EVNoire
Faith Technologies
FLO
Franciscan Sisters of Perpetual Adoration
Friends of the Black River Forest
Future Energy
Generac Power Systems Inc.
Girl Scout Troop #1477
Grid Strategies, LLC
ILLUME Advising
International Brotherhood of Electrical Workers 965
International Brotherhood of Electrical Workers 2150
International Brotherhood of Electrical Workers 2304
International Union of North America, Milwaukee Area Labor Council
International Union of Operating Engineers
Invenergy
Johnson Controls
Just Transition Fund
Kenosha Green Congregations
La Crosse Area Transit Advocates
Lakeshore Natural Resource Partnership
Law Office of Dennis M Grzezinski
League of Municipalities
League of Women Voters

Madison Gas & Electric
Manitowoc County League of Women Voters
Mead & Hunt
Menominee Indian Tribe
Middleton Sustainability Committee
Midwest Energy Efficiency Alliance
Midwest Renewable Energy Association
Midwest Tribal Energy Resources Association
Milwaukee Public Radio
Milwaukee Task Force on Climate and Economic Equity
Mobilizing Action Toward Community Health (MATCH)
National Association for the Advancement of Colored People
NU Range Development LLC
Osher Lifelong Learning Institute
Pattery Energy
Pieper Electric
Public Service Commission of Wisconsin
RENEW Wisconsin
Rocky Mountain Institute
Santec
Serve Wisconsin
Shalom Dayenu Circle
Sierra Club
Slipstream, Inc.
SOUL of Wisconsin
Steigerwaldt Land Services 5
Terra Focus
U.S. Green Building Council
University of Wisconsin - Eau Claire
University of Wisconsin - Milwaukee
University of Wisconsin - Stevens Point
University of Wisconsin - Madison, Arboretum
University of Wisconsin - Madison, Office of Sustainability
University of Wisconsin - Madison, Population Health Institute

University of Wisconsin - Madison, Center for Sustainability and the Global Environment (SAGE)

University of Wisconsin - Oshkosh

University of Wisconsin - Parkside

Urban League of Greater Madison

University of Wisconsin Sustainability Directors and Leaders

Vernon County Energy District

Walnut Way Conservation Corp

Waunakee ECO

WEC Energy Group

Western Technical College

WI Building Trades Council

Wisconsin Association of Energy Engineers

Wisconsin BioFuels Association

Wisconsin Biomass Energy Council/Clean Fuel Partners

Wisconsin Clean Cities

Wisconsin Community Action Program Association, Inc.

Wisconsin Conservation Voters

Wisconsin Department of Administration

Wisconsin Department of Agriculture, Trade and Consumer Protection

Wisconsin Department of Corrections

Wisconsin Department of Financial Institutions

Wisconsin Department of Health Services

Wisconsin Department of Natural Resources

Wisconsin Department of Revenue

Wisconsin Department of Safety and Professional Services

Wisconsin Department of Tourism

Wisconsin Department of Transportation

Wisconsin Department of Veterans Affairs

Wisconsin Department of Workforce Development

Wisconsin EcoLatinos

Wisconsin Economic Development Corporation

Wisconsin Green Muslims

Wisconsin Health Professionals for Climate Action

Wisconsin Housing and Economic Development Corporation

Wisconsin K-12 Energy Education Program (KEEP)

Wisconsin Office of Energy Innovation

Wisconsin's Green Fire

Wisconsin Animal Protection Society

WPPI Energy

Xcel Energy

ZEF Energy

Zerology/Mobile 22

III. BIPARTISAN INFRASTRUCTURE LAW PROGRAMS

| | | |
|--|------------------|-----------------------|
| Assistance for Small and Disadvantaged Communities | \$74,630,000 | Formula - WI Specific |
| Advanced Energy Manufacturing and Recycling Grants | \$750,000,000 | Competitive |
| Advanced solar energy manufacturing initiative | \$20,000,000 | Competitive |
| Battery and Critical Mineral Recycling | \$125,000,000 | Competitive |
| Battery Manufacturing and Recycling Grants | \$3,000,000,000 | Competitive |
| Battery Material Processing Grant Program | \$3,000,000,000 | Competitive |
| Battery Recycling Research, Development and Demonstration Grants | \$60,000,000 | Competitive |
| Broadband Equity, Access, and Deployment State Grants | \$42,450,000,000 | Formula |
| Building Codes Implementation for Efficiency and Resilience | \$250,000,000 | Competitive |
| Bus and Bus Facilities | \$3,161,294,401 | Formula |
| Bus and Bus Facilities | \$1,966,392,169 | Competitive |
| Bus and Bus Facilities: Low and No Emissions (Appropriations), | \$5,250,000,000 | Competitive |
| Bus and Bus Facilities: Low and No Emissions (Contract Authority) | \$5,624,550,890 | Competitive |
| Carbon Capture Large-Scale Pilot Programs | \$937,000,000 | Competitive |
| Carbon Reduction Program | \$124,681,249 | Formula - WI Specific |
| Carbon Utilization Program | \$310,140,781 | Competitive |
| Charging and Fueling Infrastructure Grants (Community Charging) | \$1,250,000,000 | Competitive |
| Clean School Bus Program | \$5,000,000,000 | Competitive |
| Community-based Restoration Program for Fishery and Coastal Habitats | \$400,000,000 | Competitive |
| Consumer Recycling Education and Outreach Grant Program | \$75,000,000 | Competitive |
| Cost-effective implementation of updated building energy codes | \$225,000,000 | Competitive |
| Critical Material Innovation, Efficiency, And Alternatives | \$600,000,000 | Competitive |
| Deployment of Technologies to Enhance Grid Flexibility | \$3,000,000 | Competitive |

