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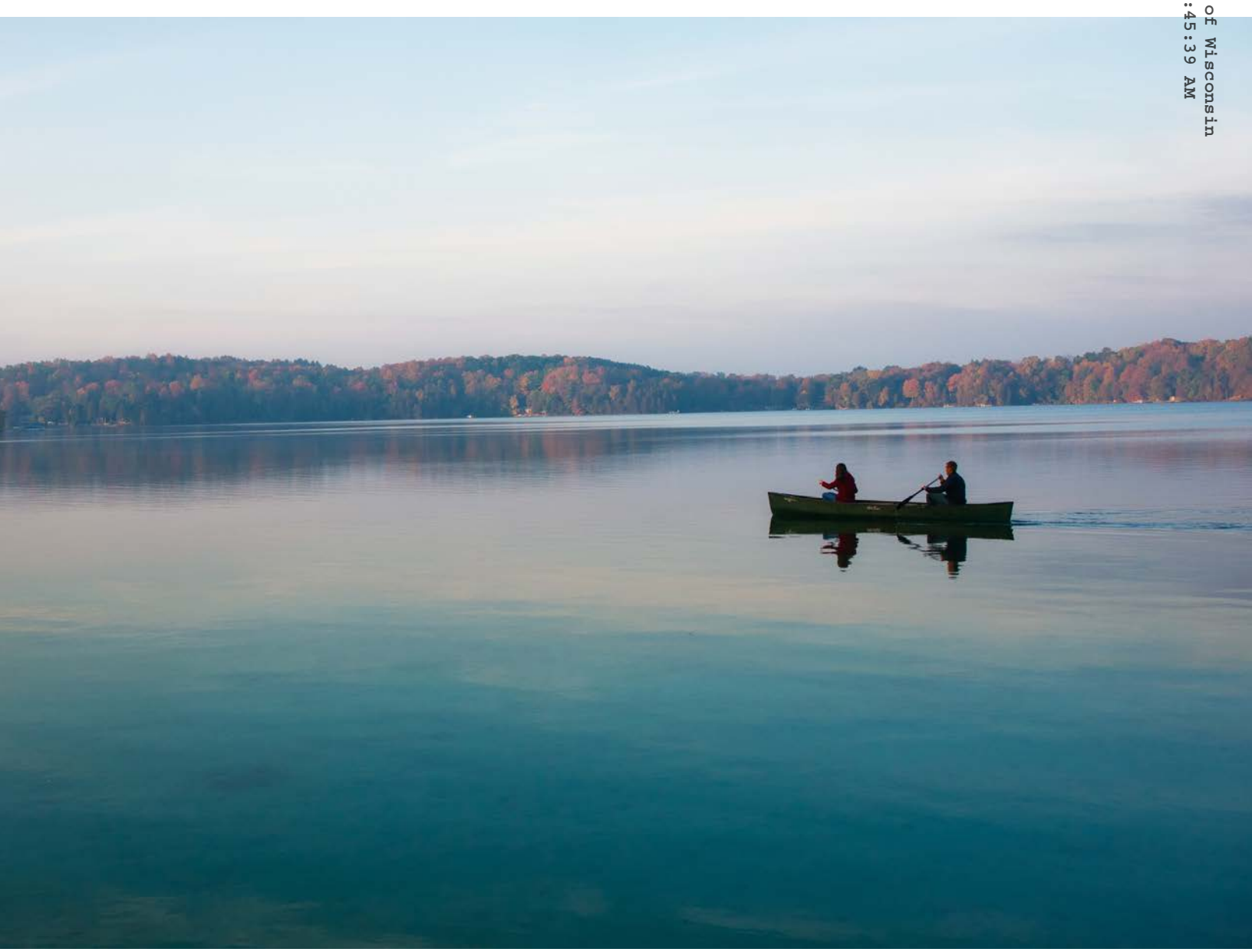
GOVERNOR'S TASK FORCE ON

CLIMATE CHANGE REPORT



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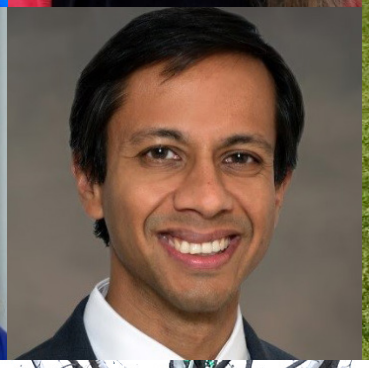

Dibaginjigaadeg Anishinaabe Ezhitwaad
Caring for those who take care of us
A Tribal Climate Adaptation Menu

GOVERNOR'S TASK FORCE ON

CLIMATE CHANGE REPORT

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All photos courtesy of the Lt. Governor's Office and iStockphoto unless otherwise noted.
Cover photo provided by Travel Wisconsin.

Pictured on the inside front cover from top left to bottom right: Trevonna Simms, Pastor Bridget Jones, Jessica LeClair, Dr. Chirantan Mukhopadhyay, Lieutenant Governor Barnes visits Tomandl Farm, City of River Falls residents celebrate the switch to renewable energy (Credit: Mike Noreen), Lieutenant Governor Barnes visits with members of the Bad River Band of Lake Superior Chippewa, Dodge County Farmers Healthy Soil & Water (Credit: Tony Peirick), The Great Lakes Indian Fish & Wildlife Commission Tribal Climate Adaptation Menu, Lieutenant Governor Barnes tours storm damage with members of the St. Croix Chippewa Indians of Wisconsin, and James Edward Mills leads an outdoor adventure with The Joy Trip Project.

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

LAND ACKNOWLEDGMENT

The task force would like to acknowledge that the work that led to this report took place on land that was stolen from Indigenous peoples, who have lived in harmony with this land and its natural resources since time immemorial. This work would not be possible without wisdom and knowledge from the 11 federally recognized Native Nations and one federally unrecognized Native Nation with whom the state of Wisconsin shares geography: Bad River Band of Lake Superior Chippewa, Forest County Potawatomi, Ho-Chunk Nation, Lac Courte Oreilles Band of Lake Superior Chippewa Indians, Lac du Flambeau Band of Lake Superior Chippewa Indians, Menominee Indian Tribe of Wisconsin, Oneida Nation, Red Cliff Band of Lake Superior Chippewa, Sokaogon Chippewa Community Mole Lake Band of Lake Superior Chippewa, St. Croix Chippewa Indians of Wisconsin, Stockbridge-Munsee Community Band of Mohican Indians, Brothertown Indian Nation.

ACKNOWLEDGMENTS

We wish to acknowledge and appreciate the significant contributions of the members of the Governor's Task Force on Climate Change. In addition, we are grateful to the U.S. Climate Alliance for their support and contributions, along with the long list of individuals and organizations who provided expertise, including The Bridge Studio, Wisconsin Initiative on Climate Change Impacts, RENEW Wisconsin, Wisconsin Clean Cities, 1000 Friends of Wisconsin, Organic Valley, Great Lakes Indian Fish & Wildlife Commission, Monroe County Climate Change Task Force, Dodge County Farmers Healthy Soil & Water, Midwest Energy Research Consortium, Great Plains Institute, Urban Footprint, City of River Falls, City of Milwaukee, University of Wisconsin Sustainability, Electa Quinney Institute for American Indian Education, Groundwork Milwaukee, Health Care Without Harm, Mary Griggs Burke Center for Freshwater Innovation Northland College, The Joy Trip Project, City of Bayfield, Oneida Nation, Badger Rock Community Center, Marathon County Conservation, Planning, and Zoning Department, Walnut Way Conservation Corp, Midwest Renewable Energy Association, Wisconsin Bike Fed, Trevonna Simms, Pastor Bridget Jones, Dr. Chirantan Mukhopadhyay, and Jessica LeClair. We also wish to express our thanks to the state agency staff who provided invaluable support, and to the many members of the public who attended meetings and listening sessions, submitted public comment, and shared their expertise.

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"The people are ready for change. The people are demanding change. Farmers are choosing more sustainable agricultural practices. Utility companies are investing in renewable energy. And our local communities are reforming their policies to promote greener, cleaner economies."

Lieutenant Governor Mandela Barnes
Chair of the Governor's Task Force on Climate Change

FOREWORD

Letter from Lieutenant Governor Mandela Barnes

Just months before Governor Evers named me chair of his Governor's Task Force on Climate Change, I spent a summer day touring storm damage in northern Wisconsin. While storm damage tours are a common duty for governors and lieutenant governors, this tour was different. Fourteen tornadoes had hit Wisconsin in a span of two days. The people I met with were overwhelmed with the destruction that stood before us—most unsure of how they would recover. Farms that had been in families for generations were gone.

Since I took office, much of my time as lieutenant governor has been spent learning about the impact climate change has been having on our state. Extreme weather generates a costly toll on farmers and their crops. Flooding is impacting homes, infrastructure, and water quality. Deadly cold spells have shut down our state. And our Great Lakes are experiencing a period of record-high water levels, which has grave consequences for coastal ecosystems and will cost communities millions of dollars.

But more alarming is that the health and well-being of every citizen in this state is in grave danger because of the changing climate. Many have already been harmed by human-caused climate change, and further health risks are imminent if we don't take urgent action.

That's why Governor Evers created this task force. Our charge is to combat the crisis at hand, to do so in a way that weds science and data with the experiences of citizens in the state, to learn how different communities and industries have been impacted, and to learn from those that are already leading the way in combatting this crisis.

And that's exactly what this task force did. We focused our work on the people of Wisconsin. We united a diverse coalition—representing different perspectives, communities, and industries—with a shared vision to make Wisconsin a cleaner, safer, and more equitable state.

We also focused on listening to the voices that have gone unheard by past leaders of this state and nation—the voices of people of color and low-income communities, whose air and water are more likely to be polluted but whose communities are far less likely to be included in policymaking. These voices must be part of the conversation and drive solutions—anything less will continue the long pattern of environmental racism we have witnessed in this country.

The policy solutions you will find in this report lay the foundation for our state to become a leader in tackling the climate crisis. And while adopting those policies is an important first step, it's clear that our state must continue to take bold, aggressive actions in order to protect our precious natural resources and preserve our beautiful outdoor spaces.

The climate crisis has been hundreds of years in the making, and we know that we will not solve it with one set of recommendations or one biennial state budget, but our state has let this crisis go unaddressed for too long.

The people are ready for change. The people are *demanding* change. Farmers are choosing more sustainable agricultural practices. Utility companies are investing in renewable energy. And our local communities are reforming their policies to promote greener, cleaner economies.

We can and must make Wisconsin a place where everyone can grow up in a safe and clean environment and has the opportunity to thrive, no matter their ZIP Code.

Lieutenant Governor Mandela Barnes
Chair of the Governor's Task Force on Climate Change

"While the climate crisis and COVID-19 pandemic are distinct, the known systemic impacts are not. Like COVID-19, climate change is a global phenomenon requiring massive structural transformations of economic and social institutions."

Kristofer James Canto
Chair, Healthy Communities and a Strong Economy Subcommittee,
Governor's Task Force on Climate Change

FOREWORD

A Message from the Governor's Task Force on Climate Change

As the task force met over the course of 2020, the U.S. experienced another unprecedented year of extreme heat, wildfires, hurricanes, and flooding. The devastation of these disasters impacted the lives and livelihoods of Americans already struggling to cope during a worldwide pandemic.

While the climate crisis and COVID-19 pandemic are distinct, the known systemic impacts are not. Like COVID-19, climate change is a global phenomenon requiring massive structural transformations of economic and social institutions.[1]

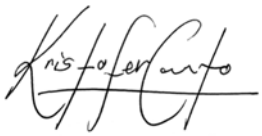
The effects of climate change transect all sectors, geographies, and people. And while we all experience these changes, low-income communities and communities of color are disproportionately impacted, bearing the most severe consequences.

Failing to act swiftly and leaving the climate crisis to manifest unchecked will continue to wreak havoc across the nation and in the great state of Wisconsin. Conceptualizing the magnitude of the problem is challenging. However, we know that this global phenomenon is experienced locally.

Wisconsin's climate is changing. Climate challenges include more hot, humid weather with more intense and more frequent heavy rainfalls, as well as freezing winter rain instead of snow, followed by deep winter freezes (such as those from a polar vortex). These changes affect the stability of Wisconsin's economic sectors as well as human health and safety.[2] Immediate action is necessary.

- We must develop opportunities to mitigate carbon emissions and increase renewable energy;
- We must enhance our infrastructure's adaptive capacity and strengthen overall environmental, economic, and social resilience;
- We must educate and train our workforce with the skills needed for a transition to a low-carbon economy; and
- We must ensure all actions are equitable and intentionally minimize unintended and disproportionate impacts.

This is the first step in bold and courageous action. Developed collaboratively by appointees from all sectors, institutions, and communities across the state—and under the leadership of Lieutenant Governor Mandela Barnes—it is with great pleasure and responsibility that the Governor's Task Force on Climate Change presents the following recommendations for consideration by Governor Tony Evers and the Wisconsin State Legislature.



Kristofer James Canto
Chair, Healthy Communities and a Strong Economy Subcommittee, Governor's Task Force on Climate Change

EXECUTIVE SUMMARY

Governor Evers' and Lieutenant Governor Barnes' Climate Leadership and the Governor's Task Force on Climate Change

Recognizing the importance of addressing climate change, Governor Evers and Lieutenant Governor Barnes are committed to championing innovation and inclusive, forward-leaning actions that make Wisconsin a leader in reducing greenhouse gas (GHG) emissions and preparing for the impacts of climate change. This commitment was first demonstrated in Governor Evers' February 2019 announcement—just a few months after he was elected—that he would join the U.S. Climate Alliance, a bipartisan coalition of 25 governors committed to implementing policies that advance the goals of the Paris Agreement: to reduce GHG emissions to 26–28 percent below 2005 levels by 2025.[3]

Following this announcement, on August 16, 2019, Governor Evers issued Executive Order #38, which established the Wisconsin Office of Sustainability and Clean Energy. He charged the office with: 1) achieving a goal of 100 percent carbon-free electricity by 2050; 2) ensuring Wisconsin is reducing emissions in line with the Paris Agreement; 3) developing a clean energy plan; 4) promoting clean energy workforce training; 5) fostering clean energy innovation, research, and business development; and 6) developing efficiency standards for new and existing state buildings.[4]

Further, on October 17, 2019, Governor Evers, along with Lieutenant Governor Barnes, signed Executive Order #52, establishing the Governor's Task Force on Climate Change (task force). The task force was charged with developing policy recommendations to meaningfully mitigate and adapt to the effects of climate change for the benefit of Wisconsin communities. The task force's list of policy recommendations were to be delivered to the governor on or before August 31, 2020; however, due to the challenges of the COVID-19 pandemic, this deadline was extended.

Appointed as task force chair by Governor Evers, Lieutenant Governor Barnes kicked off the first meeting of the 32-member task force in December 2019. Task force members met regularly in public meetings from December 2019 to October 2020. In order to more thoroughly develop and discuss climate solutions, the task force formed three subcommittees: Healthy Communities and a Strong Economy; Land Use and Conservation; and Energy, Housing, Infrastructure, and Transportation. Expert guests were invited to present at both full-member meetings and subcommittee meetings. In addition to these public meetings, the task force hosted five virtual listening sessions and called for written public commentary.

The recommendations found in this report are intended to lay the foundation for the state to better adapt to and mitigate the effects of climate change, while also seeking economic opportunities in renewable energy and conservation. This report provides an array of policy options, along with a variety of implementation strategies. Because the economic and human costs of climate change are far too great to ignore, it is imperative that the Governor, his administration, and the state legislature all take meaningful action to combat the climate crisis. While the COVID-19 pandemic has created significant barriers for our state, including fiscal barriers, there is opportunity to stimulate the economy through job creation in clean energy and conservation. While a full economic analysis has not been done on the policies listed within this report, the task force did discuss fiscal challenges and encourage future conversations on fiscal cost to include the long-term costs of climate change—both for the economy and the people of our state.

TASK FORCE MEMBERS

The task force represents an array of industries and communities—from industry professionals to youth activists, from elected and Tribal officials to entrepreneurs. These diverse perspectives are further informed by research and data from climate scientists, subject matter experts, and public participation.

The task force members were selected by Governor Evers and Lieutenant Governor Barnes to broadly represent Wisconsinites from across the state. All participants actively participated in the development of the recommendations, and the diverse opinions of task force members and the public were taken into consideration. As such, these recommendations should be taken as a package; not all members agreed with each specific recommendation, but members agreed that these recommendations reflected the general consensus of the task force and should be forwarded to the Governor.

LIST OF TASK FORCE MEMBERS

Lieutenant Governor Mandela Barnes, Chair

Secretary Preston Cole, Department of Natural Resources

Secretary Randy Romanski, Department of Agriculture, Trade & Consumer Protection

Pamela R. McGillivray, Department of Workforce Development

Dr. Darrell L. Williams, Wisconsin Emergency Management

State Senator Mark Miller, Monona

State Representative Mike Kuglitsch, New Berlin

State Representative Greta Neubauer, Racine

August Ball, Founder/CEO, Cream City Conservation & Consulting, LLC, Milwaukee

Kristofer Canto, Enterprise Risk Management Senior Analyst, American Family Insurance, Madison

Stacy M. Craig, Environmental Stewardship Advocate, Mason

Jeffrey Crawford, Attorney General, Forest County Potawatomi Community, Milwaukee

Robert "Bert" Garvin, Executive Vice President - External Affairs, WEC Energy Group, Milwaukee

Paul Graham, President, Central Waters Brewing Company, Amherst

Anna Haines, Professor of Natural Resource Planning, Director of the Center for Land Use Education and Wisconsin Center for Environmental Education, University of Wisconsin - Stevens Point, Stevens Point

Bill Hogseth, Watershed and Organizing Coordinator, Wisconsin Farmers Union, Chippewa Falls

Dylan Jennings, Bad River Band of the Lake Superior Tribe of Chippewa Indians, and Director, Public Information Office, Great Lakes Indian Fish & Wildlife Commission, Odanah

Sheri Johnson, Director, Population Health Institute, Associate Professor (CHS), Department of Population Health Sciences, University of Wisconsin Madison School of Medicine and Public Health, Madison

Amber Meyer Smith, Vice President of Programs and Government Relations, Clean Wisconsin, Madison

Kathleen "Katie" McGinty, Vice President, Global Government Relations, Johnson Controls, Inc., Milwaukee

Robert Nigh, Board Member, Wisconsin Farm Bureau Federation, Viroqua

Rob Palmberg, Vice President – Strategic Planning, Dairyland Power Cooperative, La Crosse

Mike Peters, President/CEO, WPPI Energy, Sun Prairie

Chris Pollack, Member, Wisconsin Farm Bureau Federation, Ripon

H. Jeffery Rafn, Ph.D, President, Northeast Wisconsin Technical College, Green Bay

Doug Rebout, Roger Rebout & Sons Farms, Janesville

Stephanie Salgado, Youth Climate Action Team, Madison

Kerry Schumann, Executive Director, Wisconsin Conservation Voters, Madison

Kirsten Shead, Co-Executive Director, Milwaukee Water Commons, Milwaukee

Mark Stoering, President - Wisconsin, Michigan, Xcel Energy, Eau Claire

Bob Stone, Assistant Business Manager/Business Agent We Energies, International Brotherhood of Electric Workers, Local 2150, Menominee Falls

Krystal Westfahl, Executive Director, Minocqua Area Chamber of Commerce, Minocqua

CLIMATE SOLUTIONS* | 9 SECTORS | 3 POLICY PATHWAYS

POLICY PATHWAYS INCLUDE: ● EXECUTIVE/AGENCY ACTION (EA) ● 2021–2023 STATE BUDGET (SB) ● LEGISLATION (LE)

	CLIMATE JUSTICE & EQUITY				
01	Create an Office of Environmental Justice	p. 23	EA	SB	LE
02	Improve the state consultation process with Native Nations	p. 24	EA	SB	LE
03	Mandate a racial disparity impact study	p. 26	EA		LE
04	Implement anti-racism education	p. 26	EA		LE
	ENERGY				
05	Improve data collection	p. 29	EA		
06	Develop electricity storage and microgrids for critical infrastructure	p. 30	EA	SB	LE
07	Increase energy use reduction goals	p. 32	EA		
08	Expand Wisconsin's Focus on Energy® funding	p. 33		SB	LE
09	Support load management	p. 34	EA		
10	Support low-cost debt financing of customer clean energy projects	p. 35	EA	SB	LE
11	State lead by example	p. 37	EA		
12	Update state commercial and residential building energy codes	p. 38	EA		LE
13	Set utility carbon-reduction goals	p. 40	EA		
14	Support community solar	p. 40	EA	SB	LE
15	Update interconnection standards	p. 41	EA		
16	Require analysis on the social cost of carbon	p. 42			LE
	TRANSPORTATION				
17	Climate and environmental justice audited transportation planning and development	p. 46	EA		LE
18	Promote public transit and green public transportation	p. 47		SB	LE
19	Support hybrid-electric vehicles, electric vehicles, and infrastructure	p. 48	EA	SB	LE
20	Safe, clean, and complete streets	p. 49		SB	LE
	AGRICULTURE				
21	Support farmer-led watershed groups	p. 51		SB	LE
22	Pay farmers to increase soil carbon storage in agricultural and working lands	p. 52		SB	LE
23	Avoid conversion of natural working lands	p. 55	EA	SB	LE
24	Make managed grazing livestock production systems an agricultural priority	p. 56		SB	LE
	RESILIENT SYSTEMS				
25	Update rules and increase collaboration on rainfall models strategies	p. 59	EA		
26	Focus on wetlands	p. 60	EA	SB	LE
27	Create a flood resilience plan with a focus on urban- and rural-specific watershed action	p. 62	EA	SB	LE
28	Fund and execute a statewide climate risk assessment and resilience plan	p. 63	EA	SB	LE
29	Establish local control for waste	p. 64		SB	LE

	CLEAN ECONOMY				
30	Establish a Green Energy Advisory Council	p. 68	EA		
31	Create and deploy workforce transition plans	p. 68	EA	SB	LE
32	Support public post-secondary educational entities	p. 70	EA	SB	LE
33	Create new jobs through conservation and prepare individuals for work within the green energy sector	p. 71		SB	LE
34	Create a Wisconsin Economic Development Corporation Green Grant and Loan program	p. 72	EA	SB	LE
35	Conduct a complete analysis and create a pathway to participate in or implement carbon pricing that is optimal for Wisconsin	p. 74	EA		LE
	EDUCATION				
36	Expand support for teaching K-12 Climate Science and creating climate resilient schools	p. 77		SB	LE
37	Launch a climate change public education campaign	p. 78	EA	SB	
	FOOD SYSTEMS				
38	Increase funding to support local food systems	p. 81		SB	LE
39	Develop a food waste program	p. 82		SB	LE
40	Create a Manoomin (Wild Rice) Stewardship Council in partnership with interested Native Nations	p. 83	EA	SB	LE
41	Create a statewide subsistence adaptation plan	p. 84	EA	SB	LE
	FORESTRY				
42	Prioritize forest conservation to "keep forests as forests"	p. 87		SB	LE
43	Pursue reforestation in rural areas	p. 88		SB	LE
44	Encourage tree planting in urban areas	p. 89		SB	LE
45	Implement climate-focused forest management	p. 90		SB	LE
46	Support Wisconsin wood product utilization	p. 91		SB	LE
	TIER 2**				
47	Avoid all new fossil fuel infrastructure	p. 93	EA	SB	LE
48	State divestment of fossil fuel stocks and other interests	p. 93			LE
49	Allow third party renewable financing (solar/energy generation)	p. 95	EA	SB	LE
50	Develop strategies for the cost-effective early closure and reduced use of coal facilities	p. 95	EA		LE
51	Work with Midcontinent Independent System Operator and stakeholders to focus on enhancing opportunities and financial value for clean distributed energy resources	p. 96	EA		
52	Maximize co-benefits and related financial value from clean energy projects	p. 97	EA		
53	Modernize rate design	p. 99	EA		
54	Promote the use of clean transportation fuels to ensure immediate and long-term emissions reductions	p. 99	EA		LE
55	Encourage antitrust enforcement	p. 101		SB	LE

* The climate solutions listed here are not organized by priority or ranking.

** Tier 2 policy options are proposals that were raised and, to some extent, discussed during the task force process or brought up during the public hearing and public comment period. Each of these options drew both support and concern from task force members, a reflection of the diversity of perspective and worldview of the members. They are included as Tier 2 proposals to indicate they may merit further discussion and consideration outside of the work of the task force.

THE TASK FORCE BY NUMBERS:

COMMUNITY VOICE + PARTICIPATION

One of the task force's goals was to incorporate citizen views, concerns, and ideas into climate recommendations. The task force was largely successful in doing so. More than 1,000 Wisconsinites participated in listening sessions and individuals from all but three of the 72 counties in Wisconsin participated in some way. The task force also received over 500 written comments related to the climate crisis in Wisconsin.

PEOPLE

1,000+
listening session participants

32
task force members

PARTICIPATION

95%
counties participating

513
online public comments submitted

INDUSTRIES REPRESENTED ON THE TASK FORCE:

Environmental justice advocates, environmental organizations, corporations, Native Nations, utilities, small businesses, farmers and farm organizations, public health professionals, technical colleges, universities, youth, tourism, labor unions, state legislature, and state agencies.

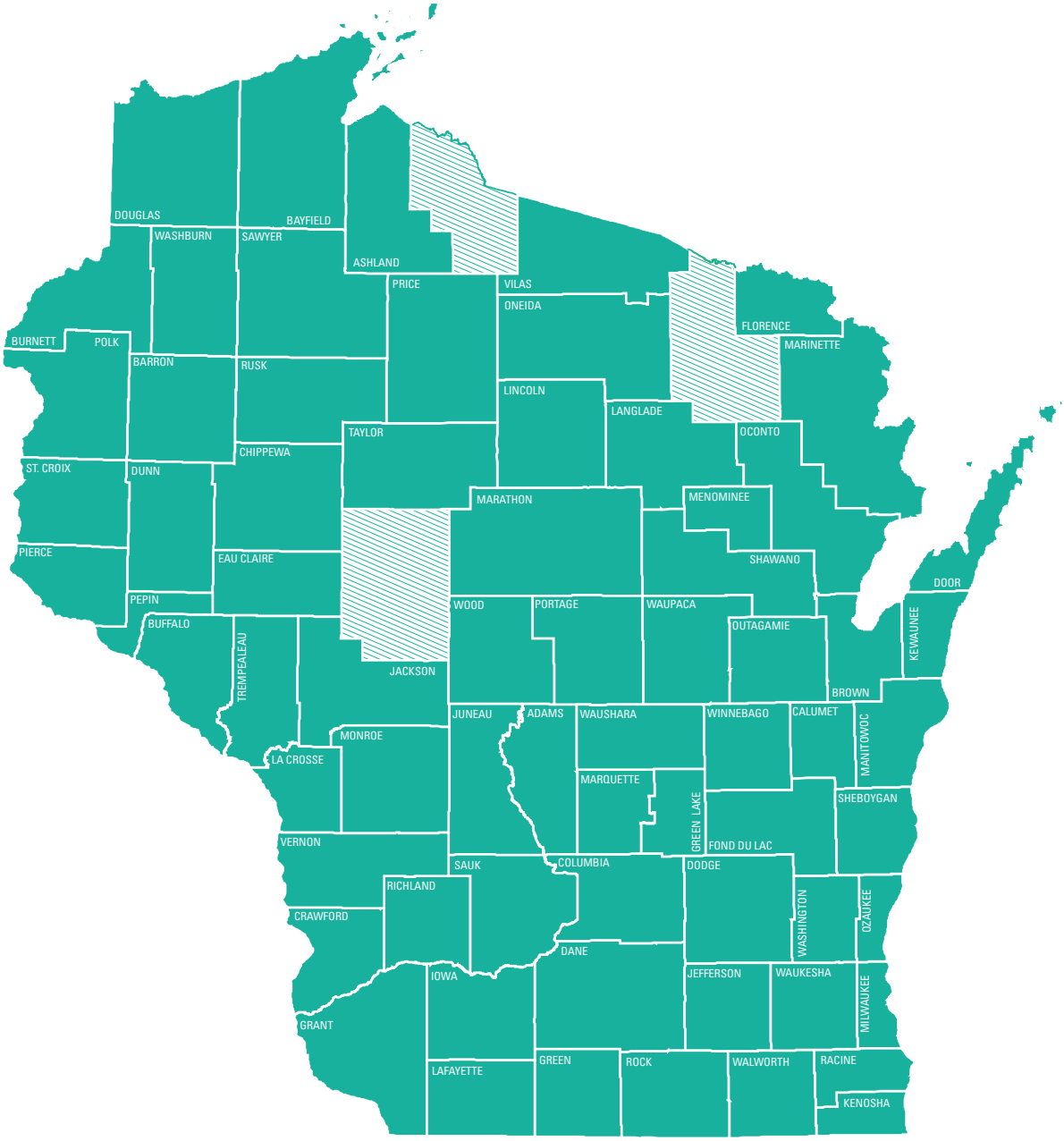
EVENTS

34
expert presentations

21
subcommittee meetings

5
member meetings

5
virtual listening sessions



69 out of 72 Counties Participated

ENVIRONMENTAL JUSTICE

Decades ago, Professor Robert Doyle Bullard, who some consider to be the father of environmental justice, said this about the environment and the action of institutions: "Whether by conscious design or institutional neglect, communities of color in urban ghettos, in rural 'poverty pockets', or on economically impoverished Native-American reservations face some of the worst environmental devastation in the nation."[5]

Since then, studies have proven that environmental racism is very real and has had a profound impact on the health and well-being of Black, Indigenous, and other communities of color (BIPOC) and low-income communities. A 2018 U.S. Environmental Protection Agency (EPA) study found that pollution disproportionately affects BIPOC communities.[6] They are more likely to live near and breathe polluted air, as are people who experience poverty. A 2016 joint study from the National Association for the Advancement of Colored People, Clean Air Task Force, and National Medical Association found that Black Americans are more likely to live in close proximity to fossil fuel facilities and be exposed to the toxins they emit. The report concluded that "the life-threatening burdens placed on communities of color near oil and gas facilities are the result of systemic oppression perpetuated by the traditional energy industry, which exposes communities to health, economic, and social hazards."[7]

In Wisconsin, the Sierra Club notes that working-class communities are subject to pipelines and their potential threats, and low-income communities are exposed to fracking, mining, and hazardous waste.[8] In 2016, Wisconsin received a failing grade in a report by the Center for Effective Government. The report analyzed how many people of color and low-income residents live within close proximity to dangerous chemical facilities.[9]

While study after study has proven that BIPOC and low-income communities have been adversely affected by environmental policies, the stories and voices of these communities have also affirmed that environmental racism exists and is harming their communities. That is why the task force made environmental justice a focus of its work and aspired to incorporate equity into its recommendations. While task force members participated in multiple environmental racism presentations, invited experts from communities of color and rural communities to present at meetings, and analyzed recommendations with an equity lens, it must be noted that there is still much more work that can and should be done to ensure policies adopted by the state do not disproportionately affect BIPOC and low-income communities. Much more intentional work by the task force and the state of Wisconsin is needed to truly adopt equitable policies. In addition, environmental discussions and decisions must include the voices and perspectives of those most impacted by their outcome, and there must be significantly more diverse representation throughout the policymaking process. Lastly, in order to achieve environmental justice in Wisconsin, government bodies—along with others including corporations, nonprofit organizations, foundations, financial institutions, and the education system—must confront the racism and bias that exist within their systems. More importantly, it's crucial that elected leaders and executives begin making decisions that put people over profit.

