



Life is Better By the Lakes:

How the Great Lakes Region is Responding to EPA Calls for Leadership in Climate Action

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Introduction

Responding to climate change across the globe is a huge economic opportunity to create jobs, grow businesses, and build better living environments while making a meaningful impact on CO2 emission reduction. The response requires a coordination of policy, technology, and markets, and a minimization of headwinds, with a concerted focus on innovation. Climate solutions are critical to protecting the 21% of the world’s fresh surface water that makes up the Great Lakes (National Oceanic and Atmospheric Administration, 2024). States, cities, and tribal nations across the U.S. compiled some of their best ideas into their Priority Climate Action Plans (PCAPs) submitted to the U.S. Environmental Protection Agency (EPA) in response to EPA’s Climate Pollution Reduction Grant (CPRG) program, setting the subnational players up to compete for \$4.6 billion in funding. A research team at the University of Michigan (U-M) reviewed the Great Lakes region (comprising six state plans, seven city plans, and three Tribal plans), looking for common themes, opportunities for collaboration, and compelling innovation ideas to accelerate climate action. This document summarizes the findings.

Background

Spurred by the congressional passage of the Inflation Reduction Act (IRA), the U.S. EPA created the Climate Pollution Reduction Grant (CPRG) program, which provides \$5 billion in funding for the reduction of greenhouse gas (GHG) emissions and air pollution, with \$4.6 billion earmarked for competitive implementation, and \$250 million for non-competitive planning grants. The program has been split into two phases: planning grants and implementation grants. To be eligible for the competitive grant funding, states, cities, Tribes, and territories submitted plans outlining the anticipated impact of their reduction measures across the near- and long-term (EPA did not specifically define these time horizons, so they were instead determined by each reporting jurisdiction and ranged from 2040 to 2050). Phase 1 of this program hones in on flexible support for reporting entities, regardless of their current progress towards climate action. The EPA guidance required states, cities, Tribes and territories to design climate action strategies that focused on six sectors: electricity generation, industry, transportation, buildings, agriculture/ natural and working lands, and waste management. The deadline for the PCAP for states and cities in Phase 1 was March 1, 2024, while the deadline for the plans for Tribes and territories was May 1, 2024, although there were many early submissions. This research outlines a summary of a selection

State Plans

Wisconsin	Illinois
Ohio	Minnesota
Indiana	Michigan

City Plans

Milwaukee	Chicago
Cleveland	Detroit
Columbus	West Michigan (Grand Rapids & Kentwood, Michigan)
Indianapolis	

Tribal Plans

Keweenaw Bay Indian Community
Midwest Tribal Energy Resources Association
Forest County Potawatomi Tribe

of plans in the first phase of this program, and highlights key themes, opportunities, and potential gaps for improvements as reporting entities look to submit their Comprehensive Climate Action Plan (CCAP) within two years of their original submission. The PCAPs are, by definition and in practice, not comprehensive, and some highlight GHG reduction measures that the entities filing are likely to prioritize in the EPA competitive funding opportunity for \$5 billion.



Participating Tribes

Michigan

Grand Traverse Band of Ottawa and Chippewa Indians
 Gun Lake Tribe
Keweenaw Bay Indian Community**
 Lac Vieux Desert Band of Lake Superior Chippewa Indians
 Little River Band of Ottawa Indians
 Little Traverse Bay Bands of Odawa
 Saginaw Chippewa Tribe
 Sault Ste. Marie Tribe

Minnesota

Bois Forte Band of Chippewa
 Forest County Potawatomi Tribe
Fond du Lac Band of Lake Superior Chippewa*
Grand Portage Band of Lake Superior Chippewa*
Leech Lake Band of Ojibwe*
 Mille Lacs Band of Ojibwe
Minnesota Chippewa Tribe*
 Prairie Island Indian Community
 Shakopee Mdewakanton Sioux Community
 White Earth Nation

Wisconsin

Bad River Band of Lake Superior Chippewa*
Forest County Potawatomi Community**
Ho-Chunk Nation*
Lac Courte Oreilles Band of Lake Superior Chippewa*
 Lac du Flambeau Band of Lake Superior Chippewa
 Menominee Indian Tribe of Wisconsin
Oneida Nation of Wisconsin*
 St. Croix Chippewa Tribe
 Stockbridge-Munsee Band of Mohican Indians

**Priority Climate Action Plan was developed in partnership with the eight participating Tribes
 **Reviewed individual submitted plan.*

The Approach

This analysis summarizes 16 plans (Appendix 1) that are located within the Great Lakes region. More specifically, the team reviewed six states, seven cities, and three Tribal plans to better understand variances within goals, targets and proposed measures across different jurisdictional levels.

There were three themes the team examined including:

- Key common drivers of emissions by states;
- Proposed emissions reduction solutions; and
- Opportunities for collaboration across jurisdictions

This research can potentially provide useful, broader impacts in two primary areas. First, by identifying and synthesizing common trends and unique reduction measures across multiple states, best practices can be gleaned to help inform and amend proposals prior to submitting the CCAP in 2025. A second possible broader impact of this report is the opportunity to assist in increasing sustainability literacy for state, local and Tribal entities. By having a suite of common decarbonization measures, partnered with a summary of effective stakeholder engagement methods, jurisdictions that have not yet developed a roadmap can use these findings as a starting point or enhance their implementation efforts based on successes in other places.

The plans listed GHG emissions reductions measures by sector including buildings, power/electricity, and transportation - which were consistently the highest emitting sectors. This is not to minimize the need for a focus on agriculture/working lands, waste management, and industry. The summary compiled here was constrained by resources which required a narrowing of scope. For each sector, there is a discussion of the plans, a brief description of the key decarbonization measures, unique callouts, and gaps identified in the current PCAPs.

