REPORT TO THE GOVERNOR

December 2020

Climate Change Subcabinet update report

2020 annual report to the Governor on the Climate Change Executive Order

MINNESOTA POLLUTION CONTROL AGENCY

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This report is available in alternative formats upon request, and online at www.pca.state.mn.us.

Document number: cc-mn3-01

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Introduction

On December 2, 2019, Governor Walz signed Executive Order 19-37, "Establishing the Climate Change Subcabinet and the Governor's Advisory Council on Climate Change to Promote Coordinated Climate Change Mitigation and Resilience Strategies in the State of Minnesota." The Climate Change Executive Order emphasized that climate change is an existential threat for all Minnesotans, putting our health and wellbeing, natural resources, and our economy and ways of life at risk. The executive order highlighted the ways that our climate is already changing rapidly, and how more extreme weather and temperature shifts are negatively affecting our farms, communities, and industry today.

The executive order also drew attention to existing disparities in Minnesota, including those based on race, gender, geography, and economic status, which can exacerbate or worsen climate change impacts and risks for some communities. The executive order exhorts state leaders and policy makers to consider equity in our response to climate change in order to respond effectively to community needs and reduce existing disparities.

In 2007, Minnesota's legislature passed ambitious statutory goals for reducing greenhouse gas (GHG) emissions with bipartisan support through the Next Generation Energy Act (NGEA); however, we have not made sufficient progress to date. The executive order noted that Minnesota failed to meet its 2015 goal of reducing emissions by 15 percent, and the state is not on track to meet our future goals, either.

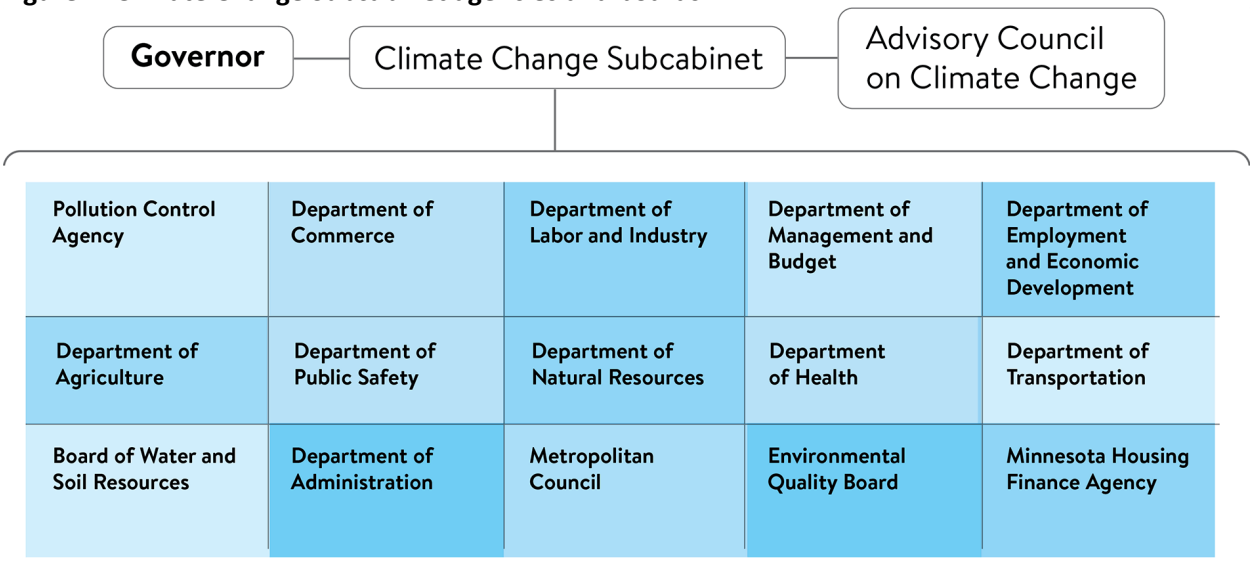
The executive order called for a redoubling of efforts to meet or exceed our NGEA goals and increase community resilience in the face of climate change. State government must work together with a coordinated approach to effectively address these significant and complex challenges. To that end, the executive order created two new organizational structures to encourage and enhance collaboration: a new Climate Change Subcabinet, consisting of 15 state leaders from the executive branch, and an Advisory Council on Climate Change including 15 community members appointed by the Governor.

Within the purpose and mandate of the subcabinet, the executive order required an annual written update provided to the Governor. This document fulfills the annual reporting update for 2020 and provides an update on the subcabinet's progress to date. Appendices to this update report also outline more comprehensive summaries of ongoing climate change mitigation, adaptation, and resilience work of the subcabinet's agencies and boards.

Annual update for 2020

The executive order created Minnesota's Climate Change Subcabinet, comprising state leaders from 15 agencies, boards, and departments within the Executive Branch. The subcabinet is chaired by the commissioner of the Minnesota Pollution Control Agency (MPCA). Members of the subcabinet are the commissioners, executive directors, or chairs of each of the named subcabinet agencies and boards (Figure 1).

Figure 1: Climate Change Subcabinet agencies and boards



Under the executive order, the subcabinet has two primary purposes: climate mitigation and resilience policy and strategy development, and public engagement. First, the subcabinet is tasked with identifying and advancing equitable climate policies and strategies that will help the state accomplish a number of goals, including:

- Meet or exceed our GHG emissions goals and achieve 100 percent clean energy by 2050
- Enhance the climate resiliency of Minnesota's natural resources, working lands, and communities
- Assist the state enterprise, families, businesses and local communities to prepare for climate impacts that cannot be avoided
- Promote economic development, innovation and job creation
- Ensure equitable distribution of benefits and address disparities in current impacts related to climate change

Secondly, the executive order calls for enhanced public engagement as part of the subcabinet's work to identify and advance equitable policies and strategies. The executive order identifies specific groups with whom the subcabinet should focus engagement, including Tribal Nations, communities that have been underrepresented in policy discussion and development, communities that are disproportionately impacted by climate change, and workers impacted by the transition to a cleaner economy. Building partnerships, facilitating dialogue, exploring locally relevant solutions, and providing opportunities for Minnesotans to get involved with and stay informed about climate issues that matter to them are all key components of meaningful public engagement.

In 2020, the Climate Change Subcabinet was officially convened for the first time, and held meetings in January, February, May, July, September, October, and November. The primary agenda items for the subcabinet were to establish strong interagency collaboration, determine appropriate structural and

staff support, review state agencies and boards ongoing climate change mitigation and resilience work, determine near-term policies and strategies to consider for upcoming legislative sessions, and build the subcabinet's vision for public engagement.

In September, the subcabinet and elected leaders from Tribal Nations held a Government-to-Government forum to begin the formal coordination with Tribal Nations on climate change efforts within Minnesota's geography. The Tribal Coordination Team's report below provides a broader description of the Government-to-Government Climate Forum and the efforts to build strong coordination with Tribal Governments and indigenous communities.

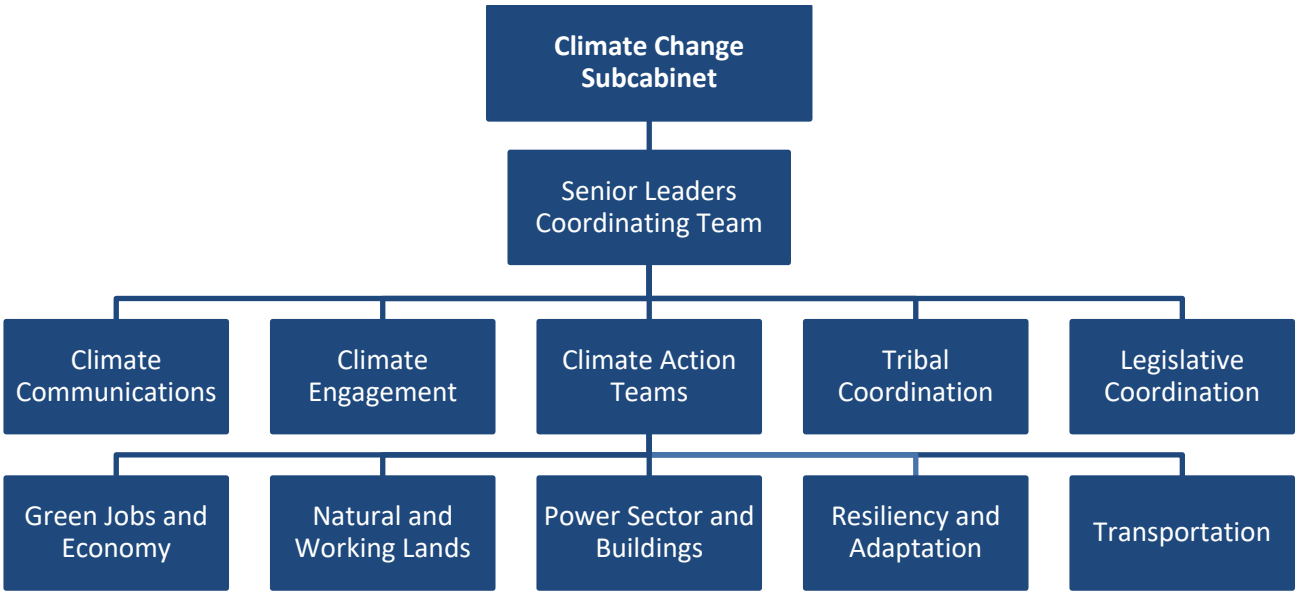
In October, the subcabinet held a joint public meeting with the Environmental Quality Board (EQB) to update the public on progress since the signing of the executive order. At this special joint session, leadership and staff from subcabinet agencies and boards provided brief presentations on our organizational structure, goals, and progress to date, including Tribal coordination, interagency climate communications, and the climate engagement framework.

Creating an effective support structure

In 2020, senior leaders at the subcabinet agencies and boards designed an operational structure to foster collaboration and ensure the work required by the executive order continues at a pace commensurate with the urgency of the climate crisis.

The Senior Leaders Coordinating Team (SLCT) consists of deputy commissioners, assistant commissioners, and senior leaders from each named agency, board, and council in the executive order. The SLCT meets every two weeks, and focuses on fostering understanding and collaboration across member agencies and the working teams it supervises (Figure 2).

Figure 2: Working teams supporting the Climate Change Subcabinet



In 2020, the subcabinet and SLCT established multiple working teams to accomplish the objectives identified in the executive order, outlined below and in Table 1.

- **Climate Communications Team:** creates and maintains consistent branding and messaging across the subcabinet; plans and executes a shared media strategy and coordinated campaigns across the subcabinet's agencies and boards

- **Climate Engagement Team:** develops a plan for engagement, identifies mechanisms to engage with Minnesotans across the state, and assists other teams in conducting effective public engagement
- **Climate Action Teams:** five topic-specific teams focused on researching, vetting, and conducting stakeholder engagement regarding climate mitigation and resilience policies and strategies
- **Tribal Coordination Team:** brings together the tribal liaisons from all subcabinet agencies and boards to work with Tribal Nations and Tribal Governments to ensure there is open dialogue, meaningful engagement, and respectful coordination
- **Legislative Coordination Team:** connects the legislative and government relations directors from all subcabinet agencies and boards to ensure that climate-related policies considered by the subcabinet are connected and supported as needed in state legislative proceedings

Table 1: Working team members

Team	Lead	Participating agencies and boards
Climate Communications Team	MPCA	ADMIN, MDA, COMM, DEED, EQB, MDH, MHFA, DLI, MMB, DNR, Met Council, DPS, MnDOT, BWSR
Climate Engagement Team	EQB, MPCA, MnDOT	MDA, COMM, MDH, MHFA, DNR, BWSR
Green Jobs and Economy Action Team	DLI, MPCA	MDA, DEED, DNR, MnDOT
Natural and Working Lands Action Team	MDA, DNR	EQB, MDH, MPCA, BWSR
Power Generation and Buildings Action Team	COMM	ADMIN, DLI, MHFA, MPCA
Resiliency and Adaptation Action Team	MPCA	ADMIN, MDA, COMM, DPS, DLI, DOC, DEED, EQB, MDH, Met Council, DNR, MnDOT, BWSR, 1854 Treaty Authority, Corps of Engineers, Hennepin County, Minnesota State University
Transportation Action Team	MnDOT	ADMIN, COMM, MDH, MHFA, Met Council, MPCA, Northeast Minnesota Regional Transportation Coordinating Council
Tribal Coordination Team	COMM, MPCA	MDA, DNR, MnDOT
Legislative Coordination Team	MPCA	ADMIN, MDA, COMM, DEED, EQB, MDH, MHFA, DLI, MMB, DNR, Met Council, DPS, MnDOT, BWSR

Initiating work with action teams

The five Climate Action Teams provide the primary forums for identifying possible policies and strategies, conducting research, and analyzing potential costs and benefits, feasibility, and impacts. Each action team also engages with stakeholders, organizations, and members of the public interested in the team's specific topic area.