There is still much more work that can and should be done to ensure policies adopted by the state do not disproportionately affect BIPOC and low-income communities.

It's crucial that elected leaders and executives begin making decisions that put people over profit.

HOW CLIMATE CHANGE IS IMPACTING WISCONSIN

THE HUMAN AND ECONOMIC COSTS

Whether it be the loss of life during an extreme weather event, long-term illness due to air pollution, or the costly economic toll climate change is having on farmers and rural communities, the changing climate is impacting everyone.

Climate inaction is projected to have tremendous health and economic costs, and recent studies have indicated that these costs are *already* weighing on Americans. 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.[10] In Wisconsin, this extreme heat event caused elevated levels of heat stress, heat stroke, and heat exhaustion. Since then, Wisconsin has experienced additional extreme weather events, including tornadoes, flooding, 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°F.[11]

In economic costs, Wisconsin communities have already suffered tens to hundreds of millions of dollars of damage over the past decade due to extreme precipitation. Increased precipitation is leading to increased flooding and storm surge, which impact communities and industries along the Mississippi River and the Great Lakes as well as tourism along Wisconsin's waterways and beachfronts. A wetter, warmer climate also increases precipitation and temperature variability. These swings in extremes are already negatively impacting Wisconsin's agriculture and livestock sectors, which depend on predictable weather patterns.

According to the National Oceanic and Atmospheric Administration's Billion-Dollar Weather and Climate Disasters database, between 2000 and 2020 there were 19 severe storm, two flooding, and six drought-related billion-dollar disasters that affected Wisconsin to the tune of $100 billion in impacts.[12]

THE SCIENCE

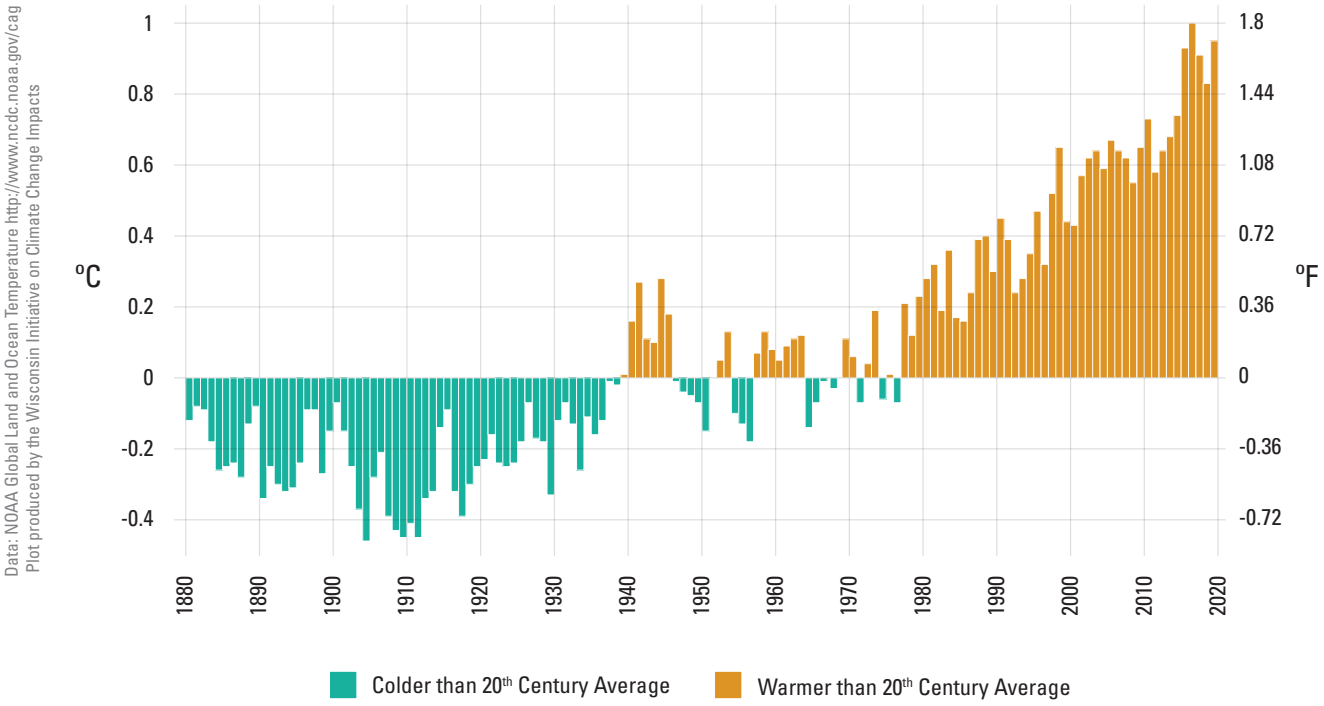
The climate has changed. Since the 1880s, the global average surface temperature has increased by approximately 1°C (2°F). Nineteen of the 20 warmest years on record have all occurred since 2001.[13] Even if the world meets its current commitments set under the Paris Agreement, the globe is projected to warm up to 3.1°C by 2100.[14]

Global climate change impacts regions, communities, and populations unequally. The Wisconsin Initiative on Climate Change Impacts (WICCI), a statewide collaboration of scientists and stakeholders, has evaluated these impacts on Wisconsin since 2007. In a recent report, WICCI identified how climate change is impacting Wisconsin broadly and specifically, and which communities will bear disproportionate consequences.[15] Many of these projections and findings are consistent with the 2011 WICCI Assessment and add further detail, analysis, and confidence to the findings and projections from then.

Since the 1950s, Wisconsin has warmed 2.1°F and its annual precipitation has increased by 15 percent (4.5 inches). While winters have warmed faster than summers, the number of extremely hot days (days with temperatures exceeding 90°F) and hot nights is expected to triple and quadruple, respectively, by 2050, assuming GHG emissions continue to rise. These broader increases in precipitation and warming are likely to drive more extreme weather events, such as floods and heatwaves, which will affect Wisconsin's communities and industries in unequal ways.

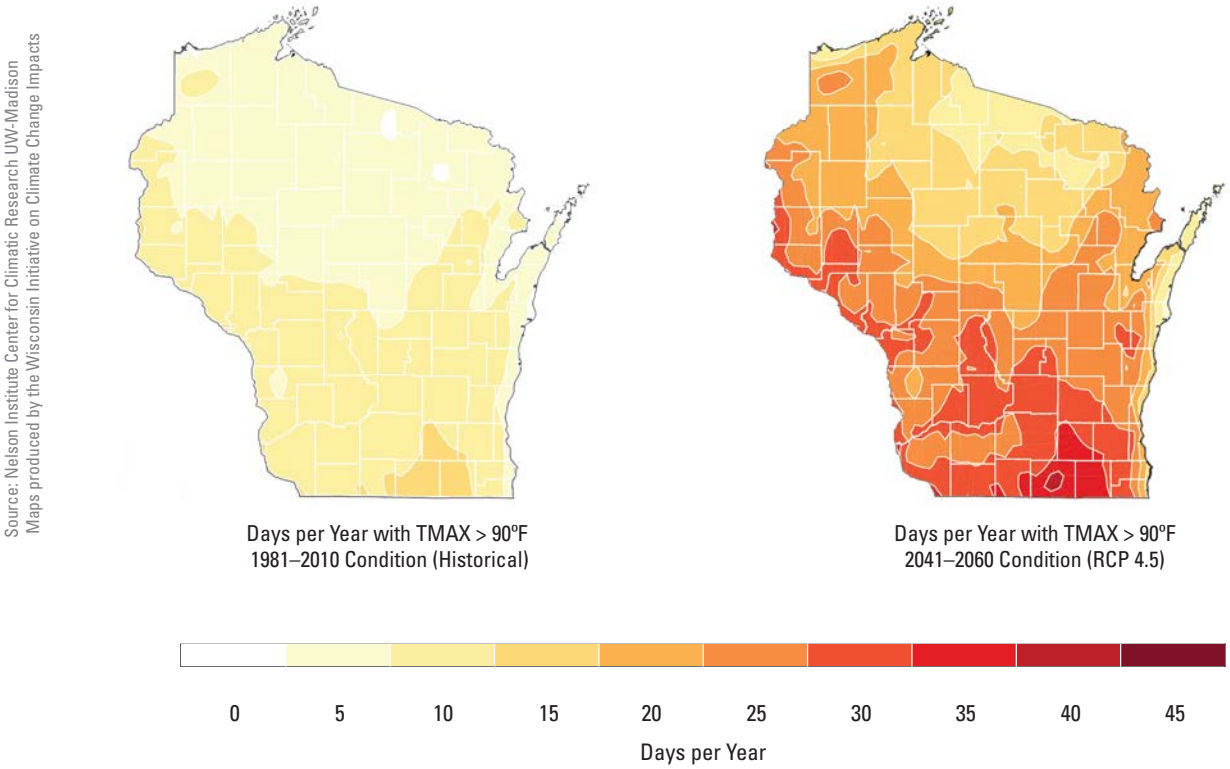
In the case of extreme heat, southern Wisconsin will be hit particularly hard if it experiences 80 to 90 extremely hot days per year, as is currently projected for mid-century. In this scenario, communities of color, the elderly,

Global Temperature from 1880–2019



Number of days per year when the temperature exceeds 90°F

Historical extreme heat frequency (left) and mid-century extreme heat frequency (right) for a low-end emissions scenario (RCP 4.5)



individuals with existing health conditions, and economically disadvantaged communities who lack sufficient cooling capabilities will face disproportionate impacts. Increased warming is leading to decreased snowpack and warmer winters, and threatening Wisconsin's iconic coldwater fisheries by shifting the range of temperature tolerance beyond many species' survivability. Extreme heat is also leading to harmful algal blooms in lakes, the proliferation of infectious diseases and pests, and increased storm surge along beaches and marinas. These realities disproportionately affect outdoor recreation and tourism industries that depend on the health and stability of these natural resources.

Black, Indigenous, other communities of color, and low-income communities within Wisconsin are already disproportionately impacted by air pollution and flooding. Wisconsin is home to 11 federally recognized Native Nations and one non-state or federally recognized Nation, which hold strong cultural, spiritual, health, and economic ties to fisheries, native habitats, and wild species and cultivars that are strained by increased warming and precipitation. Some underrepresented coastal communities may have lower tax bases, so they are less able to respond to and rebuild from extreme storm and contamination events. Increased global warming will further exacerbate these socio-economic inequities and potentially bring others to light without ambitious, state-led climate action.[16]

WISCONSIN'S CURRENT GREENHOUSE GAS EMISSIONS

In August 2020, the Department of Natural Resources (DNR) published the *Wisconsin Greenhouse Gas Emissions Inventory Report* for the state's Office of Sustainability and Clean Energy and the task force.[17] The DNR used the EPA's State Inventory Tool to estimate Wisconsin's emissions for the years 2005 and 2017, and emissions trends from 1990 through 2017.

In 2017, the electricity sector accounted for most of Wisconsin's GHG emissions (33 percent), followed by transportation (24 percent), agriculture (15 percent), industrial energy use and processes (14 percent), residential and commercial building energy use (13 percent), and waste (1 percent). At the same time, the state's emissions decreased by 9 percent between 2005 and 2017, primarily driven by decreasing carbon intensity of the electricity sector. Every sector's emissions decreased between 2005 and 2017 except for industrial processes and agriculture, with agriculture accounting for the largest increase on an absolute emissions basis. In addition, Wisconsin's carbon-sequestering forests and natural lands lost over 25 percent of their carbon sink capability between 2005 and 2017 due to intensified agriculture and the conversion of cropland to urban development.[18]

2017 WISCONSIN EMISSIONS

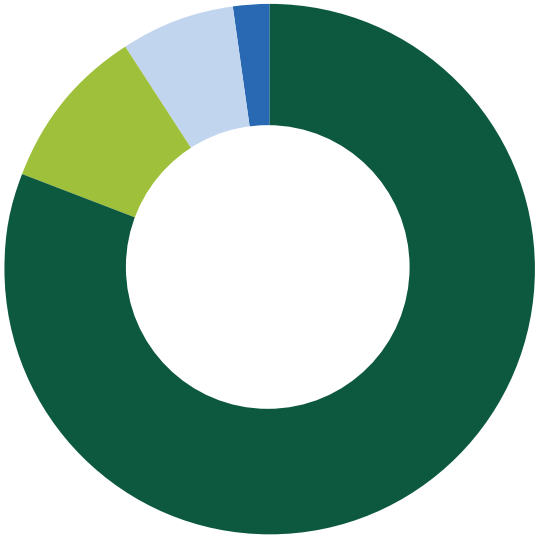
BY SECTOR

- 33% Electricity
- 24% Transportation
- 15% Agriculture
- 11% Industrial
- 8% Residential
- 5% Commercial
- 3% Industrial Processes
- 1% Waste

2017 WISCONSIN EMISSIONS

BY GREENHOUSE GAS

- 81% Carbon Dioxide (CO_2)
- 10% Methane (CH_4)
- 7% Nitrous Oxide (N_2O)
- 2% Fluorinated Gases (HFC, PFC, SF_6)



Charts originally produced by the Wisconsin Department of Natural Resources for the 2020 Wisconsin Greenhouse Gas Emissions Inventory Report.
Data sourced from EPA's State Inventory Tool, https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool

ADVOCATES FOR CHANGE

Trevonna Simms
MILWAUKEE, WI

"Many folks in the Milwaukee community have not seen jobs with livable wages in decades due to deindustrialization, making it harder to live a quality—let alone energy-effi ient—life.

Our deteriorating homes are the biggest cause of my community's carbon footprint that cost us money and health problems with little job opportunities to fix our climate issues.

This climate crisis does not look the same outside of Milwaukee but there's still a lack of urgency statewide. Our state is behind on becoming more energy efficient compared to our neighbors in Illinois and Minnesota because our state lacks opportunities to create more clean and energy-efficient communities.

For the sake of the most marginalized folks in rural and urban areas, we need the opportunities to create an economy that would better their lives, health, and ultimately their community."

Pastor Bridget Jones
SUPERIOR, WI

"When we talk about sustainability, especially in the Northland, often job creation is set against environmental protection. But in the Judeo-Christian tradition, humans were first created to care for the world God made, and I believe that is still our job before anything else.

In addition to loving God, who created the whole Earth, the other job we were given is to care for our neighbors. And God makes it clear that the most vulnerable among us deserve special care. So often climate change, pollution, environmental degradation, and resource depletion disproportionately affect poor communities and communities of color.

Fortunately, it is possible to care for the Earth, care for our neighbors, and have a robust economy. Transitioning away from fossil fuels like fracked gas and toward renewables allows our state to move forward into a bright, clean, sustainable future while joining God's work of healing and renewing the Earth."

Dr. Chirantan Mukhopadhyay
MILWAUKEE, WI

"As medical students we learned about the many 'determinants' of health, focusing on the physical, mental, and social. Now the medical community is realizing how important our natural world is in keeping us healthy and is speaking out about the importance of the ecological or environmental determinants of health.

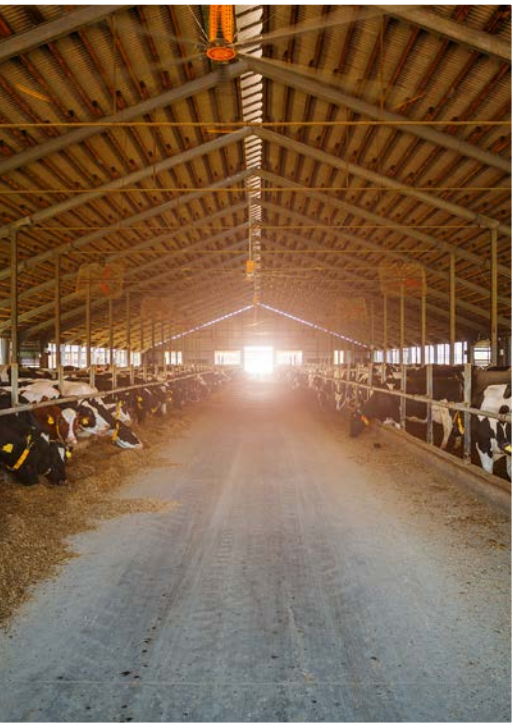
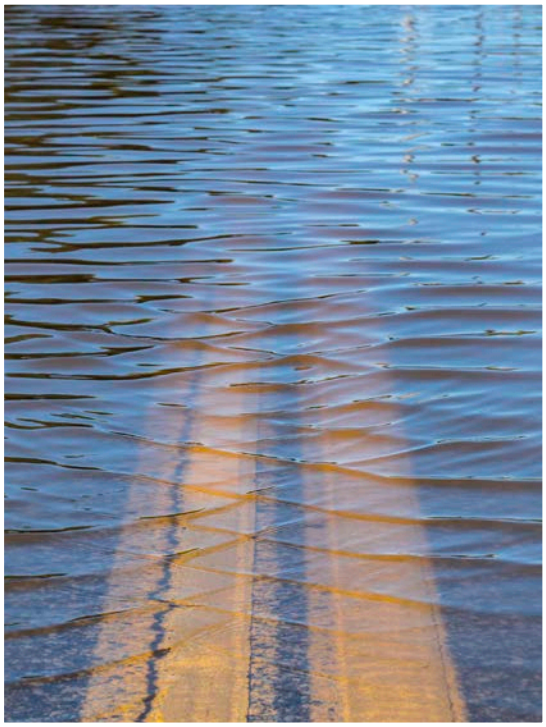
You can't be healthy if the water you drink is tainted, if the air you breathe isn't clean, or if climate instability creates conditions for worsening wildfires, fl oding, storms, and the inability to grow food. The climate crisis is negatively impacting the health and well-being of people all around the world, especially communities of color and children, including right here in Wisconsin.

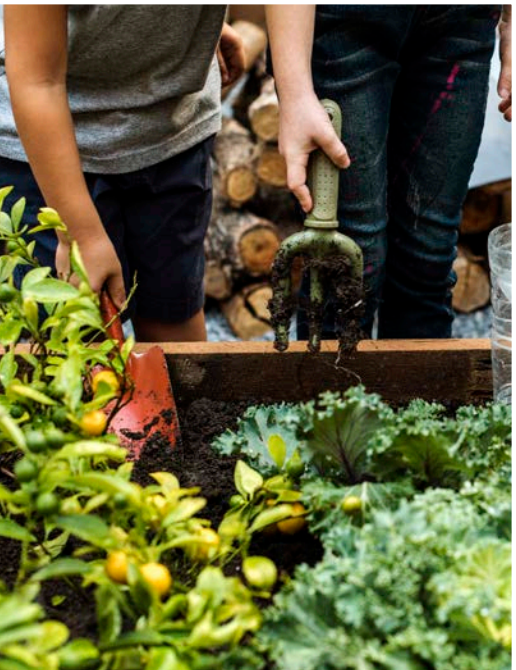
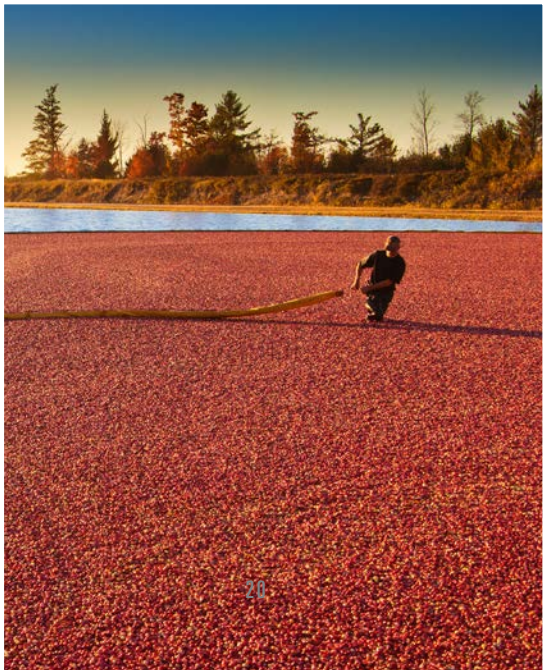
If we address the grave threat to our health that climate change represents, we have an opportunity to create a safe, secure, and healthy future for our patients and our children. We must take decisive action now."

Jessica LeClair
MADISON, WI

"As a public health nurse, I have witnessed how accelerated climate change has affected the health of our communities for more than a decade. Some communities are closer to the front lines of the climate crisis than others because of environmental racism. Within these communities there are extremely vulnerable populations, such as people who are very young, very old, pregnant, and living with chronic health conditions. These populations are experiencing health inequities due to disproportionate exposure to fl oding, heat waves, extreme weather, and other symptoms of climate change.

Working to slow down the damage to our climate is a net gain with the health and social justice lens. Promoting health and racial equity should be a central component of strategies designed to combat the climate crisis. Climate justice recognizes climate change as a human and civil rights issue, and we must engage this opportunity for a more equitable and sustainable Wisconsin."

Welcome
Explore
Enjoy
Wisconsin
State Forests

CLIMATE SOLUTIONS

ACROSS 9 SECTORS | 3 POLICY PATHWAYS

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POLICY PATHWAYS INCLUDE:
- EXECUTIVE/AGENCY ACTION (EA)
- 2021–2023 STATE BUDGET (SB)
- LEGISLATION (LE)

CLIMATE JUSTICE & EQUITY

Climate change is not only an issue of GHG emissions and global temperatures. As the climate shifts, human lives—particularly those in communities of color, low-income communities, immigrant communities, communities with limited English proficiency (LEP), and Indigenous communities—are affected by compromised health, financial burdens, and social and cultural disruptions.[19] The ones primarily causing climate change are NOT the ones being disproportionately harmed by it. More affluent countries on a global level and more affluent communities within the U.S. and Wisconsin have a much larger carbon footprint. Yet it is less affluent countries and communities who bear the greater burden.[20] Climate justice reorients climate discourse from focusing solely on reducing emissions and recasts it as a human rights movement, centering the communities most vulnerable to climate change's impacts in its solutions.[21]

According to the EPA,[22] many factors affect a community's ability to prepare for, respond to, and cope with climate change's health impacts, including:

- Living in areas particularly vulnerable to climate change (e.g., coastal communities),
- Coping with higher levels of existing health risks when compared to other groups,
- Living in low-income communities with limited access to healthcare services,
- Having high rates of uninsured individuals who have difficulty accessing quality healthcare,
- Having limited availability of information and resources in a person's native language, and
- Less ability to relocate or rebuild after a disaster.

Communities of color, low-income communities, immigrant communities, and LEP communities are more likely to live in areas with high exposure to air and water pollution, and older and less-efficient infrastructure, and areas prone to extreme heat and flooding.[23] In the U.S., race is a more powerful indicator than class in determining one's proximity to toxic facilities.[24] Indigenous communities are particularly vulnerable to climate change's environmental impacts, as they heavily rely on natural resources for food, health, and cultural and spiritual identity.[25] These factors, in addition to a historical lack of access to resources and decision-making institutions, put these communities at an unjust risk to the health, economic, and environmental impacts of climate change.

Climate justice is an extension of environmental justice, a movement born out of the U.S. Civil Rights Movement of the 1960s. The EPA defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."[26] In practice, achieving environmental justice means guaranteeing that these vulnerable communities receive equal protection from environmental and health hazards, and equal access to the decision-making process that determines their economic and energy outcomes.

CLIMATE JUSTICE & EQUITY

01	Create an Office of Environmental Justice	p. 23	EA	SB	LE
02	Improve the state consultation process with Native Nations	p. 24	EA	SB	LE
03	Mandate a racial disparity impact study	p. 26	EA		LE
04	Implement anti-racism education	p. 26	EA		LE

01 Create an Office of Environmental Justice

STRATEGY Create an Office of Environmental Justice tasked with collaborating across state agencies and engaging with Black, Indigenous and communities of color, low-income communities, and environmental justice advocates to design climate policies that reduce emissions and pollutants and address the cumulative and deadly impacts of their concentration within these communities.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

Creating an Office of Environmental Justice would help Wisconsin's government protect the health of its citizens and environment while promoting environmental equity in the administration of its programs. Many Great Lakes states have similar administrative bodies. The Illinois Environmental Protection Agency has an Environmental Justice Officer,[27] who coordinates all environmental justice efforts of the agency through the Commission on Environmental Justice.[28] Through a 2019 executive order, Michigan created an Office of the Environmental Justice Public Advocate and an Interagency Environmental Justice Response Team.[29] New York has an Office of Environmental Justice within the state's Department of Environmental Conservation.[30] Illinois,[31] Michigan,[32] Minnesota,[33] and New York[34] all have Environmental Justice Advisory Groups, which appoint diverse representatives from across the state to advise on inclusive and equitable policy development.

02 Improve the state consultation process with Native Nations

STRATEGIES

- Pilot a DNR program to develop a database for Tribal officials to submit concerns.
- Implement a DNR training program that would provide tailored trainings for staff on cultural and Tribal climate work.
- Ensure consultation process includes both high-level decision makers within agencies and technical staff from agencies.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

According to the Great Lakes Indian Fish & Wildlife Commission's *A Tribal Climate Adaptation Menu*, "climate change has impacted and will continue to impact Indigenous peoples, their lifeways and culture, and the natural world upon which they rely, in unpredictable and potentially devastating ways."[35]

In March 2019, Governor Evers signed Executive Order #18 relating to the affirmation of the intergovernmental relationships among the state of Wisconsin and 11 Native Nations located within the state. The order directed cabinet agencies to engage Native Nations on a government-to-government basis in developing policies and programs that directly impact Native Nations or their members and appropriately consult Native governments on matters that indirectly impact Native Nations or their members. The order also directed state agencies to update the current consultation process.