Findings

The Great Lakes climate action plans provide instructive insight into how the region is gearing up to make use of the federal IRA allocations for implementation now and in the future. While these plans were built very quickly - PCAPs were prepared and filed in under a year - and do not demonstrate the full tactics jurisdictions will employ, the PCAPS are an important step. While the states, Tribal nations, and municipalities filed their plans somewhat independently, the CPRG program has resulted in an increase in collaboration seen directly in the way the Tribes worked collectively and seen indirectly in the coordination behind the scenes among other players. The action of building the PCAPs with the same structure creates a roadmap of common measures for action, and when the CCAPs are filed in 2025, there will be the opportunity to track the progress from PCAP to CCAP as well as much greater insight into climate actions taken by jurisdictions filing more comprehensive detail.

The planning steps that states, cities, Tribes and territories took prior to preparing their filings - including forming climate councils, conducting sustainability analyses, streamlining processes and more - were

evident. Some jurisdictions had more mature planning processes, including for example climate planning councils and enabling legislation (e.g., Illinois, Wisconsin, Minnesota and Michigan). Such processes were associated with more comprehensive PCAP plans, including more detailed quantification of impacts, and more specific priority targets and timelines. Planning is important.

Measurement and quantification is also important, enabling insights into progress and trends. That visibility identifies the biggest drivers of emissions, where to take early steps, whether the efforts are having the expected outcomes, and more.

Continued momentum requires building regular and deep buy-in from communities, stakeholders, and governmental leadership and ownership across implementing authorities. Given the different forms of government responding - from leaders of Tribal nations to states and cities - the authority structures have corresponding levels of variability.

Broad themes

The team found common threads in the plans that can help with enabling future action. There are certainly challenges ahead for this work including more deeply engaging the public, creatively utilizing the variety of financial incentives, both public and private, to reduce costs effectively, collaborating within and between jurisdictions, and expanding the needed workforce. There is more to be done in each of these areas.

- All of the measures create opportunities for people, but **none of this work can be effective if not done in an informed way with communities**. As noted in the sections that follow - in the building sector and considering a historic lack of trust, in the power sector and examining the public outreach necessary to create support for renewables, and in the transportation sector and identifying the need for education and outreach to increase public transit or expand use of EVs - more and better public engagement is critical.
- Jurisdictions articulated different ways they are **stacking financial resources or federal programs**, as well as other monetary support. Given the upfront capital-intensive nature of many of the measures, the federal programs authorized by Congress under the IRA, and other funding opportunities, **create huge momentum**. States, cities, and Tribes must take advantage of the resources available to enable implementation.
- Another theme of the plans was **collaboration within and between jurisdictions**. Learning from others and sharing best practices will support actions moving forward and streamline responses. This was obvious in the creation of the plans (for example, the way Tribal nations worked together to submit in concert), and in the execution that is already underway, like regional planning for additional renewable build across boundaries. Academic institutions, industry, NGOs, advocacy groups, and more all have important roles to play in enabling next steps. There is a need for a **reduction of silos and more attention to interconnections**, to inform challenges like air travel, cross-boundary transportation, harmonization of grid planning and permitting, energy trading and more.
- There was repeated mention of the need to **expand workforce development** all along the spectrum of positions, skill sets, and professional levels to enable execution of the plans. From energy efficiency workers who know how to handle a building envelope to finance professionals who can navigate capital markets and more, **all sectors identify a need for growing their ranks**. This is a huge task that will require coordination between employers, higher education institutions, community colleges, NGOs, unions, apprenticeship programs, K-12 schools, government, and other entities in order to move strategically.

Results

State Emissions Comparison

It should be noted that while the submitted PCAP plans measured emissions, the data is preliminary. All information in this section is derived from the state PCAPs submitted, unless otherwise indicated.

Illinois

Illinois' annual GHG emissions as of 2021 were estimated at 228 MMTCO₂e, with transportation accounting for the largest share, followed by power. This represents a nearly 20% decline from 2005 emissions of 283.6 MMTCO₂e. Power was the highest-emitting sector in 2005, contributing 94 MMTCO₂e. Still, it also saw by far the biggest decline of any sector between 2005 and 2021, driven primarily by a shift to cleaner energy sources, and the retirement of older, inefficient coal plants (Natural Resources Defense Council, 2015).

Indiana

Indiana's GHG emissions totaled 193 MMT CO₂e in 2021. The top-emitting sectors in Indiana were the electric power, industry, and transportation sectors. Indiana did not provide a baseline year to understand the emissions trend across sectors.

Minnesota

Minnesota's annual emissions as of 2020 were estimated at 124.5 MMTCO₂e, and these declined by 23% between 2005 and 2020. Since 2005, emissions from the electricity generation sector have declined by 54%. The significant decrease is mainly due to the production of electricity from renewable sources like wind and solar energy instead of coal. Emissions from Minnesota's homes and industrial facilities have risen 14%, due to the continued use of oil and natural gas to heat and operate. While GHG emissions in the state's transportation sector have fallen 18% since 2005, most of that decrease is attributed to reduced aviation and vehicle usage during the pandemic.

Michigan

The inventory shows that Michigan's net GHG emissions as of 2019 were 166.73 MTCO₂E, an overall decrease of approximately 15% since the baseline year of 2005, as used in the MHCP. Agriculture was the only inventory sector to experience an increase in emissions, with a 23% increase between 2005 and 2019; as with Wisconsin, this can be attributed to the expansion of livestock production and/or changes in land management practices.