Action teams for Transportation, Power Sector and Buildings, and Natural and Working Lands cover the three largest sources of GHG emissions in Minnesota, and therefore have a special focus on identifying opportunities for, and barriers to, reducing emissions. In addition, the Natural and Working Lands team evaluates strategies to expand carbon storage opportunities on Minnesota's landscape. The Resiliency and Adaptation team leverages a preexisting team to continue ongoing work across the enterprise to implement policies and strategies that build resiliency and adaptation. The Green Jobs and Economy

team seeks to identify opportunities for expanding job creation and economic opportunities while transitioning from a high-carbon economy to a low-carbon economy.

In 2020, the first four action teams listed above focused their efforts on the two main purposes outlined in the executive order: climate mitigation and resilience policy and strategy development, and public engagement.

Action teams identified near-term ideas for policies and strategies to consider for the 2021-2022 legislative sessions or to prioritize for further development with partners and consideration in ongoing agency activities and programs. Initial ideas and focus areas were built on concepts that had emerged from past engagement with the public, partners and stakeholders, as well as those considered most feasible and critical near-term first steps to build the foundation for climate change action. Each action team recognizes that these ideas do not reflect the full suite of potential policies or strategies needed to meet the expectations of the executive order and address the climate crisis.

Action teams also focused on public engagement within their area of expertise to establish new connections and build upon existing relationships, collect input on focus areas, and foster partnerships.

- **Natural and Working Lands:** hosted listening sessions with interested organizations such as Minnesota Forest Resources Council, Conservation Minnesota, Trust for Public Land, League of Minnesota Cities, Minnesota Farm Bureau, Minnesota Farmers Union, Minnesota Forest Industries, and The Nature Conservancy. The purpose of these listening sessions was to share information, seek input on the team's efforts, and discuss possible opportunities for partnership and collaboration.
- **Power Sector and Buildings:** held targeted listening sessions to seek feedback, share policy priorities, and provide foundational information on carbon free electricity and building codes. The team began engagement efforts by connecting with stakeholder organizations and partners such as 100% MN, Sierra Club, Fresh Energy, Take Action Minnesota, the Fond Du Lac Band of Lake Superior Chippewa, and Prairie Island Indian Community.
- **Resiliency and Adaptation**: hosted listening sessions with interested organizations to share an overview of the executive order, review initial Action Team ideas, and gather feedback. To date, listening sessions have engaged groups and organizations such as the Minnesota Climate Adaptation Partnership, Minnesota Center for Environmental Advocacy, The Nature Conservancy, Minnesota Environmental Partnership Water Cluster, Trust for Public Land, Great Plains Institute, Clean Water Council Policy Committee, the Minnesota Association of Soil & Water Conservation Districts, and the Minnesota Association of Flood Plain Managers. Whenever relevant and feasible, this team has co-hosted public engagement with the Natural and Working Lands team in recognition of the overlap of the teams' focus, shared partners, and stakeholder groups.
- **Transportation:** shared potential near-term actions and gathered feedback during the summer and fall of 2020 by hosting a public listening session and launching an online survey. Approximately 80 people from 45 unique ZIP codes attended the listening session and close to 900 people from across the state completed the survey. The team's potential near-term actions were informed by related engagement efforts conducted from 2018-2020 as part of the Pathways for Transportation Decarbonization project.

The Green Jobs and Economy team began meeting in fall 2020 and is currently ramping up its work to apply a climate change and green jobs lens to Minnesota's economic recovery. This team is committed to expanding the definition of green jobs beyond what has traditionally been considered. Looking beyond renewable energy installation and energy efficiency jobs, this team will consider the breadth of strategies and skills needed to achieve emission reductions including maintaining and enhancing carbon sequestration activities as well as increasing climate resiliency of Minnesota's communities, natural

resources, and working lands. As Minnesota is currently experiencing an economic slowdown, this team will explore and elevate opportunities for green job creation and a just transition for impacted workers as part of the state's economic recovery actions.

Information about the five Climate Action Teams is available on the Our Minnesota Climate website: Working teams.

Incorporating equity in climate policy development

In September 2020, the SLCT participated in a training session led by Chris Taylor, Chief Inclusion Officer for the state of Minnesota, to better understand how to incorporate equity considerations into potential climate policies and strategies. The session focused on an equity analysis framework developed by the Governor's Office, "Applying an Anti-Racism Lens to Our COVID-19 Response," and how senior leaders and staff can apply this framework in our climate work. Looking forward, the SLCT will continue work with the Chief Inclusion Officer to build the working teams' capacity to address current disparities and inequities through the state's climate work.

In 2020, the MPCA helped coordinate engagement and information-sharing opportunities for the action teams with several agencies' equity groups and advisory councils to effectively respond to the executive order's call to engage frontline communities – those who are now experiencing or will experience the most severe impacts from climate change – and others who have been historically excluded from policy conversations. This included providing an update on the work and goals of the subcabinet to the MPCA's Environmental Justice Advisory Group (EJAG) in June 2020. The MPCA, EJAG, and Climate Engagement Team will continue working together to identify further opportunities for meaningful engagement.

This work extends well beyond the efforts that fit neatly within the mandate of the executive order. State agencies, departments and boards across the subcabinet are exploring avenues to increase engagement with disproportionately impacted communities, frontline communities, and others to ensure that those impacted have a voice and the opportunity to participate in the process. Examples include, but are not are limited to:

- Department of Agriculture working with new farmers and immigrant farmers
- Department of Commerce assisting under-resourced communities with energy and heat programs
- Department of Health focusing attention on current health disparities in Minnesota, and how climate change could exacerbate disparities
- Department of Natural Resources engaging with new and more diverse voices in natural resource management
- Department of Transportation including more diverse voices in transportation planning and the Sustainable Transportation Advisory Council
- Minnesota Housing Finance Agency working with under-resourced communities to ensure access to safe, efficient, and affordable housing

Developing a process for coordination with Tribal Nations

The Tribal Coordination Team was created in recognition that coordination and consultation with Tribal Nations is a key aspect of the work of the Climate Change Subcabinet and advancing our common climate goals. Key reasons for close collaboration include:

- Each agency and board on the Subcabinet recognizes and respects the Government-to-Government relationship between the State of Minnesota and the Tribal Nations as outlined in Executive Order 19-24.
- Tribes are national leaders in climate change work. Several Tribes in Minnesota have been working on addressing climate change and have successfully implemented projects that benefit both Tribal Nations and the state. The Climate Change Executive Order initiated new opportunities for effective and efficient collaboration to develop and pursue shared goals.
- Tribal environmental departments from each respective Tribal Government have the technical knowledge and expertise to help inform and shape opportunities for collaboration between the State of Minnesota and Tribal Nations.

The subcabinet recognizes that effective coordination includes meeting early and regularly, prior to actions or decisions being made. This approach ensures all involved can have the same information and can ask questions as work progresses.

Since a formal process for coordinating on climate change does not exist currently, in 2020 the Tribal Coordination Team began working with Tribal Nations to develop a process together. The team is working at multiple levels to develop partnerships and collaboration, including connecting with Tribal environmental staff, building coordination between subcabinet and Tribal leadership, and collaborating across state agency Tribal liaisons. In addition, a staff member from the 1854 Treat Authority joined the Resiliency & Adaptation Action Team. Additional opportunities to work directly with the other Climate Change Action Teams are being explored.

A key partner in the Tribal-state collaboration is the Minnesota Tribal Environmental Committee (MNTEC), which is a group of Tribal environmental professionals. The Tribal Coordination Team attended the June 2020 MNTEC meeting to share general information about the work of the subcabinet. Beginning in July 2020, MNTEC and the Tribal Coordination Team established separate climate change-focused meetings. These meetings provide an opportunity for MNTEC and the Tribal Coordination Team to provide updates on the work of the Subcabinet and climate work more broadly, seek input on initial Action Team efforts, and to collaborate on building new processes and opportunities for better coordination. This climate change-focused group is working on articulating overall goals for the state engagement with Tribal environmental programs and methods to ensure effective collaboration between the Tribes and the Subcabinet.

MNTEC and the Tribal Coordination Team collaboratively planned the September 2020 Climate Change Government-to-Government (G2G) Forum and worked to ensure that both state and Tribal leaders were prepared for a robust discussion. The team also communicated with Tribal Leadership to express the subcabinet's desire to build strong, long-term partnerships with Tribal Nations and provided an overview of the subcabinet work at a Tribal Leaders Weekly call hosted by the Governor's Office. Additionally, prior to the G2G Forum, members of the subcabinet and SLCT attended a presentation on Dakota and Ojibwe cultural values and how these values are inextricably linked to the work of climate change.

The September 2020 Climate Change G2G Forum served as a strong starting point for building a long-term partnership and collaboration between the subcabinet and Tribal leaders. Following the forum, the subcabinet and Tribal Leadership agreed to meet quarterly to continue close coordination.

Building capacity for enhanced engagement

The Climate Engagement Team (CET) has three core objectives:

- Develop a framework or plan for public engagement that will provide a long-term vision and ensure meaningful public involvement in the subcabinet's efforts
- Assist and advise Climate Action Teams in their public engagement efforts
- Create opportunities for public engagement around climate-related issues

In 2020, the CET drafted initial concepts for the framework, aiming to provide a holistic model for public engagement. The framework will articulate a vision for public engagement that will support the transformational change needed to address climate change concerns in Minnesota, including interconnected issues of equity and economic health. It will include both a long-term, ambitious, transformational engagement plan as well as essential, near-term engagement activities.

The draft engagement model is centered on nested components that provide "on-ramps" for public involvement at different levels: individual, community, sector, state, and multilevel (Figure 2).

The CET is working to ensure that the framework will include specific opportunities for working with and engaging with frontline communities and environmental justice groups.

Figure 2. Draft engagement model

To date, the CET has shared the draft concepts and framework and discussed with the SLCT, the Subcabinet, the MPCA's Environmental Justice Advisory Group, and several potential external partners. The draft was also presented as part of the public Climate Change Subcabinet-EQB joint meeting in September 2020.

The team developed a survey to ask Minnesotans how they want to engage with the state agencies and Subcabinet on climate action. So far, the survey has received over 550 responses; the CET is still promoting the survey and analyzing responses. In addition to conversations with partners, the survey will help inform and incorporate ideas for engagement and how the Subcabinet can work collaboratively to achieve common goals. In 2020, the CET and action teams also worked together with subcabinet agencies and boards to inventory past and ongoing climate engagement efforts.

To assist and advise the five action teams, the CET identified and assigned an individual liaison for each team. The liaisons add capacity for action teams and ensure consistent engagement efforts across teams.

In October 2020, the CET launched the Our Minnesota Climate Forum Series. The forum series is designed to offer additional opportunities for subcabinet members and other state leaders to engage with representatives from private, non-profit, and public sectors about climate-related issues and potential solutions. The forum series convenes conversations to explore the wide range of climate action the state could pursue to meet or exceed our GHG emissions goals and achieve 100 percent clean energy by 2050, enhance our climate resiliency, prepare for climate impacts that cannot be avoided, promote economic development, innovation and job creation, as well address current disparities and ensure equitable distribution of benefits from potential climate solutions.

The forum series provides a platform to share progress and challenges with a wider public audience, solicit ideas for and feedback on potential climate mitigation and adaptation actions, and hear directly from Minnesotans about what climate solutions they support. The forum series will center equity in its content and design, and include perspectives from subject matter experts and members of the public that represent Minnesota's diversity. These forums can serve as a touchpoint for the public to hear about subcabinet activities and opportunities to be involved in specific projects or policies.

More information about the forum series and additional opportunities for members of the public to participate is available on the Our Minnesota Climate website: Get involved.

Communicating climate change impacts and solutions

The Climate Communications Team was created to develop and execute coordinated campaigns across the subcabinet's agencies and boards to advance equitable climate policies and strategies. In 2020, the main challenge for this team was to support sustained media focus on local climate change impacts and solutions amid a global public health crisis, a national conversation about systemic racism and community safety, and a presidential election year.