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."

Native Americans are likely to be one of the most vulnerable populations to climate change. Because of their heavy reliance on natural resources for food and health and because they are culturally connected to their land, most are resistant to relocating to escape the harsh conditions caused by extreme weather, wildfires, and habitat loss. Across the United States, tribes manage 95 million acres, 11 million acres more than the National Park Service, with many reservations home to diverse habitats.

Not only are tribal communities resistant to relocating, but many tribal boundaries were created through the treaty process which granted use off healthy resources in perpetuity. Inability to utilize the local resources for subsistence, economic, and spiritual purposes represents a breach or abbrogation of rights. Additionally, Native Nations and Citizens of the Native Nations don't always have the option to leave or move away from these homelands, due to economic constraints and other considerations.

Improving communication, engagement, and consultation with Wisconsin's Native Nations can help both the state and Native Nations address issues and concerns earlier in the policy and decision-making process. These proactive efforts will not only help ensure that sovereignty and treaty rights are upheld, but can also help protect and preserve Tribal and ceded land where citizens of the Native Nation live, hunt, fish, gather, and practice their culture—all important aspects that contribute to their health and well-being.

- CLIMATE LEADER -

THE GREAT LAKES INDIAN FISH & WILDLIFE COMMISSION

The Great Lakes Indian Fish & Wildlife Commission (GLIFWC), founded in 1984, represents Wisconsin, Minnesota, and Michigan's 11 Ojibwe tribal nations. Through the 1837, 1842, and 1854 treaties, these 11 tribes reserve the right to hunt, fish, and gather within the U.S. To support the exercising of these treaty rights in treaty-ceded territories, GLIFWC provides natural resources management, expertise, conservation enforcement, legal and policy analysis, and public information services.

GLIFWC infuses an Ojibwe perspective into its work to protect and enhance the natural resources and habitat of treaty-ceded territories. Because climate change is deeply affecting the environment and altering and disrupting the ecosystems within ceded territory, GLIFWC is actively working to understand, adapt to, and mitigate the effects of climate change. Its goal is to assist member nations in co-managing the land and thus limiting the impact climate change is having on Ojibwe people's right to hunt, fish, and gather from their land—something that is integral to their well-being and livelihood.

In 2019, GLIFWC released *A Tribal Climate Adaptation Menu*, an extensive collection of adaptation methods that provides the framework to incorporate Indigenous and traditional knowledge, culture, language, and history into climate work. The menu is a collaborative product developed by a diverse group of people representing tribal, academic, intertribal, and government entities in Minnesota, Wisconsin, and Michigan.

As Wisconsin embarks on combatting the climate crisis, it is imperative it does so with the input and collaboration of its 12 Indigenous Nations. As the original people and stewards of the land that is now called Wisconsin, Indigenous people hold the wisdom to care for the land.

For more information, visit https://www.glifwc.org

03 Mandate a racial disparity impact study

STRATEGY Mandate racial disparity impact studies for development projects.

Executive/ Agency Action

Legislation

An environmental impact assessment (EIA) is a management tool many organizations use to evaluate the potential environmental impacts of a project, typically projects involving large-scale siting and construction. Companies, governments, and the public use EIAs to assess the costs and benefits of a project using an environmental lens, prior to making a final decision. Because environmental hazards, displacement, and economic immobility continue to disproportionately impact people of color and low-income communities, development projects (especially those receiving government assistance and contracts) should apply a sociological lens to their decision-making.

Requiring an independent racial disparity study that includes environmental hazard exposure, economic impact to vulnerable communities, and GHG emissions would not only serve to protect historically disproportionately impacted populations, but also limit opportunities for environmental and communal harm while simultaneously creating a market for cleaner energy options and equitable developments.

Many states perform similar assessments. California's Office of Environmental Health Hazard Assessment developed CalEnviroScreen to help decision-makers map and identify communities disproportionately exposed to and impacted by environmental pollutants. CalEnviroScreen uses state and federal environmental, health, and socioeconomic data to identify cumulative pollution burdens by geographic area. "Poverty, race and ethnicity, and education" are included socioeconomic factors.[36] In New Jersey, many of the state's fossil-fuel power plants, waste treatment and storage centers, landfills, and recycling plants disproportionately impact communities of color and lower-income neighborhoods. To address this disparity, New Jersey recently passed landmark legislation S232, which requires the state's Department of Environmental Protection to evaluate the environmental and public health impacts of existing facilities on these communities when reviewing permit applications, and to deny permits to new facilities found to lead to negative environmental justice impacts.[37]

04 Implement anti-racism education

STRATEGY Educate state employees and the Wisconsin legislature about systemic oppression and implicit bias.

Executive/ Agency Action

Legislation

POLICY PATHWAY

- In November 2019, Governor Evers signed Executive Order #59, directing state agencies to develop equity and inclusion action plans and the Department of Administration to develop and provide mandatory equity and inclusion training for state agency employees. This should include anti-racism training and the Wisconsin legislature should implement anti-racism training for legislators and staff to address the systemic bias and racism that exists in government.

Environmental racism and climate change are inextricably linked because the embedded racism and bias that exist within social, government, corporate, and financial systems deem who benefits from activities that produce harmful emissions and who suffers most from the consequences. Historically, communities of color and low-income communities have suffered the most.

Government has a solid track record for cultivating policy that negatively impacts communities of color. For example, the *Wagner Act* (AKA the National Labor Relations Act of 1935) and the *Social Security Act of 1935*[38] excluded about half the workers in the American economy—namely agricultural and domestic workers, jobs primarily filled by African Americans. For another example, the General Infantry Bill[39] denied benefits to millions of African American soldiers.

Because systemic racism remains embedded in our social structures, the average American's historical and racial literacy is depressingly low. Without knowledge of our country's history, unconscious bias education alone will not prevent government agency workers or the general public from continuing to propose and support policies and laws that are unjust.

ENERGY

Energy production and use outside of the transportation sector represents 57 percent of Wisconsin's GHG emissions and is therefore a critical emissions source to mitigate. This sector is made up of electricity generation (33 percent), along with onsite fuel combustion for space and water heating in residential (8 percent), commercial (5 percent), and industrial (11 percent) buildings.[40] This significant portion of Wisconsin's emissions profile represents major opportunities to improve the state's energy production, transmission, and end-use infrastructure. Pursuing these opportunities has the potential to result in co-benefits like improved human health, economic development, equity, and resilience.

Wisconsin has already made progress in addressing energy-sector emissions. Between 2005 and 2017, CO_2 emissions from electricity produced in the state fell by 16 percent,[41] due in large part to decreased coal use and increased use of natural gas and renewable energy sources.[42] In fact, electricity generation from non-hydro renewable sources grew the fastest over this time period, increasing by 2.6-fold. CO_2 emissions from energy use in the residential, commercial, and industrial sectors decreased 10 percent from 2005 to 2017.

Despite this progress, there remain a number of actions that Wisconsin can take to further decarbonize its energy sector. The recommendations outlined below aim to improve data collection and reporting, increase the efficiency of new and existing buildings, expand the state's renewable energy capacity, encourage demand response and load management, and develop financing tools to help fund Wisconsin's clean energy transition.

Several of the recommendations in this sector include actions that increase the deployment of energy efficiency projects, many through Focus on Energy®,Wisconsin's statewide energy efficiency and renewable resource program. This program not only supports economic development through the creation of jobs, but also provides utility bill savings for customers. Job creation from energy efficiency can be direct (e.g., in manufacturing, installation, servicing) and indirect (e.g., through increased disposable income to be redistributed in the economy). Studies have shown that investing in energy efficiency measures can create 380 jobs per Terrawatt-hour (TWh) of electricity saved, whereas investing in fossil-fuel plants creates only 110 jobs per TWh of electricity generated.[43] In addition to job creation, bill savings for customers results in indirect economic growth through additional disposable income. In 2019, according to an independent evaluation, Focus on Energy® provided $4.05 in direct economic benefit for every dollar spent, including $487 million worth of avoided utility costs.[44]

All decarbonization efforts should incorporate equity considerations from the onset, through planning, design, and implementation. Without careful design, planning, and community input, programs designed to decarbonize the energy sector may have unintended consequences that worsen inequity. Low-income households face higher energy burdens (the portion of income spent on energy bills) and greater energy insecurity than higher-income households, and also face disproportionately high health impacts from indoor and outdoor air pollution.[45] Because of this, low-income customers can most directly benefit from energy efficiency programs and renewable energy projects, but the planning, design, and implementation of the programs and projects must be undertaken with input from these communities to ensure that all aspects are undertaken to maximize the benefit on these communities.

ENERGY

05	Improve data collection	p. 29	EA		
06	Develop electricity storage and microgrids for critical infrastructure	p. 30	EA	SB	LE
07	Increase energy use reduction goals	p. 32	EA		
08	Expand Wisconsin's Focus on Energy® funding	p. 33		SB	LE
09	Support load management	p. 34	EA		
10	Support low-cost debt financing of customer clean energy projects	p. 35	EA	SB	LE
11	State lead by example	p. 37	EA		
12	Update state commercial and residential building energy codes	p. 38	EA		LE
13	Set utility carbon-reduction goals	p. 40	EA		
14	Support community solar	p. 40	EA	SB	LE
15	Update interconnection standards	p. 41	EA		
16	Require analysis on the social cost of carbon	p. 42			LE

05 Improve data collection

STRATEGY Direct agencies to work collaboratively to accurately report emissions, inform other reporting and carbon tracking efforts, monitor progress, and provide data in decision-making to help Wisconsin reach its goals.

EA Executive/ Agency Action

POLICY PATHWAY

- Select agencies to track electricity consumption and GHG emissions to measure the progress of carbon-reduction strategies and help inform agencies and decision-makers regarding progress in Wisconsin's emissions-reduction goals.

In order to understand the effects of GHG emissions on air quality and human health, there needs to be recurring reports and studies on these effects. Providing clear and consistent carbon data metrics, including data regarding electricity consumption and emissions on an hourly basis, will assist in tracking carbon emissions and identifying opportunities for energy reductions or shifting energy consumption to less-carbon-intensive time frames. These reports are also useful for any measurement towards progress of goals related to GHG emissions. This will also allow statewide agencies and decision-makers to collaborate to make better-informed decisions on how to reduce emissions. Without these data, reports, and studies it would be hard to measure progress and see if implemented policies have yielded the intended impacts.

Inequities in living conditions and health disproportionately place low-income communities and some communities of color at greater risk of the health impacts of climate change. Low-income communities and minority communities are likely to be exposed to environmental toxins and poor air quality that increases the risk of respiratory illnesses and asthma exacerbation. These communities will benefit the most from the development of accurate metrics and data that could support the development of new Focus on Energy® or utility-sponsored programs. These programs could help shift or reduce the energy peak, align energy efficiency with carbon-reduction goals, and align energy consumption with zero-carbon generation.

The design of the reports and studies should include input from communities around Wisconsin, including impacted low-income and vulnerable communities, ensuring that their perspectives and needs contribute to mitigation strategies.

06 Develop electricity storage and microgrids for critical infrastructure

STRATEGIES

- Build resilience of the energy distribution system by exploring administrative and legislative avenues to support local resilience through pilot programs and incentives.
- Increase funding to the Public Service Commission of Wisconsin's (PSC) Office of Energy Innovation to help local communities develop critical green energy infrastructure, such as microgrids.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- PSC approval of utility incentive pilot programs, potentially including incentives and low-cost financing.
- Additional resources to support pilots can be allocated through the upcoming budget.
- Grants or other funding can be used to accelerate microgrid deployment.

Microgrids are self-sufficient energy systems serving discrete areas such as college and hospital campuses, business complexes, and neighborhoods. Microgrids include one or more distributed energy sources (for example, solar panels, wind turbines, combined heat and power (CHP)), and can include battery energy storage.[46] When renewable-powered microgrids are coupled with battery storage, they can also serve as tools to support community resilience during broader weather or security-caused outages. Piloting and promoting the use of such microgrids in Wisconsin can help the state meet its carbon goals, and can help ensure energy resilience, especially for facilities that rely on uninterrupted power, including hospitals and others.

- CLIMATE LEADER -

CITY OF RIVER FALLS

On January 1, 2020, the City of River Falls became the first city in Wisconsin to power all its city buildings on 100 percent renewable energy. With a population of 15,000, River Falls is in the northwestern part of the state near the Wisconsin-Minnesota border and on the banks of the Kinnikinic River.

A decade ago, the city began to prioritize conservation by promoting and adopting energy efficient measures such as shutting off idling motors and turning off unused lights. These actions were followed by switching to light-emitting diodes (LED) or fluorescent lights in city buildings and then later installing automatic light sensors. The city then worked with WPPI Energy, their wholesale power supplier, to offer more renewable energy options, including a program called "Green Blocks" that allows customers to power their houses and businesses with renewable electricity for just an additional $3 per month. By 2018, River Falls had the third-highest customer participation in the nation for purchasing renewable energy just behind Portland, Oregon, and Alameda, California. The city is also credited with building Wisconsin's first city-owned solar garden and is home to a Habitat for Humanity Eco-Village, a cluster of 18 solar-powered homes that produce more electricity than they consume. In 2016, the City of River Falls received the Award of Continued Excellence from the American Public Power Association.

When the city flipped the switch on January 1, 2020 it powered up its seven government buildings with renewable energy. Those buildings include their city hall, the public library, the public works garage, the wastewater treatment plant, the public safety building, the emergency medical services station, and the city pool. Later in 2020, the cost of Green Blocks dropped to $2 per 300 kilowatt-hour (kWh) and at that point all metered city facilities, other than buildings, were transitioned to 100 percent renewable energy.

"Going 100 percent renewable for the city buildings and facilities is a logical extension of the actions taken over the past decade and values demonstrated by our community members including individual homeowners, businesses and institutional property owners like churches and schools who voluntarily have been working together and working forward doing our part with energy choices. The credit belongs to the community who both has followed our lead and found opportunities to lead us in considering future generations, embracing change, and serving our community."
Scot Simpson, City Administrator for the City of River Falls.

City officials credit their accomplishments to dreaming big and acting, prioritizing community engagement, and taking incremental steps in conservation and energy efficiency and then renewable energy.

For more information visit www.rfcity.org/renewable

The Office of Energy Innovation (OEI), in collaboration with University of Wisconsin (UW) Extension and other local partners, has had great success in helping communities become energy independent through grant programs and education outreach.[47] More funding needs to be allocated to expand OEI's programming and increase local engagement in the green energy transition and economy.

All Wisconsinites are affected by extreme weather events and natural disasters, which can result in grid outages. It is important that households have access to power for extended periods to enable communities to provide support to residents during a disaster. Power disruption can be particularly dangerous for the elderly and people with pre-existing medical conditions who require access to critical services such as breathing machines and home dialysis equipment.

Increased funding to OEI to provide additional microgrid pilot programs should be designed to service marginalized communities. These communities may not have the resources to track grant announcements, or write grant applications, or have the technical resources to identify how microgrids could best serve their needs. The programs should be designed to incorporate outreach, engagement, and education to help overcome these barriers and ensure that the program funding and activities reach those most in need. This grant program should not only help local neighborhoods, counties, or municipalities, but also local Native Nations.

07 Increase energy use reduction goals

STRATEGY The PSC should set a utility energy use reduction goal or standard of two percent for utility-provided electric and one percent for natural gas as well as other fossil fuels, including propane, heating oil, gasoline, and diesel (where reductions of those fuels is caused by electrification and associated with Focus on Energy® and public utility incentives).

EA Executive/ Agency Action

POLICY PATHWAYS

Pursuant to Wis. Stat. § 196.374(3)(b)1, which requires that the PSC evaluate Wisconsin's utility-administered energy efficiency and renewable energy resource programs, the PSC should issue an order revising the energy efficiency goals, or have the administration execute a goal.

Energy efficiency resource standards (EERS) are long-term energy savings targets for utilities, requiring utilities to meet a portion of their electric or natural gas needs using energy efficiency programs. *2005 Wisconsin Act 141* requires the PSC to establish energy efficiency and renewable energy targets every four years. Efficiency programs are administered through Focus on Energy®, Wisconsin's statewide energy efficiency and renewable resource program. The state sets Focus on Energy®'s budget at 1.2 percent of utility revenues, which limits energy efficiency goals. Under these funding constraints, in May 2018, the PSC set targets for 2019–2022 of approximately 0.6–0.7 percent of sales for electric utilities and 0.6 percent of sales for natural gas utilities.[48]

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.

The above goals would track with the overall energy-reduction goals set by the 2008 Governor's Task Force on Global Warming for electricity and natural gas and be similar to those set or recommended by other states, including Illinois, Minnesota, and Colorado.[49,50] This would also allow for

energy-efficient electrification (and electric vehicles and other traditionally gas- or diesel-fueled equipment) to begin replacing propane, heating oil, and transportation fuels – further contributing to emissions reductions. This makes Wisconsin more energy independent, more resilient, and reduces energy costs. The inclusion of not only energy efficiency but also distributed renewable energy, electrification, and battery storage could allow for the goals to be implemented right away, as opposed to over time as proposed in 2008, and may allow for higher goals. This policy would build upon Focus on Energy®'s highly cost-effective existing program.

The policy, if fully and properly implemented, should result in significant energy use reduction by underserved communities, as well as an ability for them to take advantage of the cost savings of beneficial vehicles and building electrification, thereby significantly reducing their energy costs. Although the overall impact will likely be very positive, in order to ensure that underserved communities can fully participate, it is critical to have them involved in decision-making regarding how to meet the energy use reduction goals to ensure that utility-offered programs are accessible and cost effective. It will be important to conduct effective outreach to underserved communities regarding all utility programs through avenues of communication that they regularly use.

08 Expand Wisconsin's Focus on Energy® funding

STRATEGIES

- Increase Focus on Energy® and utility incentive funding and align programs with energy- and carbon-reduction goals and low-income energy efficiency and clean energy programs.
- Develop programs within the Focus on Energy® scope aimed at facilitating a logical transition to electric appliances and equipment where feasible.
- Provide education and outreach regarding goals and benefits of policies, including vehicle electrification and other carbon-reducing activities.

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LE Legislation

POLICY PATHWAYS

- Wis. Stat. § 196.374(3)(b)2, which currently requires each energy utility to spend 1.2 percent of annual operating revenues from retail sales on funding efficiency programs, would be modified to significantly increase the funding percentage.
- Wis. Stat. § 196.374(7)(a), which currently allows municipal utilities and electric co-ops to collect an annual average of $8 per meter in fees, would be modified to increase the annual average fee that they can charge and direct the additional funding to energy efficiency and renewable energy programs.
- Wis. Stat. § 196.374, which outlines parameters for statewide energy efficiency and renewable resource programs, would be modified as necessary to expand energy efficiency and renewable energy incentive programs to include beneficial building and vehicle electrification, including battery energy storage and microgrids.

Energy efficiency is the cheapest and cleanest way to make sure Wisconsin's energy needs are met by eliminating the need for additional costly power plants. Reducing the amount of energy needed to provide services like heating, cooling, and lighting to customers also reduces the emissions from fossil-fueled generation and helps Wisconsin meet its carbon-reduction goals. Programs offering energy efficiency resources and incentives help lower customers' energy costs, reduce peak energy demand, reduce harmful air pollution, and support local job growth.

Wisconsin's Focus on Energy® administers resources and financial incentives on behalf of 107 electric and gas utilities. The program is funded by investor-owned utilities as required by Wis. Stat. § 196.374(2)(a), and by fees collected by participating municipal and electric co-ops.[51] Focus on Energy® offers energy efficiency and renewable energy programs for both residential and non-residential customers (including business, government, institutional, industrial, and agricultural). In 2019, according to an independent evaluation, Focus on Energy® provided $4.05 in direct economic benefit for every dollar spent, including $487 million worth of avoided utility costs.[52]

Increasing the funding that investor-owned utilities (IOUs) must spend on energy efficiency, and increasing the amount that municipal utilities and co-ops can collect for this purpose, will allow the Focus on Energy® to broaden and deepen its reach. The program can broaden by servicing more customers, and deepen by offering additional incentives, to include support for the beneficial electrification of buildings and vehicles, battery storage, and microgrids. Funding should also focus on job training and economic growth in the sector, as energy efficiency can support a clean energy economy in Wisconsin through jobs in manufacturing and installation.

Low-income households spend a disproportionately higher percentage of their household income on energy, known as their energy burden. At the same time, they are more likely to live in older, less-efficient homes, and the upfront cost of energy-saving upgrades is often prohibitive despite the longer-term payback. Extreme heat in the summer and cold in the winter caused by climate change will continue to make the economic impact worse on these families. Promoting additional energy efficiency measures will help reduce energy bills and providing technical resources and incentives for installation will help low-income households overcome the initial investment barrier to energy efficiency. In order to ensure that these communities can fully participate, it is critical to have them involved in decision-making regarding the design and implementation of the incentive programs, to ensure that the programs are meeting their needs, are accessible to them, and help realize the goal of cost-effectively reducing their energy use.

09 Support load management

STRATEGY Establish programs at the PSC to incentivize load management, or demand-side management (DSM), including tariffs to incentivize stationary and mobile battery load management.

EA Executive/ Agency Action

POLICY PATHWAYS

- Direct the PSC to establish programs and tariffs.

Load management, or demand-side management (DSM), is used to reduce consumer energy demand, and is especially important during peak demand times to reduce load and minimize the need for additional fossil-generated power plants to come online. DSM can be implemented through energy efficiency (installing efficient products or technologies to permanently reduce the demand) or demand response (DR, altering demand or behavior in the short term in response to a peak demand event), and is deployed through education and incentives. DSM offers a variety of environmental benefits, including reducing energy usage, offsetting the need for fossil-fueled power plants, and helping to manage system challenges from increased wind and solar energy.

To help address peak demand issues, it is important to establish flexible DR programs. The PSC's *Final Strategic Energy Assessment 2018-2024* reported an increase of 5.4 percent in peak energy demand by 2024 (despite energy consumption growing by less than 1 percent per year), so increasing grid flexibility will be critical to manage customer costs and minimize environmental impact if the system peak continues to increase.[53]

These DR programs should be designed to incentivize stationary and mobile battery storage. Program design should be based on "on-peak" charging projections to help ensure that owners of batteries are incentivized to charge batteries during times of low energy demand and discharge energy at peak demand times to assist with demand response. The purpose would be to establish electricity rate structures and technology-based smart charging programs which encourage charging at times most beneficial to the electricity system and consumers. These programs have great potential, especially if Wisconsin sees substantial increases in electric vehicle (EV) adoption, and vehicle-to-grid charging becomes available. The PSC should consider approving pilot programs to help utilities gain experience and information about creating a user-friendly EV charging experience that benefits all electric customers and the electric grid.

This effort should also identify and implement other opportunities to incentivize customers to use energy when it is abundant and not when it is scarce, including through tariffs.

This will have a positive effect on underserved communities if programs are created to provide additional advantages to owning EVs, which should increase their deployment and use, resulting in decreased energy costs and EV emissions. However, if underserved communities are not able to fully participate in DSM programs, utilize EVs, or other storage, they will be shut out of some of the benefits of these programs. To mitigate potential negative impacts, incentive programs should be designed to serve these communities, especially in EVs and battery energy storage.

10 Support low-cost debt financing of customer clean energy projects

STRATEGIES

- Maximize property assessed clean energy (PACE) financing opportunities for commercial customers. Encourage all counties to implement PACE ordinances for commercial properties and provide information about PACE to businesses that likely may benefit.
- Provide on-bill financing for residential and governmental customers. Utilities should provide on-bill financing with low-interest loans (or potentially no-interest loans for low-income residences) for residential and governmental customers that are less likely to benefit from PACE. Financing would be for remaining costs after application of available incentives, including utility incentives, tax credits, and federal grants.
- Explore a Wisconsin Green Bank. Create a study committee to look into various public, private, nonprofit, and hybrid models that would fund projects, including worker training and equitable clean energy buildout in low-income communities and communities of color.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- Allow the PSC, or the appropriate government agency, to approve community renewable energy projects and ensure that the community benefits.
- PSC approval of tariffs allowing for low-cost debt financing on utility bills, potentially with the opportunity for rate recovery of the amount of subsidization of interest rates.

- Convene working groups to further investigate policy implementation.
- Debt financing subsidies could be provided from state funds if there is no rate recovery of utility financing.
- State funding would likely be needed to form and operate a green bank.
- If the formation of a Wisconsin Green Bank is utilized in lieu of or in addition to on-bill financing, passage of legislation authorizing and creating such a bank.
- Revisit 2*020 Assembly Bill (AB) 765* on green banks, which failed to pass earlier this year and required a study and appropriation on green banks in Wisconsin.

Establishing mechanisms to finance energy efficiency and renewable energy will expedite project and technology deployment that directly reduces emissions. Providing a variety of financing tools will promote project development and expand access by making these opportunities more affordable. In addition to incentives (such as Focus on Energy® and utility incentives, state tax credits, and grants), it is important to provide access to low-cost debt financing to encourage customers to implement cost-effective clean energy projects. Without this debt financing, many customers may not have the funding to implement what would otherwise be cost-effective measures and/or may have other competing uses of their available funds that prevent them from implementing projects.

PACE financing allows property owners to obtain low-cost, long-term loans for energy efficiency, renewable energy, and water conservation improvements. The financing tool covers hard and soft costs, and is repaid through the property tax bill, so there is no upfront cost and ownership transfers with the property. PACE ordinances have already been adopted in 45 Wisconsin counties, realizing significant energy, water, and cost savings.[54]

Utility-provided on-bill financing allows customers to invest in efficiency improvements, such as heating, ventilation and air conditioning (HVAC) upgrades or insulation, and repay the cost through their utility bill. Through on-bill financing, the utility takes on the cost of the energy efficiency or renewable energy project, and then collects repayment through its customer billing process. Governments can get involved by assisting with the initial capital or credit, or by taking advantage of on-bill programs themselves.

Green banks are financial institutions that use a combination of public funds and private investment to finance the deployment of renewable energy and energy efficiency projects. Green banks have been in operation for more than ten years and there are currently 14 green banks in operation in the U.S.[55] While the specific focus of these green banks varies, the goals of all green banks are to use local expertise to deploy capital to drive investment in additional clean energy projects that create jobs and reduce emissions. In 2018, U.S. green banks catalyzed $676 million in total investment in projects across the country, resulting in a cumulative impact of over $3.5 billion in investment since 2011. During that time, the private-to-public investment ratio for green banks has averaged 3.4 to 1. Wisconsin has previously pursued legislation to study the feasibility of establishing a green bank, *2020 AB 765*[56], but that has not been passed.

Although low-cost financing programs should generally have a beneficial impact on underserved communities, it will be important to consult with underserved communities during planning, development, and implementation to make sure that financing programs are accessible and help effectively reduce their energy use. These should not be limited to urban areas but also include rural areas, which will likewise face energy challenges as the climate crisis worsens. It is critical

to ensure that there is effective outreach regarding the availability of low-cost debt financing to underserved communities.

11 State lead by example

STRATEGIES

- Wisconsin state agencies and decision-makers should set a strong example by taking steps to reduce GHG emissions within the State's asset portfolio through energy and water conservation, waste management, energy production, building efficiency, transportation use, procurement policies, and guidance for local governmental units.
- Direct the Wisconsin Department of Administration (DOA) to work with other state agencies to set and take steps each year to meet energy- and carbon-reduction goals consistent with the most stringent Wisconsin public utility plan. Seek funding from Focus on Energy®, utility incentives, on-bill financing, and/or other available low-cost financing methods (to the extent that they are available) to reduce costs and pay for projects out of energy savings.

EA Executive/ Agency Action

POLICY PATHWAYS

As part of a Wisconsin lead-by-example program, the State can do the following:

- All agencies track both energy use and GHG emissions and set reduction goals.
- Track energy and emissions reductions and benchmark all existing state buildings and leaseholds. The State should share its benchmarking methods with interested local communities, potentially through the Green Tier Legacy Communities program or other mechanism.
- Set specific energy efficiency goals for state buildings, such as meeting ENERGY STAR® Performance levels by 2027.
- Set a policy of incorporating renewable energy generation into all new construction and increase the amount of renewable energy the State and UW System purchase to achieve 100 percent carbon-free energy before 2050. Alternatively, DOA could establish a more aggressive goal of 100 percent clean energy by 2025 for state operations, including a 30–50 percent energy reduction by 2030 for all state buildings and UW campuses, requiring state buildings to be 20 percent more efficient than current building codes, and requirement to acquire all additional electricity through renewables by 2025.
- Consider including carbon footprint reductions and not just energy-use reduction in state performance contracts.
- Join the Better Buildings Challenge of the U.S. Department of Energy (US DOE) to help document and share state data. Under this program, leading businesses, manufacturers, cities, states, universities, and school districts commit to improving the energy efficiency of their buildings portfolio by at least 20 percent over ten years and share their strategies and results.
- Participate in US DOE voluntary technical assistance initiatives geared towards state government.
- Adopt a policy of replacing state fleet vehicles and off-road equipment with EVs and electric equipment whenever it is cost-effective, considering total cost of ownership—purchase price (reduced by any Focus on Energy®, utility, or other incentives), projected operating cost savings 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).