Ohio

Ohio's annual GHG emissions as of 2021 were estimated at 212.3 MMTCO₂e. A bulk of the state's emissions are contributed by coal-fired power plants, manufacturing industries, and transport. However, Ohio has also seen a decline of ~4% in overall emissions since 2019, mainly driven by reductions in the Transportation and Industry sectors.

Wisconsin

Wisconsin's last update to its GHG inventory occurred in 2018; net GHG emissions were estimated at 126.3 MMTCO₂e, with power and transportation contributing the largest share. Gross emissions decreased by 9.5% from 2005 to 2018. The electricity sector showed the largest decrease in emissions from 2005 to 2018 (20.1%), driven by a shift to cleaner energy sources. Agricultural emissions - primarily methane and nitrous oxide - increased by 21.3%, which can be attributed to the expansion of livestock production and/or changes in land management practices.

Buildings Sector

Sector Overview

The buildings sector broadly refers to the built environment, which includes a mix of small and large scale commercial, residential and multi-purpose buildings. In examining decarbonization measures in this sector, plans included strategies for both existing construction and new developments. The buildings sector was consistently ranked as one of the top three drivers of greenhouse gas emissions in the inventories of the plans evaluated. In particular, it was listed as the top driver of emissions in Illinois, Milwaukee and the Potawatomi Tribe, respectively.

Summary of Measures

Across the 16 plans evaluated, there were a broad range of measures proposed to assist in the gradual and/or rapid decarbonization of the buildings sector. The solutions proposed typically fell into three categories: measurement, efficiency and electrification. In the measurement category, proposals included building performance standards across small, medium and large-sized commercial buildings and voluntary benchmarking programs. Such standards and programs could help incentivize and encourage building owners to gain a better understanding of their buildings' current energy usage, with the aim of identifying and understanding opportunities for enhanced performance in comparison to asset classes of a similar size.

Energy efficiency proposals, focused on improving a building's performance, included weatherization assistance, efficiency targets (such as Indiana's goal to have 90% of eligible buildings retrofitted by 2050), as well as funding pools to provide investment capital to enable homeowners and commercial owners to pay for retrofitting. Similar to measuring, efficiency efforts were seen as an easy win for plans to decrease their emissions and enable energy savings within their communities.

The third and final set of proposals noted across multiple plans pertained to electrification. This trend included deployment of significant capital expenditures to electrify heating systems in larger commercial buildings, as well as the updating of building codes for new developments. These measures were seen as not only accelerating decarbonization in existing buildings through improved performance, but also as a roadmap for new building developments to be constructed with sustainability in mind.

Innovative Measures

Unique measures related to the buildings sector were noted in the city of Cleveland, state of Minnesota and the Potawatomi Tribe. Using the IRA incentives to the fullest results in combining financial "carrots" where possible, or "incentive stacking" - for example, leveraging a combination of tax credits, rebates, weatherization assistance support, and other incentives in one single building upgrade, to minimize

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upfront costs. In Cleveland, such measures included incentive stacking of building envelope/electrification improvements and upgrades for LIDAC communities. This stacking is unique in that it rapidly reduces the up-front costs of improvements, and allows LIDACs to reap the environmental benefits of upgrades at an accelerated pace. Moreover, the city also proposed the launch of an educational website for homeowners to identify efficiency incentives applicable to their homes, as well as a list of eligible contractors in their area.

Within the state of Minnesota, a unique measure that was proposed was the partnering of decarbonization steps with indoor air quality improvement strategies for LIDAC, with a targeted focus on LIDACs with identified energy burdens. Lastly, within the Potawatomi Tribe, a targeted measure was proposed to assist all homes within the community in transitioning from natural gas heating to heat pumps. More specifically, the plan outlined a goal of having an energy audit conducted on all consenting tribe members' homes by 2025.

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While several strong emissions reduction measures were noted across the plans, three had the potential to offer intersectional co-benefits.

- The first measure proposed that states partner with commercial landlords to assist them in **obtaining green building certification**. After receiving such assistance, landlords could subsequently charge a premium to private sector tenants who have sustainability targets of their own.
- Secondly, many of the measures mentioned workforce development to support tactics such as **retrofitting, code upgrades and energy benchmarking programs**. The associated workforce development and contractor training required to implement these emissions reduction measures at scale provide ample opportunity for renewed economic development rooted in building a green economy.
- Third, a common thread across multiple proposed measures was the enhancement of **sustainability literacy and education in communities**, to better understand their home and/or building's energy usage and what steps they could take to improve efficiency and ultimately save money. These literacy facets of the measures were especially pertinent for LIDACs, who often face disproportionate hardship from energy burdens.

Improvements

In evaluating potential gaps and recommending next steps for states, cities, and Tribes to include in their forthcoming CCAP reports, there were two main areas for improvement. First, a key risk of many of the measures proposed was that benchmarking and tracking programs were often voluntary - which places the burden of both program adoption and reporting squarely on smaller commercial building owners.

Independent building owners outside of conventional commercial real estate might not have capacity to participate, and/or might need assistance and support in the form of educational material, workshops, and/or training in platforms such as ENERGYSTAR Portfolio Manager to be successful. States could consider partnering with local utilities to enhance participation and simplify the reporting process for smaller square-footage buildings, to minimize this risk.