In this context, leveraging existing opportunities for subcabinet agencies and boards to communicate about climate change was paramount. In 2020, this team used an earned media strategy including coordinated press events and targeted media relations to highlight the myriad ways climate change is affecting our communities, farms, and industry today and frame potential solutions.

For example, MPCA, EQB and the Department of Agriculture held a joint press event in September 2020 event to draw attention to climate change's impacts on our water resources and how Minnesota's farmers can and should play a pivotal role in our solutions.

Figure 3. MPCA Commissioner Laura Bishop, center, speaks at Olmsted County Soil Health Farm, September 2020

Secondly, this team produced and implemented a coordinated social media campaign across subcabinet agencies and boards titled "Climate changed." The goal of this campaign was to use compelling visuals to demonstrate that climate change is no longer a far-off future possibility; it is negatively affecting our communities here and now. The campaign focused on climate trends including increasing precipitation, more extreme rainfalls, warming winter temperatures, and increasing extreme heat events. The Climate Communications Team paired these local, observable impacts of climate change with messages and artwork, and distributed a social media

toolkit to all subcabinet agencies and boards for their use. This team plans to continue using this toolkit model for additional social media campaigns in the future.

Figure 4. Examples from "Climate changed" social media campaign

In 2020, the Climate Communications Team also planned, designed, and created a new, enterprise-wide website about climate change: Our Minnesota Climate (mn.gov/climate). The Our Minnesota Climate website is an interagency campaign tool to advance innovative and equitable climate solutions. Through real stories and engaging visuals, the site demonstrates how state leaders are united behind the goal of establishing and accelerating policies and strategies to meet or exceed our goals for reducing greenhouse gas emissions and increase community resilience in the face of climate change.

Our Minnesota Climate outlines local, observable climate trends, covers state actions and the Walz-Flangan administration's response to climate change, and provides a platform to validate and amplify strategies and solutions that are already being implemented by businesses, non-profits, tribal nations, local governments, and other communities. The site also includes information on the Climate Change Subcabinet and its working teams, the Governor's Advisory Council on Climate Change, and opportunities for members of the public to participate in the state's climate work and stay informed.

Figure 5. Our Minnesota Climate homepage

Inaugural meeting of Governor's Advisory Council

The executive order established a 15 member Governor's Advisory Council on Climate Change to assist the subcabinet in its duties. In particular, the advisory council will assist in identifying opportunities for, and barriers to, policies and strategies to reduce emissions and increase climate resiliency in Minnesota's communities. The advisory council will also assist in considering equity and ensuring our climate solutions reduce existing disparities and support a just transition for affected workers and businesses.

In September 2020, the Walz-Flanagan administration named the first appointees to the advisory council. Following this announcement, state leaders held individual interviews with each appointee to identify each member's vision and area of interest for their work with the advisory council. These interviews will help guide the agenda planning for upcoming council meetings and inform the process to build a successful relationship between the advisory council, subcabinet, and the public. The advisory council met for the first time in late November 2020.

The full list of advisory council members and links to recordings of advisory council meetings are available on the Our Minnesota Climate website: Governor's Advisory Council on Climate Change.

Appendices: Ongoing Climate Work of Climate Change Subcabinet Agencies and Boards

Each Subcabinet agency and board provided the following description of their current work related to addressing climate change in Minnesota.

Appendix A: Department of Administration

The Department of Administration (Admin) oversees and manages the administrative functions of other executive branch state agencies, including purchasing and contracting, facilities management, construction management.

With $176.5 million in annual operating costs and 475 full-time employees, Admin oversees $2.1 billion in state purchases, maintains 4.4 million square feet of owned space and leases an additional 3.6 million square feet of space for over 100 state agencies, boards and councils. The agency also insures $12 billion in property and 13,400 vehicles and manages over 400 building projects and $166 million in capital appropriations annually.

There are several divisions within Admin that directly contribute to reducing Minnesota's carbon footprint and greenhouse gas emissions.

Office of Enterprise Sustainability (OES)

The Office of Enterprise Sustainability (OES) was established by Executive Order 17-12 and reaffirmed by Governor Tim Walz in Executive Order 19-27 to assist the 24-cabinet level state agencies in achieving their goals to reduce GHG emissions, as well as, to reduce waste, energy and fuel consumption, water usage, and increase the sustainable procurement of goods and services in government operations. These goals were established after extensive review of existing statutes and other goals and objectives outlined for the 24-cabinet-level state agencies (also called *the enterprise*).

Reduce Fleet Fossil Fuel Consumption: 30% reduction of state fleet consumption of fossil fuels by 2027 relative to a 2017 adjusted baseline.

- Energy Consumption: 30% reduction in consumption of energy per square foot by 2027 relative to a 2017 adjusted baseline.
- Reduce Water Consumption: 15% reduction of water use by 2025 relative to a 2017 adjusted baseline.
- Reduce Solid Waste: 75% combined recycling and composting rate of solid waste by 2030.
- Sustainable Procurement: 25% of total spend on priority contracts are sustainable purchases by 2025.
- GHG Emissions: 30% reduction of greenhouse gas emissions by 2025 relative to a 2005 calculated baseline.

The GHG goal of 30% reduction by 2025 relative to a 2005 calculated baseline mirrored goals outlined in the 2007 Next Generation Energy Act. To date, the enterprise has achieved 84% progress towards goal. Reductions in GHG emissions in state government operations is largely due to the decarbonization of the electricity grid and long-term reductions in energy use in state facilities e.g. Minnesota State Capitol Complex. In 2019, GHG emissions from state operations increased. State fleet fossil fuel consumption, particularly in medium and heavy vehicles, was the largest driver of growth in GHG emissions in 2019.. Colder weather reduced miles per gallon and more snowfall required additional snow removal. Emission factors for delivered energies like electricity and district energy also did not improve last year.

The OES created a one-of-a-kind sustainability reporting tool and for the last three years has been tracking state agencies' progress towards achieving goals outlined in the Executive Order. Last year, OES published a public facing dashboard at www.sustainability.mn.gov to follow State government's progress towards meeting the sustainability goals and provide transparency in government operations. The dashboard measures progress at both the State and agency-specific level and is the most comprehensive of its kind in the nation.

The OES is only tracking GHG emissions from the 24-cabinet level state agencies. Data does not include legislative or judicial branches, boards and commissions, tribal governments, or local units of government.

The OES developed master contracts for state agencies and local units of government to procure solar photovoltaic installations, electric vehicles supply equipment (EVSE), energy evaluations of buildings, and recycling and organics collection technical services.

The OES is the lead partner with Xcel Energy to implement electric vehicle (EV) service pilot project which will install up to 200 EVSE in Xcel's service territory for state fleet vehicles. The OES was also successful in securing $2 million in appropriation bonds to fund 13 EV fast chargers and up to 100 level EVSE on state property throughout the state for use by fleet vehicles and the public.

Office of State Procurement

The Office of State Procurement oversees $2.1 billion in goods and services purchases annually and offers volume discounts to state agencies and local units of government through 1,600 enterprise contracts and the two largest multi-state cooperative purchasing programs in the nation.

The Office of State Procurement (OSP) partners with the MPCA to manage the State of Minnesota's Sustainable Procurement Program (SSP). The SSP focuses on improving the environmental, social, and economic impacts of government procurement by establishing sustainable state contracts, sharing best practices for sustainable procurement, fostering a community of government purchasers who prioritize sustainability, and facilitating equal opportunity for target groups, economically disadvantaged, veteran owned, and small businesses to meet sustainability requirements to do business with the State. The enterprise spends about $138 million annually on priority contracts, of which $29 million, or about 21% was spent sustainably in 2019 and to date, the enterprise has achieved 84% progress towards goal. The sustainable spend on priority contracts increased by 5% from 2017 to 2019. In 2019, the SSP program was one of 10 agencies to be recognized by the Humphrey School of Public Affairs with a State Government Innovation Award.

By making more sustainable purchasing decisions in state government, Minnesota can reduce solid waste, shrink its carbon footprint, promote a strong, equitable local economy, and improve energy and operational efficiencies across the enterprise. To learn more about the State's sustainable procurement efforts, please see the Sustainable Procurement Program webpage at www.pca.state.mn.us/epp

Facilities Management

Facilities Management maintains and operates 22 state-owned buildings, including the State Capitol, plus 32 parking facilities, 25 monuments, 40 acres of green space for a total of 4.4 million square feet in

addition it coordinates events on the Capitol Complex. Since 2008, Facilities Management has made significant energy-efficiency investment and reduced energy usage by over 20 percent.

In 2019, Facilities Management completed major energy-efficiency and water conservation measures at the Transportation Building which included direct digital controls, low flow fixtures, irrigation deduct meter, variable air volume boxes, replacement of 2 air handling units with wall fans and LED lights. The measures will have an estimated 13% reduction in energy usage and 50% reduction in water usage.

Currently, there are four solar photovoltaic (PV) installations on the Capital Complex for a total of 436 kW. The first solar installation was on the new Senate office building (133 kW) and three additional installations (303 kW) were added to the Transportation, Stassen, and Administration buildings in 2019.

Admin rolled out a series of upgrades to the State Capitol Complex recycling program in 2016. The upgraded included the introduction of organics recycling, installation of new collection stations and easy-to-understand signage and phased out desk-side trash collection. These upgrades have helped the Capitol Complex increase its recycling rates and reduce its carbon footprint.

The state spends approximately $5 million a year on electricity for the Capitol Complex. In 2016 the Department of Administration with Xcel Energy, announced a new 20-year agreement – Renewable*Connect Government program with Xcel will lock in a price on renewables that will save an estimated $100,000 over that period.

Fleet Services

Fleet Services leases vehicles to state agencies for official state business. The division's lease program manages vehicle acquisition and disposition, fueling, maintenance, auto insurance, and life-cycle management for roughly 1,000.

Admin's Fleet Services is committed to supporting a sustainable fleet, through alternative fuels, hybrid technology, and electric vehicles. Admin has increased it's share of hybrids in the fleet from 21% in 2017 to 49% in 2019; and has added 35 battery electric and plug-in hybrid electric vehicles in that time.

Admin's fleet is officially recognized as a Sustainable Fleet by the National Association of Fleet Administrators (NAFA). The NAFA Fleet Accreditation Program recognizes fleets for having a credible sustainability plan and for making meaningful progress toward reducing total emissions.

The enterprise has a goal of 30% reduction in state fleet consumption of fossil fuels by 2027 relative to a 2017 adjusted baseline. In 2019 state operations increase fossil fuel gallon use by about 10% from 2018. The key drivers of this increase were a more severe winter and increased use of fuel in transit service. More severe winters require more snow removal and more idling. Admin's fossil fuel use also increased in 2019 compared to 2018 primarily from increased fuel use by the medium and heavy vehicles used for plowing snow and grounds maintenance at the Capitol Complex. In 2019, the state increased its number of hybrid, plug-in hybrid, and electric vehicles as a share of its light-duty fleet by 54% to a total of 1,112 vehicles.

Real Estate and Construction Services

Real Estate and Construction Services (RECS) manages over 400 (annually?) construction projects and 800 property leases annually and provides enterprise-wide leadership to ensure that all state buildings

are sustainable and energy-efficient and reducing greenhouse gas emissions. Overall, the state has a real property footprint that includes 5,585 buildings and gross square feet and acreage equaling about 5.5 percent of the state land base.

Admin's RECS worked with the Minnesota Department of Commerce, the University of Minnesota's Center for Sustainable Building Research, and outside contractors and consultants to develop and support the sustainable building guideline called Buildings, Benchmarks & Beyond Sustainable Building 2030 Energy Standards (SB 2030). SB 2030 mirrors the Architecture 2030 program and requires increasing energy efficiency standards. SB 2030 energy standards are required on all state-funded projects in Minnesota, but they can be easily applied to any building project.

Projects that begin their schematic design phase on or after January 1, 2020 will be subject to the 2020-2024 standard achieving an 80% reduction from the average building baseline. Projects will be required to meet the new requirement to meet both an energy and carbon standard, the implementation of renewables based on hierarchy, and use the same standard for renovations as new construction. For more information go to www.b3mn.org

RECS also assist state agencies with developing and implementing "green leases" to reduce the environmental impacts of government operations. Standard green lease provisions included: electric vehicle charging stations; management practices to protect health and conserver resources; annual utility reporting; temperature setting guidelines; sustainable building guidelines; recycling, construction and demolition recycling; energy and water conservation; and water refill stations. Some additional negotiable clause include: storm water management; winter salt application; urinal water flow; green cleaning; and LED lighting.