- Assess and address resilience of the State's infrastructure and share best practice information regarding electrification and resilience with communities through the Green Tier Legacy Communities program or other mechanism.

According to the EPA, states lead by example by establishing energy management and GHG reduction programs within their own buildings and operations. These efforts save money on energy bills, lower GHG emissions, and demonstrate the feasibility and benefits of clean energy technologies and strategies to the larger market. This program, if properly implemented, should provide operational cost savings for the State government and lower its carbon and broader environmental footprint. State agencies will realize significant direct energy and GHG reductions from State government operations, buildings, and fleet. Indirect impacts include the energy and GHG reductions from municipalities and other jurisdictions that can learn from the State's example and take similar action. This policy should directly provide a small but not insignificant share of meeting the 2050 goal and should increase EV usage to help meet transportation goals. Also, if the State acts as a leader and shares the benefits of its actions with others, it can encourage and catalyze others' actions, resulting in greater emission reductions.

This has a positive effect on underserved communities because it should reduce the State's emissions and encourage others to lower their emissions. The positive impacts of this policy on underserved communities would likely be greatest if the State prioritizes implementation of the policy in areas where the State has operations in underserved communities. Purchasing policies could intentionally address underserved communities, for example by including requirements for a minimum level of contracting with small, women- and BIPOC-owned businesses. Paving a path for municipalities will enable underserved communities to save energy costs over time, which can be directed to other community needs, and increase resilience to climate impacts such as flooding, which often disproportionately impact lower-income neighborhoods and individuals.

12 Update state commercial and residential building energy codes

STRATEGY Update state commercial and residential building energy codes; include EV charging.

EA Executive/ Agency Action

LE Legislation

POLICY PATHWAYS

- The Department of Safety and Professional Services proposes updates to state residential and commercial codes. Wisconsin should adopt the most current energy code without amendment (unless specific provisions are not feasible or cost-effective in Wisconsin) and should establish a process for more regularly updating the state code to align with the model code.
- Legislation that would provide for 1) regularly updating the state energy codes based on model codes, including for EV readiness, unless specific provisions in the model codes are not feasible or cost-effective in Wisconsin, 2) updating the state energy codes beyond generally accepted model codes if it is feasible and cost-effective to do so in Wisconsin, and 3) allowing local communities to implement their own ordinances that are more stringent than the state energy codes so long as they clearly provide how to comply with the state and local codes.

Energy codes provide minimum requirements for energy efficiency in commercial and residential building construction. Codes are a cost-effective way to reduce energy use, reduce carbon emissions, improve occupant comfort, and save money for utility customers. Energy codes are adopted at the state level, and many local jurisdictions adopt "stretch" codes that go beyond their state or model codes.

The International Energy Conservation Code (IECC) is the most widely adopted model energy code, and is updated every three years through a voting process facilitated by the International Code Council (ICC). Through this process, government members from state and local governments (including representatives from building departments, sustainability offices, housing departments, and others) meet to vote on provisions affecting efficiency in the new code, including standards for the structure (walls, floor, ceiling, insulation), openings (windows and doors), and conditioning (ducts, ventilation, and leakage).

Wisconsin's energy code is currently the 2015 IECC with amendments for commercial buildings and the 2009 IECC with amendments for residential buildings. Because Wisconsin's codes are outdated, new building projects have not implemented all potential cost-effective energy efficiency measures included in newer codes, and the State does not have EV charging readiness requirements for new buildings. EV adoption can significantly lower transportation emissions, especially as clean generation is added to the grid and the use of coal and other fossil fuel generation is reduced. EV charging infrastructure is substantially more cost-effective to install during initial building construction than as a retrofit, and so should be included in Wisconsin's building energy code.

Wisconsin's present codes prevent local communities from requiring additional energy efficiency measures, which limits the ability of local communities to meet their clean energy goals. Enabling local governments to develop and implement stretch codes that are more stringent than the base state codes would allow leaders to achieve higher energy savings locally while accelerating market acceptance.

Cost-effective code updates should result in net cost savings for Wisconsinites, both from reduced energy use in buildings and because of the ability to utilize EVs, which have much lower operating costs than gas or diesel vehicles. In addition to cost savings, this will result in substantial reductions in carbon and other air emissions, including nitrogen oxide, sulfur dioxide, particulates, and mercury, resulting in health benefits. This policy is critical to ensuring that underserved communities are part of the clean energy transition, and that the safety and quality of housing stock improves over time.

While building energy codes should have a positive impact, it is important to consult with underserved communities to ensure that code updates are cost-effective and are applicable and beneficial to their communities. It is also important to note that lower-income members of underserved communities may not be able to afford EVs as quickly as others—in fact, low-income people in Wisconsin may struggle to secure any sort of reliable transportation and cannot afford any sort of vehicle. As the state works to promote EVs, it must be mindful of this and continue working to make low-carbon transportation available to all people.

13 Set utility carbon-reduction goals

STRATEGIES

- Establish carbon-reduction goals for utilities as follows:
  - By 2030, reduce net carbon emissions from the power sector to at least 60 percent below 2005 levels.
  - By 2050, reduce power sector net carbon emissions to 100 percent below 2005 levels.
- Utilities should be given flexibility in order to maintain reliable, resilient, and cost-effective infrastructure.

Executive/ Agency Action

POLICY PATHWAY

- The PSC should track progress towards these goals by utility through its biennial *Strategic Energy Assessment*.

The power sector provides the largest opportunity for cost-effective GHG emissions reductions. As other sectors pursue beneficial electrification (e.g., transportation and building fuels), decarbonizing the power sector is going to be critical to further reduce emissions economy-wide. The PSC's *Final Strategic Energy Assessment 2020-2026* indicates that Wisconsin utilities are on pace to reduce their aggregate emissions to 44 percent below 2005 levels by 2026, surpassing the 40 percent reduction target multiple providers had previously set for 2030.[57] What's more, these projected reductions do not consider a coal plant retirement announced in May, half of the 1,000 megawatts of solar power Alliant Energy is planning to acquire by 2024, or the solar farms being developed by non-utility companies.

Most emissions reductions are expected to come from utility-scale renewable energy projects with utility resource procurement or replacement reflecting the current demand and economics-based utility regulatory structure. Where cost-effective, and especially where it results in environmental justice or resilience benefits, reductions should also come by partnering with customers across multiple sectors and thereby leveraging funding from Focus on Energy® and utility incentive programs. At the same time, utilities may need some flexibility with their goals in order to maintain infrastructure that provides safe, reliable, and affordable energy and to allow for maintenance of grid stability. The goals may be appropriately modified to be consistent with a significant federal, nationwide carbon-reduction policy that includes all economic sectors when such a policy is put in place.

14 Support community solar

STRATEGY Encourage utility buildout of community solar and review green tariff models from other states as well as the Madison Gas & Electric (MG&E) model. At the same time, facilitate community solar/renewable energy sponsored by local communities and Tribes to help them meet their clean energy goals.

Executive/ Agency Action

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Legislation

POLICY PATHWAYS

- Development tariffs under Wis. Stat. §. 196.192 that allow for community solar.
- Allow local government to help regulate these projects.
- If the PSC believes changes are needed to Wis. Stat. § 196.192 to allow this policy, legislation should be introduced to do so.

To achieve 100 percent renewable electricity, Wisconsin needs local, community-driven action. However, communities need support and incentives to invest in renewable energy projects so that they can be part of the state's green energy future. Community solar programs provide greater access for several reasons: ownership (renters for whom rooftop solar isn't an option can access community solar), geography (those in shady or otherwise suboptimal locations for solar can participate in community solar), and economics (participants avoid high upfront installation costs of an individually owned system while still accessing solar). These programs can help create community buy-in, expand renewable energy project development in both rural and urban areas, and help low-income communities have ownership over their energy.

Many other states in the Midwest have successful and popular community renewable energy projects, most notably in Minnesota with the state's community solar gardens. This policy has also been implemented in Colorado (HB20-1064 (2020)) and Virginia (HB 572 (2020)), with a pilot program in the New York State Legislature (A01281 (2019-2020)). In fact, Colorado has just updated its community solar gardens legislation to increase the maximum size and make it easier for people in the community to be part of a garden (HB19-1003 (2019)). New York has multiple cooperatives that seek to improve energy justice and renewable energy use (e.g., The New York City Energy Co-op).

15 Update interconnection standards

STRATEGY Interconnection standards have not been updated in Wisconsin since 2004, and do not reflect developments in technology and energy storage markets. The Wisconsin Distributed Resources Collaborative and the PSC should address existing interconnection concerns and should specifically address energy storage.

EA Executive/ Agency Action

POLICY PATHWAYS

- PSC promulgation of modifications to Wis. Admin. Code § PSC 119.
- The PSC could appoint a committee, consisting of stakeholders actively involved with the Wisconsin Distributed Resources Collaborative and other relevant stakeholders as appropriate, to develop recommendations for modifying Wisconsin's current interconnection rules.

2001 Wisconsin Act 16 directed the PSC to promulgate rules for the interconnection of distributed generation facilities to utility electric systems, and required those rules to:

- Establish uniform statewide standards—to the extent technically feasible and cost-effective—that promote the development of distributed generation facilities;
- Address engineering, reliability, and safety concerns; and
- Establish methods for determining charges for interconnection.

The PSC promulgated interconnection rules in January 2004 as Ch. PSC 119, Wisconsin Administrative Code. The rules establish uniform interconnection requirements for all regulated electric utilities in Wisconsin, including:

- A standardized application process that allows streamlined processing for small facilities with capacity of 20 kW and less; and
- Technical requirements related to system design, safety, technology, and equipment certification.

Wisconsin's interconnection procedures are outdated and ambiguous, resulting in differing standards and rules among different utilities. In order for the power grid to properly utilize distributed resources, industry standards (e.g., IEEE-1547) need to be revised and updated. At the same time, processes need to be established that will address technology changes or other technical issues as they arise over time.

In 2019, the Minnesota Public Utilities Commission approved the Minnesota Distributed Energy Resource Interconnection Process and Agreements (MN DIP/DIA), modeled after the Federal Energy Regulatory Commission's Small Generator Interconnection Procedures (FERC SGIP). This update aimed to make the interconnection process more efficient and consistent statewide while encouraging technology-neutral distributed energy resource deployment.[58]

This policy, if fully and properly implemented, should result in more efficient and effective interconnection standards that make it easier and more cost-effective for underserved communities to implement customer clean energy projects, lowering carbon and other emissions, and potentially their energy costs. In order to ensure greater benefits to underserved communities, it will be important to allow underserved communities to be involved in the rulemaking process to help make sure the new interconnection standards allow them to effectively and efficiently interconnect their potential facilities.

16 Require analysis on the social cost of carbon

STRATEGY Support the passage of Wisconsin *2019 AB 766*, introduced in January 2020, to require the PSC to consider the social cost of carbon in its analysis in decisions about construction of new utility-scale energy generation.

Legislation

POLICY PATHWAYS

Passage of *2019 AB 766*. If passage of that bill is not feasible, it is likely important to at least confirm whether a statutory change is needed to allow the PSC to consider carbon emissions and the ability of utilities to meet their 2030 and 2050 goals when evaluating new proposed generation and other facilities, since Wis. Stat. §196.491(3)(d)3 provides that "[i]n its consideration of environmental factors, the commission may not determine that the design and location or route is not in the public interest because of the impact of air pollution if the proposed facility will meet the requirements of ch. 285."

The social cost of carbon estimates the damages resulting from climate change, including net changes in human health, agricultural productivity, property damage from increased flood risk, and heating and cooling costs.[59] Presently, the PSC does not consider the impacts of carbon emissions when it decides whether to approve a new generation source. Considering the cost of carbon should allow the PSC to make better decisions to achieve the 100 percent carbon-free electricity by 2050 goal. This policy would help the PSC to better compare the costs and benefits of new sources of energy generation and storage, including natural gas options, wind and solar options, utility-scale battery storage options, customer battery storage, and/or EV options where most of the project costs are paid by customers who receive targeted incentives from Focus on Energy® or utilities in return for commitments by the customers to operate under tariffs that add cost-effective capacity to the system.

Several other states are already using the social cost of carbon. For example:

- The social cost of carbon serves as the basis for the value of "zero-emission credits" paid to electric utilities under state clean energy legislation (NY, IL).
- Electric utilities are required to use the federal social cost of carbon in their resource planning (CO, MN, WA).
- State legislation requires regulators to incorporate the social cost of carbon in policy analysis (CA).

TRANSPORTATION

Transportation is integral to a functioning society. It is one of the most essential services a state can provide. Wisconsin's transportation system and infrastructure includes an extensive range of multi-modal elements, including roadways, highways, bus transit systems, passenger and freight railways, airports, and pedestrian and bicycle infrastructure—all of which connect residents and visitors to families, friends, services, jobs, and communities. It also enables the movement of commodities in, out, and around the state. The efficiency and reliability of Wisconsin's transportation system and supporting infrastructure have a direct impact on the state's economy and environment, which in turn effects the quality of life for its 5.8 million residents.

Emissions from the transportation sector are a direct output from the combustion of fossil fuels used to power vehicles. However, the types of fuels used and the number of vehicle miles traveled (VMTs) can have a significant impact on total emissions. In Wisconsin, transportation sector GHG emissions are the second-largest source of economy-wide emissions, representing 24 percent of total emissions in 2017.[60] Cars, buses, trucks, off-road vehicles, commercial aircraft, boats, and rail all contribute to transportation end-use emissions. Nationally, light-duty vehicles are the largest contributor within the sector, accounting for 59 percent, while medium- and heavy-duty vehicles follow at 23 percent, resulting in on-road vehicles making up more than three-quarters of transportation emissions.[61] While transportation emissions in Wisconsin have declined 6 percent since 2005, developing and adopting strategies that avoid or reduce our fossil-fuel dependence is critical to creating a clean transportation future for the citizens of Wisconsin. These strategies include utilizing low-carbon fuels and new and efficient technologies, and reducing VMTs through smart land-use planning, mode-shifting, and active transportation. Pursuing these transportation solutions can 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.

EVs powered by rechargeable batteries currently present the strongest potential to significantly reduce GHG emissions in the transportation sector, especially when the electricity is generated with low-carbon resources.[62] EVs provide many benefits, including lower maintenance costs, lower fuel costs, zero local emissions, quieter operation, and faster acceleration. Recognizing these benefits, consumers around the world are purchasing EVs leading to continued market expansion. This is evident in the 40 percent year-on-year increase of EV sales around the world in 2019.[63] Much of this growth is a result of declining battery costs and increased driving range. For example, although battery packs remain the single-highest-cost component in EVs, battery prices dropped from $650/kWh in 2013 to $156/kWh in 2019.[64] Forecasts from Bloomberg New Energy Finance's Electric Vehicle Outlook 2020 report suggest that price parity with internal combustion vehicles occurs by the mid-2020s; however additional policy support is needed to maintain market growth and to facilitate the necessary build-out of charging infrastructure.[65] In addition to the market expansion of electric light-duty vehicles, electric transit buses are fully available at the commercial level and are growing rapidly. For example, the U.S. zero-emission bus fleets grew 36 percent between 2018 and 2019.[66]

Based on the most recent data available, in 2019 there were 1,963 plug-in hybrid electric and 1,140 battery electric vehicles on the road in Wisconsin, with 259 publicly accessible charging stations.[67,68] To accelerate the rate of adoption needed to significantly reduce emissions in the transportation sector, it is essential that Wisconsin implement policies and programs to support this rapidly evolving market.

In addition to technology improvements, the way communities use and plan the development of space

result in increased VMTs, which has a direct impact on air quality and human health. Land-use planning is inextricably linked to our transportation system and planning efforts should include a process that evaluates how a community may grow and develop over time, including the role transportation planning can play in avoiding or encouraging sprawl, vehicle-focused travel, and a separation of living, working, and leisure spaces. For instance, utilizing a smart-growth planning approach encourages and improves regional accessibility, housing and neighborhood density, mixed-use development, street connectivity, walkability, and public transit proximity.[69] This type of integrated approach to land-use planning will increase economic, social, and environmental benefits across the state.

Research has shown that environmentally harmful infrastructure such as highways and ports have been intentionally and disproportionately placed in low-income communities and communities of color.[70] This results in high exposure to air, water, and noise pollution in these communities, which in turn results in racial health disparities and economic divestment. In addition, historically, state and municipal transportation planners have not adequately provided equitable access to transportation services.[71] Reframing transportation planning to be more equity-focused, with a greater emphasis on community engagement, can result in more meaningful public involvement and encourage the development of a shared equitable transportation outcome across all stakeholders.

The following recommendations will build a strong foundation for achieving a clean transportation future, while also addressing historical inequities in access to transit and health impacts associated with transportation-related air pollution. ◙

TRANSPORTATION

17	Climate and environmental justice audited transportation planning and development	p. 46	EA		LE
18	Promote public transit and green public transportation	p. 47		SB	LE
19	Support hybrid-electric vehicles, electric vehicles, and infrastructure	p. 48	EA	SB	LE
20	Safe, clean, and complete streets	p. 49		SB	LE

17 Climate and environmental justice audited transportation planning and development

STRATEGY Direct the Wisconsin Department of Transportation (WisDOT) to perform climate and environmental justice impact analyses as transportation-related projects are considered and developed.

EA Executive/ Agency Action

LE Legislation

POLICY PATHWAY

- WisDOT transportation planning and development should analyze and report the carbon emissions and environmental justice impacts associated with transportation assets. The carbon and climate impact analysis should include an evaluation of a project's potential impacts on VMTs, transportation-related carbon emissions, and an assessment of climate resilience.

Quantifying transportation projects' carbon impact can help planners evaluate a proposed project and identify cost-effective, low-carbon alternatives. For instance, New York requires metropolitan planning organizations (MPOs) to estimate the energy and carbon emissions from their long-range transportation plans and their transportation improvement programs.[72] This type of analysis provides planners with an analytical framework for evaluating a transportation project's carbon and associated health impacts, allowing planners to evaluate the full direct and indirect costs of a project.

Transportation infrastructure (e.g., roads, highways, bridges, railways) are susceptible to climate impacts such as rising temperatures and more frequent and intense rainfall. Given the expected impacts of climate change, it is essential that we build and prepare our transportation assets to better withstand anticipated and unanticipated shocks and stresses that degrade and damage transportation infrastructure. Greater resilience can be achieved by implementing planning and land-use policies that focus on building resilient design into existing and new infrastructure, promoting compact urban developments, and encouraging the use of a variety of transportation modes. For instance, climate change projections can be used to identify areas at greater risk of flooding, which allows transportation planners to safeguard key transportation routes against climate impacts. Climate change projections can also be incorporated into decisions regarding the rebuilding of infrastructure damaged by extreme weather events, helping to determine if it is cost-effective to rebuild to a standard above the pre-disaster level. Utilizing tools that support building resilient infrastructure now and into the future are essential as Wisconsin prepares for a changing climate.

The environmental justice analysis should consider the positive and negative impacts of the project on underserved communities. This should include whether negative impacts could be reduced or positive impacts could be increased by incorporating public transit. This planning should be performed at local and state levels. WisDOT could provide resources to local governments to conduct their own transportation and land-use planning. Best practices could be shared with local governmental units through the Green Tier Legacy Communities Program.

These analyses would help address the concerns repeatedly raised during the listening sessions regarding the potential Interstate-94 highway expansion in Milwaukee, as well as similar issues with other transportation projects.

18 Promote public transit and green public transportation

STRATEGIES

- Increase funding for Wisconsin's public transit systems through the state budget to help meet current and future needs.
- Allow municipalities and regions to effectively coordinate and fund local transportation systems. Focus on opportunities to better facilitate connections between unemployed or underemployed workers and available jobs.
- Develop regional public transit plans. Evaluate regional transit needs, including high-speed and light rail. Look into various funding mechanisms (such as tax increment financing (TIFs)) for public infrastructure and public, private, and hybrid funding models. Also look into workforce aspects.
- Promote the construction and use of high-speed rail and other long-distance public transit.

SB 2021–2023 State Budget

LE Legislation

To reduce carbon emissions and energy costs associated with transportation, it is important to develop and implement plans that provide beneficial, low-carbon public transportation opportunities to Wisconsin residents. Additionally, this policy is critical for providing greater transportation equity and increased mobility across the state. Because public transportation is often the lowest-cost option for those who do not have the means to own or lease a personal automobile, greater investment in and access to public transportation is critical.

Engaging large local- area employers is vital to ensuring that public transportation routes meet the transportation-to-work requirements of the communities in which businesses are located. Accordingly, it is important that local employers, governments, and public transit providers work collaboratively to develop transportation solutions that cost-effectively meet the specific needs of local and regional demands.

Recognizing the benefits of electric buses, several transit agencies across the U.S. are incorporating electric buses into their fleet. According to CALSTART, the U.S. zero-emission bus fleet increased nearly 37 percent from 2018 to 2019, as almost every state across the country has a transit agency with an electric bus in its fleet.[73] Electric bus benefits include lower maintenance and operational costs, zero tailpipe emissions leading to significant health benefits for local communities, quieter operation, and faster acceleration. Identifying funding sources, such as the Volkswagen Environmental Mitigation Trust Fund (both State and Tribal) or the Federal Transit Administration Low-No grants, to support the transition to electric transit buses will be an important step to achieving clean transit options for Wisconsinites.

Creating high-speed rail to connect cities within the state and to connect Wisconsin with major cities in neighboring states can help reduce street traffic and the presence of individual cars. This would improve health and create a better built environment for communities in both urban and rural areas. It is important that representatives from underserved communities be included in the regional transportation planning to make sure that their communities are properly served.

19 Support hybrid-electric vehicles, electric vehicles, and infrastructure

STRATEGY Develop a statewide electric transportation plan that:

- Includes input from key stakeholders (e.g., utilities, charging providers, EV manufacturers and sellers, underserved communities, the PSC, and others),
- Focuses on steps to ensure that cost-effective charging infrastructure and incentives are developed to rapidly, efficiently, and effectively increase EV adoption throughout the state, in all sectors, and
- Places a special focus on underserved areas such as rural and lower-income urban areas.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

Vehicle electrification is a key solution for decarbonizing the transportation sector, especially as the electric grid is decarbonized. EVs offer consumers multiple benefits, including lower operating, maintenance, and fuel costs; smoother driving; and faster acceleration. Because of the high efficiency of the electric drivetrain, the fuel economy of an EV compared to an internal combustion engine is significantly higher.[74] Further, a 2018 study from the University of Michigan's Transportation Research Institute found that EVs cost less than half as much to operate as gas-powered cars, with the average cost to operate an EV in the U.S. being $485 per year (vs. $1,117 for a gasoline-powered vehicle).[75]

Presently Wisconsin charges an EV surcharge for battery electric, hybrid electric, and plug-in hybrid vehicles (BEVs, HEVs, and PHEVs) which is higher in registration cost compared to traditional gas and diesel vehicles. To many this is considered a disincentive to the purchase, leasing, and use of EVs and hybrids. In order to encourage EV penetration, in the short run it would be beneficial to remove the current additional fees, especially as the EV market matures. Ultimately, as deeper penetration of EVs occurs, it will likely be important to develop alternative funding for road maintenance and development. This may include collecting enhanced registration fees or utilizing road usage fees. An analysis on how to approach this issue is necessary.

In order to encourage significant EV deployment, it is necessary to address "range anxiety" issues caused by the limited availability of public charging infrastructure and the fact that many individuals and households in apartments or similar residential settings may not be able to charge at their residence. Accordingly, it is important that steps be taken to help ensure that accessible and affordable charging is available throughout the state. It is especially important to focus on areas where the market, on its own, would likely take longer to provide charging access (e.g., rural areas and low-income areas).

To support and grow their EV markets, states across the country have developed EV plans that outline actions and strategies to advance their EV deployment goals.[76] To name a few, Colorado, Minnesota, Pennsylvania, and Connecticut all released their strategies within the past two years.[77] In order to adequately address how best to accelerate EV adoption and the associated infrastructure, it is important that Wisconsin develop a statewide electric transportation plan with input from key stakeholders.

20 Safe, clean, and complete streets

STRATEGIES

- Require the WisDOT to incorporate Complete Street designs in all state roadway projects.
- Restore eminent domain acquisition for pedestrian and bike trails.
- Increase state funding for the Transportation Alternatives Program (TAP) and direct a portion of funds to under-resourced communities and environmental justice communities.
- Provide funding for bicycle programs and bike infrastructure in low-income communities.

SB 2021–2023 State Budget

LE Legislation

In 2009, Wisconsin's state legislature passed a Complete Streets law that limited state and federal funds provided by WisDOT for highway reconstruction projects that didn't include bicycle and pedestrian walkways. States and cities across the country have adopted Complete Street policies in order to more actively consider cyclists, pedestrians, and transit users in the design and planning of all roads. For instance, typical characteristics of a complete street include bike and walking paths, highly visible crosswalks, curb extensions, and streetlights. However, in 2015 the Complete Streets law was repealed in an effort to reduce the Department of Transportation's regulatory costs. Yet according to nonprofit Wisconsin Bike Fed, the Complete Streets policy improved health and safety, and helped local governments reduce cost burdens associated with serious injuries as a result of poor street design.[78] In addition, increases in biking and other alternative methods of transportation can help reduce emissions. A 2015 study by the Institute for Transportation and Development Policy found that a significant increase in biking worldwide could reduce CO_2 emissions in urban areas.[79] In Wisconsin, if 20 percent more people in Madison and Milwaukee biked for short trips versus driving a car, the state could emit 57,405 fewer tons of CO_2. [80]

Eminent domain law in Wisconsin is articulated in Article 1, Section 13 of the Wisconsin Constitution. It allows private property to be taken by state or local governments, so long as the property is taken for a public use and the owner is justly compensated. In 2017, the use of eminent domain was prohibited to be used to establish or extend recreational trails, bicycle ways, bicycle lanes, or pedestrian ways which, according to the Sierra Club, has led to a slow-down of more than "twenty projects across the state that would improve recreation and transportation options" and "millions of federal dollars are being left unspent."[81]

In 2015, the Fixing America's Surface Transportation Act (FAST Act) eliminated the Moving Ahead for Progress in the 21st Century Act (MAP-21) Transportation Alternatives Program (TAP). It was replaced by Transportation Alternatives (TA) Set-Aside Implementation funding that supported activities previously eligible under TAP, as well as smaller projects such as pedestrian and bicycle facilities, and those that address community improvement and environmental mitigation. Investments in pedestrian and bike infrastructure typically happen in wealthy communities, ignoring the needs of low-income communities. However, to achieve a sustainable, equitable transportation system, it is critical that Wisconsin make investments in pedestrian and biking infrastructure in low-income or underserved communities. These investments improve travel safety and access to jobs, services, and recreation while providing a healthy and low-cost alternative to car ownership and public transit.

AGRICULTURE

The U.S. is home to nearly 900 million acres of farmland, including pasture and grazing lands.[82] Wisconsin alone has more than 13 million acres of agricultural land and operates more dairy farms than any other state.[83]

Climate change has negatively affected agricultural producers through increased frequency and severity of extreme weather events, and these events are projected to intensify in the future.[84] Farmers are experiencing first-hand these negative impacts. For example, unpredictable weather patterns and extreme weather events continue to create challenging growing seasons and negatively impact crop production and animal health, further contributing to financial stress already persistent throughout agricultural communities due to low commodity markets. While some crops might benefit from a longer growing season, other species and varieties of crops grown in an area are projected to shift, resulting in the need for new equipment, knowledge, and resources to maintain agricultural viability.[85]

Although agriculture currently is a net source of emissions, farms and ranches hold great potential to generate negative emissions from increased carbon sequestration and reduce emissions from operations through low-cost strategies, in addition to providing other critical societal benefits such as food, habitat, and economic growth.[86]

There are also synergies among climate-smart agriculture practices, such as waste management and composting systems that reduce emissions and improve soil health and carbon sequestration. Realizing this potential will require widespread adoption of climate-smart crop management practices and operational changes by hundreds of thousands of individual farmers and ranchers.