Second, many measures failed to account for - or seek to remedy - historic disinvestment legacies and a lack of trust between energy-burdened communities, government agencies and utility companies. As such, for future iterations of plans, states could collaborate with nonprofits and community activists that have long-standing relationships in energy-burdened neighborhoods and are already doing energy justice work. Some steps were reflected in the LIDAC plans submitted (discussed later in this report) but since EPA did not require those plans, not all jurisdictions addressed the issues. States and cities could also compensate organizations and activists for their assistance; the involvement of a trusted party or parties would help increase the likelihood that residential decarbonization measures would be more broadly adopted.

Power Sector Sector Overview

Across the plans, power decarbonization primarily focuses on increasing renewable energy and storage development, and shifting power generation away from fossil fuels. However, the plans differ in how to achieve renewable energy goals, and how aggressive these goals are. The most aggressive targets were in Indianapolis, which called for 100% renewable power by 2028, and the states of Illinois and Michigan, which had goals of 100% renewable power by 2045 and 2050, respectively. Other states, like Ohio, did not set any numerical targets for renewable energy. Indiana set a comparatively low target of 45% renewables by 2050.

The most aggressive targets were in Indianapolis, which called for **100% renewable power by 2028**, and the states of Illinois and Michigan, which had goals of 100% renewable power by 2045 and 2050, respectively.

States also took different approaches with respect to how much their decarbonization initiatives would focus on utility-scale renewable development (5 MW+, typically generated in an aggregated fashion at a central site) versus distributed generation and community solar (<5 MW, typically generated locally across homes, businesses and other decentralized sites) (U.S. Energy Information Administration, 2023). Wisconsin focused on distributed generation in order to increase the resiliency of local governments and communities. On the opposite end of the spectrum, Milwaukee sought to allow municipal and county governments to subscribe to large-scale projects in coordination with We Energies, Milwaukee's public utility. Other plans fell somewhere within this spectrum, with some states like Indiana setting megawatt goals for both utility-scale and community solar. The Midwest Tribal Energy Resources Association (MTERA) went even beyond to specify goals for installed megawatts of solar, wind, and hydropower.

Summary of Measures

There were a few main approaches taken within the evaluated plans. Michigan and Illinois, which already

have robust plans for power sector decarbonization, focused less on the power sector and more on other areas. Michigan cited their recently developed comprehensive climate plan (the MI Healthy Climate Plan) and highlighted where CPRG grant funding would be used to make the goals from its plan even more aggressive through implementation. This is another example of stacking policy initiatives for more effective results. Illinois, on the other hand, chose to focus its plan on other sectors instead of power, perhaps because of the relative maturity of its Climate and Equitable Jobs Act (CEJA) statute, and the importance of other sectors in that state. Specifically, between one-fourth to one-third of U.S. freight passes through Chicago, so Illinois' plan placed a heavy emphasis on transportation decarbonization initiatives.

Innovative Measures

A unique approach in Illinois that will be valuable to evaluate effectiveness of implementation was to promote modeling of CEJA to monitor progress. Illinois also developed a measure to specifically support small utilities in planning for the clean energy future.

One consistent challenge in the energy transition has been engaging with communities along the way, to ensure renewable development is happening in a supportive public engagement environment. Michigan creatively attempts to address this barrier by focusing measures specifically at developing programs that work with communities. The state aimed to do this by providing further resources for “Renewables Ready Communities” to increase renewables by an extra 5-6% from the targets set by the MI Healthy Climate Plan, and by setting new energy storage standards. The Renewables Ready Communities grants provide up to \$5,000 per MW to renewable energy permittees and expected hosts that underwent local permitting processes, with \$2,500 per MW when the host and permitter differ (Michigan Department of Environment, Great Lakes and Energy, n.d.), and the CCAP goals build upon this already established program.

The City of Detroit's plan was the only one that explicitly considered energy justice - focusing on limiting consumer electricity cost to no more than 6% of annual income for low-income households, and leveraging partnerships for renewable energy workforce development for LIDAC residents. Other jurisdictions can follow Detroit's lead in a way that suits their particular needs.

Certain plans, like the city of Cleveland's, mentioned interconnection and permitting reform for renewables, and the development of Virtual Power Plants (VPPs) and microgrids. It also mentioned joining a regional clean cities coalition, which will advocate for streamlining permitting and stabilizing renewable energy capacity markets.

Improvements

The state of Ohio had no quantitative goals for renewable energy or emissions reductions, which

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raises concerns as to whether the plan is sufficiently detailed, and how potential CPRG funding would be utilized. However, Ohio's lack of quantitative goals likely stems from limited prior work on setting climate targets, and political factors such as lower stakeholder support for renewable energy and decarbonization.

Indiana had less ambitious carbon reduction targets than other states did - for example, aiming for only 45% renewables by 2050. This was surprising given that Indiana has particularly good wind energy resources, but could be due to pushback against renewable energy development and merits further review.

Significant gaps remain in addressing the barriers to renewable energy generation, from public engagement to transmission to interconnecting to permitting. This could be because of the need for interconnection and permitting reform at the federal or Independent System Operator (ISO)/Regional Transmission Operator (RTO) level, but this is still a key area that needs more focus in future plans. Demand response was another aspect of power decarbonization that needs additional attention. Demand response could have a huge impact on decarbonizing the grid, because it can change power consumption in order to better match the supply for power with the demand.

Overall, the majority of plans have robust power sector decarbonization proposals. However, states need to think about aspects of power decarbonization that go beyond simply scaling up renewable energy as much as possible, and the states that do not have clear or aggressive renewable energy targets need to focus on setting those.