Surplus Services

Surplus Services is another example of how the enterprise is reducing its carbon footprint and following the state's solid waste hierarchy – reduce, reuse and recycle. Surplus Services acquires and distributes many types of items, including office supplies and furniture, medical supplies and equipment, clothing, a wide range of vehicles, machine tools, hardware and electrical supplies and more. These items are made available to eligible organizations for a nominal service charge, helping customers realize incredible savings. Admin' Surplus Services also operates the state auction program, conducting live and online auctions which serve the public and return revenue to state government. Approximately 92 percent of auction proceeds are returned to owner agencies.

Appendix B: Department of Agriculture

While agriculture generates GHGs, it can also be a major contributor to solving the climate crisis. In fact, many of the systems and practices used to protect water quality have GHG-reduction benefits as well. Additionally, many of these practices can improve soil health and have crop yield benefits. Many of these systems and practices also create new economic opportunities for Minnesota farm families and businesses. Examples of agricultural activities that provide multiple environmental benefits, including climate change mitigation include:

- Vegetative cover is a prime example of an agricultural activity that provides multiple environmental benefits, including climate change mitigation.
- Agricultural soil carbon stocks are increased by diversifying rotations with perennials, minimizing soil disturbance, using manure as a soil amendment, and incorporating cover crops where practicable. Nitrogen management practices increase efficiency of nitrogen use, reducing nitrate leaching into groundwater and surface water and nitrous oxide emissions.
- In livestock agriculture, covering and flaring gases, using anaerobic digesters, or employing grazing, are ways to reduce methane emissions.

Agriculture is also highly dependent on specific climate conditions and, consequently, is sensitive to the effects of climate change. As the climate continues to change, agricultural producers are adapting, and will need to continue to adapt in responding to and rebuilding from disasters as well as adapting their pest, nutrient, and water management, conservation practices, crop rotations and areas of crop production, and crop/livestock management.

The Minnesota Department of Agriculture (MDA) has many resources to help producers reduce GHGs, improve water quality and soil health, and respond and adapt to climate change impacts, which are outlined below.

Minnesota Agricultural Water Quality Certification Program

The Minnesota Agricultural Water Quality Certification Program (MAWQCP) is a voluntary opportunity for farmers to implement conservation practices that protect water, soil, and wildlife, while reducing emissions. The MAWQCP partners with the MPCA and the United States Department of Agriculture (USDA) to quantify estimated greenhouse gas emission reductions from agricultural practices. These range from changing land use and cropping practices to nutrient reduction.

The MAWQCP employs accredited agronomy and conservation professionals that are licensed by the MDA to work directly with farmers to identify opportunities for implementing innovative and cost-effective measures for treating environmental risks within their farming operations, including promoting and tracking adoption of new practices for their GHG mitigation benefits. The MAWQCP further provides direct financial assistance via MDA grants and through exclusive pools of federal funds via USDA-NRCS for MAWQCP-participants.

MAWQCP certification is a process of assessing every land parcel and every crop grown on it for any risks, physical or managerial, on a whole-farm basis. Those who treat all risks will be certified and in turn obtain regulatory certainty for a period of ten years. MAWQCP-certified farms have implemented thousands of new practices, from cover crops to perennial plantings to buffers to nutrient management

to sediment basins to no-till and more. In addition to promoting and tracking adoption of new practices for their GHG mitigation benefits, the MAWQCP has developed special endorsements for certified farms that undertake extra effort to integrate soil health and climate friendly farm practices and management throughout their operations. For applicable practices implemented through MAWQCP-certification, the average emission reduction is 37 tons per practice per year.

Agriculture Best Management Practices Loan Program

The Agriculture Best Management Practices (AgBMP) Loan Program is a water quality program that provides low-interest loans to farmers, rural landowners, and agriculture supply businesses. The purpose is to encourage agricultural Best Management Practices that prevent or reduce runoff from feedlots, farm fields and other pollution problems identified by the county in local water plans. AgBMP Loans can fund a wide range of practices that not only have water quality benefits, but can also reduce GHGs and improve resilience to adverse changes in weather. These include manure management and conservation tillage practices. AgBMP loans can be used in combination with other financial assistance, such as cost-share or grants.

Drainage Water Management

The MDA collaborates with other agencies, local governments, academic institutions, and industry organizations to foster innovation in designing and managing agricultural drainage (removal of excess water from fields through the use of ditches and subsurface pipe), including temporary storage, to maximize benefits and protect the environment.

Sustainable Agriculture Demonstration Grants

Part of the Agricultural Growth, Research, and Innovation (AGRI) Program, grants are awarded to individuals or groups for on-farm sustainable agriculture research or demonstration of practices that promote environmental stewardship and conservation of resources as well as improve profitability and quality of life on farms and in rural areas (see www.mda.state.mn.us/business-dev-loans-grants/agri-sustainable-agriculture-demonstration-grant)

Vegetative Cover Activities

The MDA and other state agencies are also working with the agricultural community and others to promote and implement increased vegetative cover in targeted cropland areas. This includes not only set aside programs such as CRP and RIM, but maintaining productive cropland while incorporating perennial cover such as alfalfa, or cover crops. Minnesota has several projects that are assisting with this effort, including:

- **Vegetative Cover Study**. A recently released study, *Vegetative Cover in Minnesota: Prospects and Challenges*, outlines challenges and opportunities to increase adoption of vegetative cover (see: https://wrl.mnpals.net/islandora/object/WRLrepository%3A3609
- **Forever Green**. A partnership with the University of Minnesota's Forever Green Initiative for research and development of new high-value commodity crops and cropping systems (cover and

perennial crops) and to support development of new supply chains that provide profitable markets for these crops.
https://www.mda.state.mn.us/protecting/cleanwaterfund/forevergreen

- **Cover crop research**. Research activities on cover crops are intended to provide information leading to increased adoption (see www.mda.state.mn.us/environment-sustainability/clean-water-research-program).

Nitrogen Management Activities

Programs to address nitrogen in groundwater also help reduce nitrous oxide emissions to the atmosphere.

- **Nitrogen Fertilizer Management Plan and Groundwater Protection Rule**. The MDA implemented the Nitrogen Fertilizer Management Plan, which is MDA's blueprint for addressing nitrate in groundwater, which can also lead to nitrous oxide reductions. NFMP activities include working with local advisory teams of farmers and agricultural advisors, and others to discuss and implement nitrogen fertilizer BMPs. In addition, Minnesota has adopted a Groundwater Protection Rule to address nitrate in groundwater from nitrogen fertilizer (see www.mda.state.mn.us/pesticide-fertilizer/minnesota-nitrogen-fertilizer-management-plan).
- **Other nitrogen management activities**. The MDA is working with farmers on several on-farm initiatives to improve nitrogen management through activities such as the Nutrient Management Initiative, where farmers can try alternative nitrogen management practices that may improve yields, save money, and reduce runoff and emissions (See www.mda.state.mn.us/environment-sustainability/farm-projects).

Renewable Energy and Bioproducts Programs

The MDA works to promote biofuels and bioproducts to add value to agricultural and forest products. It provides information about ethanol, biodiesel, and other biodiesels and periodically offers grants for equipment and infrastructure.

- Recently, the MDA released a report on recommendations from the Governor's Council on Biofuels (see www.mda.state.mn.us/environment-sustainability/governors-council-biofuels), intended to accelerate achievement of Minnesota's petroleum replacement and GHG goals.
- The AGRI Bio-incentive Program encourages commercial-scale production of advanced biofuels, renewable chemicals, and biomass thermal energy through production incentive payments (see www.mda.state.mn.us/environment-sustainability/agri-bioincentive-program).

Programs to Address Methane Emissions

Several MDA programs meant to address water quality concerns, soil health, manure management, and providing farmers with value-added economic opportunities, can also be used to help reduce methane emissions. These include:

- **Methane Digester Loan Program.** The MDA developed the Methane Digester Loan Program in 1998 to help supplement the funds needed for livestock producers in Minnesota to begin installing digesters on their farms. These are no-interest loans of up to $250,000 (see www.mda.state.mn.us/methane-digester-loan-program).
- **AGRI Livestock Investment Grant.** The AGRI Livestock Investment Grant encourages long-term industry development for Minnesota livestock farmers and ranchers by helping them improve, update, and modernize their livestock operation infrastructure and equipment. Methane digesters and manure lagoon covers are eligible.
- **Cropland Grazing Exchange.** The Cropland Grazing Exchange (CGE) matches livestock farmers with crop farmers who have forage (crop residues, cover crops, etc.) to harvest. The MDA partnered with the USDA Natural Resources Conservation Service and the Sustainable Farming Association of Minnesota to develop this tool.

Assistance related to extreme weather events

The MDA offers assistance to producers who are experiencing damage and losses to crops, livestock, and structures; potential water, soil, food, or other contamination, and other catastrophic events that can result from climate change. The MDA webpage, Food and Ag Emergency Response (www.mda.state.mn.us/food-ag-emergency-response) provides comprehensive information on MDA's and other agencies' resources.

- **Disaster Recovery Loan Program**. These funds are available at 0% interest to farmers for expenses not covered by insurance, including clean up, repair, or replacement of farm structures and septic and water systems, as well as replacement of seed, other crop inputs, feed, and livestock, when damaged by high winds, hail, tornado, floods, or excessive rainfall. www.mda.state.mn.us/disasterloan
- **Agricultural Improvement Loan Program**. This loan program can provide 3.25% financing for buildings that have been lost to flooding and are being replaced with new buildings. www.mda.state.mn.us/agricultural-improvement-loan-program
- **Restructure II Loan Program**: Farmers can use this loan program to refinance their debt at 3.50%, providing them with funds to help repair flood damage of an agricultural nature. www.mda.state.mn.us/restructure-ii-loan-program
- **Livestock Investment Grant Program**. Producers who suffer a loss due to adverse conditions may apply for these funds to help cover up to 10% of the cost for the purchase, construction, or improvement of buildings or facilities for the production of livestock, and the purchase of fencing as well as feeding and waste management equipment. www.mda.state.mn.us/business-dev-loans-grants/agri-livestock-investment-grant
- **24-hour Agricultural Chemical Emergency Response**. All new reports of incidents are directed to the MDA emergency response (spills) team, which is responsible for directing and assisting with the response and cleanup of emergency incidents. www.mda.state.mn.us/pesticide-fertilizer/emergency-spill-response

- **Agricultural Chemical Response and Reimbursement Account (ACRRA)**. ACRRA reimburses costs incurred in cleaning up agricultural chemical (pesticide and fertilizer) incidents. www.mda.state.mn.us/grants/disaster/acrra
- **Emergency Response to Ammonia Spills website**. This site is designed as an educational aid for those who respond to, prepare for, or who will be in charge when a spill of anhydrous ammonia occurs. www.mda.state.mn.us/pesticide-fertilizer/emergency-response-anhydrous-ammonia-releases-spills
- **Minnesota Farm Advocates**: Farm Advocates provide one-on-one assistance for Minnesota farmers who face crisis caused by either a natural disaster or financial problems. www.mda.state.mn.us/about/commissionersoffice/farmadvocates

Preventing and Managing Pests and Disease

As invasive insects, diseases, and weeds and other pests increase, the MDA has resources focused on them. Climate change may compound these stresses on crops grown in Minnesota. Programs include:

- **Arrest the Pest**. An MDA program for reporting invasive or noxious plants, pests, or diseases that relies on Minnesota residents acting as volunteers to report potential threats to Minnesota's forests and crops(see www.mda.state.mn.us/plants-insects/arrest-pest).
- **Integrated Pest Management (IPM) Program**: The IPM Program develops and implements statewide strategies for the increased use of IPM to manage established pests on private and state managed lands. www.mda.state.mn.us/pesticide-fertilizer/integrated-pest-management
- **Noxious and Invasive Weed Program**: The Noxious and Invasive Weed Team works with the Minnesota Noxious Weed Advisory Board, local governments and landowners to protect the environment, public health, public roads, crops, livestock, or other property in Minnesota from the injurious impacts of noxious and invasive weeds. The Noxious Weed Advisory Committee represents a wide range of agencies and organizations. This committee advises the Commissioner of Agriculture about plant species regulation, weed management and implementation of Minnesota's Noxious Weed Law. Enforcement of the Noxious Weed Law is a shared responsibility with local governments (see www.mda.state.mn.us/plants-insects/noxious-invasive-weed-program).