Wisconsin has an opportunity to act on climate initiatives that would increase the resilience of the state's farmers while providing climate change benefits. Opportunities include: 1) reducing emissions via changes to on-farm management, and 2) advancing soil carbon sequestration on agricultural lands through the implementation of conservation practices. These opportunities could be approached by the state through the combination of developing innovative new programs and projects as well as leveraging existing funding and structures of state conservation programming.

Globally, soils store two to three times more CO_2 than the atmosphere and two to five times more carbon than is stored in vegetation.[87] How we manage this carbon pool can have significant impacts on climate change. With nearly 900 million acres of agricultural land in the U.S., there is an enormous opportunity to rebuild soil organic carbon, sequester atmospheric carbon, and reduce CH_4 and N_2O emissions.[88, 89] Some estimates suggest that if the U.S. were able to adequately address economic, social, and technical barriers to implementing soil management best practices, U.S. croplands have the potential to sequester 1.5–5.0 billion metric tons of CO_2e per year for 20 years.[90, 91] The same agronomic practices that increase carbon sequestration also can help mitigate flood events, protect water quality, recharge groundwater, and increase resilience to drought.[92] Recognizing the societal importance of food production, land managers and policymakers must strive to balance the protection of ecosystems for climate mitigation and other environmental co-benefits with the need to optimize agricultural management to feed a growing world population. The state of Wisconsin is a critical piece of this puzzle.

AGRICULTURE

21	Support farmer-led watershed groups	p. 51		SB	LE
22	Pay farmers to increase soil carbon storage in agricultural and working lands	p. 52		SB	LE
23	Avoid conversion of natural working lands	p. 55	EA	SB	LE
24	Make managed grazing livestock production systems an agricultural priority	p. 56		SB	LE

21 Support farmer-led watershed groups

STRATEGIES

- Increase funding for farmer-led watershed groups promoting conservation practices.
  - Establish the funding to be sufficient, increase funding to producer-led grants, increase staff support at Department of Agriculture, Trade, and Consumer Protection (DATCP) to track group's progress, and support producer-led groups regionally.
  - Establish a soil carbon and climate pilot program with producer-led watershed groups to assess the extent and value of climate mitigation practices to generate carbon credits based on verified protocols and models used in existing carbon markets. Identify barriers to participation by agricultural producers and opportunities and solutions to overcome those challenges.
  - Fund classes and seminars to educate farmers of the benefits of no-till and minimum-till practices in their fields.
  - Increase support for nutrient and manure management to reduce N_20 and CH_4 emissions.

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- Statutory revision Wis. Stat. §. 93.59 to increase limit of award per producer-led group.
- Increases in producer-led funding and position authority for DATCP.

DATCP currently provides funding to producer-led groups that focus on non-point-source pollution abatement activities through the Producer-Led Watershed Protection Grant Program (PLWPG). The program's goal is to improve Wisconsin's soil and water quality by supporting and advancing producer-led conservation solutions by increasing on-the-ground practices and farmer participation in these efforts. Since launching in 2016, the program has grown from 14 groups to 31 groups funded to date.[93] The PLWPG has been an effective tool to increase farmer participation in non-point-source pollution abatement efforts to improve water quality and soil health. While each group is different, most focus on conservation practice implementation, increasing outreach and communication opportunities, and research and water quality monitoring activities. Allowing farmers to experiment with new practices through this grant program has been an important tool towards advancing conservation innovation in the state and has facilitated the acceptance of non-traditional techniques via peer-to-peer (farmer-to-farmer) learning and networking. The groups developed and coordinated through this program are well poised to be experimenters, advocates, and messengers for climate-smart agricultural practices.

The agriculture sector holds the potential to serve as a critical climate solution, and a soil carbon pilot program would help inform the practices and markets that would support climate-smart agriculture in Wisconsin. This recommendation is directly related to the pay farmers to increase soil carbon storage in agricultural and working lands recommendation below. Similar success has been exhibited through other state programs such as Maryland's Healthy Soils Program, which was established in 2017 through state legislation and to date has achieved the CO_2 equivalent of removing over 5,000 passenger cars from the road through farmer adoption of cover crops, adopting no-till or low-till farming practices, and rotational grazing.[94]

There are farmers that will be reluctant to change their farming practices, so it's critical that there is thorough engagement with farmers across the state and that there are opportunities for all farmers to learn more about the value of carbon sequestration through no-till and cover crops.

22 Pay farmers to increase soil carbon storage in agricultural and working lands

STRATEGIES

- Establish a "carbon farmers" program at DATCP to develop methods for measuring how much carbon is stored through agricultural management practices and provide tax incentives or subsidies.
  - Create and fund a pilot program through the Soil and Water Resource Management grant to help inform the feasibility of a state-based agricultural policy that pays farmers for carbon sequestration.
  - Work with partners to understand carbon market options for Wisconsin that would be consistent with, and complementary to, other efforts in the Midwest and federal legislation to increase access to carbon markets for the state's agriculture and forestry industries.

- CLIMATE LEADER -

DODGE COUNTY FARMERS HEALTHY SOIL & WATER

Dodge County Farmers Healthy Soil & Water is a producer-led group whose mission is to improve soil and water through conservation practices and education. The group promotes improving soil health through the use of cover crops, residue management, and reduced tillage.

For the past five years, the group has provided the knowledge and leadership needed to improve farming practices by building a strong network of farmers, conducting research, holding monthly meetings, providing progress reports, and hosting special events like on-farm visits. The group also works collaboratively with non-farming organizations such as the DNR, Natural Resources Conservation Service, lake associations, and other conservation groups to ensure farming practices are not detrimental to the land and water.

With the changing climate and increased precipitation, the group believes that implementing soil health practices can help reduce runoff and erosion as well as create a more efficient carbon sink—all while making agriculture more sustainable. They also believe the best way to make these practices more widespread is through education, especially peer-to-peer education. By demonstrating that no-till and cover crops do work, showcasing examples of these farming practices in their areas, illustrating what can be gained, and providing incentives for conservation practices that protect soil health, more farmers can adopt sustainable farming practices.

Dodge County Farmers Healthy Soil & Water is committed to being part of Wisconsin's solution to preserving its natural resources and working to create a state where both its rich farming practices and conservation practices can co-exist.

For more information, visit https://www.dodgecountyfarmers.com

- Increase incentives for cover crops, reduced tillage, and crop rotation adjustments to increase soil carbon storage.
  - Establish a cost-share program to provide annual incentive payments to farmers who sign agreements for long-term best management practices (BMPs) that mitigate the impacts of and agriculture's contribution to climate change, increase soil health, reduce erosion and over-application of nutrients, and increase soil carbon storage.
  - Establish a Climate Leader Award for a farm each year to highlight and educate about climate-smart farming operations.
- Increase funding and technical support for carbon storage programs and practices.
  - Establish an additional staffing grant award to support county land conservation departments in climate impact assessment and planning efforts through their land and water resource management plans.
  - Provide climate science technical support capacity at the state and county levels to support agricultural practices that mitigate the impacts of and agriculture's contribution to climate change, including increasing managed grazing, alternative manure management practices, input reduction, and assessing carbon storage metrics and methods.
  - Establish a climate science education team consisting of state agencies and University of Wisconsin System resources (including the UW Division of Extension) to develop educational curriculum, classes, and materials focused on the importance of agricultural climate best management practices and resources for on-farm implementation.
- Increase nutrient and manure management support to reduce N_2O oxide and CH_4 emissions.

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- These initiatives would require increased funding for incentives and position authority at DATCP.

The creation of a "carbon farmers" pilot program that pays farmers for carbon sequestration and GHG offsets would allow farmers to learn how to participate in markets that reward sustainable management practices. This pilot program would enable DATCP and agricultural operators to gain a thorough understanding of various carbon credit protocols and the degree of carbon credits that various practices can generate, and therefore the amount of carbon tax credits a farm could receive if a true carbon market is established in the Midwest. A working group would be formed to perform iterative evaluations of the pilot program in the context of current federal legislation and regional carbon markets. This ongoing evaluation of the pilot program will determine the feasibility for a state carbon market for agriculture, taking into account how it could function, how Wisconsin farmers would participate, the interest of companies in participating and purchasing credits, and the appropriateness of these carbon markets for Wisconsin farmers.

To broaden incentives for cover crops, reduced tillage, and crop rotation changes to increase soil carbon storage, an increase in Wisconsin's Soil Water Resource Management grants that provide funding through counties for on-farm implementation of conservation practices could be used. In addition, rewarding farmers' innovative and aggressive climate action can generate increased awareness of climate change impacts and communicate the need for farmers to participate in these efforts.

Recently some county land conservation departments have worked to incorporate climate change or extreme weather events in their land and water resource management plans, and additional funding to counties to conduct climate change assessment and planning efforts through their five- and ten-year land and water resource management plans is integral to understanding the localized impacts and mitigating climate change at the county level. County land conservation departments are the on-the-ground staff that build close relationships with farmers around conservation and deliver one-on-one technical assistance for projects and practices. Additional county-level staff to support farmers at this level is integral to maintaining and advancing any climate benefits realized through on-farm conservation practices. County staff also rely on engineers and other specialists at DATCP to bring their local conservation practices and programming to fruition. Therefore, a state Climate Change Adaptation and Mitigation Coordinator position at DATCP to assist with climate-smart agriculture practice implementation strategies at local levels would broaden the expertise provided by the state agency and help support county partners in addressing climate change in the land use sector in ways most relatable to their local conditions. This position would help assess conservation practices for their climate change adaptation and mitigation benefits and would aid counties in broadening their assessment strategies to include climate change-related metrics. A multi-agency climate science education team would provide needed statewide expertise for farmers, consumers, industry, and units of government to turn to for climate-related programming and information.

23 Avoid conversion of natural working lands

STRATEGIES

- Incentivize identification of long-term additional farmland and conservation land base at the local level through additional land use planning efforts.
  - Increase technical and financial support to local units of government to educate landowners about benefits of the Farmland Preservation Program (FPP) and Conservation Reserve Enhancement Program (CREP), and resources to assist landowners to participate.
  - Increase support to local units of government to conduct farmland preservation planning activities.
- Expand the income tax credit levels for landowners who comply with all soil and water conservation standards.
- Explore allowing grasslands to be eligible for lower assessments through possible modification of use value law.
- Provide funding to support economic development opportunities within Agricultural Enterprise Areas (AEAs).

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- Create an interagency state/federal working group to investigate addition of grasslands to use value assessment.
- Statutory change to increase tax credit levels, funding for economic development, and local government resources.

Extensive research and data have catalogued the impacts of land conversion from agriculture, forestry, and grasslands to developed uses.[95] Wisconsin needs its agricultural land more than ever to provide food, fiber, and fuel. Protecting the most productive farmland should be of the utmost

importance for Wisconsin's economy that is so extensively supported by our working lands. Voluntary compliance with conservation standards and adopting conservation practices through programs like FPP and CREP not only improve water conservation and yield potential and reduce erosion and fuel inputs but also increase carbon sequestration capacity of the soil.[96] The financial incentives these programs provide motivate increased adoption of soil health practices that increase carbon storage capacity.[97]

FPP has contributed significantly to raising awareness of agricultural land's value, yet more can be done to avoid conversion to other uses. FPP and the tax credit it provides are a tool to increase conservation compliance across participating areas and to increase the number of acres covered by nutrient management plans. Currently only landowners with farmland within a certified farmland preservation zoning district or who own lands covered by an effective farmland preservation agreement are eligible to receive the farmland preservation tax credit. Increasing the tax credit would address shortfalls created by inflation and increased expenses for compliance with program requirements while promoting continued implementation of soil and water conservation standards.

The valuation standard for agricultural lands in Wisconsin differs from other land assessment categories because the value is determined by the income it will produce as farmland. Per state law, these lands must be primarily devoted to agricultural use. Agricultural lands include lands devoted to crop production, those pastured for livestock, or lands enrolled in certain agricultural or conservation programming under Tax 18.[98] Grasslands provide needed wildlife habitat, their perennial cover provides long-term soil carbon storage, and they reduce nutrient and sediment runoff to water resources. Encouraging unproductive cropland to transition to permanent perennial cover as grasslands through consideration for use value tax assessment may create motivation for transitioning those less-productive parcels.

Agricultural development is a statutorily defined goal of the AEA program.[99] However, no funding mechanism has been defined for achieving this goal in the first ten years of the program. Investing in economic development in areas that have prioritized a commitment to agricultural use should further the program agenda of facilitating interest in agricultural preservation. A pilot program to invest in designated AEAs would allow those communities to identify and implement rural economic development opportunities within and surrounding AEAs to support agricultural infrastructure, community businesses, farm viability, and enterprises that are so vital to sustainable rural economies.

24 Make managed grazing livestock production systems an agricultural priority

STRATEGIES

- Allocate funding for a statewide grazing program at DATCP with three to four dedicated regional coordinators (employed by DATCP or partner organizations) to support transition to grazing practices through technical assistance, business planning, and producer education.
- Establish a program with competitive grants for education and technical assistance to land and water agencies and nonprofit organizations.

2021–2023 State Budget

Legislation

POLICY PATHWAY

- This program would require position authority and funding for grants for education and technical assistance at DATCP.

Managed grazing of perennial grasslands provides a continuous living cover on the soil, reducing soil disturbance and increasing the potential for building soil carbon.[100] Managed grazing reduces the use of fossil-fuel-burning equipment used for planting, harvesting, and hauling manure, as well as petroleum-based fertilizers and chemicals whose production also contributes to GHG emissions on the larger global scale.[101] In addition, managed grazing can improve soil health, provide high-quality habitat for grassland wildlife and pollinators, sequester carbon, and increase water-holding capacity, protecting the landscape from heavy rain events and flooding caused by climate change.[102] It provides these ecosystem services while reducing production costs and increasing net income for farmers. For example, a Minnesota report identifies that transitioning 25 percent of ruminants to managed grazing and 25 percent of croplands to a combination of perennial cover, diverse rotations, and cover crops could reduce the nation's GHG emissions by up to 9 percent.[103] Electrical usage is also typically lower on managed grazing farms. Fans, lights, electric feeding motors, and augers are used less during the 180-day grazing season, reducing the draw on rural power grids during times of peak use.

In 2014, Wisconsin lost the Grazing Lands Conservation Initiative (WI-GLCI), which provided important technical assistance and educational opportunities to farmers. The WI-GLCI, a grant program coordinated by DATCP, received federal and state funding and resulted in 100,000 acres of new managed pasture and 100,000 acres of improved pasture from 2000 to 2012.[104] The WI-GLCI program provided the flexibility for local and regional organizations and agencies to access resources and tailor programming to local needs.

The program provided trained grazing specialists who conducted pasture walks and other educational events to show farmers managed grazing in practice on their neighbors' farms. These gatherings allowed grazing specialists to make initial contacts with farmers interested in managed grazing, leading to the creation of grazing plans for their farms and provision of ongoing technical assistance so livestock farmers could gain skills in managing their pastures. The program encouraged on-farm research and required researchers to involve farmers on their planning teams in developing research priorities. The program's goal was to increase the acreage of new and/or improved pasture by ten percent per year over the next ten years.[105]

RESILIENT SYSTEMS

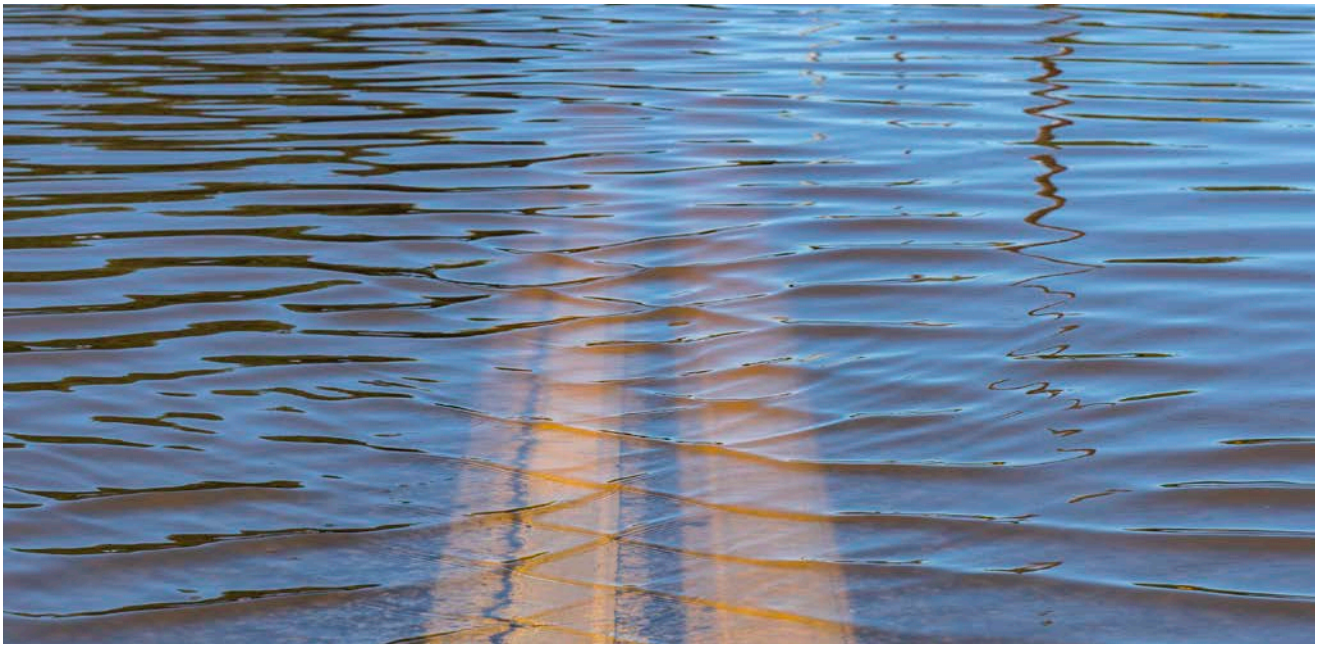
Wisconsin's climate is changing. Climate challenges include more hot and muggy weather, more intense and frequent heavy rainfalls, and freezing winter rain instead of snow, followed by deep winter freezes. These changes affect the stability of Wisconsin's economic sectors as well as human health and safety. Future projections under a low-GHG-emissions scenario suggest Wisconsin will continue to warm into the middle of the 21st century, including a tripling in the frequency of extreme heat days.[106]

Wisconsin is also likely to become wetter in the coming century, and extreme precipitation events are likely to increase in frequency and magnitude.[107] For example, in March 2020 flood events in Ashland, WI, caused over seven million gallons of sewage to flow into Lake Superior, which is the source of Ashland's drinking water.[108] Ashland was also subjected to 500-year storm events in 2012 and 2016 and was in the center of a 1,000-year storm event in 2018. Stormwater management planning is one of many crucial adaptation strategies to build the resilience of communities across Wisconsin due to increased rain events.

While we know the actions needed to mitigate carbon emissions and slow the impacts of a changing climate, we also know with certainty that we must build our adaptive capacity to enhance Wisconsin's resilience to the changes ahead. Although the environmental impacts of changing climate have been known for some time, we have failed to appropriately address these negative externalities by reflecting climate-related fi ancial impacts within our broader economic and financial systems. The subsequent result is infrastructure, communities, and industry sectors built upon a misunderstood perception of the environmental reality. By measuring climate-related financial risk of short-, medium-, and long-term climate scenarios, we can begin to understand the financial implications of a changing climate and the strategic investments needed to transition to a low-carbon future.

The past decade has brought some of the worst natural disasters and the resulting leaching of hazardous environmental contaminants into nearby, often low-income communities. Natural disasters are not great equalizers when it comes to recovery; lower-income individuals 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, leaving them more vulnerable to toxic leaks and contaminated air and water.[109] Housing prices decline as affluent people relocate out of flood zones and other environmentally unstable areas, allowing poorer families to move in. These trends may continue if commensurate resources are not provided to sustain or rebuild for those most in need and decision-makers are not suffi iently addressing disaster prevention.

As cities assess modifications to zoning, land use, and real estate development, it is critical to acknowledge climate science—however inconvenient—and take measures to address disaster preparedness, aimed particularly at helping the most vulnerable communities. Decades of land development, housing policy, and economic growth have shaped Wisconsin's communities. Through these policies, communities of color have been deemed undesirable and subsequently receive inequitable investment in critical infrastructure and services. Whether directly or indirectly, these systemic actions have segregated individuals by their skin color and economic status. These drivers of climate change and resulting health and safety impacts must be front and center and considered throughout the implementation of these recommendations.



RESILIENT SYSTEMS

25	Update rules and increase collaboration on rainfall models strategies	p. 59	EA		
26	Focus on wetlands	p. 60	EA	SB	LE
27	Create a flood resilience plan with a focus on urban- and rural-specific watershed action	p. 62	EA	SB	LE
28	Fund and execute a statewide climate risk assessment and resilience plan	p. 63	EA	SB	LE
29	Establish local control for waste	p. 64		SB	LE

25 Update rules and increase collaboration on rainfall models strategies

STRATEGIES

- Update statutes and administrative rules to reflect rainfall projection models rather than historic precipitation models, which often rely on outdated data and are less reflective of climate realities.
- Work with regional and federal partners to assess the status of rainfall models associated with severe weather events, precipitation levels, and intensity-duration-frequency (IDF) curves, and consider ways to update those models to reflect climate change more accurately.

EA Executive/ Agency Action

POLICY PATHWAYS

- Administrative rule or policy change explicitly recognizing that localized, scaled-down rainfall projection models based off scientifically accepted IDF curves fall within the regulatory requirements of Wis. Admin. Code § NR 243.
- Coordinate to update rainfall models with funding for research and development of statewide rainfall projections and regional coordination with other states to support National Oceanic and Atmospheric Administration (NOAA) update.

Multiple reports have indicated that temperature and precipitation totals for the state will continue to rise. Moreover, the frequency, duration, and severity of extreme weather events are all increasing in Wisconsin. Until recently, many Wisconsin programs relied on U.S. Geological Survey Soil Conservation Service *Technical Paper 40* (TP40) for rainfall data.[110] TP40 was published in 1961 and used historic rainfall data between 1937 and 1958. Given the age of that information, the data and limits set by TP40 were clearly out-of-date and inapplicable as limits by the early 2000s. In 2013, the NOAA published NOAA *Atlas 14*, which identified precipitation frequencies for much of the U.S., including the Midwestern states.[111] *Atlas 14* represents an ongoing, collaborative study between NOAA and regionally defined states to analyze historic rainfall data to identify precipitation event frequencies. Regions are updated and integrated into *Atlas 14* as states within a region opt-in to the review. Following publication of the updated data, *Atlas 14* specifically overrules TP40 and serves as the rainfall model for Wisconsin.

While *Atlas 14* updated 60-year-old models, the study still does not sufficiently account for precipitation changes that are exacerbated by climate change. Wisconsin has seen an escalation in rainfall duration, frequency, and severity as well as seasonal shifts resulting from climate change.[112] Therefore, models and regulations premised on historic analyses cannot adequately account for the increased rate of these changes. When the regulatory standards are not representative of weather realities, rural communities face an increased threat of water contamination from agricultural runoff, manure spills, and leaking facilities. At a minimum, representative standards would likely increase the required storage capacity of many manure lagoons around the state and could potentially change spreading practices.

WICCI is beginning precipitation research that could improve the effectiveness of many Wisconsin programs that rely on *Atlas 14* rainfall data. One of WICCI's proposals, the Wisconsin Rainfall Project, will develop geographically specific, downscaled climate projections across the state. The Wisconsin Rainfall Project will be capable of more accurately projecting extreme precipitation events across the state and has already been cited by the City of Madison on municipal stormwater projects.

26 Focus on wetlands

STRATEGIES

- Reconnect hydrologic systems and strategically restore wetlands to help solve runoff and flooding issues in watersheds impacted by climate change.
- Prioritize wetland restoration and remediation.
- Establish an advisory council of experts to help craft a statewide strategy to restore the natural capacity of Wisconsin landscapes to manage and store water.
- Support two pilot watershed assessment projects to develop methods of identifying degraded hydrologic conditions and restoration priorities at the sub-watershed scale. The methods and practices modeled will be a resource for watershed resilience planning throughout the state.
- Support demonstration projects to showcase watershed-based wetland and floodplain restoration techniques and practices that build resilience to flooding and drought.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- An advisory council can be created by legislative, executive, or agency action, with membership and mission outlined in its charter.
- Watershed assessment projects and flood demonstration projects can be implemented through legislation or budget action. Since wetland and floodplain restoration achieves multiple objectives (e.g., runoff management, flood control, carbon storage, fish and wildlife habitat), these recommendations could be funded by soliciting requests for proposals through existing grant programs. Strong local collaborations are often crucial to the success of these projects and lay groundwork for identifying joint concerns and securing funding to address them.

Wisconsin has lost nearly half of its original ten million acres of wetlands since the late 1800s.[113] The legacy of wetland loss has fundamentally changed the way water flows across our landscapes. Millions of acres of wetlands have been ditched and drained; thousands of miles of streams have been diverted, straightened, or armored; and many of our rivers are disconnected from adjacent floodplains along major stretches.

These degraded conditions of wetlands disrupt the capacity of our watersheds to store and manage water, and cause increased runoff, flashier flows, decreased baseflow, and severe erosion. Absent intervention, the capacity of our landscapes to manage water will continue to decline, even as climate vulnerabilities and associated damages continue to rise. We need to prioritize wetland and floodplain restoration to ultimately improve the condition of watersheds across the state to handle the increased intensity and frequency of precipitation and to maintain baseflow and shallow groundwater supply during periods of drought.

An advisory council is needed to convene experts who will help move Wisconsin forward in developing a statewide strategy to address water management issues. The pilot watershed assessment projects and flood demonstration projects will provide a starting point for examples of how local collaborations can work together to identify shared problems, identify potential solutions focused on restoring the land's natural capacity to manage and store water, implement restoration practices, and measure results. While these projects are geographically situated, the framework and lessons learned will be useful for other communities grappling with similar problems.

The advisory council can be convened as soon as possible to work on short- and long-term recommendations for forming a state strategy to improve watershed health and resilience. The advisory council's work will be iterative and informed by results from the pilot watershed assessments, flood demonstration projects, and other information. Pilot watershed assessment projects can begin immediately as well, but need 12–18 months to complete. Construction of demonstration projects can be completed in one field season pending engineering and restoration costs. Training opportunities associated with demonstration sites will be ongoing.

27 Create a flood resilience plan with a focus on urban- and rural-specific watershed action

STRATEGY A flood resilience plan should include the following characteristics and goals:

- A plan for flood prevention;
- Water quantity and quality controls through natural solutions;
- A goal to restore historical wetlands in flood zones;
- Strict regulation on development in existing wetlands through easing of permitting for restoration work and subsidies for property owners;
- Review of existing riparian buffer ordinances (provide protective revisions);
- Additional funding for existing flood resilience programming;
- Protection of critical wetlands and undeveloped lands in upper watersheds that impact downstream urban areas;
- Assessment of watershed-level flood risks based on future flood and precipitation projections, in coordination with existing state assessments and research from the WICCI;
- Formation of a resilience office, which can house staff to implement statewide flood resilience planning and shoreline erosion mitigation, and develop stormwater green infrastructure recommendations and planning; and
- Incentivize partnerships by providing training, planning tools, grant funds, and trained facilitators to help nonprofits, county, landowner, federal, and state agencies work together to implement community resilience plans.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- A flood resilience plan would identify at-risk areas and prioritize them for funding.

This recommendation focuses on resilience: proactive solutions, prevention measures, and mitigation of the impacts of increased flooding due to the current and worsening effects of climate change. Flooding of both urban and rural communities across Wisconsin has been an increasing issue. Across the U.S., floodplain management is often a piecemeal and disjointed undertaking.[114] Local governments are often left to develop their own plans, with minimal coordination among neighboring jurisdictions or clear priorities from state agencies or officials. Therefore, to develop a unified vision for floodplain management, the state should follow a model similar to one most recently employed by Texas.[115] The Texas Water Development Board is developing a statewide flood plan that will be based on regional plans developed for each major river basin within the state. While developing basin plans, communities are encouraged to work jointly and engage with a range of stakeholders to identify major risk factors, consider and compare flood protection options, and reach consensus on priority projects and protection policies. In addition to promoting collaboration between individual localities, this framework provides a forum in which socioeconomic vulnerabilities can be addressed and supports prioritization of nature-based and other solutions that will provide benefits above and beyond flood protection.[116]

There are myriad potential benefits of watershed-based planning. For example, watershed-level analyses can help reveal land-use impacts across jurisdictions that might have otherwise gone unrecognized.[117] Understanding flood-risk drivers on a watershed scale can help identify key opportunities to enhance the health of natural systems, such as restoring degraded streams or wetlands and reconnecting floodplain lands. Looking across local planning and policy can also expose knowledge, data, and regulatory gaps in stormwater or floodplain management that can contribute to increased risk for citizens and assets.