Transportation Sector

Sector Overview

The transportation sector broadly refers to systems and methods used for moving goods and people. Transportation emissions occur primarily due to the combustion of petroleum products such as gasoline and diesel, therefore plans focused mostly on curtailing GHGs through reduced fossil fuel consumption. GHG emissions from transportation account for about 29 % of total U.S. GHG emissions, making it the largest contributor. Between 1990 and 2021, GHG emissions in the transportation sector increased more in absolute terms than any other sector (U.S. EPA, 2024). This demonstrates the need to think about policy sticks and carrots creatively to impact decarbonizing the sector.

The transportation sector is one of the top emission reduction drivers for all the states. While automotive manufacturing is one of the key economic sectors in the Great Lakes, the emissions related to manufacturing are considered under the "Industry" sector, and this section covers emissions from the usage of transportation. In terms of vehicle composition, on-road vehicles (light-duty, medium-duty, and heavy-duty vehicles) accounted for the majority of emissions in the transportation sector, hence was the focus of the PCAP. The sector did not focus on

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marine or air travel, and the shift to sustainable aviation fuel was mentioned in other sections (such as Agriculture and Industry) in different PCAPs.

Summary of Measures

Across the plans evaluated, many measures were proposed to assist in the transportation sector's gradual and/or rapid decarbonization. The solutions proposed can be categorized as strategies aimed to reduce the need for travel and/or the distance of trips, strategies encouraging the use of more energy-efficient modes of transport, and strategies focused on enhancing vehicle and fuel technologies to reduce emissions.

To reduce the need for travel and/or the distance of trips, plans highlighted the reduction of vehicle miles traveled (VMT) thereby reducing emissions, enabling a shift toward alternative modes of transportation, and expanding public transit. To enable the shift to alternative modes of transportation, states focused on building the necessary infrastructure, such as pedestrian/biking pathways and off-road facilities for pedestrians and cyclists, and developing education programs. This was well complemented by transit zoning and incentive programs that encourage alternative transportation methods, promote alternative travel by increasing parking fees for roadways, and implement congestion pricing. Illinois in particular planned to shift 15% of trips to lower-carbon forms of travel (walking and biking) by 2050.

To encourage energy-efficient modes of transportation, plans focused on the transition of public, commercial and private vehicles to ZEVs and modernization, typically by including financial incentives and perks for adopting the use of ZEVs and other alternative fuel vehicles, investing in electric charging infrastructure, updating building and zoning codes to accommodate such EV infrastructure, and continued research to increase adoption of ZEVs in low-income communities. A majority of the methodologies available for shifting to cleaner transportation are driven by federal or state funding, particularly for charging infrastructure. The PCAP aims to fill the gaps, focusing on workforce development, equitable access, and research and development to enable access to chargers across the state.

The Michigan plan had most of the measures in this category. In Michigan, the PCAP builds off existing initiatives to decarbonize fleets, such as the BIL's Clean School Bus Program, which will help transition school buses to zero-emission vehicles (ZEVs). City plans in Michigan, such as Southeast Michigan Council of Governments (SEMCOG) and West Michigan, focused on their continued relationship with car and battery manufacturers, including Ford and General Motors, to increase the adoption of EVs.

Due to its vast logistics network, Illinois' PCAP is focused on adopting zero-emission technologies for small and medium freight operators through heavy-duty vehicle charging infrastructure. The intention was to support local and regional routes within high-emission urban areas particularly. One notable initiative in Illinois was the development of a Heavy Duty Vehicle Charging Infrastructure Program designed to facilitate the transition of these fleets to EVs by providing the necessary charging infrastructure, which is often a barrier for smaller operators. Building community knowledge was another theme that encouraged the shift to low-carbon transport, however, there was no mention of increasing social acceptance and facilitating a mindset shift to move to EVs.

Plans also detailed implementing stricter fuel economy standards and technological improvements such as enhanced vehicle efficiency. This aim was mentioned across the plans. A notable measure was the

electrification of freight rail and trackside power in Illinois, to curb diesel emissions from idling freight cars and generators on freight yards;

Innovative Measures

To avoid emissions, Ohio stood out in building biking and walking commute habits among students through “The Safe Routes to School” program, which provides resources, technical assistance, and project funding to encourage and enable students in K-12 to walk or ride their bikes to school. Similarly, while all state plans mentioned moving to public transit, Wisconsin aimed to reduce traffic by shifting commercial passenger and freight flight trips to intercity rail or eliminating travel altogether by using technology such as videoconferencing.

In the shift to ZEVs, while there was a strong focus on EVs and plug-in hybrid electric vehicles (PHEVs) across plans, SEMCOG was the only plan that showed promise toward deploying hydrogen in public fleets, through a concrete target of replacing diesel buses with hydrogen buses.

Only Wisconsin explicitly focused on addressing vehicle full-lifecycle emissions through the mention of recycling, replacing small engines, and utilizing low-carbon cement for transportation infrastructure. However, other plans, such as Michigan, included the same in the industry sector emissions.

Moreover, several other initiatives from the Michigan Department of Transportation’s (MDOT) statewide Carbon Reduction Strategy (CRS) were highlighted that are underway to decarbonize the sector, such as zero-emission ferry conversion, development of EV battery manufacturing facilities, and multi-state EV charger deployment. Indiana already has a Medium- and Heavy-Duty Vehicles Grant Program, which provides funding for repowering or replacing eligible vehicles.

Some plans, such as Minnesota’s, provided a high-level implementation schedule and milestones for low- and no-carbon fuels in vehicles and equipment, as well as other forms of clean travel such as bicycling, walking, transit, and carsharing. Since these are requirements for the forthcoming CCAP, though, rather than the PCAP, other plans are not expected to provide the same until the next iteration.