Appendix C: Minnesota Department of Commerce

The Minnesota Department of Commerce plays a significant role in making Minnesota more resilient to the threats posed by our changing climate as well as lowering the carbon footprint of Minnesota's Energy sector and contributing towards climate mitigation.

Climate Mitigation

In the area of climate mitigation, Commerce helps the Public Utilities Commission regulate the state's electric and gas utilities, to ensure they maintain reasonable rates, reliability of supply, and achieve state's environmental goals, including reducing carbon emissions. In addition, Commerce is engaged in the following areas

Legislative

- Commerce will work to pass Energy Optimization, Clean Energy First, and the 100% Carbon Free Energy Standard.
- Commerce will evaluate and assess opportunities and policy proposals for utilities serving Minnesota customers to reduce electric-sector greenhouse gas emissions, such as through economic commitment and seasonal dispatch of coal plants.

Energy Conservation

Ensures effective implementation and achievement of 1.5% annual electric and 1.0% annual natural gas energy savings goals by administering the Conservation Improvement Program.

Ensures successful implementation of existing electric utility resource plans.

Renewable Energy

- Commerce has led efforts to enable the state to meet its the statutory goal of having 25% of Minnesota's entire electricity supply come from renewable energy by 2020, five years ahead of target in 2025.
- In recognition of the above achievement, Commerce is advocating for expanding the renewable electricity standard to 40% by 2025 and 55% by 2035.
- Commerce works with the Legislature to ensure effective spending of the Renewable Development Account.
- Commerce convenes studies on important topics for renewable energy integration such as grid scale energy storage.
- Commerce works with utilities to build sufficient EV infrastructure to support the electrification of State of Minnesota fleet vehicles.

Equity

- Commerce is working on expanding participation of tribal governments and tribal members in Commerce services in collaboration with sovereign tribal governments.
- Energy Assistance will target bill payment assistance benefits according to household income and heating costs.
- Energy Assistance will reduce inequity in rates of service by geography, race, or ethnicity, through outreach, community engagement, online access to services, and reduced administrative barriers.
- Commerce will evaluate and advocate for energy services that are affordable, reliable and sustainable.

Climate Adaptation

In the area of climate adaptation, Commerce maintains the state's energy emergency plan, coordinates with Minnesota's utilities on restoration of service during or after emergencies, including weather-induced outages, and deploys a Consumer Response Team to assist with disaster recovery situations through its Insurance Division. Commerce has been actively collaborating with the National Association of Insurance Commissioners to survey Minnesota insurance companies on their preparation for climate change.

Commerce serves as the lead entity to coordinate resources and information among state agencies that have responsibilities for matters related to energy. Climate adaptation-related activities of the department include:

Energy reliability

- Model long-term energy needs under changing economic and environmental conditions, including changes in climate.
- Monitor utilities' generation, transmission and distribution plans to assure that energy reliability is maintained.
- Coordinate activities with regional and federal agencies responsible for assuring reliability in the electricity sector, such as the Midwest Independent System Operator (MISO), the Midwest Reliability Organization, and the North American Electric Reliability Organization.
- Monitor supplies of liquid fuels (petroleum, biofuels) to assure that adequate supplies are maintained.

Energy emergency planning

- Create in-house expertise at the state level on energy assurance planning and resiliency, focusing on critical infrastructure interdependencies, cyber security, energy supply systems, energy data analysis, and communications. Commerce has staff working in energy assurance planning and Certified Emergency Management.

- Coordinate Minnesota's utilities on restoration of utility service during or after a weather-related emergency.
- Refine the existing Energy Assurance Plan to incorporate response actions to new energy portfolios.
- Smart Grid technologies, cyber security, and emerging energy issues, gather data on delivered fuels and update contact lists.
- Revise appropriate state policies, procedures, and practices to reflect the Energy Assurance Plan.
- Develop and initiate processes or mechanisms for tracking the duration, response, restoration, and recovery time of energy supply disruption events.
- Train appropriate personnel on energy infrastructure and supply systems and the content and execution of the Energy Assurance Plan.
- Conduct and/or participate in energy emergency exercises (intra- and interstate) to evaluate the effectiveness of the Energy Assurance Plan.

Consumer response team

- Distribute information, answer questions, and work with insurance companies on claims.
- Help individuals make informed decisions after a storm damages a home, vehicle, or property.

Planning and data analysis

- Coordinate with the MPCA to produce a report on greenhouse gas emission trends every two years.
- Evaluate impacts of climate change on insurance investments through participation on the National Association of Insurance Commissioners' Climate Change and Global Warming Working Group.
- Board representative to "Under 2 MOU" — Subnational Global Climate Leadership Memorandum of Understanding: The parties agree to share information and experience on redesign of the power supply and grid, technical solutions, and advances in promoting large-scale switch to renewable energy and the integration of renewable energy sources, actions needed to ensure security of supply, and strategies to promote energy efficiency.

Energy efficiency and renewable energy

- Administer the federal Weatherization Assistance Program to help low-income families make their homes energy efficient, which can increase adaptation to extreme temperatures.

- Ensure that electric and natural gas utilities offer cost-effective energy efficiency programs for their customers with a goal of reducing electric usage by 1.5% annually, which can help to address peak electric loads in periods of extreme heat.
- New state initiatives such as the Commerce-administered Made in Minnesota Solar Energy Incentive Program and Xcel Energy's community solar garden program are expanding solar businesses in Minnesota and creating local jobs.
- Participate in Department of Labor and Industry's Advisory committee that adopted new energy codes for Minnesota in 2015.

Appendix D: Department of Employment and Economic Development

Community Energy Transition Grant Program; Office of Community Finance

Minnesota utility companies are shifting away from fossil fuel energy sources to help mitigate climate change. This transition may include closing existing electric generating plants powered by coal, nuclear energy, or natural gas. However, these plant closures have the potential to cause severe social and economic impacts to local communities. The program is designed to help assist communities with the economic dislocation associated with closing local plants. These grants help communities by researching, planning, and implementing activities designed to assist workers find new employment, increase opportunities to offset tax base loss from the closing plant, and develop alternative strategies to attract new employees to the community.

https://mn.gov/deed/government/financial-assistance/community-funding/community-energy.jsp

Brownfield's and Redevelopment, Office of Community Finance

DEED also administers several programs related to the Redevelopment of Brownfields. Brownfields are properties where a past use hinders redevelopment because of the real or potential threats of contamination. According to the MPCA's *Benefits of Brownfield Redevelopment* report, some of the benefits of Brownfield cleanup include: improving neighborhood connectivity and public health, decreasing energy consumption and carbon emissions, reserving carbon-sequestering green spaces, and growing local economies by supporting new residences and business opportunities. DEED's programs help support these efforts by providing financing for contamination cleanup and redevelopment of these sites which ultimately create jobs, increase property values and local tax base, and provide housing opportunities for communities.

https://mn.gov/deed/government/financial-assistance/cleanup/

Minnesota Investment Fund (MIF), Office of Business Finance

DEED administers the MIF program which provides up to $1 million in financing to businesses to help add new workers and retain high-quality jobs. The program focuses on industrial, manufacturing and technology-related industries and aims to increase the local and state tax base and improve economic vitality. MIF assists with capital costs for development and within the MIF statute, eligible projects may include those that "promotes or advances the green economy." Among eligible activities, MIF can "fund strategic investments in renewable energy market development, such as low interest loans for renewable energy equipment manufacturing, training grants to support renewable energy workforce, development of a renewable energy supply chain that represents and strengthens the industry throughout the state, and external marketing to garner more national and international investment into Minnesota's renewable sector." https://mn.gov/deed/business/financing-business/deed-programs/mif/

Data Tools, Economic and Labor Market Research Office

DEED has been a consistent partner with other state agencies in providing information related to climate change. DEED has been involved in several research projects such as the development and design of EQB's first environment and energy report card in 2012 with subsequent updates, working with a consultant to conduct the economic modeling for the 2016 Climate Solutions and Economic Opportunities report and participated on the interagency environment and climate team.
https://mn.gov/deed/data/

Appendix E: Minnesota Environmental Quality Board

The Environmental Quality Board (EQB or Board) is a forum for leadership and coordination across Minnesota state agencies on priority environmental issues that are interdisciplinary and cross-jurisdictional. EQB also oversees the state's Environmental Review Program and serves as a locus for public engagement. The Board is made up of the heads of nine state agencies and eight public members, one from each of Minnesota's congressional districts. EQB's current work plan includes projects and initiatives that address climate change adaptation and mitigation.

The EQB's mission is to enhance Minnesota's environmental quality for current and future generations by leading interagency work to advance meaningful public engagement and facilitate informed decision-making on critical environmental issues.

Public Board Meetings

The EQB holds monthly public board meetings to have regular discussions across state leadership and with the public about the direction of emerging environmental issues in Minnesota. These issues are often directly or indirectly tied to climate change. The EQB values public voice and facilitates public participation through multiple formats. The exchange of ideas and perspectives between the public and Board members helps to develop the shared understanding of complex environmental issues that is a prerequisite for successful action.

Environmental Congress

The Minnesota Environmental Congress happens every two years and is a cornerstone of public dialogue and engagement on the environment. The 2019 Congress focused on climate change – participants learned about climate impacts to Minnesotans, explored ways to apply solutions in their communities, and had an opportunity to hear from and engage with state leadership on climate. This free, day-long conference included sessions on community preparedness, innovative practices in agriculture, transitioning to a low-carbon transportation system, protecting our water resources, and more.

2020 State Water Plan: Water and Climate

The 2020 State Water Plan spotlights actions Minnesota can take to protect our waters from climate change. In order to protect our waters, we must also take decisive action to reduce greenhouse gas emissions to curb the worst effects of climate change. Planning for the future of Minnesota's water must include an honest appraisal of the effects our changing climate is having on this vital resource and how these changes will impact Minnesotans, wildlife, habitat and landscapes across the state. The purpose of the 2020 State Water Plan is to establish a framework for aligning state agencies, legislative priorities, and local government policy, programs and actions for the coming decade. EQB developed this plan to set an agenda for tackling the stubborn and complex water problems that climate change will intensify for Minnesotans. The 2020 Plan has five goals that represent focus areas for Minnesotans

to become more resilient to climate change and prepare for its impacts on water in the coming decade. Each goal contains recommended strategies and actions to achieve it:

- Goal 1: Ensure drinking water is safe and sufficient
- Goal 2: Manage landscapes to protect and improve water quality
- Goal 3: Manage built environment and infrastructure for greater resiliency
- Goal 4: Manage landscapes to hold water and reduce runoff
- Goal 5: Promote resiliency in quality of life

Incorporating Climate Change into Environmental Review Program Requirements

Minnesota's Environmental Review Program provides critical information about potential environmental effects of proposed projects to inform project decision-making and permitting. In response to Executive Order 19-3 and in support of EQB's work plan, the Environmental Review Implementation Subcommittee of the EQB convened a technical team to advise them on improvements to the Environmental Review Program for assessing potential climate effects. The team will identify opportunities to ensure information about climate change is included in project assessments. Assessing a proposed project's potential climate effects can help decision makers identify opportunities to reduce greenhouse gas emissions, improve environmental outcomes, and make more informed climate adaption and resiliency decisions.

Solar on Closed Landfill Study

In 2019, the Minnesota Legislature appropriated funds to the Environmental Quality Board to gain a better understanding of the opportunities and barriers for developing solar on sites in Minnesota's Closed Landfill Program. The EQB, in collaboration with an interagency team, contractor, and stakeholders, completed a technical assessment of the sites and developed a legislative report recommending steps to facilitate solar on closed landfills in a way that aligns with the state's sustainability goals. Facilitating solar development on contaminated sites can reduce development pressure on agricultural and natural lands, generate jobs in clean energy, and help the state achieve its climate goals.

Minnesota Environment and Energy Report Card

EQB's 2019 Minnesota Environment and Energy Report Card provides a snapshot of Minnesota's environment, providing valuable information for the public and policy-makers. The report focuses on five key areas of Minnesota's environment: climate, energy, air, water and land. Each section presents three metrics that help assess the state of the environment. The 2017 report card set a baseline for energy and environmental metrics. The current report card shows mixed results. For many indicators, we continue to fall short of goals. Climate change, declining pheasant population, continued reliance on petroleum, nitrate in our groundwater, and a drop in public transit use are all issues that need creative

collaboration to find solutions. There are positive highlights since the 2017 report card. Renewable electricity and household energy use are both metrics that changed from yellow to green in 2019 because the state has achieved 25% renewable electricity production and we continue to make energy efficiency improvements to our homes.