State-led collaboration across jurisdictions can also help identify priority projects, which can stimulate jobs and reduce future losses, thereby positioning the state to access and disperse federal resources more quickly. By empowering communities with tools and resources to collaborate within a watershed, the state can increase the scale, cost-effectiveness, and benefits of risk-reduction projects, and better leverage local resources against federal dollars. For example, after experiencing years of extreme weather events in the region, topped off by three consecutive years of devastating floods, Monroe County formed a climate change task force and is now a model for regional planning, assessment, and action.[118] Examples like this illuminate that a state flood strategy should be developed on a watershed basis.

28 Fund and execute a statewide climate risk assessment and resilience plan

STRATEGY Utilizing robust data and state-of-the-art technology to better understand climate-related financial risk across the state, we can begin to strategically invest in adaptation measures that build resilience. This work must integrate processes that empower regional and local units of government to continue adaptation and resilience planning forward. The goal must be to build processes that are iterative and enable communities to withstand system shocks, whether climate, health, or economic in nature.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

POLICY PATHWAYS

- Require that climate change be included in comprehensive plans by revising Wis. Stat. § 66.1001 to include a tenth required element: climate change.
- Require that local hazard mitigation plans include climate change.
- Require communities throughout Wisconsin to include climate change in their community health improvement assessment and plans.

It is critical that Wisconsin understand the risks associated with the changing climate described above and projected future scenarios. According to a federal report by the U.S. Commodity Futures Trading Commission (CFTC), virtually every part of the economy is vulnerable to the adverse effects of climate change, including human health and safety, infrastructure, agriculture, residential and commercial property, and labor productivity.[119] Without imminent progress mitigating global temperature rise, climate change will reduce economic productive capacity and threaten opportunities for generating jobs and income.[120] Such an outcome could result in disorderly price adjustments in various asset classes and have other less-predictable adverse effects in many facets of the U.S. financial system. Climate risk assessment should analyze impacts associated with both physical and transitional climate risks.

A statewide climate risk assessment and resilience plan is necessary to identify infrastructure and communities most at risk of climate change impacts. Understanding vulnerabilities and the statewide financial ramifications of changing climate will ensure mitigation and adaptation measures taken are fiscally responsible and deliver the most equitable and highest return on investment. This effort transects all state agencies and should be developed collaboratively, with state, regional, and local participation. Failing to understand the climate-related financial risk for the state of Wisconsin will inhibit the effective transition

to a low-carbon economy and present major risks to statewide economic and financial systems. Acting now to measure, understand, and address these risks will allow for a more swift, coordinated, and confident response strategy—positioning Wisconsin as a leader in climate action and resilience.

Adequate funding is necessary to successfully develop a statewide climate risk assessment and resilience plan. Funding should consider the need for dedicated staff, technology, and consultant resources. In addition, funding should be provided to state and regional agencies and academic partners to ensure their time can be dedicated appropriately.

29 Establish local control for waste

STRATEGY Give local control back to local governments and allow local jurisdictions to adopt environmental regulations above and beyond state minimum.

SB 2021–2023 State Budget

LE Legislation

Municipalities can reduce waste and emissions, and protect natural resources by developing and mandating their own environmental regulations. In 2016, the Wisconsin legislature passed *2015 AB 730*, which took authority away from municipalities to ban plastic bags. *2015 AB 730* gave the state authority over the regulation of auxiliary containers, which includes bags, bottles, or other reusable and single-use packaging. In addition to preventing bans, *2015 AB 730* prohibits local governments from imposing a fee for the use of these containers or regulating their disposition or sale.[121]

Failing to understand the climate-related financial risk for the state of Wisconsin will inhibit the effective transition to a low-carbon economy and present major risks to statewide economic and financial systems. Acting now to measure, understand, and address these risks will allow for a more swift, coordinated, and confident response strategy—positioning Wisconsin as a leader in climate action and resilience.

CLEAN ECONOMY

Transitioning to a clean economy will deliver economic, environmental, and public health outcomes for Wisconsin. Across the U.S., the energy sector is moving away from fossil fuels and towards clean sources of energy.[122] In order to be economically competitive within the region and nationally, workforce and economic development initiatives are necessary to prepare Wisconsinites for these careers of the future.

This energy transition will also provide important public health co-benefits and can help Wisconsin communities adapt to the expected impacts of climate change. Increasing renewable energy deployment and transitioning away from fossil fuels will reduce both GHGs and conventional air pollutants including oxides of nitrogen (NO_x), sulfur oxides (SO_x), particulate matter, and mercury pollution. Moreover, developing the clean economy in Wisconsin will reduce the disproportionate pollution burden faced by communities of color and low-income communities.

The clean energy transition is already underway in Wisconsin and nationally. According to 2020 Clean Jobs Midwest, there were over 76,000 clean energy jobs in Wisconsin prior to the COVID-19 crisis, including individuals in all 72 counties.[123] At the end of 2019, the clean energy sector employed more Wisconsin workers than all waiters and waitresses, computer programmers, lawyers, and web developers in Wisconsin combined.[124] Further, clean energy jobs (including jobs related to energy efficiency) in Wisconsin grew 1.5 times faster than the state's overall employment.[125] These clean energy jobs are currently split almost evenly between the combined Milwaukee and Madison metro areas and Wisconsin's rural areas, demonstrating that clean energy jobs can lead to both urban and rural economic growth.[126]

Nationally, clean energy jobs continue to make up an increasing share of total energy sector employment.[127] Energy efficiency already employs more than one out of every three U.S. workers in the overall energy industry.[128] Wind service turbine technicians and solar photovoltaic installers are the number one and number three fastest-growing occupations.[129] This national trend can also be found in the continued job growth for wind jobs in Wisconsin, increasing more than two percent in each of the past two years.[130] Additionally, many jobs in the clean energy economy are accessible to workers with a 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.[131] For instance, over two-thirds of clean energy jobs are in construction and manufacturing.[132] As Wisconsin looks to recover from the current health and economic crisis, investing in the clean economy can spur sustained job creation and economic growth for the state.

Investing in the clean economy also builds long-lasting community and environmental resilience. Jobs programs can also build on existing apprenticeship and service models and serve as a pathway for individuals from underserved communities into the clean energy economy. While the potential for clean energy jobs in Wisconsin is significant, policy actions are crucial to build an inclusive clean energy workforce and ensure that all individuals may participate in the clean energy transition.[133] This includes retraining for displaced fossil-fuel workers, as well as apprenticeship programs that serve historically marginalized communities. Focused training programs can expand clean energy jobs to those of all backgrounds and help rectify the current lack of diversity in the sector. The COVID-19 pandemic and its disparate health and economic impacts on communities of color raises the urgency on ensuring a just transition to a clean economy.

This section's recommendations center on the participation of communities, labor unions, affected industries, and apprenticeship and education programs. This includes affected community participation on the recommended Green Energy Advisory Council

and the Just Transition Advisory Committee. Wisconsin can build on successful examples in other states when designing these efforts. Other states including Colorado, New Mexico, and New York have already created high-level offices to elevate just transition elements into their energy planning.

Broad and coordinated economic development across sectors and regions can ensure that no communities are left behind. Careful planning for the retirement of fossil fuel assets and re-investment in affected communities can lessen the financial impact to workers, local businesses, and counties. Centering communities and workers in these efforts is vital to building a just transition for all Wisconsinites, and active participation and leadership of broad stakeholder groups has been built into the following recommendations.

CLEAN ECONOMY

30	Establish a Green Energy Advisory Council	p. 68	EA		
31	Create and deploy workforce transition plans	p. 68	EA	SB	LE
32	Support public post-secondary educational entities	p. 70	EA	SB	LE
33	Create new jobs through conservation and prepare individuals for work within the green energy sector	p. 71		SB	LE
34	Create a Wisconsin Economic Development Corporation Green Grant and Loan program	p. 72	EA	SB	LE
35	Conduct a complete analysis and create a pathway to participate in or implement carbon pricing that is optimal for Wisconsin	p. 74	EA		LE

30 Establish a Green Energy Advisory Council

STRATEGY Establish a Green Energy Advisory Council (Council) consisting of leaders of companies, utilities, labor unions, technical colleges, and apprenticeship programs and tasked with creating a strategic venue for interaction and training programs and curricula driven by industry's priority workforce needs.

EA Executive/ Agency Action

Creating this Council to oversee green job training will benefit both Wisconsin's economy and the environment. Investing in this workforce will signal to companies that Wisconsin is ready to transition to the clean economy, and it will ensure that Wisconsin's workforce will be ready for the innovative and renewable industries of the future. The Council should also be directed to ensure current fossil fuel industry workers, communities of color, and low-income individuals have opportunities to benefit from education and jobs related to green energy.

The clean energy transition is already underway in Wisconsin, and preparing workers for the transition is imperative for the state's economic, community, and public health. By 2018 Wisconsin already had eight times more workers in the clean energy sector than in fossil fuels.[134] Continued investment in this workforce through training and apprenticeship programs will create pathways for all Wisconsinites to participate in this growing workforce and the clean energy careers of the future.

Energy efficiency leads all clean energy sectors in Wisconsin, employing over 63,500 people—accounting for 8 in 10 of all clean energy workers.[135] Energy efficiency also directly reduces costs for households and businesses and is one of the most cost-effective GHG mitigation strategies. Renewable energy generation came in second with nearly 6,000 jobs, led by solar and wind.[136] These sectors now employ more than the approximately 3,300 workers employed at coal power plants.[137] Continued investments can support these growing state industries while positioning Wisconsin to play a leading regional role in the Midwest's clean economy.

A coordinated state approach to these efforts can help maximize the value of these investments by ensuring that job training programs are responsive to the latest industry trends while serving community needs. Employers in the energy sector cite lack of expertise and technical training as the number one issue when hiring.[138] This problem is particularly acute within the energy efficiency construction sector, where more than 90 percent of employers surveyed said it was somewhat difficult or very difficult to find qualified hires.[139] Trade programs can open pathways to these professions for Wisconsinites without a college degree. Targeted training programs developed in consultation with industry partners can provide Wisconsinites with the technical trade skills and certifications needed to lead in the clean energy economy.

31 Create and deploy workforce transition plans

STRATEGIES

- Establish a Just Transition Advisory Committee to 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. The committee would help draft a just transition plan for Wisconsin for consideration by the governor and legislature.

- Establish and fund a clean energy training and reemployment program for affected workers as well as workers new to the workforce with special attention to people and communities of color, Indigenous people and Native Nations, low-income people and communities, and formerly incarcerated people. Utilize established apprenticeship and technical college programs to deliver this training. Seek existing federal funding to supplement this initiative.
- Ensure jobs created include worker's rights, such as paid family leave, sick days, health insurance, and a fair wage.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

The climate crisis has many implications for jobs throughout Wisconsin and the U.S., especially when the fossil fuel industry is phased out for more renewable energy. However, this also provides a unique opportunity for Wisconsin to create jobs and have workers from the fossil fuel industry be part of a just transition to a green economy. There is a need for these new jobs to help those who were previously in the fossil fuel industry, as well as communities of color, formerly incarcerated people, and low-income communities and households.

In 2019, coal and natural gas provided 76 percent of Wisconsin's net power generation.[140] There were approximately 3,300 workers employed at these power plants at the end of 2019.[141] Wisconsin's power sector is moving away from coal as a fuel source, based on consumer demand for cleaner power and the declining cost of natural gas and renewable resources. This is a key component to reaching a zero-carbon target.

The effects of coal plant closures on workers and communities have the potential to be significant if not managed correctly. These plants have in many cases provided workers with strong union jobs capable of supporting a family on less than a college degree. In addition to impacts on individual workers and their families, the loss of coal-fired power plants can have severe impacts on municipal tax bases, which provide important local services. Establishing a thorough workforce transition plan early in the plant decommission process will result in a better transition away from carbon-based fuels. This plan coupled with a robust and properly funded training and re-employment policy will help alleviate the negative impact on communities that are affected by plant closures.

When fair access to good jobs with fair pay and safe conditions exist, individuals and communities become healthier. This policy could help improve income inequality and other social determinants of health. Part of the just transition to a green economy is not only ensuring equity in access to good jobs, but also ensuring that those jobs include workers' rights such as family leave, sick days, fair wages, and health insurance. These rights are vital to support the transition but also to improve the health of people in the workforce. This policy needs to help those who are most vulnerable not only to mitigate the climate crisis, but also to address current systemic barriers and inequities in the current economy.

This policy is specifically related to environmental justice, especially if modeled after Minnesota, Colorado, and Virginia, which brings attention to specific communities such as communities of color, fossil fuel workers, and low-income communities among others.

Minnesota's legislature is currently considering the *Minnesota Green New Deal* (HF 2836 (2020)), which includes job training programs and the opportunity to participate in the clean energy economy with specific attention to communities of color, Indigenous people, low-income communities, workers in the fossil fuel industry, and formerly incarcerated people.[142] Minnesota legislators

have also introduced another bill, HF 3938 (2020),[143] which would initiate a sustainable energy planning strategy for Minnesota's transition to a renewable energy economy and includes a strong jobs consideration.

In 2019, Colorado passed HB19-1314,[144] which creates a just transition office in the division of employment and training in the Department of Labor and Employment. In addition to this permanent high-level office, the bill established a just transition advisory committee tasked with developing a draft just transition plan with participation from affected stakeholder groups.

In 2020, Virginia passed the *Virginia Energy Plan* (HB 714),[145] which includes creating jobs in the energy efficiency program and a just transition, among other key points. Also in 2020, the Virginia legislature introduced a separate bill, HB 547 (2020),[146] that would establish the Virginia Energy Economy Transition Council to assist Virginia in the transition from the use of fossil fuels to renewable energy by 2050.

32 Support public post-secondary educational entities

STRATEGIES Implement new educational programs and curriculum changes within existing educational programs that reflect and support a workforce transition to the new jobs and skills required in response to actions taken to minimize the impact of climate change.

POLICY PATHWAYS

- Appoint members to the University of Wisconsin Board of Regents and the Wisconsin Technical College System Board of Trustees, as well as Secretary of the Department of Workforce Development.
- Support the new required education program in the 2021-2023 State Budget.
- Direct that a portion of the existing funding for workforce training—such as Wisconsin Technical College System's Workforce Advance Training (WAT), Wisconsin Economic Development Corporation (WEDC), and Department of Workforce Development Fast Forward grants—be designated to support worker retraining to learn necessary skills as businesses and manufacturers adopt new technologies in response to climate change.
- Fund for the development of educational pathways that allow students to progressively, cost efficiently, and easily move from system to system, attaining higher-level credentials, retraining as technologies change, and making occupational career changes.
- In order to receive or compete for funding, a post-secondary educational entity should establish an advisory committee that includes employers engaged in implementing new strategies, products, and processes in response to climate change.
- Fund the Higher Educational Aids Board (HEAB) to target scholarships to students engaged in studies directly related to programs preparing them for careers in occupational areas addressing or responding to climate change.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

Without a skilled and available workforce, Wisconsin will not be able to reach its goals that minimize climate change impacts. Supporting the development of academic and technical skills through post-secondary educational programs will help grow the workforce needed by businesses and employers as they introduce new strategies, products, and processes in response to climate change. These new opportunities often require the retraining of an employer's existing workforce, which can be costly. Subsidizing that cost allows these employers to adopt needed changes.

33 Create new jobs through conservation and prepare individuals for work within the green energy sector

STRATEGIES

- Create a green jobs corps pilot program in Milwaukee. Pilot a program in Milwaukee modeled after the Oakland Green Jobs Corps, a job-training pipeline providing green pathways out of poverty for low-income adults in Oakland, CA.
- Create a state-funded and state-run AmeriCorps-like program to train and deploy workers to provide assistance restoring and rebuilding natural lands in both rural and urban areas. Potential areas of work include:
  - Coordinate resilience at local/watershed/regional levels in both urban and rural settings.
  - Restore and build natural outdoor space for children in under-resourced areas.
  - Lead tree-planting initiatives in urban areas, in Native Nations, and on public lands.
  - Assist and train locals to build and care for community gardens in low-income and Native Nations across the state.
- Create a state trails and parks job program for individuals transitioning out of the correctional system.

SB 2021–2023 State Budget

LE Legislation

These programs would create jobs and put more Wisconsinites to work, preserve and rebuild natural areas, and make Wisconsin more resilient to the effects of a changing climate. These programs are designed to help program participants from diverse backgrounds build sustainable careers within the clean economy through technical training, professional development, and industry connections.

The Milwaukee green job corps pilot program would train workers to be prepared for the nation and the state's transition to renewable energy. The program would also provide benefits to local communities by ensuring that there is a renewable energy workforce prepared to supply clean energy to some of the communities most impacted by climate change.

This program would be modeled on the successful Oakland Green Jobs Corps program, which was launched in the fall of 2008. The City of Oakland awarded $250,000 to local capacity-building partners to start the program.[147] Participants move through the program in phases. The first two learning components include hands-on construction and trade skills as well as classroom instruction that covers relevant clean energy industry topics (e.g., solar panel installation, principles of sustainability, and environmental justice). Participants are then placed in six-month paid internships for on-the-job training. The program provides a certificate of completion, and students are eligible for federal financial aid.

The program provides trainees with the tools to build careers in the clean economy through world-class job training, environmental education, and connections to green jobs. In turn, the graduates help advance community climate protection goals by creating a skilled local workforce capable of doing the work necessary to achieve widespread GHG reductions in the community.

Conservation programs developed under this effort will focus on building career opportunities for program participants while also increasing climate resilience. These programs can help achieve environmental justice by targeting training and employment to people of color and low-income individuals. These initiatives could also provide employment opportunities for those affected by the COVID-19 pandemic and associated economic impacts, including young people.

A state-funded and run AmeriCorps-like program could build on existing initiatives such as WisCorps[148] to further expand the conservation workforce while investing in Wisconsin's natural lands and resources. These efforts could help prepare the state for the impacts from climate change in both rural and urban areas. Watershed restoration programs could bolster floodwater management and increase drought preparedness. Urban greening efforts including tree planting, community gardens, and increasing access to urban outdoor space would not only sequester GHGs but would also improve local air quality and increase recreation opportunities in underserved communities.

34 Create a Wisconsin Economic Development Corporation Green Grant and Loan program

STRATEGY Create a WEDC Green Grant and Loan program to support Wisconsin businesses that focus on zero-waste, energy efficiency, green technology, and green businesses. Designate a portion of these funds to support people of color, women, and veteran-owned businesses. Also, designate a sub-set to start-ups investing in new technologies.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

Renewable energy is the fastest-growing energy source in the U.S., doubling from 2000 to 2018.[149] Nearly 90 percent of this growth is driven by wind and solar, with increases between 2008 and 2018 of 5 times the amount of wind generation and 48 times the amount of solar generation.[150] Continued cost declines have made renewable technologies cost-competitive with traditional generating sources,[151] and the Energy Information Administration forecasted that wind and solar will make 76 percent of all new capacity additions this year.[152] A 2019 report found that new solar and wind installed capacity is already more cost-effective than 74 percent of the existing U.S. coal fl et.[153] While this industry is growing quickly and costs continue to decline,[154] government policies that support the research, development, and deployment of renewable energy technologies will continue to be important in further driving costs down and spurring new innovations.

While federal tax incentives are helping this industry grow, state-specific funding could help attract renewable energy companies to Wisconsin and could help incentivize current companies to invest in green technology and research. In addition, as home to the UW System and other great higher education institutions, the state should explore how it can retain young entrepreneurs and make Wisconsin a smart choice for start-ups.

Existing state economic development corporations can serve as a central organizing entity for these efforts. WEDC[155] leads economic development efforts for the state by providing resources, operational support, and financial assistance to companies, partners, and communities in Wisconsin. WEDC connects more than 600 partners, including regional economic development organizations, industry, academic institutions, and community partners, to foster economic growth across the state.

WEDC manages a number of grant, loan, tax credit, and venture capital programs but does not have one specific to funding businesses related to clean energy, zero-waste, or green technologies. Creating one could help draw and generate these businesses to and in our state, lessen our reliance on imported energy, create jobs, and retain students graduating from the state higher education systems.

- CLIMATE LEADER -

THE JOY TRIP PROJECT

Founded by James Edward Mills, a 2014 Fellow of the Mountain & Wilderness Writing Program at the Banff Centre in Alberta, Canada, and the 2016 recipient of the Paul K. Petzoldt Leadership Award for environmental education, the Joy Trip Project is a newsgathering and reporting organization that covers outdoor recreation, environmental conservation, acts of charitable giving, and practices of sustainable living. Through storytelling, the Joy Trip Project aims to discover how to live in harmony with the natural world and the rest of humanity.

Through the Joy Trip Project and his work, Mills highlights the need to diversify the outdoors and asserts that "the nation's wild places—from national and state parks to national forests, preserves, and wilderness areas—belong to all Americans. But not all of us use these resources equally. People from marginalized communities are much less likely to seek recreation, adventure, and solace in our wilderness spaces." Coined by Mills as the "adventure gap," the lack of inclusivity and diversity within outdoors spaces is a huge threat to the environment. If people do not feel connected to the land and its resources, how do they become good stewards of it? Mills calls attention to this issue through his work and challenges individuals, government, and non-profits to engage with under-represented communities and help make public lands and outdoor recreation more equitable. He also highlights how policies related to the national park system have historically discriminated against Black people—including how Jim Crow laws were incorporated into the national park systems.

In addition to advocating for the outdoors to be more inclusive, diverse, and equitable, Mills actively works to get more diverse populations into the outdoors by leading hiking, camping, and fishing adventures. He is committed to sharing his love and passion with the outdoors in hopes that outdoor spaces will reflect the diversity within our country. Mills believes that over the next several years, it is imperative that conservationists and outdoor recreation advocates engage underrepresented segments of the population to ensure the next generation is engaged with the land.

For more information, visit
https://joytripproject.com/about-joy-trip-project/

Wisconsin could follow the example set by other states that have taken steps to integrate clean economy considerations into their state economic development corporations. For instance, the Michigan Economic Development Corporation has recently participated in bilateral memorandums of understanding (MOUs)[156] and prioritized green infrastructure in its investments.[157] Massachusetts has had a separate economic development corporation for over a decade committed solely to the clean energy economy.[158]

35 Conduct a complete analysis and create a pathway to participate in or implement carbon pricing that is optimal for Wisconsin

STRATEGIES

- Create a study commission to better understand potential impacts of revenue-generating, revenue-neutral, and cap-and-trade or other carbon pricing systems for the state of Wisconsin, and determine how the state can best support regional and federal carbon pricing efforts. Report out by December 31, 2021.
- Launch carbon pricing pilots:
  - Internal carbon price research and implementation through UW System institutions.
  - Partner with a voluntary, large Wisconsin-based emitter to test a carbon pricing pilot to create a model for other large emitters.

EA Executive/ Agency Action

LE Legislation

Pricing carbon will accelerate Wisconsin's transition toward a green sustainable economy. According to the Intergovernmental Panel on Climate Change (IPCC), policies that put a price on high emitters are needed to achieve cost-effective 1.5°C pathways.[159] Eleven states across the country currently participate in carbon markets and use the generated revenue to help fund a wide range of programs like energy efficiency initiatives, flood preparedness and coastal resilience, clean transportation projects, and clean energy investments.

Ten states participate in the Regional Greenhouse Gas Initiative (RGGI), a cap-and-trade program that is reducing power-sector GHG emissions across the New England and Mid-Atlantic region.[160] Beginning in 2021, Virginia will become the eleventh RGGI member and the first Southern state to join the initiative.[161] Pennsylvania is also working toward joining RGGI.[162] A similar group of states, through the Transportation & Climate Initiative (TCI), is currently working to "design a regional low-carbon transportation policy proposal that would cap and reduce carbon emissions from the combustion of transportation fuels."[163]

California's cap-and-trade program plays a pivotal role in helping the state reach its climate goals while helping disadvantaged and low-income communities. Covering 85 percent of the state's GHG emissions, the program has generated more than $12 billion in revenue over the past decade. Sixty percent of these funds have gone to projects that directly benefit marginalized communities across the state.[164]

Part of the just transition to a green economy is not only ensuring equity in access to good jobs, but also ensuring that those jobs include workers' rights such as family leave, sick days, fair wages, and health insurance. These rights are vital to support the transition but also to improve the health of people in the workforce.

EDUCATION

Article 6 of the United Nations Framework Convention on Climate Change highlights education and training as "integral" to reducing the impacts of climate change.[165] In fact, a recent study quantified that over a 30-year period, climate change education—if implemented globally—could reduce emissions by almost 19 gigatons of CO_2e, largely attributed to lifestyle changes that resulted from awareness of the causes and impacts of climate change.[166] Thus, an informed citizenry represents a critical foundation to build climate mitigation and adaptation strategies.

In the U.S., there is no federal requirement that climate change be taught in schools, despite over 80 percent of American parents supporting its inclusion in science curricula.[167] States set their own policies, such as by adopting the Next Generation Science Standards, which broadly require that global warming be introduced as a "core idea" in middle school. However, only 20 states and the District of Columbia (representing 36 percent of U.S. students) have adopted these standards. Another 24 states, including Wisconsin, have developed custom standards based on broad K-12 science education frameworks, but standards are inconsistent in whether they highlight climate change as a human-induced problem.[168] Wisconsin's Standards for Science include climate change curricula for grades 6 through 12, including the "core idea" that human activity is a causal factor.[169]

Beyond providing knowledge of the causes, impacts, and solutions to climate change, the education system itself is a model of climate change's costs and unequal impacts. Each year in the U.S., K-12 districts spend more money on energy than they do on computers and textbooks combined—over $6 billion annually—and up to 30 percent of this use is inefficient or unnecessary, leading to excess GHG emissions.[170] In Wisconsin, public schools collectively spend over $175 million in energy costs each year, the second-largest expenditure in many school district budgets. When students and staff spend six to eight hours per day in aging, poorly ventilated school buildings, they may be exposed to poor indoor air quality and increased heat stress. Indoor air pollution in schools has been linked to higher asthma rates in minors.[171] In Wisconsin, the asthma burden disproportionately falls upon racial and ethnic minority populations.[172] According to new research, areas with growing numbers of hot school days demonstrate decreased student learning rates and teaching quality, impacts that are disproportionately borne by lower-income school districts and students of color.[173]

Schools that pursue energy efficiency measures not only save money and reduce GHG emissions, but they can also reinvest these savings into improving their learning and environmental justice outcomes. A 2019 study found that if 67 percent of Wisconsin's public-school buildings "improved their energy usage to exceed the current energy code, they would save an additional $8,220,000 in utility costs."[174] These savings can be put towards green infrastructure, such as green spaces and school gardens, which offer outdoor learning opportunities, higher neighborhood quality, and stormwater management. School gardens, for example, can help advance environmental justice and health equity by increasing access to nutritious foods, serving as a scaffold for science education, and providing pathways to green careers in urban and regenerative agriculture. One Wisconsin school that transformed its building to a greener, healthier facility achieved $85,000 in annual energy savings; decreased allergies and asthma by 75 percent, absenteeism by 15 percent, and communicable diseases by 425 percent; and increased test scores, teacher retention, and enrollment. ◙

EDUCATION

36 Expand support for teaching K-12 Climate Science and creating climate resilient schools p. 77 SB LE

37 Launch a climate change public education campaign p. 78 EA SB

36 Expand support for teaching K-12 Climate Science and creating climate resilient schools

STRATEGIES

- Reduce school building energy consumption and emissions.
- Increase green infrastructure at schools.
- Develop interdisciplinary, standards-aligned curriculum resources at the elementary, middle, and high school levels, including an understanding of climate, the interconnected nature of climate change, its potential local and global impacts, and individual and societal actions that may mitigate its harmful effects.
- Restore the ability for school districts to exclude investments in energy efficiency and renewable energy from revenue limits.

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LE Legislation

In 1990, the Wisconsin Center for Environmental Education (WCEE) was officially created under *1989 Wisconsin Act 299.* The WCEE has two main programs on which its staff focus: KEEP, the Wisconsin K-12 Energy Education Program, and LEAF, Wisconsin's K-12 Forestry Education Program. The WCEE also supports Green & Healthy Schools (GHS) which began in 2002. GHS empowers, supports, and recognizes schools for nurturing healthy kids and sustainable communities. These programs may be used as mechanisms to move forward with teaching K-12 Climate Science in schools.