Among the Tribal plans, only Keweenaw Bay Indian Community (KBIC) focused on the public fleet, and preferred a targeted approach by replacing 10 government vehicle fleets with EVs and installing a charging station. Midwest Tribal Energy Resources Association (MTERA) took a holistic approach to addressing ridesharing, increasing and electrifying public transit, and shifting to biking/walking. Lastly, the Potawatomi Tribe is taking a staggered approach to pilot six EV options (light, medium, and heavy-duty) to assess the charging requirements before determining which vehicles are best suited for EV conversions in the short term by 2030, and which vehicles may need to wait for better technology before they can transition.

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Improvements

While the primary approaches were similar across the region, the standouts for emissions reduction are Illinois, Michigan, and Minnesota, including SEMCOG for locally focused work. Policies like vehicle miles traveled (VMT) for light duty vehicles or EV infrastructure deployment are likely to have the most impact but also the largest amount of community engagement required to implement, while public transit is an affordable way to decrease emissions fast if there is sufficient uptake. There is a lot of innovation on the heavier-duty side, like the pursuit of green hydrogen, and the EV schoolbus programs.

Workforce Planning

Overview

Given that this section is optional for the PCAP and required for the future CCAP, not all states, cities, Tribes and territories provided details on workforce planning. Michigan and Illinois provided this information, while Ohio, Wisconsin, Minnesota, and Indiana elected to cover workforce development in their CCAP. Similarly, among the city and Tribal plans, only SEMCOG provided an overview of workforce planning initiatives. Still, all plans acknowledged the importance of workforce planning and development in enabling the deployment of the measures, and reiterated the importance of equity in ensuring that job opportunities are accessible to all community members, particularly those from disadvantaged backgrounds.

Summary of Plans

Some states, such as Michigan, Illinois, and Indiana, provided an overview of the likely increase in demand for specific roles that will arise due to each measure. Michigan also discussed the workforce planning activities as of Q1 2024, which include apprenticeship programs, the launch of a Michigan Electric Vehicle Jobs Academy in 2023 to connect industry and talent in automotive and electrification roles, and a MI Healthy Climate Corps program to advance the goals of the MHCP. The state also focused on leveraging its expertise in customized workforce training through the newly appointed Community and Worker Economic Transition Office led by the Michigan Department of Labor and Economic Opportunity (LEO) to tailor programs for future clean energy jobs.

Additionally, the state referenced the existing Energy Transition Impact Project (ETIP), which helps communities impacted by the closure of energy facilities. The ETIP develops strategies to expand job opportunities, remediate sites, and mitigate related economic and socio-economic dislocations.

Illinois also has existing clean workforce and business development programs and has provided initiatives around workforce development in each sector, such as clean buildings contractor training, workforce training for fleet and freight operators, and expansion of its existing initiatives. While

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Indianapolis’ plan suggests LIDAC may experience job growth, details regarding this anticipated increase are absent from the PCAP. The CCAP’s workforce planning and LIDAC analysis will be valuable for clarifying this point.

Among the city plans, Milwaukee provided a preliminary workforce planning analysis. The major emphasis was on “identifying partners” to assist in clean job creation - for example, for the net zero building initiative. The city aims to establish a program for regional sustainability assistance, including shared sustainability staff for participating communities to embed climate pollution reduction practices in local governments.

The SEMCOG plan discusses job creation across various sectors due to the implementation of climate action measures. It also focuses on leveraging the State of Michigan’s “Sixty by 30” initiative to improve access to post-secondary education and grow the skilled workforce (Michigan Department of Lifelong Education, Advancement and Potential, n.d.).

The tribal plans of the Potawatomi Tribe, MTERA, and KBIC did not delve deeply into workforce planning. KBIC discussed the workforce training and new roles that must be filled to fulfill the decarbonization measures. The CCAP workforce chapters will likely be informative.

Low Income/Disadvantaged Communities

Overview

Based on EPA’s guidelines for identifying LIDACs, plans used the Climate and Economic Justice Screening Tool (CEJST) and Environmental Justice Screening and Mapping Tool (EJScreen) to identify LIDACs in their region. Wisconsin and Michigan explicitly mentioned following the EPA’s technical guidance of incorporating the following:

1. Any Census tract that is included as disadvantaged in the Climate and Economic Justice Screening Tool (CEJST);
2. Any census block group that is at or above the 90th percentile in any Supplemental Index of the Environmental Justice Screening and Mapping Tool (EJScreen) when compared to the nation or state, and
3. Any geographic area within Tribal lands and indigenous areas as included in EJScreen.

States	Illinois	Ohio	Minnesota	Michigan	Wisconsin	Indiana
Total Census Tracts	3,123	2952	1338	2845	4292	1498
LIDAC Census Tracts	1452	1088	200	996	1475	554
% of Census Tracts - LIDAC	46.49%	36.86%	14.95%	35.01%	34.37	36.98%

Graph 1: Percentage of LIDAC census tracts in the states analyzed.* (footnote- Illinois PCAP did not contain the information on the total census tracts)

Due to ongoing efforts in the states, some cities had more comprehensive tools to identify the impact of different burdens on LIDAC. For example, SEMCOG included specific dashboards that they already have to identify environmental burdens on vulnerable communities such as LIDAC. For example, [SEMCOG’s GREEN \(Growing our Resilience, Equity, and Economy with Nature\) Dashboard](#) and [SEMCOG’s Equity Emphasis Area Dashboard](#) were instrumental in identifying the burdened areas across various economic, social, and environmental factors.