| | | |
|---|-----------------|-----------------------|
| Digital Equity Competitive Grant Program | \$1,250,000,000 | Competitive |
| Disaster Relief Fund (Building Resilient Infrastructure and Communities [BRIC]) | \$1,000,000,000 | Competitive |
| Earth Mapping Resource Initiative | \$320,000,000 | Competitive |
| Electric drive vehicle battery recycling and second-life applications | \$200,000,000 | Competitive |
| Energy Auditor Training Grant Program | \$40,000,000 | Competitive |
| Energy Efficiency and Conservation Block Grant | \$2,356,000 | Formula - WI Specific |
| Energy Efficiency Revolving Loan Fund Capitalization Program | \$2,070,000 | Formula - WI Specific |
| Energy Improvement in Rural and Remote Areas | \$1,000,000,000 | Competitive |
| Energy Storage Demonstration Projects and Pilot Grant Program | \$355,000,000 | Competitive |
| Ferry Service for Rural Communities | \$1,000,000,000 | Competitive |
| Flood mitigation actions and Flood Mitigation Assistance (FMA) Program Grants | \$3,500,000 | Competitive |
| Highway Research and Development Program | \$735,000,000 | Competitive |
| Intelligent Transportation Systems Program | \$550,000,000 | Competitive |
| Large-scale water recycling and reuse projects | \$450,000,000 | Competitive |
| Local and Regional Project Assistance (RAISE Program) | \$3,750,000,000 | Competitive |
| Local and Regional Project Assistance (RAISE Program): Urbanized Grants | \$3,750,000,000 | Competitive |
| Low-income home Energy Assistance Program (LIHEAP) | \$500,000,000 | Formula |
| Metropolitan Transportation Planning | \$31,387,325 | Formula - WI Specific |
| National Electric Vehicle Formula Program | \$78,654,701 | Formula - WI Specific |
| National Infrastructure Project Assistance | \$5,000,000,000 | Competitive |
| New Solar Research & Development | \$20,000,000 | Competitive |
| Pilot Program for Transit-oriented Development Planning | \$68,864,631 | Competitive |
| Planning Programs | \$966,443,225 | Formula |
| Pollution Prevention technical assistance grants | \$100,000,000 | Competitive |
| Preventing Outages and Enhancing the Resilience of the Electric Grid | \$2,500,000,000 | Formula |

| | | |
|--|-----------------|-------------------------|
| Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Program | \$141,771,514 | Formula - WI Specific |
| PROTECT Planning Grants | \$140,000,000 | Competitive |
| Public Transportation Innovation | \$192,820,967 | Competitive |
| Pumped Storage Hydropower Wind and Solar Integration and System Reliability Initiative | \$10,000,000 | Competitive |
| Reconnecting Communities Pilot Program: Planning Grants (Appropriations) | \$100,000,000 | Competitive |
| Rural Broadband Program Loans | \$74,000,000 | Competitive |
| Rural e-connectivity (ReConnect) Broadband pilot, Broadband Loans | \$1,926,000 | Competitive |
| Rural Grants | \$4,851,261,000 | Formula |
| Solar energy technology program activities | \$40,000,000 | Competitive |
| Solar energy technology recycling research, development, and demonstration program | \$20,000,000 | Competitive |
| Solar Improvement Research & Development | \$40,000,000 | Competitive |
| Solar Recycling Research & Development | \$20,000,000 | Competitive |
| State battery collection, recycling, and reprocessing programs | \$50,000,000 | Competitive |
| State Digital Equity Capacity Grant Program | \$1,250,000,000 | Formula |
| State Energy Program (expanded use) | \$10,351,000 | Formula - WI Specific |
| Strengthening Mobility and Revolutionizing Transportation | \$500,000,000 | Competitive |
| Technology and Innovation Deployment Program | \$500,000,000 | Competitive |
| Training and Education | \$127,500,000 | Competitive/ Formula |
| Upgrading Our Electric Grid and Ensuring Reliability and Resiliency | \$5,000,000,000 | Competitive |
| Water recycling and reuse projects | \$550,000,000 | Competitive |
| Water storage, groundwater storage, and conveyance projects | \$1,050,000,000 | Competitive |
| WaterSMART Grants | \$400,000,000 | Competitive |
| Weatherization Assistance Program | \$132,107,000 | Formula - WI Specific |
| Wind energy technology program activities | \$60,000,000 | Competitive |
| Wind energy technology recycling research, development, and demonstration program | \$40,000,000 | Competitive |

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