To help high-needs schools develop interdisciplinary, standards-aligned climate change curriculum resources at the elementary, middle, and high school levels, the Department of Public Instruction (DPI) may provide direct grants or contract with other agencies or

non-governmental organizations (NGOs) to assist in material development. These climate change standards should include an understanding of climate, the interconnected nature of climate change, its potential local and global impacts, and individual and societal actions that may mitigate its harmful effects. In June 2020, New Jersey became the first state to fully integrate climate change education into its K-12 curriculum, moving it from an isolated topic under the sciences to a component of other subjects like social studies, health, and mathematics.[175]

As part of the 2013–2015 budget, Governor Walker approved the ability of a school board, via a resolution, to proceed with a Revenue Limit Exemption for energy efficiency projects. This allowed school districts the authority to approve to borrow money beyond revenue limits set by the state to pay for energy efficiency measures (renewable energy was excluded). Essentially, the return on investment of the implemented energy efficiency project would pay for itself over time and help a school district realize the benefits of reduced energy consumption and associated cost savings right away.

As part of the 2017–2019 budget, Governor Walker exercised his veto authority and implemented a 1,000-year moratorium on the school district energy efficiency revenue limit exemption, reversing his previous decision. This was due to a number of districts increasing their debt related to exceeding revenue limits for energy efficiency projects. Governor Walker explained this would "maintain the ability for school districts to ask taxpayers if they wish to exceed revenue limits and eliminate an exemption that has been viewed as a loophole to revenue limits."

With limited budgets, this shut down the opportunity for school districts to pursue large energy efficiency projects. Energy efficiency and now low-cost renewables (especially solar) should still have the ability to pay for themselves over time. If this revenue limit exemption is reinstated, it will allow flexibility for school districts to pursue new projects. DPI could work closely with other state agencies with energy expertise to provide measurement and verification of the project's proposed savings (pre- and post-implementation) in order to protect taxpayers and improve our school infrastructure.

37 Launch a climate change public education campaign

STRATEGIES

- Enable Wisconsinites to understand why they need to take urgent action to reduce carbon emissions.
- The campaign(s) will:
  - Focus on phenology—showing how scientists have found that recent changes in plants' and animals' life cycles demonstrate that Wisconsin's climate is changing and predict how it will change in the years to come.
  - Show how those changes are affecting and will affect Wisconsinite lives as well as how Wisconsinites should manage affected natural systems to benefit themselves and their environment.
  - Acquaint Wisconsinites with the need for and benefits of task force policies to reduce carbon emissions and increase clean energy.

EA Executive/ Agency Action

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Many climate policies recommended by this task force will only succeed with broad, public buy-in. A climate change public education campaign must provide Wisconsinites with information about climate change, how it is impacting and will impact Wisconsin, and how Wisconsinites can best mitigate or adapt to those changes, in part by helping to implement the recommendations of the task force. This campaign can counter climate change misinformation while identifying the health and economic benefits Wisconsinites will gain from a cleaner economy and environment. By generating widespread awareness of these benefits, these campaigns can help build, expand, and sustain public support of Wisconsin's climate policies.

FOOD SYSTEMS

A robust food system is an integral part of Wisconsin's economy, health, and sustainable future. The state's agricultural and food production sectors are responsible for feeding both local residents and far-reaching communities throughout the U.S. Importantly, the state's food system is closely tied to familial history and heritage for many of the Wisconsinites who contribute to the growth and production of food in the state. This legacy is especially apparent amongst many local Native Nations and subsistence hunters and farmers, who not only rely on local food resources for health and survival, but also as a key component of their cultural heritage.[176]

Yet as Wisconsin's food system has expanded through the decades, so too have the challenges involved in efficiently managing food production and distribution in an equitable, environmentally favorable manner. In the U.S., the average meal can travel many hundreds of miles from source of production to the point of consumption.[177] A significant percentage of our food resources are not even consumed, and end up decomposing in landfills.[178] Such practices fail to prioritize local food economies and pull fresh, healthy food options away from Wisconsin communities. Food-related transportation and unnecessary waste also contribute to GHG emissions in the U.S.

As such, an improperly managed food system can result in significant contributions to climate change. Yet many of the food resources in Wisconsin are themselves vulnerable to the warming climate. In particular, subsistence communities and Native Nations who rely on resources like wild rice for consumption and livelihood may be significantly impacted by climate-driven environmental changes in the coming decades.[179] Though the precise impacts of climate change on these food sources must be further investigated, there is little doubt that adaptation strategies will have to be developed to help protect communities relying on these resources. In addition to the cultural losses, the decline in the Wisconsin subsistence and wild rice food sectors would dramatically increase food insecurity, adversely affect the health of the communities relying on these resources, and put undue pressure on the existing food supply chain in the region.

More than one in ten households in the state are becoming food insecure.[180] The flaws in the distribution of food resources and the vulnerabilities of the Wisconsin food system to climate change are two major contributing factors. Hispanic and African American households are particularly vulnerable and show disproportionately high rates of food insecurity throughout the state.[181] Redistributing surplus food and investing in local food economies could have a significant impact correcting for these inequities. However, resources must also be allocated to specifically protect wild rice habitats and subsistence lifestyles to help address the vulnerabilities of Tribal food sources and cultural heritage to climate change.

Strategies to improve Wisconsin's food system must focus on bolstering the local production and distribution of food resources. Such strategies must build connections between suppliers and local communities, support subsistence and wild rice food supplies, and minimize waste with efficient redistribution of food surpluses. Taking such steps will help to ensure a healthy Wisconsin population, economy, and environment.

FOOD SYSTEMS

38	Increase funding to support local food systems	p. 81		SB	LE
39	Develop a food waste program	p. 82		SB	LE
40	Create a Manoomin (Wild Rice) Stewardship Council in partnership with interested Native Nations	p. 83	EA	SB	LE
41	Create a statewide subsistence adaptation plan	p. 84	EA	SB	LE

38 Increase funding to support local food systems

STRATEGY Help ensure robust local food systems and economies by increasing funding to the state's Farm-to-School and Buy Local, Buy Wisconsin programs; creating and funding the Governor's Farm-to-Fork proposal; and supporting programs that promote local food system development to connect people with healthy and nutritious food options.

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LE Legislation

The modern globalized food system has resulted in a significant separation between the source of food production and the location of eventual consumption. Though highly variable by location, studies have found that food resources in the U.S. can travel over a thousand miles from farm to plate.[182] Food transportation on this scale is not only unnecessary in many cases, but also results in significant adverse impacts to the environment and local communities in Wisconsin. Local food production ensures GHG emissions from shipping and refrigeration are minimized and results in fresher, healthier food remaining within the local community where it was grown or produced.[183] Fostering a local food system also gives consumers greater transparency and purchasing power to choose foods grown and produced with high health standards (e.g., organic items).

The Farm-to-School program is an example of a local food initiative with significant benefits to several segments of a given community.[184] By building connections between schools and local food producers, the program ensures school children have access to healthy local food items that are essential for growth and development in early childhood. Educational activities associated

with the program give opportunities for students to learn more about health, farming practices, and the local origins of their meals.[185] The program supports local food producers (including farmers, processors, ranchers, and others) by offering financial opportunities for food sales within their community. As a whole, the Farm-to-School program strengthens local economies and promotes vibrant, connected communities by building producer-consumer relationships between Wisconsin farmers and schools.

The proposed Farm-to-Fork program would have a similar benefit to local Wisconsin food economies. Rather than connecting food producers specifically with schools, Farm-to-Fork aims to build connections between local food suppliers and other entities in need of large quantities of fresh, healthy food (especially those with cafeterias). The program aims to help the public develop healthy eating habits and to provide information about local food producers, while also supporting community farmers and producers through enhanced access to key local markets. The program would award grants to businesses, universities, hospitals, and other entities that are innovative or provide models for other entities to adopt.

A third state program supporting the local food economy is the Buy Local, Buy Wisconsin (BLBW) competitive grant opportunity.[186] Managed by the DATCP, BLBW aims to assist the state's agricultural and food supply sectors with expanded opportunities for food sales at the local level. Grants are offered to help suppliers overcome challenges related to the marketing and distribution of their products in local markets. The program offers a total of $200,000 in annual funding with a maximum project award of $50,000 and a requirement that grantees provide a cash or in-kind match of 50 percent (minimum) of the total budget for the project.[187] Grants are awarded to a wide variety of applicants, including "groups or businesses involved in Wisconsin production agriculture, food processing, food distribution, food warehousing, retail food establishments or agricultural tourism operations," according to the DATCP BLBW call for proposals.[188] In the history of the program's 67 funded projects, BLBW has generated some $10 million in new food sales at the local level, generated or helped retain 233 jobs in the state's food production sector, and helped to support thousands of producers and food markets throughout Wisconsin.[189]

39 Develop a food waste program

STRATEGY Pilot a food waste program, modeled after the successful Nashville Food Waste Initiative, which encompasses preventing food waste, redirecting surplus food, and composting, with a special focus for areas with food deserts. Once the pilot program has proven successful on a city level, the program could be launched statewide. The program should work directly with various stakeholders, including restaurants, farmers, grocery stores, and local communities.

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LE Legislation

Food waste is a major issue in the U.S. that contributes significantly to GHG emissions and has serious implications for sustainable and equitable farming practices. According to the EPA, Americans threw out more than 40 million tons of food in 2017, amounting to more than 15 percent of the total waste generated in the U.S. that year.[190] Only about 6 percent of that food waste was composted, while the remaining 94 percent ended up contributing significant GHG to the atmosphere as it decomposed in a landfill or burned in a combustion facility.[191] In addition to the emissions resulting from wasted food, the water, energy, and human efforts involved in producing the food in the first place are also wasted. Wisconsin, as one of the country's leading

agricultural states, has a unique opportunity to support the agricultural industry and local communities throughout the state by addressing this pressing environmental and social issue.

Food waste is an especially concerning issue given the disparities that exist in Wisconsin regarding access to food. Rates of food insecurity vary throughout the state, but more than one in ten households are considered food insecure on average, highlighting how pressing the issue of food availability is for many communities in Wisconsin.[192] Food insecurity is even more serious among Hispanic and African American households, at 32 percent and 34 percent, respectively (as of 2017).[193] The disparity between food availability in these communities and the general population underscores the significant environmental justice concerns when it comes to food insecurity in Wisconsin.

Importantly, food insecurity is closely associated with adverse health outcomes that are preventable with reliable access to healthy food options.[194] If the policy focuses on redirecting food surplus to areas that have limited access to food (also known as food deserts) then it can help households who are food insecure receive healthy food as well as encourage sustainable farming practices in rural areas. Such policies can offer communities access to fruits and vegetables instead of processed foods, which can help improve overall health and well-being.

Efforts are already being made to address the issue of food waste at the local level. The *Milwaukee City-County Task Force on Climate and Economic Equity Preliminary Report* describes the need to "develop strategies to reduce food waste, feed hungry Milwaukee residents, increase composting, and develop markets for compost."[195] Milwaukee officials have considered the successful Nashville Food Waste Initiative as a blueprint.[196] This program engages stakeholders in the community—including restaurants, governments, and retailers—to prevent food waste, redirect surplus food to those in need, and compost food that must be disposed of.

40 Create a Manoomin (Wild Rice) Stewardship Council in partnership with interested Native Nations

STRATEGY Form a permanent council to work in partnership with Tribes and Ojibwe wild rice chiefs to provide support developing long-term solutions for proper management and protections for northern wild rice (*Zizania palustris*), lakes, rivers, and surrounding ecosystems. A minimum of half of the membership should be determined by interested Native Nations and include Ojibwe wild rice chiefs.

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LE Legislation

Wild rice, also known as Manoomin, is a culturally significant plant that has provided food for the Ojibwe and Menominee people for over a thousand years.[197] The Ojibwe were one of several Tribes that migrated from the East Coast after a prophecy predicted invaders from the sea and plentiful food growing in the West.[198] The migrating tribes soon discovered that food to be the wild rice of the Great Lakes region, a grain that is an incredible nutritional source in the region and which became critically important to the Native American diet for generations.[199]

Wild rice grows in the northern regions of Wisconsin and is well adapted to the state's harsh winter climate.[200] Yet the species is also extremely sensitive to environmental conditions. It is estimated that half of Wisconsin's wild rice has already been lost because of poor water quality, human activity, and loss of ideal natural habitats.[201] The effects of climate change now pose yet

another significant threat to wild rice and the way of life for Native Nations who rely on Manoomin as a food source. Warming winter temperatures and increasing extreme weather events are expected to lead to significant additional losses of wild rice in the state.[202] Alarmingly for the future of wild rice, Northern Wisconsin is anticipated to be the location of the greatest warming in the state over the next 50 years.[203]

Ongoing, dedicated work alongside Native Nations to protect and preserve wild rice would also have positive environmental impacts in the state. Aside from the major role it plays in the Ojibwe diet and way of life, wild rice is a key element of Great Lakes coastal and interior wetlands that provides essential habitat and food for a variety of animal species. Wild rice can significantly improve local water quality by stabilizing soils, absorbing nutrients, and reducing friction from wind and flowing water.[204] Each of those ecosystem services is lost without proper management of wild rice systems.

In 2018, Minnesota Governor Mark Dayton created a Wild Rice Task Force, which issued a comprehensive report on managing wild rice in the state.[205] The leading report recommendation was to create a Minnesota Wild Rice Stewardship Council to help protect the state's wild rice ecosystems. The council—made up of scientists, government representatives, and representatives from all 11 of the state's federally recognized Tribes—is charged with better managing wild rice because of the positive health impacts, ecosystem services, and cultural importance of Manoomin in the state. The nutritional benefits of wild rice are particularly relevant to the Tribes that rely on the food staple because of the disparities between citizens of the Native Nations and their white peers in both Minnesota and Wisconsin.[206]

41 Create a statewide subsistence adaptation plan

STRATEGY Support the development of a statewide resource vulnerability index and an accompanying subsistence adaptation plan. Conduct initial survey work—in collaboration with Wisconsin communities—to identify species of importance for subsistence. Develop a team to evaluate and assess the natural resources that subsistence communities rely upon in Wisconsin to eventually use for improved management throughout the state.

EA Executive/ Agency Action

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LE Legislation

POLICY PATHWAYS

- Appropriate funds to develop and carry out this work and the development of a statewide resource vulnerability index and an accompanying adaptation plan.

Climate change threatens food systems throughout the region and will disrupt subsistence lifestyles in Wisconsin. As regional populations continue to rise and the demand for food production increases, large agricultural practices will potentially have to increase production. Importantly, communities of color are likely to be disproportionately affected by the sensitivities of the Wisconsin food system to climate change given the existing disparity between healthy food availability compared to White communities.[207] Inner-city minority groups have limited access to harvesting opportunities, while rural communities endure environmental degradation of subsistence resources that provide much-needed and oftentimes traditional/cultural forms of nourishment.

A multifaceted approach, which would encourage state residents to proactively grow and harvest their own food throughout the year, could reduce some of the mass food production demand. As climate change threatens native species significant for cultural, subsistence, economic, and aesthetic purposes, a comprehensive adaptation plan could be simultaneously created that encompasses vulnerable resources and mechanisms for adaptation planning.

Yet an assessment of resources of significance and the level of vulnerability is important to document and understand, in order to better prepare and plan. Many resources are already at record threat level. In northern parts of the state and throughout the region, walleye populations are struggling to thrive as water temperatures increase and other environmental factors related to climate change make it difficult for survival. Walleye are important to Wisconsin's economy in the form of hook-and-line fishing, but also significant to rural and Native Nations that depend upon clean fish for consumption. Understanding the species' vulnerability for mitigation and adaptation planning will help Wisconsin communities address current resource issues and plan for future adaptation.

FORESTRY

U.S. forests serve as a carbon sink, offsetting approximately 10–20 percent of U.S. emissions each year.[208] Forests are one of the largest sources of negative emissions nationwide, and activities like reforestation and improved forest management hold the great potential to increase carbon sequestration.[209] Broadly speaking, forestlands are a source of GHG emissions when they are converted to other land uses (e.g., cropland), when trees are harvested or otherwise removed, and because of catastrophic wildfire. Forests accumulate carbon through tree growth, replanting, and afforestation. Carbon stored in long-lived wood products, such as timber used in buildings, is a mechanism for storing sequestered carbon outside the forest itself. Forest conservation (i.e., keeping forests as forests) is a foundational pathway and good management is essential to keeping those forests preserved and healthy.

Forests are Wisconsin's dominant land type, comprising 48 percent of the state's landscape, or 17 million acres of Wisconsin's 35 million acres of land.[210] From the Northwoods to the urban areas of Milwaukee, these dynamic, living systems are vital to Wisconsin by providing raw material to the forest and wood products industry, recreational areas, public health benefits such as improved air and water quality, and ecosystem functions such as wildlife habitat and watershed protection. Wisconsin's forests also provide a unique opportunity to address climate change because they both prevent and reduce GHG emissions while simultaneously providing essential social, environmental, and economic benefits. However, changes in climate are expected to impact the function, health, and productivity of forests, particularly in northern latitudes, and forest managers face many challenges associated with the uncertainty of how forests will respond to environmental changes.[211]

Active management can reduce the impacts of climate change, but the efficacy and sustainability of many adaptation and mitigation practices need to be refined with further application and monitoring. For example, forest management that considers the future changes in our climate can increase carbon storage by up to 3.4 million metric tons of CO_2 per year, or an increase of 23 percent over current carbon sequestration rates.[212] Additional carbon can be stored by modifying other management practices to maximize carbon benefits, such as planting tree seedlings in forest stands currently below well-stocked levels and increasing harvest intervals. In addition, implementing adaptive, climate-focused management strategies could help ensure Wisconsin forests are more resilient to climate change impacts.

Forests contribute vastly to the state's ecological, social, and economic well-being. The majority of Wisconsin's forestland is located in rural areas of the state in counties with low median incomes, while urban forests contribute to more-livable communities and reduce temperature and heat stress in underserved communities. The following recommendations aim to strengthen the state's forest resources and industries and have a positive impact on those nearby communities through local jobs, reduced energy costs, and an overall positive economic and social impact in these historically underserved communities. ◙

Photo courtesy of Travel Wisconsin

FORESTRY

42	Prioritize forest conservation to "keep forests as forests"	p. 87	SB	LE
43	Pursue reforestation in rural areas	p. 88	SB	LE
44	Encourage tree planting in urban areas	p. 89	SB	LE
45	Implement climate-focused forest management	p. 90	SB	LE
46	Support Wisconsin wood product utilization	p. 91	SB	LE

42 Prioritize forest conservation to "keep forests as forests"

STRATEGIES

- Tax forest land on its current use rather than its highest and best use.
- Provide tax credits or other financial incentives to landowners donating conservation easements with carbon benefits.
- Investigate the development of a family forest carbon credit program for small woodland owners.
- Source additional funding to acquire conservation easements and purchase lands to maintain them as working forests, protecting stored carbon and supporting local economies.

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LE Legislation

POLICY PATHWAYS

- Legislation would be required to change current or create new statute(s) that provide tax-based incentives.

Preventing forest conversion and keeping forests as forests will help protect the carbon already stored in Wisconsin's forests. Forested land cover can mitigate the effects of climate change by providing soil protection.[213] Long-term increases in forest area and growing stock allow forest carbon storage to increase. Keeping forests as forests can increase carbon storage by up to 276,000 metric tons of CO_2 per year. Maintaining a balanced distribution of forest types, ages, and size classes is an important consideration.

A recent study on the economic contributions of conservation easements suggests working forests protected by conservation easements have an overall positive economic impact on rural economies.[214] Sustainable forestry practices, influenced by forest certification and land fragmentation, help ensure Wisconsin's forests are managed in a way that contributes ecologically, socially, and economically to our well-being. However, trends in ownership patterns continue to show more landowners owning smaller parcel sizes, a key contributor to fragmentation of the forested landscape and reduced carbon-storage capacity. Parcelization continues to occur as the number of landowners continues increasing while average parcel size continues decreasing, leading to concerns about habitat connectivity and economies of scale associated with sustainable forestry practices, which could have negative economic consequences for both landowners and the logging community. Efforts like a family forest carbon program help connect rural family forest owners with companies to address climate change by giving families an opportunity to earn income from their land, in exchange for implementing sustainable forest practices that help sequester and store carbon. Companies can then purchase this carbon in the form of verified carbon credits.[215]

43 Pursue reforestation in rural areas

STRATEGIES

- Develop and implement a rural tree-planting campaign.
- Increase funding for private landowner assistance through the Wisconsin Forest Landowner Grant Program (WFLGP) to encourage more tree planting.
- Prioritize afforestation efforts on public lands.
- Secure funding to purchase and reforest open lands that were formerly forested, creating the first state forest with a primary goal of carbon storage.

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LE Legislation

POLICY PATHWAYS

- Fund a rural tree-planting campaign.
- Increase funding for WFLGP.

Reforestation via tree planting is one of the simplest and most powerful tools for increasing carbon storage on our lands. Wisconsin has many opportunities on public and private lands to increase trees and stocking for healthy forests, and increased reforestation on public and private lands in the state could offset as much as 5.6 million tons of CO_2 per year.[216] Lands to target for tree planting include unprofitable, marginal, or highly erodible farmland, agricultural or open lands in flood-prone areas, open lands along riparian zones, and areas where opportunities to create or connect wildlife corridors is high.

Many rural forest landowners are also agricultural producers located in counties with low median incomes; tax breaks and funding for tree planting will encourage forest management and increase carbon sequestration and storage. In addition, communities along rivers or other low-lying communities would benefit from reduced stormwater runoff because of trees. Afforestation (the planting of a forest or trees in an area where there was no previous tree cover) may at times be viewed as competing with agriculture, so to mitigate any negative impacts this effort would focus on marginal and low-quality agricultural land. A campaign to plant trees in rural areas could start immediately, with the DNR Division of Forestry working with partners on this campaign and prioritizing afforestation analysis and efforts on public lands.

44 Encourage tree planting in urban areas

STRATEGIES

- Improve the health and well-being of urban communities by developing and implementing an urban tree-planting campaign to foster more shade tree planting initiatives, fund removal and replacement of dying ash trees, and other efforts.
- Provide financial and technical assistance to Wisconsin communities interested in participating in carbon credit programs, such as City Forest Carbon Credits.
- Support the development of urban wood programs to build local economies and utilize local wood products, while continuing to sequester the carbon found in urban wood.

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LE Legislation

POLICY PATHWAYS

- Increase financial and technical assistance for Wisconsin communities for tree planting for the Urban Forestry Grant Program to foster more shade tree planting initiatives.

This recommendation specifically calls for immediate increased financial and technical assistance for Wisconsin communities to foster more shade tree planting initiatives. Urban tree planting combined with enhanced tree maintenance can substantially increase urban forest carbon storage and deliver additional carbon mitigation benefits through energy savings, especially if tree planting programs are targeted to urban heat islands. The forest canopy in Wisconsin's urban communities has the potential to store an additional 332,000 metric tons of carbon as well as provide other co-benefits such as improved public health, reduced city temperatures, stormwater reduction, reduced heating and cooling costs, improved air quality, increased property values, and other social, community, and economic co-benefits.[217]

Urban trees cover a small area relative to the whole state but play an important role in improving air and water quality and public health. While urban trees sequester and store carbon, they reduce energy demands because of their shade-giving abilities and transpiration of water vapor. Urban trees also provide a range of additional benefits, including increased property values and reduced crime rates. Urban tree-planting programs provide professional tree care jobs and help build a local wood products economy. The U.S. Bureau of Labor Statistics reports that between 2020 and 2030, entry-level jobs in urban forestry will increase by ten percent.[218] The DWD projects that between 2016 and 2026 there will be an eight percent increase in the jobs outlook for Wisconsin arborists.[219] Other U.S. states like Rhode Island are also establishing urban forestry programs to help accelerate and realize the myriad benefits of these trees.[220]

In addition to the benefits to people and communities, this recommendation also focuses on developing urban wood programs to build economies and utilize wood products. Trees are about half carbon and when they are made into urban wood products the carbon remains captured for the product life, saving a significant amount of CO_2 from being emitted to the atmosphere by either burning the wood or grinding it into mulch. It is important to have markets for urban wood that offer long-term carbon storage such as furniture, flooring, and other wood products.

45 Implement climate-focused forest management

STRATEGIES

- Define carbon as a forest product through state policy to facilitate incorporation of climate-focused management goals and practices into public and private forest management programs and strengthen an emerging voluntary carbon market.
- Develop and implement climate-focused management practices for Wisconsin's urban and rural forests, including:
  - Create programs providing financial assistance (e.g., property tax incentives) for both public and private landowners to encourage underplanting in forest stands that are not fully stocked.
  - Use the defined carbon as a forest product to facilitate incorporation of climate-focused management goals and practices into public and private forest management programs.
  - Secure continued funding to acquire conservation easements and purchase lands to maintain them as working forests, protecting stored carbon and supporting local economies.
  - Facilitate development of a family forest carbon program to allow small forest owners to access forest carbon markets.

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LE Legislation

POLICY PATHWAYS

- Legislation would be required to define carbon as a forest product or to create new statute(s) providing tax-based incentives and to secure funding to acquire conservation easements and purchase lands.

Establishing carbon as a forest product would provide forest managers the economic opportunity to not only sell the wood that is cut, but also to sell the carbon from the wood that is grown. Markets are rapidly emerging, especially for large forest owners, to sell carbon either through compliance cap-and-trade programs (e.g., California's program) or through voluntary carbon exchanges. Since 2005, global voluntary carbon market projects have helped reduce, sequester, or avoid more than 437 metric tons of CO_2e.[221] Defining carbon as a forest product would help strengthen an emerging carbon market and incentivize growing trees and help to store additional carbon. This change would incentivize the inclusion of increasing carbon storage as part of forest management.

Consideration should be given to how defining carbon as a forest product (and resulting sale of carbon credits in a forest carbon market) affects traditional wood markets in Wisconsin. This could be addressed by highlighting data from U.S. Department of Agriculture (USDA) Forest Service's Forest Inventory programs, which shows that net wood volume growth greatly outpaces harvest removals at a nearly 2:1 ratio. Sound forest management has changed to favor responsible forest management and tree harvesting such that "traditional forest management" often closely aligns with requirements outlined by carbon offset markets for forest management.

Forest-based wood markets have traditionally been defined by product outputs from sawmills, pulp mills, and other users of wood products to create physical products for sale in the market. Forest carbon is now a priced commodity in the global marketplace, and according to USDA, the U.S. carbon market is in its formative stages, with markets taking shape at the regional and state levels.[222] Forest carbon markets are not easily accessible for forest landowners in Wisconsin, and forest carbon needs further quantification and emphasis as a forest product as outlined in this recommendation and associated strategies.

46 Support Wisconsin wood product utilization

STRATEGIES

- Develop and implement a campaign on the benefits of using Wisconsin wood products, such as "local wood is good."
- Acquire data and conduct analysis to calculate Wisconsin's carbon emissions and the impact of various forestry-based strategies to store carbon.
- Invest in research, development, and commercialization of Wisconsin-grown mass timber, cross-laminated timber, biochar, and other innovative wood-based technologies to store carbon.
- Support and incentivize the use of renewable thermal energy (woody biomass), including for space heating, hot water, and industrial process heat such as district or CHP and community-scale heating programs for hospitals and schools (e.g., the Fuel for Schools program).

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LE Legislation

Wood is extremely effective for long-term carbon storage. Buildings made from wood not only use less energy to produce and manufacture, but – through sustainable forest management – they also can store carbon that otherwise would have been returned to the atmosphere when trees die and decompose. More than ten percent of the U.S. forest carbon sink can be attributed to long-lived wood products, such as furniture, flooring, and building materials. In 2015, over 2,600 million metric tons of carbon were stored in harvested wood products in the U.S.[223] While it is difficult to quantify exactly how much carbon could be stored in wood products in Wisconsin, it does provide a clear opportunity with the added benefit of growing jobs in Wisconsin and strengthening the state's economy, while increasing the amount of carbon stored. In addition, producing thermal energy from sustainably produced biomass that is currently generated by propane or heating oil can offset fossil-fuel use and reduce GHG emissions.

These recommendations will help strengthen the state's forest industries and have a positive impact on Wisconsin's communities through local job creation, especially in underserved communities. Education and outreach efforts to raise public awareness about sustainably harvested wood products from Wisconsin's forests will be needed to explain this in the context of sustainable forest and resource management.