Summary of Plans

Regarding data presentation, while Illinois provided a high-level overview of the number of LIDACs, states such as Ohio, Michigan, Minnesota, and Wisconsin provided detailed information on the LIDAC, including census block IDs, maps of the location, etc. Ohio provided the most detail - the demographic information in the communities and the disproportionate impact of certain industries across different LIDACs.

Engagement and collaboration with LIDAC in creating the PCAP was critical to ensure widespread representation. The plans detailed various collaboration techniques employed by states and cities. Some measures mentioned in the plans were stakeholder meetings, workshops, public listening sessions, surveys, group interviews, and the creation of an advisory committee. These engagements aimed to collect inputs on program design and understand barriers to participation in climate and clean energy strategies. Indianapolis went a step ahead to detail the responses to the surveys provided to LIDACs to identify the key priority areas for the community. Wisconsin benefitted from its existing partnerships with LIDAC - for example, through the Governor’s Task Force on Climate Change Report, Wisconsin Clean Energy Plan, and existing initiatives by Wisconsin Office of Sustainability & Clean Energy.

Planning authorities conducted a number of measures to understand the climate impacts and risks posed to counties with LIDAC. Due to geographical spread, the quantification of specific risks was relatively scarce in state plans and much more detailed in city and Tribal plans. However, Michigan examined the climate impacts and risks in LIDAC while identifying key communities impacted by the same, estimating the households affected by specific risks - such as asthma due to poor air quality (Figure 1).

Health Condition	Census Tracts 90th National Percentile Or Above	Adults 10 Or Older In All LIDAC Census Tracts
Asthma	677	1,286,397
Diabetes	350	1,477,425
Heart Disease	324	800,560

Figure 1: The number of identified LIDAC census tracts in Michigan in which 90% or more of the adult residents have either asthma, diabetes, or coronary heart disease. The chart also provides information on the number of adults living with these serious health conditions across all identified LIDAC census tracts. (Excerpted from Michigan Priority Climate Action Plan, Michigan EGLE, 2024).

Ohio also quantifies the impact, comparing the risk from environmental pollutants to LIDAC vs the rest of Ohio. The reports from Illinois and Minnesota broadly discuss the vulnerability of LIDACs to climate

impacts. Illinois quantified a few specific risks that impact the LIDAC disproportionately, such as flooding and extreme heat, for which a preliminary analysis was conducted in specific zip codes. The report also mentions the disproportionate impact of co-pollutants on the LIDAC; however, it did not quantify the risks due to a lack of detailed knowledge of the specific projects being supported.

The potential impact from priority measures was another requirement the PCAPs had to address. While qualitative benefits were present in every plan, quantification of measures was limited in PCAP and may be detailed further in CCAP. Some examples include:

- The state of Wisconsin did not provide specific numbers on benefits to LIDAC, but the PCAP plan of the Potawatomi Tribe in Wisconsin did estimate the potential gains from the energy-saving measures proposed.
- Michigan and Ohio provided concrete metrics to analyze prospective impacts on LIDAC communities. Additionally, within specific priority measures, Michigan is tracking the impact on the LIDAC by analyzing the number of applications received by existing building electrification programs – especially those that focus on LIDACs. Moreover, across each measure, some quantitative metrics were analyzed, such as avoided deaths by race, avoided lost workdays, avoided respiratory symptoms and bronchitis, avoided hospital admissions, and avoided minor restricted activity days.
- Ohio provided quantification of one county, Franklin County, to illustrate the quantification of impact from measures for LIDACs. Ohio also enumerated the dollar benefit from the reduction of internal combustion engine (ICE) vehicle miles traveled (VMT), leading to reduced morbidity and mortality, based on the traffic and highway proximity.
- Among the city plans, SEMCOG estimated the percentage of households in equity and environmental justice areas that would benefit from cost savings due to decarbonization, while identifying the areas in the region with the heaviest burden. These burdens were characterized by socioeconomic, demographic (race), environmental, and health indicators. West Michigan, Indianapolis, and Chicago quantified the impact of specific actions. Moreover, specific geographical areas with LIDACs were identified for each priority.

The Tribal plans have not been analyzed for LIDAC benefits since Tribes are classified as LIDAC. The existing regulations and funding in the state/city had a role in the maturity of the initiatives, measurement, and inclusion of LIDAC. As there is more information on the quantitative impacts on LIDAC in CCAP, it will be interesting to analyze the spread of benefits that may flow to these communities.

Future research

Now is the time to capitalize on state, city, territorial and Tribal creativity around climate action and couple those efforts with the federal incentives passed by Congress in the IRA. Studying these PCAPs for the Great Lakes region is a starting point for mapping and understanding the trajectory of the sectors, including energy, transportation, and buildings – as well as those sectors not reviewed in this work, including agriculture, waste management, and industry – and can indicate areas where expertise could

be enhanced to accelerate progress.

Possible next steps include investing in analyzing all the sectors, expanding the geography of this research to include more jurisdictions, and interviewing authors of the plans to enhance learnings about implementation and to inform analysis of the CCAPs.

While some states are utilizing the current policy structure (statutory, regulatory or administrative), other states have a wider range of authorities to implement the measures. This is a function of the existing governance structure of the jurisdictions and it would be beneficial to deep dive into which structure would be more useful for efficient and effective decision making.

This paper looked at the measures narrowly as described by the filing jurisdictions. A potential future analysis should take into account the policy framework one step removed, crossing governmental boundaries needed to support measures ranging from streamlining permitting and stabilizing renewable energy capacity markets, to speeding permitting, removing red tape, and more.

There will be considerably more detail for future analysis with the CCAPs. For example, future GHG emissions measurements will be more comprehensive, have additional data behind them, and data trends will develop from PCAP to CCAP, which will enable greater synthesis and richer recommendations.