Emerald Ash Borer Report

Minnesota has more than 1 billion ash trees. Most of these are in forests, but 1 in 5 trees in Minnesota communities is ash. Losing these trees poses a serious threat to community and rural forests across the state, and exacerbates the effects of our changing climate. In total, Minnesota ash forest types store approximately 187 million tons of carbon dioxide, mostly in the forest soil. In addition, ash trees provide shade that cut cooling needs, store and clean stormwater, clean local air, provide wildlife habitat, and serve as cultural resources. These benefits help create resilient communities that can adapt to a changing climate, but are lost as EAB kills our trees.

EQB produced the 2019 Emerald Ash Borer Report with an interagency team and provided a list of recommended actions for the state to slow the spread, support communities, manage ash wood material, and lead, engage, and coordinate. Many of the recommended actions lead to reduced greenhouse gas emissions and support the adaptation and resiliency of our ash forest resources.

GreenStep Program

Launched in 2010, Minnesota GreenStep Cities is a voluntary challenge, assistance, and recognition program to help cities achieve their sustainability and quality-of-life goals. This free continuous-improvement program, managed by a public-private partnership (including the MPCA, EQB, and Commerce), is based on 29 sustainability best practices. The program launched a pilot GreenStep Tribal Nations program in 2014 and GreenStep Schools (K-12) launched through the University of Minnesota partnership in 2020. The GreenStep programs tailor actions focused on cost savings and energy use reduction, and encourages civic innovation and equitable outcomes for Minnesotans. As of October 2020, 137 cities and four tribal nations had become members of Minnesota GreenStep.

GreenStep best practice actions include goal setting and creating climate action/adaptation plans; incorporating green infrastructure; reducing energy use in public facilities and working with businesses and residents to reduce theirs; educating youth, residents, and staff on our changing climate and engaging them in planning and actions; and much more.

Appendix F: Minnesota Department of Health

The Minnesota Department of Health (MDH) is responding to the challenges of the climate crisis through a broad range of programs and initiatives. The Minnesota Climate & Health Program, with assistance from the MDH Climate and Health Workgroup (representing programs from across the agency), maintains an ambitious strategic plan to prepare for and respond to climate change and its impacts on public health. MDH's *Minnesota Climate and Health Strategic Plan* contains seven goals, 23 objectives and 60 activities to address the health impacts of climate change in Minnesota. With the Plan reaching its midpoint in 2019, the Program developed a mid-term report to describe the important climate and health work that is happening across MDH: https://www.health.state.mn.us/communities/environment/climate/docs/progressreport.pdf. Some of this work is highlighted in more detail below.

MDH Climate & Health Program

The Minnesota Climate & Health Program (Program) is part of a nation-wide effort, funded by the Centers for Disease Control and Prevention (CDC), to anticipate, prepare for and respond to the public health impacts from climate change. The Program leads efforts for MDH towards addressing the climate crisis through a range of activities relating to education, research and capacity building.

Education

- The Program maintains a website providing information on numerous issues at the intersection of health and climate change: https://www.health.state.mn.us/communities/environment/climate/index.html. The website serves as a communication vehicle with the public and provides access to numerous resources and tools, including training modules on the following: Climate Change and Public Health 101; Extreme Heat Events; Water Quality and Quantity; Air Quality; Mental Health; and Agriculture and Food Security. The Program also maintains an active email list with over 3,700 subscribers and routinely distributes timely and topical information.
- To highlight the personal impact of the climate crisis and connect MDH staff to the public, the Program developed a *Climate & Health Stories* campaign to showcase MDH professionals working on the climate crisis and spark action across disciplines: https://www.health.state.mn.us/communities/environment/climate/story/index.html.
- Recognizing the importance of nurturing the future climate and health workforce, Program staff are committed to mentoring and collaborating with students at all levels, providing them experience in addressing public health challenges related to climate change in Minnesota. Staff have mentored undergraduate, graduate and post-graduate students on numerous projects, such as airborne pollen data analysis for the Twin Cities area, a literature review on mental health strategies for youth impacted by the climate crisis, and a survey of Minnesota physicians and nurses on climate-related beliefs and practice needs.

Research

- Program staff generate original research needed to inform and advance agency actions related to climate change. For example, in 2018 staff collaborated with the Minnesota Office of Climatology and MDH's Drinking Water Protection and Well Management sections to conduct a statewide private well vulnerability study, applying climate projection data to characterize areas of potential health risk from nitrate contamination: https://link.springer.com/article/10.1007%2Fs10584-018-2207-1. In 2019, staff collaborated with University of Minnesota (UMN) researchers to characterize disease burden for Twin Cities residents relating to ambient temperature exposures: https://pubmed.ncbi.nlm.nih.gov/31078861/ and https://pubmed.ncbi.nlm.nih.gov/29637591/.
- Currently, staff are leading a study with professors from St. Scholastica and Macalester Colleges and MDH's Mental Health Promotion program to survey Minnesota mental health providers on their knowledge, attitudes and practices related to climate change impacts on their clients. Staff are also collaborating with UMN professors on an assessment of climate migration, intersections with health, and issues and opportunities for receiving communities across Minnesota. Staff are also in the process of completing a white paper describing results from a national assessment of climate projection data conducted with partners at HGA, an architecture and engineering firm. This assessment describes states and locales that have obtained projection data for their jurisdictions and how they are using these data to inform resiliency and planning strategies with potential lessons learned for Minnesota.

Capacity Building

- In collaboration with experts at the UMN U-Spatial lab, the Program developed and released a Heat Vulnerability in Minnesota Tool, which is an interactive website designed to help assess community vulnerability to extreme heat with an emphasis on health impacts and marginalized populations. Partnering with St. Paul — Ramsey County Public Health, the tool was also used to develop a model heat vulnerability assessment for Ramsey County: https://maps.umn.edu/climatehealthtool/heat_app/Heat%20Vulnerability%20Assessment%20Report_Final_11202019.docx.
- In order to share lessons learned and advance use of climate projection data by other agencies, MDH staff convened the Minnesota Climate Data Community of Practice. This group has met twice since 2018 and will meet again in early 2021. Participants represent numerous state and local agencies, including public health, natural resources, transportation, emergency management, pollution control, commerce, and planning.
- As a way to help planners in emergency management and related fields understand regional climate trends, Program staff developed climate and health data profiles tailored to each of the six Homeland Security and Emergency Management (HSEM) regions across the state. This resource provides a framework for discussing projected local risks related to our changing climate and supports the development of climate adaptation strategies that protect community health and safety: https://www.health.state.mn.us/communities/environment/climate/data.html. Program staff

are reviewing current State and local All Hazard Mitigation Plans to determine if and how they incorporated information from the profiles and climate projection data.

Sustainability Efforts

MDH has a governance structure for sustainability, including a dedicated Sustainability Coordinator, a Steering Team of decision makers, and a Sustainability Team of interested staff. The Steering Team meets monthly and the Sustainability Team meets quarterly, both with active and growing participation. Below is a list of recent activities and accomplishments.

- **Recycling:** Successfully rolled out an organics recycling program at MDH's Golden Rule Building. This included coordinating communications, securing desk side bins, recruiting and training recycling champions, and collaborating with a team of building managers and waste contractors, consultants, other state agencies, and MDH Facilities Management.
- **Food Waste:** Worked in partnership with MDH's Food, Pools, and Lodging Services and Office of Statewide Health Improvement Initiatives, the Minnesota Pollution Control Agency, and Washington County to develop an information sheet about food waste recovery for donation for food businesses and regulators: https://www.health.state.mn.us/communities/environment/food/docs/fs/reducefoodwaste.pdf .
- **Smaller initiatives:** Increased purchasing of high-yield toner cartridges for individual printers; participated in enterprise-wide 2020 Earth Day planning by developing messages about reducing food waste and tips; assisted with a reusable bag exchange system in the Rochester District Office.
- **Agency's strategic plan on sustainability:** Developed second iteration of the MDH strategic plan on sustainability. The plan will be updated annually.
- **Required reporting:** Gather and submit monthly energy, water, and waste data for all MDH buildings over 5,000 square feet. Information id used in annual report and scorecard.
- **Hosted internship**: Hosted an intern from Macalester College who completed data analysis and a summary of an employee commuter survey; developed a proposal for a pilot project on commuting; drafted messages about food waste for recovery; and prepared messages on topics for the MDH Intranet page on Sustainability.

MDH Environmental Public Health Tracking Program

The Minnesota Environmental Public Health Tracking Program provides environmental and public health surveillance data on a variety of topics related to climate change such as air quality, asthma, chronic obstructive pulmonary disease, drinking water quality, heart attacks, and heat-related illness. Heat-related illness data, for example, are being used to inform efforts to protect vulnerable populations from extreme heat events. Learn more about climate-related data on MDH's data portal: https://data.web.health.state.mn.us/web/mndata/climate-and-health.

MDH Vector-borne Disease Program

MDH's extensive vector-borne disease program performs the following activities that may relate to climate change:

- Monitors the number of cases of each vector-borne disease (e.g., mosquito and tick-transmitted diseases) over time and space within the state.
- Collects field surveillance data (e.g., tick infection prevalence with various disease agents) to determine how vector distribution and infection prevalence changes over time and space.
- Disseminates disease prevention information to the public, medical providers, high-risk groups, and other health agencies.
- Conducts vector-borne disease research. In particular, the program has efforts to describe new or emerging disease agents, changes in endemic disease patterns, and the burden of vector- borne diseases on society.

MDH Asthma Program

The MDH Asthma Program has been involved in a number of activities related to climate change and respiratory/allergic disease.

- Program staff participated in the Council of State and Territorial Epidemiologists (CSTE) Climate Change work group that developed a suite of indicators related to climate change http://www.cste.org/?page=EHIndicatorsClimate, including a pollen indicator that states can use to track changes in the length of pollen seasons, pollen levels, and pollen types over time. Staff currently serve on the CSTE Asthma and Allergy work group that is working to develop a national aeroallergen (pollen and outdoor mold) monitoring network: http://c.ymcdn.com/sites/www.cste.org/resource/resmgr/2016PS/16_EH_01.pdf.
- The program provides technical reviews of materials, including those related to climate change, that reference allergies and asthma.

MDH Emergency Preparedness and Response Section

The MDH Emergency Preparedness and Response section helps prepare public health and healthcare for all types of hazards, including natural disasters and weather-related incidents. The section supports local readiness by:

- Providing tools, resources, and trainings to local public health departments, health care, and other key partners to develop emergency preparedness and response plans.
- Designing, implementing, and evaluating emergency preparedness exercises with partners using severe weather-related scenarios.
- Sharing information, creating situational awareness, coordinating resources, and providing risk communications in times of an emergency.

MDH Drinking Water Protection Section

MDH Drinking Water Protection section staff are actively engaged with their regulated communities, agency partners, and local resource staff in helping to address potential future changes in a manner that protects human health and safeguards our drinking water sources. Specifically, staff provide technical assistance to public water suppliers in planning for source water protection; evaluating and developing a contingency strategy and local response in the event of a water supply disruption; conducting assessment and monitoring of water quality; and supporting implementation of surface water intake and wellhead protection plans. These activities will result in better preparation, adaptation, and resiliency to the impacts of climate change on drinking water supplies.

About 80% of Minnesotans are provided with drinking water in their homes by a public water supply. MDH partners with public water suppliers to ensure safe and sufficient drinking water through a series of strategic safeguards. Water treatment challenges arising from climate change include water quality changes (algal-related taste and odor issues) that require increased use of granular/power activated carbon and increased levels of total organic carbon due to extreme flows, drought, and runoff. MDH provides technical assistance to public water suppliers in order to increase their technical, financial, and administrative capacity to manage change. MDH fosters resiliency in public water systems by supporting the work of the Minnesota Water/Wastewater Agency Response Network and by providing training on emergency preparedness and incident response. MDH also encourages the development of green water infrastructure by awarding grant money through the State Drinking Water Revolving Fund Loan program.

In 2016, MDH developed the agency-wide *Minnesota Climate and Health Strategic Plan* to increase statewide resilience and public health preparedness. A number of important drinking water strategies were identified to help public water suppliers and private well owners evaluate and prepare for potential impacts of climate change based on potential regional and local conditions. MDH Drinking Water Protection staff have formed and developed a Climate Change Adaptation Team and charter to help carry out and implement specific strategies to protect public sources of drinking water from the potential impacts of climate change.