Photo courtesy of Travel Wisconsin

TIER 2

Tier 2 policy options are proposals that were raised and, to some extent, discussed during the task force process or brought up during the public hearing and public comment period. Each of these options drew both support and concern from task force members, a reflection of the diversity of perspective and world-view of the members. They are included as Tier 2 proposals to indicate they may merit further discussion and consideration outside of the work of the task force.

TIER 2**

47	Avoid all new fossil fuel infrastructure	p. 93	EA	SB	LE
48	State divestment of fossil fuel stocks and other interests	p. 93			LE
49	Allow third party renewable financing (solar/energy generation)	p. 95	EA	SB	LE
50	Develop strategies for the cost-effective early closure and reduced use of coal facilities	p. 95	EA		LE
51	Work with Midcontinent Independent System Operator and stakeholders to focus on enhancing opportunities and financial value for clean distributed energy resources	p. 96	EA		
52	Maximize co-benefits and related financial value from clean energy projects	p. 97	EA		
53	Modernize rate design	p. 99	EA		
54	Promote the use of clean transportation fuels to ensure immediate and long-term emissions reductions	p. 99	EA		LE
55	Encourage antitrust enforcement	p. 101		SB	LE

47 Avoid all new fossil fuel infrastructure

STRATEGIES

- Avoid all new fossil fuel infrastructure for electricity generation.
- Avoid any new natural gas plants.
- Avoid new pipelines. Oppose new or expanding infrastructure whose primary purpose is transporting fossil fuels through Wisconsin.

EA Executive/ Agency Action

SB 2021–2023 State Budget

LE Legislation

Public comment to the task force consistently and repeatedly requested action to avoid new fossil fuel infrastructure in the state and requested bold action regarding our energy infrastructure. The public comment characterizes the market failure of fossil fuel industries to account for environmental damage, human health implications, and the continued placement of infrastructure adjacent to Indigenous, Black, and other communities of color. Avoiding fossil fuel infrastructure is one way to prevent a carbon lock-in, where policies, infrastructure, and investments made in the past or present commit us to high-carbon emissions in the future, even when alternative technologies are available.

Wisconsin cannot take meaningful climate action without bold action to reduce the use of fossil fuels and pivot to renewable energy. To stay within the Paris Agreement climate goals, we cannot build any new fossil fuel infrastructure, including infrastructure for the production and transportation of fossil fuels, such as wells, refineries, pipelines, and shipping terminals.

This fossil fuel infrastructure not only contributes to global warming but risks the health and safety of our communities. Air pollution from fossil fuel extraction and burning has serious health impacts. Some high-profile disasters in recent years have also demonstrated the safety risks of gas infrastructure. Any expansion of fossil fuel energy production will add to the inequitable burden on low-income communities and communities of color, both urban and rural.

48 State divestment of fossil fuel stocks and other interests

STRATEGY Fossil fuel stocks or other interests should be removed from state of Wisconsin-owned investments. In practice, this means the sale of any stocks or investments in the top 200 fossil fuel companies owned by the Wisconsin Retirement System and the UW System Foundations and the banning of any future investments in these stocks or other interests.

LE Legislation

POLICY PATHWAYS

- **Wisconsin Retirement System:** Legislative action could prohibit the state of Wisconsin Investment Board (SWIB) from investing in securities of fossil fuel companies as part of the Wisconsin Retirement System. Similar legislation has been proposed in several states, including California, Vermont, Hawaii, New York, Massachusetts, and Connecticut.
- Divestment legislation could prohibit SWIB from investing in fossil fuel companies by disallowing them as permissible investments. To minimize complications and the screening process (and associated cost) for divestment, legislation must provide clear parameters for SWIB. Typically, climate divestment legislation prohibits investment in the top 200 fossil fuel companies.
- **UW System Foundations:** Per discussions with the Wisconsin Legislative Reference Bureau (LRB), the UW System Foundations present more complex implementation questions. LRB

analysis states that there is no clear process through which the state can require the UW System Foundation to divest funds from the fossil fuel industry because the Foundation is a private 501(c)(3) nonprofit corporation. The UW System Foundation transfers gift and investment income to UW Madison but is not part of the University itself. As an independent entity, UW System Foundation is responsible for determining how it invests its assets. This principle carries through for other similarly structured university foundations.

- While there is not a clear mechanism for state requirements toward UW System Foundations, the foundations could independently divest their entire endowments from fossil fuels using the same parameters discussed above, following the lead of many other colleges and universities. There is currently a movement among UW students in support of this voluntary divestment, known as the UW Divestment Coalition.

To successfully transition to carbon-free electricity and reduce economy-wide GHG emissions, it is urgent that we implement a rapid transition off of fossil fuels and build support for investments in clean energy. Divestment advocates argue that divesting from fossil fuels removes social capital and financial resources from fossil fuel corporations, resulting in the reduction of GHG emissions. Over the past ten years, a large and growing number of government organizations, universities and university systems, nonprofits, and other organizations have divested.

If Wisconsin aims to achieve 100 percent carbon-free energy by 2050, we need to invest in clean energy research, development, and deployment. Divestment from fossil fuels opens up resources for investment in these areas, particularly if at least some of the divested resources are invested in Wisconsin-based carbon-free energy research, development, and deployment.

As climate change accelerates and renewable energy continues to become increasingly cost competitive, a growing number of financial analysts argue that fossil fuels will prove to be a bad investment. Over the past few years, coal and oil stocks have shown great vulnerability. For example, in August 2020, ExxonMobil was dropped from the Dow Jones Industrial Average. If this trend continues, especially as Americans continue to travel less due to the pandemic, removing fossil fuels from a stock portfolio becomes a more mainstream option. Enacting divestment legislation could accelerate this shift and move us further from economic reliance on fossil fuels.

Multiple studies have demonstrated that divesting from fossil fuels does not have a statistically significant impact on overall portfolio performance and has only a marginal impact on the utility derived from such portfolios.

The fossil fuel divestment movement has long pointed out the disparate impacts on marginalized communities of burning fossil fuels and highlighted how decision-makers are not centering these people's lived experiences, health, and well-being. Divesting from fossil fuels and investing in clean energy will have financial implications for the viability of these companies and will be a public demonstration of our values. Furthermore, divestment would have positive downstream impacts on environmental health for marginalized communities affected by GHG emissions and fossil fuel use. Those impacts could be expanded with targeted reinvestment of divested resources in projects benefiting marginalized communities.

49 Allow third party renewable financing (solar/energy generation)

STRATEGY The PSC or legislature should clarify the ability of customers to utilize third party financing for energy generation projects, including the ability of taxable customers (residential customers and taxable entities) to enter equipment leases since they can do so without adversely affecting the ability for the projects to receive federal tax credits and ability of nontaxable entities to enter power purchase agreements since federal tax credits could be adversely affected if these entities must enter equipment leases.

EA Executive/ Agency Action

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LE Legislation

POLICY PATHWAYS

- Development of tariffs under Wis. Stat. § 196.192 allowing for limited solar third party partnership financing.
- PSC could clarify that third parties are not considered public utilities.
- If the PSC believes that a legislative change is needed to provide for the tariffs identified above, passage of legislation specifically allowing for such tariffs.
- Legislature could clarify that third parties are not considered public utilities.

Third party financing can spur solar growth and access, increasing affordability by: 1) allowing customers to avoid upfront costs (the third party pays the capital investment and the customer can pay it off over time while accessing cheap, renewable energy) and 2) decreasing overall project costs by allowing a third party to access and pass on savings from the federal investment tax credit that certain parties (such as nonprofits and municipalities) would not otherwise be able to take advantage of. Third party solar financing can occur through solar leases (where a customer pays for use of the system over a specified time period) or power purchase agreements (PPAs) (where the system offsets the customer's utility bill and the developer sells power generated to the customer at a fixed rate).

The federal government provides a significant tax credit for solar energy projects, as well as valuable depreciation benefits, which governmental and nonprofit entities, as well as for-profit entities with limited tax liability, cannot take advantage of without partnering with a financing entity that can receive the tax benefits. In Wisconsin, there is some legal uncertainty regarding whether such partnering is allowable. This reduces the number of projects with such financing partnerships from going forward, reducing both the number of clean energy projects in the state and the flow of federal tax benefits into the state of Wisconsin. Allowing for such partnerships—potentially on a limited basis—could substantially increase customer clean energy projects and the flow of federal incentives into the state.

50 Develop strategies for the cost-effective early closure and reduced use of coal facilities

STRATEGY Revise Wisconsin Environmental Trust Financing statute Wis. Stat. § 196.27 to allow utilities to explore financing and return-on-investment options and look to PSC docket 6630-ET-101[224] as a learning opportunity to address future securitization efforts, as well as explore other potential financial tools that would support this transition for stakeholders. When retiring power plants, it is possible to create "win-win-win" situations, where customers realize cost savings,

utility investors' investment expectations are met, and GHG reductions are achieved. Some stakeholders and regulators seek a fourth "win" by providing support and transition services to affected workers and communities.

EA Executive/ Agency Action

LE Legislation

POLICY PATHWAYS

- Explore carbon credit options through the PSC docket process.
- Change environmental trust bonds and allow return on investment.

Reducing GHG emissions from Wisconsin's power sector will require retiring conventional generation, in particular coal-fired power plants. However, Wisconsin utilities are challenged by how to manage an equitable coal-to-clean transition that enables the remaining co-owned coal plants to recover investments made on the existing undepreciated balances. This is further complicated given that retiring these plants is dependent on balancing the financial situations of multiple utilities. Most of the very old, fully depreciated coal plants have been retired already, so future retirements will involve plants with higher unrecovered book balances.

Solutions need to be palatable to all stakeholders, including utilities, shareholders, communities, industry, and ratepayers. In 2019, a group of Wisconsin stakeholders made up of utilities, regulators, ratepayer advocates, environmental groups, and content experts explored the feasibility and broad applicability of a set of financial tools to accelerate the retirement of uneconomic coal plants in the state as part of the Rocky Mountain Institute's e-Lab Accelerator.[225] Coming out of the e-Lab Accelerator, the Wisconsin team agreed on the need to advance securitization, along with associated economic modeling, broader stakeholder engagement, and identification of required legislative actions.

Wisconsin can request plans from utilities that identify how they can cost-effectively close coal plants early. Wisconsin could also consider mechanisms that would allow utilities to cost-effectively address the remaining non-depreciated "book value" of their coal facilities, so these facilities can be closed as soon as feasible, including:

- Seeking carbon credits from the California or voluntary carbon markets;
- Issuing environmental trust bonds (ETBs), which were used for $100 million of the $400 million remaining book value for the recently closed Pleasant Prairie plant; or
- Providing utilities opportunities to earn a return on investment so that once a utility commits to close a coal plant by a certain date, they can use that planned closure to support the need for new generation projects and to seek a somewhat higher overall PSC-approved equity return on its investments.

51 Work with Midcontinent Independent System Operator and stakeholders to focus on enhancing opportunities and financial value for clean distributed energy resources

STRATEGIES

- Improve Midcontinent Independent System Operator (MISO) visibility and dispatch of distributed energy resources (DERs)[226] – through MISO's existing stakeholder engagement processes—and improve the quality of information MISO has about registered distributed energy resources (DERs) to enable the following:
  - More targeted dispatch, including the amount of DER dispatched and lead time for dispatching it; and

  - Improved capabilities to project future DER adoption.
- Improve DER operator visibility into the MISO market through MISO's existing engagement processes and improve the quality of information that DER operators have about MISO markets, including real-time load.
- Participate in developing changes to MISO rules. The PSC, utilities, and other Wisconsin stakeholders should participate and take a leadership role in advancing key market rule changes related to DERs.
- Improve the use of DER data in transmission planning. Make enhancements in MISO's data use and analytical tools to better enable planners to understand DER's potential impact on the transmission system and to identify any necessary transmission system enhancements that need to be made to support DER adoption.
- In implementing these recommendations, the PSC, utilities, and other stakeholders should focus on maximizing opportunities for the use of and value for clean DERs (e.g., wind, solar, biogas, battery storage) capacity and energy production/release in order to encourage the development and usage of clean DER facilities.

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POLICY PATHWAYS

- PSC staff works with stakeholders to participate in MISO and ensure that the recommendations are fully and properly implemented.

DERs are small-scale generation or energy storage resources connected to the distribution system close to where electricity is consumed. However, actions are needed to help ensure that DERs provide maximum clean energy and capacity benefits to the grid. This includes allowing DERs to fully integrate into the MISO system and maximizing opportunities for DERs to receive full financial value for their capacity and energy production (for clean energy generation) and release (for battery and other clean storage). Doing so will encourage additional clean DER installation and operation, which would help meet the state's carbon-reduction goals.

These recommended strategies came out of the Wisconsin Energy Distribution and Technology Initiative and are supported by a wide spectrum of stakeholders, including investor- and consumer-owned utilities, regulators, consumer advocates, environmental advocates, state and local governments, businesses, economic developers, and academic researchers.[227]

52 Maximize co-benefits and related financial value from clean energy projects

STRATEGIES

- DNR and DATCP should take the following steps to enhance the existing Wisconsin nutrient trading program and encourage solar and biodigestion while helping to clean ground and surface water:
  - Informing agricultural landowners and solar and biodigestion developers about potential for valuable nutrient reduction credits for ground-mount solar combined with grasses/prairies and biodigestion of manure or food waste otherwise applied to farm fields if the digestate is handled in a manner that reduces nutrient impacts to waters.
  - Providing them information regarding areas that would especially benefit from solar or biodigestion nutrient reduction (e.g., through maps showing areas with high nutrient runoff, such as farms with nutrient-rich soils, manure or food waste spreading, and/ or slopes that allow for significant nutrient runoff to water bodies). This work could

be based on existing evaluations of nutrient-impacted water bodies for Total Daily Maximum Load allocations and other available information.
  - Making them aware of potential purchasers of the credits—including 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—so they can enter transactions to sell any generated credits to them.
  - Modifying, where appropriate, implementation of the nutrient reduction credit program to make it easier for solar and biodigestion to receive and sell credits.
  - Integrating the above with the Water Quality Trading Clearinghouse allowed under *2019 Wisconsin Act 151* if and when it is implemented.
- Wisconsin DNR should also modify state brownfield grants to provide additional points for remediation and redevelopment projects that integrate solar or other clean energy (e.g., 1 bonus point for each 50 kW of clean energy per acre of brownfield remediation, up to a maximum of 5 bonus points on applications with a 100-point scoring system) and make available additional Focus on Energy® or utility incentives for such projects (e.g., increase available commercial solar incentives by 20 percent for projects on brownfields).

Executive/ Agency Action

POLICY PATHWAYS

- DNR education and outreach and potential rule making.

Managing phosphorus and nitrogen runoff is critical to maintaining the health of Wisconsin's lakes, rivers, streams, and groundwater. Projects that reduce these nutrient losses hold potentially significant financial value by generating credits that can be purchased by entities that need them, including wastewater permit holders, counties pursuing nutrient reductions with funds from wastewater dischargers with temporary variances, and lake districts and associations formed to protect water bodies that may have access to funding from their members whose property values would benefit from water quality improvements.

Solar development on farm fields can significantly improve water quality benefits because the ground cover used with solar (typically prairies or other grasses) reduces nutrient runoff. Significant water quality benefits can also come from biodigestion projects that convert manure and food waste that would otherwise be spread on farm fields to biogas and digestate, which generally has a slower nutrient release and can be used in ways to reduce nutrient runoff, especially if DNR can provide clarity regarding alternative uses of digestate. Solar and other clean energy development on brownfields can result in the beneficial reuse of those lands and revitalization of blighted areas. Programs to take advantage of these co-benefits can help to make additional solar, biogas, and other clean energy development more cost-effective and help increase their significant clean water, clean air, and other co-benefits.

53 Modernize rate design

STRATEGIES

- Review and update current rate design principles. Work with regulators and utilities to explore new rate design mechanisms that provide the right price signals to customers and the right incentives to utilities to reduce carbon emissions, encourage conservation, and reduce peak demand.
- Explore creative/innovative rate design and tariffs such as EV and community solar tariffs, time-of-use rates, and performance-based ratemaking.
- Explore options to incentivize clean energy and energy efficiency and to decrease disproportionate impacts on low-income communities.

EA Executive/ Agency Action

POLICY PATHWAYS

- Implementation of any policy regarding tariffs would likely occur through PSC rate dockets for individual utilities.
- PSC docket 5-EI-157[228] recently initiated a statewide investigation of buyback rates for customers with distributed generation, which will serve as a platform for discussing renewable energy and net metering tariffs across all utilities.

Modernizing rate design has the potential to increase opportunities for customer sited generation, allowing customers to control their energy costs and/or participate in community solar type of programs. Commenters on the draft *Strategic Energy Assessment 2020–2026* cited interest in appropriate pricing and rate design. The American Council for an Energy-Efficient Economy (ACEEE) has identified three particularly important principles for rate design: simplicity, utility revenue stability, and price signals that encourage energy efficiency and conservation. Wisconsin could:

- Explore creative, innovative rate design and tariffs. Explore rate design options such as EV and community solar tariffs, time-of-use rates, market-based rates, performance-based ratemaking, decoupling, residential demand charges, and new load market pricing rate designs.
- Establish a citizen regulatory reform study group. Establish citizen advisory committees and regulatory reform study groups to the PSC. Include ratepayers and local communities in compliance monitoring and the establishment of performance-based rates.
- Review and update current rate design principles. As smart grid technologies unleash new data, work with regulators to explore new rate design mechanisms that help encourage conservation and reduce peak demand.

54 Promote the use of clean transportation fuels to ensure immediate and long-term emissions reductions

STRATEGIES

- Utilize low-emissions fuels such as compressed natural gas and propane autogas (also known as liquified petroleum gas (LPG)) as bridge fuels to achieving a decarbonized transportation system that includes widespread adoption of zero-tailpipe-emissions technologies such as electric and fuel cell vehicles.

- Expand the use of renewable fuels including ethanol, biodiesel, renewable natural gas, and renewable propane gas.
- Establish an advisory committee that will analyze and chart a clean fuel policy pathway. Fuels should be evaluated based on their GHG emissions intensity using lifecycle accounting.
- Design a market-based clean fuels policy by July 1, 2021 that:
  - Remains fuel and technology neutral, relying on a portfolio of clean fuels including biodiesel, ethanol, renewable natural gas, electricity, hydrogen, and other renewable and low-carbon fuels.
  - Develops regulations that establish the program and defines Wisconsin's fuel standards and ability to establish a reasonable percent reduction in carbon intensity in transportation (aim for a 15–25 percent reduction by 2035).
  - Establishes incentives from the fuel market and eliminates deficits by imposing costs, so that money stays in and is redistributed in the fuel market.
  - Collaborates with other Midwestern states as part of a regional clean fuels program.

EA Executive/ Agency Action

LE Legislation

To date, two states—California and Oregon—have adopted a market-based clean fuels standard (also known as a low-carbon fuel standard (LCFS)) to decrease the GHG intensity of transportation fuels over time. The GHG intensity is a performance-based measure of GHG emitted over the full lifecycle of a fuel. This approach includes accounting for the GHG emissions from extraction to vehicle operations.[229] Lifecyle accounting also provides an incentive for improvements anywhere along the supply chain. Clean fuel standards have proven to be a fuel- and technology-neutral policy that cost-effectively reduces transportation GHG emissions, provides local economic benefits, increases energy independence, and improves health through reduced air pollution.

The first step in developing a standard is setting the average annual carbon intensity that a regulated entity must comply with—a percent reduction with a declining benchmark each year. For instance, California's carbon intensity standard is 20 percent below 2010 by 2030; Oregon's standard is 10 percent below 2015 by 2025.[230, 231] Because the standard is performance-based, fuel suppliers (the regulated entity) are free to choose how they meet the emissions target, thus having the flexibility to lower the GHG intensity of their fuels by providing low-emitting fuel alternatives (such as electricity, biofuels, renewable natural gas, and hydrogen) or through buying emissions credits. Credits are generated when a fuel is below the annual benchmark and deficits are created when a fuel is above the benchmark. This market-based approach provides flexibility and lowers cost of compliance, leading to innovation in transportation fuels.

In January 2020, the Great Plains Institute published a whitepaper, *A Clean Fuels Policy for the Midwest*, which analyzes the impact of a clean fuels policy in the Midwest accompanied by a series of principles for Midwest states to consider. This research and principles can serve as a foundation for supporting Wisconsin's approach to adopting a clean fuels policy.

55 Encourage antitrust enforcement

STRATEGIES

- Encourage the Wisconsin Attorney General (AG) and Department of Justice (DOJ) to investigate the role of agricultural monopolization as it relates to family farmers' economic resiliency when adapting to climate change using the following objectives:
  - Increase staffing by adding two full-time employees (FTE) to the Antitrust Unit of the DOJ to carry out investigations in anticompetitive business behavior.
  - Provide the Wisconsin AG with civil investigative demand (CID) authority like in other states that allow AG offices to investigate anti-competitive business practices.

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LE Legislation

POLICY PATHWAYS

- Increase staffing at CPAU at Wisconsin DOJ by adding two full-time employees (FTE).
- CID authority would require a statutory change: amend Wis. Stat. § 133.11 to delete "and does believe" from the first sentence of (1).

Consolidation within major industry sectors can have significant impacts on market access and concentration which can result in adverse impacts to competition as well as consumers and workers.[232] Family farmers in Wisconsin are uniquely positioned to play a leading role in mitigating climate change. However, adopting climate-friendly farming practices requires capital investments and a multi-year learning curve for new methods of planting, weed control, fertilization, and equipment. A highly consolidated agricultural industry, in which a few companies control the majority of inputs, can reduce market competition and stifle innovation, thereby limiting the ability of individual farmers to adopt more conservation practices amidst these economic pressures.[233] Additionally, a highly consolidated agribusiness sector can have an outsized influence on policies that shape the farming landscape and drive individual farmers' cropping decisions. For example, crop insurance and other forms of agricultural subsidies are only available for a handful of commodity crops like corn, wheat, and soybeans. These subsidies have encouraged farmers to convert diversified crop and animal operations to less diverse rotations.

Several factors have contributed to the rise in agricultural mergers and acquisitions, including technological innovation, protection of intellectual property, increased financialization of the agribusiness sector, and a lack of antitrust oversight.[234] As federal antitrust enforcement has weakened in recent years, state AGs must pick up the slack, despite tight budgets and staff limitations. There is a precedent for the Wisconsin AG to act on matters of antitrust in agriculture. However, while many state AGs have civil investigative demand authority, enabling them to investigate anticompetitive business practices, the Wisconsin AG does not. This recommendation proposes amendments to Wisconsin's statutes to allow our state AG's office to conduct more antitrust investigations.

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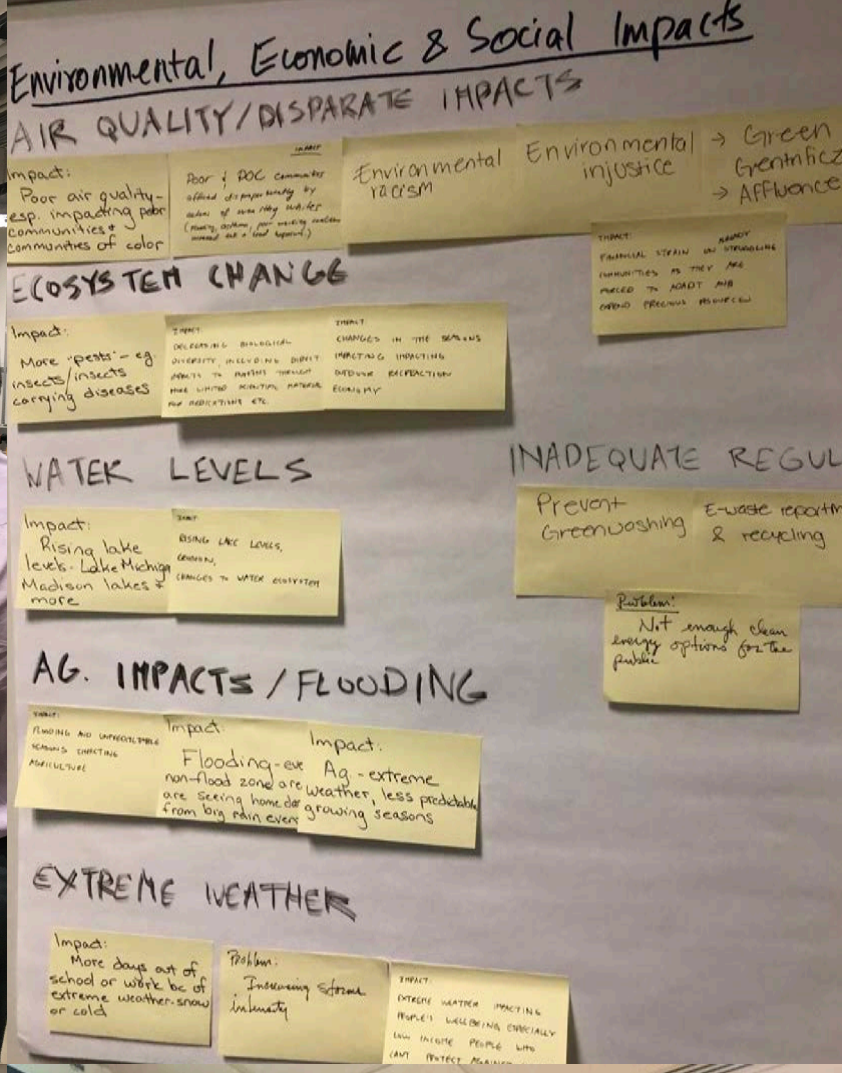

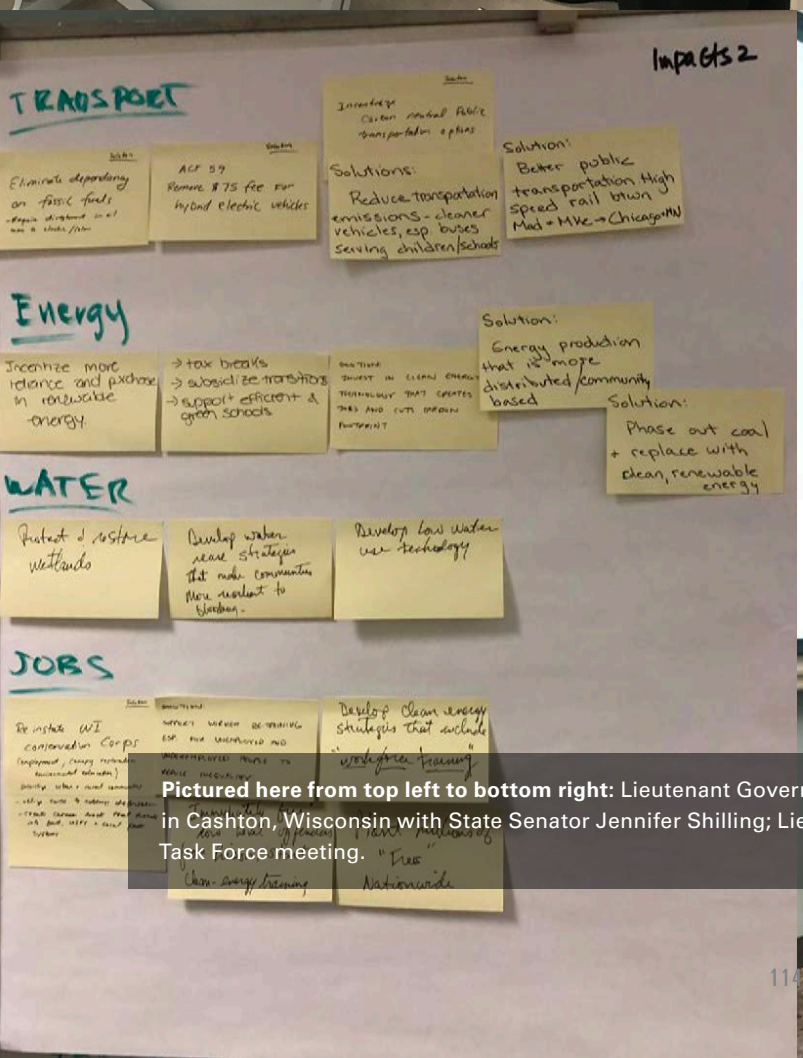

Pictured here from top left to bottom right: Lieutenant Governor Barnes visits the Organic Valley Distribution Center in Cashton, Wisconsin with State Senator Jennifer Shilling; Lieutenant Governor Barnes chairs a Climate Change Task Force meeting.

Pictured here: Lieutenant Governor Barnes learns about wind energy education training programs at Lakeshore Technical College in Cleveland, Wisconsin.

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