Methods

The PCAP analysis team built a benchmarking rubric (Appendix 2) that focused on each plan's goals for three key sectors – power, transportation, and buildings – and noted other proposals by states that did not fit clearly into these categories. The team also looked into resiliency plans, affordability, workforce plans, and impact on Low Income/Disadvantaged Communities (LIDAC). Additionally, the effort analyzed how each entity planned to collaborate with other regions, and how the new proposals interacted with existing legislation in each state. A comparison across plans was then undertaken and summarized in this report.

The Team

The team enlisted to complete this analysis was composed of two staff members from SEAS and three student researchers. The student researchers worked under the guidance of Liesl Clark, the Director of Climate Action Engagement at the University of Michigan's School for Environment and Sustainability (SEAS) and Lauren White, Deputy Director of Communications and Engagement at the SEAS Sustainability Clinic. Clark is the former Director of the Michigan Department of Environment,



From left to right: Liesl Eichler Clark, Victoria Jenkins (MBA/MS '24), Mahima Obhrai (MBA/MS '25), Jaya Uppal (MBA/MS '26), and Lauren White.

Great Lakes and Energy (EGLE) and chaired the Michigan Council on Climate Solutions, which supported EGLE preparation of the MI Healthy Climate Plan (MHCP). White is the former Sustainability Program Manager for the University of Arizona Office of Sustainability, where she co-chaired the University's inaugural Climate and Sustainability Action Plan effort, founded and directed the Office's communications program, and served on the Justice, Equity, Diversity, and Inclusion (JEDI) Committee at the Arizona Institute for Resilience.

The three student researchers - Mahima Obhrai (MBA/MS '25), Victoria Jenkins (MBA/MS '24), and Jaya Uppal (MBA/MS '26) - were all Erb Institute for Global Sustainable Enterprise dual degree students, completing MBAs at the Ross School of Business and MS degrees at the School for Environment and Sustainability. Obhrai, who specializes in Sustainable Systems, has five years of experience in operational consulting, focusing on the energy sector and financial institutions. She has helped some of the industry's leading companies optimize their operations and achieve significant improvements in organizational performance. Jenkins pursued a dual specialization in Sustainable Systems and Environmental Policy, and was a Dow Sustainability Fellow. She has four years of experience working in energy consulting in the commercial real estate sector, and recently conducted a comparative benchmarking analysis of climate action plans in Michigan to examine best practices in decarbonization and inform broader climate strategy. Uppal, who has a joint specialization in both sustainable systems and environmental justice, is a returned Peace Corps Volunteer with five years of experience in renewable energy technology.

With backgrounds in the public and private sector, and expertise ranging from finance to energy consulting to higher education, the team was well-positioned to conduct a thorough, holistic analysis of the anticipated impact of the plans evaluated.

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Glossary

BIL	Bipartisan Infrastructure Law
CCAP	Comprehensive Climate Action Plan
CEJA	Climate and Equitable Jobs Act
CEJST	Climate and Economic Justice Screening Tool
CPRG	Climate Pollution Reduction Grant
CRS	Carbon Reduction Strategy
IRA	Inflation Reduction Act
ISO	Independent System Operator
GHG	Greenhouse Gas
GWP	Global Warming Potential
KBIC	Keweenaw Bay Indian Community
LEO	MI Department of Labor and Economic Opportunity
LIDAC	Low-Income Disadvantaged Communities
MHCP	MI Healthy Climate Plan
MMTCO ₂ e	Million Metric tons of Carbon Dioxide equivalent
MTERA	Midwest Tribal Energy Resources Association
MW	Megawatts
PCAP	Priority Climate Action Plan
SEMCOG	Southeast Michigan Council of Governments
UNPCC	United Nations Intergovernmental Panel on Climate Change
US EPA	US Environmental Protection Agency
VPP	Virtual Power Plant

Appendix 1

State Plans

[Wisconsin](#)

[Ohio](#)

[Indiana](#)

[Illinois](#)

[Minnesota](#)

[Michigan](#)

City Plans

[Milwaukee](#)

[Cleveland](#)

[Columbus](#)

[Indianapolis](#)

[Chicago](#)

[Detroit](#)

[West Michigan \(Grand Rapids, Kentwood, Michigan\)](#)

Tribal Plans

[Keweenaw Bay Indian Community](#)

[Midwest Tribal Energy Resources Association](#)

[Forest County Potawatomi Tribe](#)

Appendix 2

CPRG PCAP Plan Analysis Rubric

1. Overview section

- a. Type of plan (state, city, Tribal)
- b. Existing climate targets, if applicable
- c. Stated climate targets in plan
- d. Timeline for action

2. Greenhouse Gas Inventory

- a. Key Emissions Area
- b. Key Industry/Industries

3. Decarbonization Measures

- a. Impact of Reduction Measures (cumulative goals/targets)
- b. Industry
- c. Transportation
- d. Power
- e. Agriculture
- f. Buildings
- g. Additional

4. Resilience

- a. Resiliency Plans
- b. Affordability
- c. Workforce Plans

5. Environmental Justice

- a. EJ Screening Tools Used
- b. Benefits to LIDAC
- c. Drawbacks to LIDAC

6. Governance

- a. Governing Authority to Implement
- b. Cross-state Collaboration
- c. Alignment with other plans and grants

7. Unique Callouts

- a. Additional Areas of Focus

8. Preliminary Analysis

- a. Highest Impact Potential
- b. Most Innovative/Scalable Solution
- c. Most Effective Multi-State Opportunities