Appendix G: Minnesota Housing Finance Agency

Minnesota Housing is the state's housing finance agency. For more than 45 years, we've worked to provide access to safe, decent and affordable housing and to build stronger communities across the state. In 2019, we invested $1.42 billion and assisted more than 68,900 households.

Minnesota Housing finances housing to improve all areas of life. Everyone wants a home they can afford in a community of their choice because it provides the foundation for success, supporting educational achievement, stable employment, health and prosperity. The housing needs of Minnesotans are significant and reach every corner of the State and Minnesota Housing works to support individuals, families, and communities. We are recognized as one of the leading housing finance agencies in the country and provide a wide range of effective programs.

We provide a wide continuum of tools for financing affordable housing and related services, ranging from grants for homelessness prevention and rental assistance to mortgages for home purchase and improvements. Three programs account for a majority of the 2020-21 program investment plan:

- Home Mortgage Loans will provide about $2 billion in mortgage loans and support an estimated 5,130 homebuyers in each year of the two years.
- Rental Assistance Contract Administration will provide about $374 million of federal project-based rental assistance to annually support about 30,000 of the state's lowest income households. With this assistance, households generally spend no more than 30% of their income on rent and utilities.
- Low-Income Housing Tax Credits is our primary program for developing and rehabilitating affordable rental housing. The $23 million of 9% credits that we expect to receive from the federal government will generate an estimated $200 million in private equity and leverage other financial resources to construct or rehabilitate roughly 650 units of affordable rental housing in each of the next two years.

Societal challenges such as climate change involve complex interactions across issues and sectors, and we need cross-sector solutions. Sustainable housing that utilizes both energy efficiency and clean energy solutions plays a key role in mitigating climate change, improving Minnesota's environment, reducing utility bills for residents, and providing a healthier place to live. As such, Minnesota Housing is:

- Actively participating in the Governor's Subcabinet and working to develop a more comprehensive climate strategy for Minnesota Housing
- Enhancing our existing sustainability standards for the homes and multifamily buildings we finance, which are primarily based on Enterprise Green Communities, to promote the development and rehabilitation of sustainable and resilient homes
- Working with our asset management team to continue providing sustainability education and supporting owners, managers and residents of existing buildings
- Assessing our work with an environmental justice lens, finding equitable housing solutions to minimize the impact of climate change on the most vulnerable populations

- Leveraging all available resources, such as utility incentives, city-based sustainability programs, and other partnerships
- Prioritizing health, safety and energy improvements with a number of our development and lending programs.

Appendix H: Minnesota Department of Labor and Industry

Operating and maintaining buildings involves the consumption of large amounts of energy. In 2017, Minnesota's building sector consumed 40.6% of the total energy consumed in the state, 19.5% of which was from within the commercial buildings sector, including large multifamily buildings. Minnesota is currently not on track to meet statutory greenhouse gas reduction goals of 30% reduction from 2005 levels by 2025 and 80% reduction by 2050. Efficiency in the building sector is a key contributor to meeting these goals.

The Minnesota Department of Labor and Industry regulates the construction of buildings through the State Building Code, ensuring residents have safe, energy efficient, and accessible buildings. The code applies to new residential and commercial building construction, as well as building alterations, repairs, and changes of occupancy. Minnesota law requires the State Building Code to conform as much as possible to model building codes. The agency reviews and comments on national model building codes to ensure that codes incorporated into the State Building Code are consistent with statutory standards, fit our climate zones and geographies, and achieve public safety, health, and general welfare goals.

Minnesota is obligated to review and adopt a new commercial energy code when recommended by the U.S. Department of Energy, and review and consider adopting model residential energy codes when available. Model energy codes regulate energy conservation requirements and contain design and construction standards regarding heating and ventilation, lighting, and climate control. On March 31, 2020, Minnesota adopted the 2018 International Energy Conservation Code for commercial and multifamily buildings. Buildings constructed under this new commercial energy code will be 16% more energy efficient and use 52% less energy than buildings constructed to the requirements of 1976 code. The agency adopted the 2012 International Energy Conservation Code for residential buildings in 2015. Residential provisions accounted for a 30% increase in energy efficiency over the previous residential energy code. Energy savings for future model energy codes are unknown at this time.

While the agency has adopted codes that improve energy efficiency in buildings, given the pressing demands of climate change, the Departments of Labor and Industry and Commerce convened a stakeholder workgroup in the fall of 2019 and spring of 2020 to evaluate policy options that would improve energy efficiency in commercial and multifamily buildings. The workgroup considered incentives, benchmarking, advanced energy building standards for municipalities, and statewide energy code changes as possible tools to achieve improved building energy performance. In evaluating the policies, the workgroup considered how to minimize costs, complexity, and ensure compliance.

Through the workgroup process, the Departments concluded that improving building energy efficiency would have a greater energy savings impact if code improvements were adopted and enforced statewide in the base energy code. The Departments recommended the current statewide commercial energy code be advanced and accelerated such that it achieves net zero by 2036. A net-zero building is a building with greatly reduced energy needs. In this type of building, efficiency gains have been made such that the balance of energy needs can be supplied with renewable energy technologies.

Labor and Industry will continue to work to minimize greenhouse gas emissions from new and remodeled commercial and residential buildings. This will be accomplished through:

- Evaluation of national code provisions, attendance at appropriate International Code Council code hearings, energy code development and education;
- Assistance to municipalities in their administration of the state building code;
- Education and training for building officials, inspectors, design professionals, and construction industry personnel
- The agency commits to partner with other agencies, local governments, and stakeholders to ensure buildings are energy efficient and resilient to climate change.

Appendix I: Minnesota Management and Budget

As a central service agency with an enterprise focus, Minnesota Management and Budget (MMB) plays an important role in supporting the Governor's One Minnesota plan and its priorities and in helping its partners meet their missions and goals. MMB works to ensure agencies make decisions with the best information, by considering sound research, gathering stakeholder insights, including voices from impacted communities, and soliciting input from trusted experts.

From financial activities to operations, MMB keeps Minnesota's environment at the forefront of its work in several areas. In addition to participating in the Subcabinet, MMB:

- Supports state agencies in analytically summarizing progress toward statutory greenhouse gas reduction goals and assessing options for achieving further progress.
- Facilitates quarterly reviews by the Governor's Office of progress toward statutory greenhouse gas reduction goals.
- Collects information related to estimated greenhouse gas emission reductions associated with relevant budget proposals.
- Evaluates and recommends appropriate financing mechanisms to deliver more energy efficient infrastructure, including electric vehicle charging stations, contaminated sites clean-up, and integration of renewable energy at project sites, as well as helping meet the goals of Executive Order 19-25.
- Contributes to statewide efforts aimed at reducing greenhouse gas emissions, such as through expanding opportunities for e-commerce across the enterprise.
- Prioritizes efforts to reduce consumption and targets sustainability in all areas of agency operations pursuant to Executive Order 19-27.

Appendix J: Metropolitan Council

Climate mitigation, adaptation, and resilience planning and implementation is occurring at all divisions of the Metropolitan Council (Council), including those providing organizational leadership and regional planning and technical assistance, as well as those delivering operations and services, like Metro Transit, Metro Mobility, and Environmental Services (MCES). The sections below provide a select overview of activities that the Council is currently undertaking or will embark upon soon. This is not meant to be an exhaustive list, but rather highlight major initiatives across the Council.

Council-wide Activities

Based on outcomes from *Thrive MSP 2040* — the Council's 25-year regional vision — the Council established an Implementation Work Group on Climate Change and Emissions Team (CCET). CCET's goals include coordinating across the Council; developing and improving environmentally sustainable plans, policies, and procedures (including resiliency and climate adaptation); leading by example in the Council's operations; and helping metropolitan area communities and others improve their environmental footprint and sustainability. This team is also leading the development of an agency-wide climate action and resilience plan intended to streamline, accelerate, and coordinate the Council's climate mitigation, adaptation, and resilience work across the agency. Key objectives of this plan include:

- Developing emissions and infrastructure targets and goals for Council wastewater, transit, and general operations, such as resource recovery, energy consumption, and treatment capacity.
- Developing direction and strategies integrating the Council's climate related research and analysis to support future regional planning efforts.
- Integrating climate adaptation goals and strategies into the Council's operations, infrastructure investments, and regional planning principles.
- Identifying and implementing actions for meeting and exceeding air and water quality standards.
- Researching the role of the regional parks and open space system in mitigating climate change and contributing to a more resilient region.

The team has initiated this work, with the majority of the activity and planning to occur in 2021.

Green Partnership with Xcel Energy

The Council is one of the top 10 electrical consumers in the state. As part of our commitment to reduce greenhouse gas emissions, the Council has partnered with Xcel Energy to purchase 100% renewable energy by 2040 for our day-to-day operations in Environmental Services and Metro Transit. We expect the purchase of renewable energy to not only have a reduction in our overall greenhouse gas emissions, but also to have a cost savings for our operations and our customers. In total, the Council purchases about 245,000 MWh of electricity every year – enough to power 25,000 homes in Minnesota. In recent years, the Council has pursued significant investments in advancing solar and self-generation technology

to recapture and utilize heat and other biproducts of our wastewater treatment processes. This partnership with Xcel is one more step toward a cleaner energy future.

Community Development

Metropolitan Council's Community Development division provides resources for communities working to integrate climate adaptation strategies into local comprehensive plans. *Thrive MSP 2040*, the Council's 25-year regional vision, (https://metrocouncil.org/Planning/Projects/Thrive-2040/Thrive-MSP-2040-Plan.aspx?source=child) encourages climate change mitigation adaptation to be part of comprehensive plan updates, which are required of all cities, counties, and townships within the seven-county metropolitan every 10 years. The Council will be reporting out on how local plans incorporated climate mitigation, adaptation, and resilience in the coming year.

The Community Development Division is developing a regional greenhouse gas emissions tool that will inventory GHG emissions at a municipal level, as well as provide a scenario planning tool to aid local governments in selecting actions to mitigate GHG emissions. This inventory and planning tool will provide a baseline for local and regional government planning, as well as a method for ongoing monitoring of emissions and actions taken locally to limit emissions.

The Community Development division has also completed a Climate Vulnerability Assessment, which evaluates the climate hazards of localized flooding and extreme heat on regional assets. The division has also collaborated with a University of Minnesota capstone class to complete a Social Climate Vulnerability Assessment for the same two climate hazards.

The Metropolitan Council achieved a Gold designation from the national SolSmart program for making it faster, easier, and more affordable for homes and businesses to go solar across the region. The Council's Gold designation highlights the organization's achievements in expanding solar across the region, such as by offering resources and technical assistance on solar planning, and market development and finance. The Council continues to advise communities on solar, including 26 municipalities that have achieved or are on the pathway to achieving SolSmart designation, meaning that they are meeting standards for incorporating national solar energy best practices into their planning and permitting processes to become solar-ready communities. These communities represent 1.5 million residents in the region.

Through the Council's Metropolitan Housing and Redevelopment Authority, the Community Development division launched the Solar for Vouchers program. This program provides technical assistance to help multi-family rental property owners to install solar panels and reduce their energy costs. Property owners can take advantage of the savings resulting from this technical assistance in exchange for a commitment to rent some of their units at market rates to Section 8 Housing Choice Voucher program participants. Still in the early phases after program launch, the Council staff will continue to monitor the progress of this first year of the program and evaluate outcomes in the coming year.

Environmental Services

Metropolitan Council Environmental Services (MCES) provides wastewater services and integrated planning to ensure sustainable water quality and water supply for the metropolitan region. MCES

operates seven wastewater treatment plants (WWTPs) and one water reclamation facility (WRF), which treat over 200 million gallons of sewage per day. Multiple climate adaptation strategies are being implemented throughout MCES, including the Inflow and Infiltration Reduction Program, Flood Response and Mitigation, and Infrastructure Rehabilitation.

Inflow and Infiltration Reduction Program

Inflow and Infiltration (I/I) are separate and related challenges that allow clear water from stormwater and groundwater to enter the wastewater system, increasing base flow and peak flow delivered to WWTPs and resulting in costly and unnecessary expansion of pipes and WWTP capacity. I/I volumes are affected by increased precipitation and storm intensities. I/I can cause excessive flows, leading to untreated sewage discharges to basements or waterways that endanger public and environmental health.

Previous studies of the MCES system indicate that up to 20% of the annual wastewater flow is from I/I. Reduction of the base flow from I/I preserves system capacity for growth and allows for surface water to recharge the region's aquifers. (https://metrocouncil.org/Wastewater-Water/Planning/Wastewater/Inflow-and-Infiltration.aspx)

The Council has reported on I/I in the region in the past and on a regular basis, as this issue continues to be an important component of both adapting to changing rainfall amounts in the region, as well as preserving system capacity This work is on-going and ever important given the changing climate and the continued population growth in the region.

Flood response and mitigation

To meet our customer level of service commitment to all our customers (municipalities, industries, and watershed districts and management areas) Environmental Services operates, maintains, and plans the wastewater system in ways that allow us to adjust to the changing climate. We do this through:

- Maintaining/executing flood management plans for each of our facilities to ensure our level of service commitment despite the rising water levels around our facilities. Last spring is a good example of how we executed on our flood management plans and continued to meet our service commitment to our customers.
- Our interceptor renewal program with a goal of ensuring all our inceptor pipes are in good or higher condition. We have long-term plans established to ensure we meet this goal.
- Stormwater best management practices at our facilities allows us to manage differing levels of precipitation we receive throughout the year and over the years. We are able to prevent flooding and runoff from our sites which helps to protect our assets and the natural resources around our facilities.

Environmental Services also has developed tools and resources to support our operations and the region in adjusting to the changing climate in our region. A couple that the Council has reported on previously include our inflow and infiltration grants and our stormwater grants that are available to our customers throughout the region. The Council also works very closely with watershed districts and local governments to provide recommendations and professional expertise to advance their implementation of stormwater practices in their jurisdictions.

Emissions and energy reduction, and energy recovery

The Council's *2040 Water Resources Policy Plan* articulates strategies for the Council to reduce emissions, conserve energy, recover energy from generated from processes, and to expand utilization of renewable energy. The use of emissions controls to allowed Environmental Services to reduce emissions at and below what is required by applicable regulations, while achieving full system optimization at our wastewater treatment facilities. Further, staff have also worked on optimizing processes to mete permit and operational requirements and reduce energy use. Environmental Services also recovers energy that is generated through our processes – steam, digester gas, heat from effluent.

Metro Transit

Metro Transit provides an integrated network of buses, light rail, and commuter trains, as well as resources for those who carpool, vanpool, walk, or bike in the metropolitan area. Like Environmental Services, Metro Transit has also employed building optimization strategies across its facilities to reduce energy use. While specific emissions targets and strategies will be further detailed in the agency-wide climate action and resilience plan discussed above, some strategies that are currently underway are described below.

Bus Electrification

Metro Transit currently has 133 hybrid and eight batter electric buses. Hybrid buses were introduced in 2002 and now comprise about 15% of the fleet. These buses have about 25% better fuel economy than standard buses, operate very quietly, and recharge the battery when braking. Metro Transit piloted the eight electric buses, with no tailpipe emissions, with the launch of the METRO C Line. and has been testing the technology in Minnesota's cold weather environment. Metro Transit has more recently been developing a $100 million partnership with Xcel Energy for Bus Electrification. This new Partnership would present the opportunity to accelerate Metro Transit's plan to expand electrification efforts to other routes in the region. Metro Transit will develop a bus electrification plan as part of this partnership.

Adaptation in Route Planning

Through our continuity of operations planning, Metro Transit has focused on the creation and implementation of route- and facility-specific plans to ensure recovery and resumption of disrupted transit operations for many situations, ranging from natural hazards such as flooding to human-caused disruptions such as protests. Metro Transit has used updated information in the Council's climate vulnerability assessment to establish alternative routes during periods of localized flooding. These alternative routes are included in the business continuity plans.

Appendix K: Minnesota Department of Natural Resources

Department of Natural Resources' (DNR) climate efforts fall into three general categories:

1. Tracking and sharing data and information about climate trends and impacts.
2. Mitigating climate impacts through flood damage reduction grants, reduced greenhouse gas (GHG) emissions in our operations, and maintaining and increasing carbon sequestration on state-managed lands.
3. Enhancing climate resiliency and adaptation of communities and natural systems.

We are also participating on three of the five Climate Action Teams supporting the Subcabinet and the executive order.

Tracking and Sharing Data

State Climatology Office

DNR climatologists serve as the state's subject matter experts on Minnesota's changing climate, delivering over 100 in-person and remote presentations in 2019 and 2020, reaching thousands of Minnesotans during that time. DNR climatologists also contributed data, graphics, analyses, and written content to dozens of public-facing documents, web pages, and assessment reports, as well as to various stakeholders in state and local governments.

In 2019-20, DNR shared its climate and climate change expertise with Minnesota cities, towns, counties, tribes, community leaders, policy-makers, resource managers, and business leaders, and engaged a cross-section of economic sectors including agriculture, forestry, transportation, technology, manufacturing, outdoor recreation, new media, and government.

Communication efforts

DNR has a responsibility to provide accurate, scientific climate change information to help public agencies at all levels of government, the private sector, and all Minnesotans understand and adapt to climate change. DNR staff routinely respond to requests for information from the public, the media, and other state agencies. In addition, the agency maintains a public website about climate change in Minnesota that provides:

- Information about Minnesota's climate trends and how climate change is impacting wildlife, plants, waters, historic resources, infrastructure, and available outdoor recreation activities in Minnesota.
- An interactive tool – called Minnesota Climate Trends – for summarizing observed precipitation and temperature trends in Minnesota.
- Examples of adaptation and mitigation strategies the DNR is employing in our day-to-day work.

In 2020, DNR initiated a project to provide access to future climate scenarios in Minnesota through a simple, user-friendly web portal. The web portal will make locally relevant climate projection data – which is essential for climate adaptation planning – publicly available for Minnesota for the first time. The target completion date for this project is June 30, 2021.

Mitigating climate impacts

Greenhouse gas emission reductions (operations)

DNR has been tracking and reducing GHG emissions generated by the use and operation of fleet vehicles and facilities for several years. In FY19, operational GHG emissions were 20,562 million tons of carbon dioxide equivalents ($MTC0_2e$). Emission reductions are currently exceeding the targets set forth in the NextGen Energy Act and EO 19-27. Between 2010 and 2019, DNR reduced its documented GHG emissions 2019 by 28%. Reductions from the 2005 baseline estimated by the Office of Enterprise Sustainability are 56%.

DNR continues to implement a range of incremental strategies to reduce GHG emissions in both fleet and facilities. DNR is updating internal policies to reflect long-term goals and strategies included in EO 19-27. DNR's actions to reduce operational GHG emissions include both changes in operational practices and physical assets. DNR also installs renewable energy systems when feasible for new and remodeled buildings.

Carbon sequestration on state-managed lands (forests, grasslands, state parks)

DNR is maintain and enhancing carbon sequestration by managing almost all of its 5.5M acres of state land in a naturally vegetated state. DNR's public land asset portfolio includes 46,000 acres of designated old growth forests and the sustainable harvest and regeneration of 30,000 acres of forest on an annual basis.

DNR acquires approximately 12,000 acres per year, increasing carbon sequestration capacity while also maintaining carbon sequestration on forestlands and other high-carbon ecosystems like grasslands/prairies. Monitoring of carbon stock fluxes on state-managed lands will be undertaken in the future so that carbon impacts of management decisions can be measured. DNR also provides technical and financial assistance to private landowners and community and urban forests. The agency is in the process of refining its assistance efforts to better emphasize and support carbon mitigation potential; for example, more than 820,000 acres of private lands have current woodland stewardship plans that could help support and enhance carbon sequestration.

Resiliency and Adaptation

Flood damage reduction grants

The Flood Hazard Mitigation Grant Assistance Program partners with local governments to develop, fund and implement flood risk reduction measures in urban and rural communities such as Afton, Austin, Breckenridge, Moorhead, Thief River Falls, and elsewhere. At-risk structures are removed from flood prone areas, structural works are constructed to protect from flooding, and floodplains restored.

Projects are typically designed and constructed to the 100-year level plus three feet of freeboard to account for uncertainty and future climate conditions, building in resiliency.

Hydrology-related efforts

DNR has been involved in 62 stream channel restorations, 46 dam modifications and 39 dam removals in recent years. Agency involvement varies and can include technical expertise and consultation on design, construction oversight, funding procurement, or project coordination. These types of projects improve the five components of the stream system – hydrology, water quality, geomorphology, biology and connectivity – all of which have links to climate change adaptation and resiliency.

Poorly designed or constructed stream crossings (including bridges, culverts and fords) can have negative impacts to all five components of the stream system. DNR is leading a statewide inventory of stream crossings to identify: 1) how crossings impact streams, 2) which crossings have the most impact, and 3) why the impacts are problematic. DNR has collected a significant amount of inventory data, including data for sites in at least nine major watersheds and three counties. Additionally, DNR has been developing a geomorphic approach to culvert design by incorporating channel and floodplain metrics. This design method will improve fish passage and floodplain connectivity through the culvert, enhancing resiliency to more extreme rain events. Water permitting staff also work with individuals, businesses and local units of government to make sure that bridges, culverts and other infrastructure in public waters is designed and constructed for the type of hydrologic conditions reasonably anticipated with the changing climate.

DNR is also working with ~85 counties and ~850 municipalities and townships around the state that administer floodplain and/or shoreland ordinances to incorporate higher standards that protect the natural beneficial functions of floodplains and near-shore vegetation, and to keep development away from highly sensitive areas such as bluffs, actively eroding riverbanks, and flood-prone areas.

State parks and recreation areas

Strategies being implemented in state parks to increase the ability of Minnesota's natural and cultural resources to withstand the effects of climate change include: improving resiliency, adaptation efforts, and assessments. One example is the ongoing effort to study the rapid change taking place in Nerstrand-Big Woods State Park as a result of more frequent and heavier rainfall. A multi-agency team has been monitoring the site, collecting data, and evaluating management options. One management strategy DNR is testing is planting small plots of tree species that are not generally found in upland Big Woods forests, but that may have a better chance of surviving wetter conditions. Staff have planted several small plots in the flood-damaged areas with silver maple, hackberry, swamp white oak, cottonwood, and disease-resistant elm. The plots will be monitored for five years.

Managing invasive species and conducting prescribed burns in fire-dependent natural communities are examples of activities underway by DNR that enhance natural communities, thereby increasing resiliency by reducing other stressors. Annually, DNR staff accomplish nearly 6,000 acres of prescribed burns and over 11,000 acres of invasive species management to improve and maintain resiliency in state parks.

Finally, the current and future effects of climate change are also being factored into state park and trail development projects. Infrastructure is being designed and built in new and innovative ways to withstand increased use and changing weather patterns.

Biodiversity

DNR has focused land acquisition around connectivity to enhance both the resilience and adaptive capacity of Minnesota's natural communities. Planning and management efforts consider systems level response to climate change in determining things like appropriate species mixes and approaches to invasive species management. Other actions include conversations around ecosystem services that can enhance the state's biodiversity and hydrologic systems while serving to help land use needs such as water infiltration and filtration.

Assisted migration

DNR operational order #124, which establishes minimum standards and procedures for native plant community restoration and reconstruction projects on DNR-administered lands, provides direction for DNR staff utilizing assisted migration to address the impacts of climate change. Assisted migration (the intentional movement of species in response to climate change or other landscape alterations) may be used by DNR staff when there is considerable evidence pointing to the ecological need, as well as evidence clearly suggesting that other adaptation strategies aren't suitable. There are two types of assisted migration:

- *Assisted Movement within Native Range*: the intentional movement of plant materials beyond DNR procurement standards but still within the native range of the species.
- *Assisted Movement Outside Native Range (Range Expansion)*: The intentional movement of plant materials to areas outside of their native range in response to anticipated geographic shifts of suitable climate as a result of climate change.

Preserving Minnesota's biodiversity in an ever-changing climate is an immense task and there is no perfect solution. DNR recognizes the inherent risks associated with implementing assisted migration activities while recognizing that choosing to do nothing also comes with risk. DNR is focused on using foremost research and information in combination with best professional judgment to manage risks, and sustain and improve the overall ecological fitness of Minnesota's natural landscape in the face of climate change.

Reforestation

DNR regenerates more than 30,000 acres of forest annually to a diverse mixture of conifers and hardwood species, some of which are expected to thrive in a warmer and wetter climate. DNR has worked on 45 climate adaptation forestry projects since 2017. Several of these focused on bringing more diversity to ash forests to encourage retention of a forest ecosystem in anticipation that emerald ash borer will ultimately kill the ash trees. Additionally, 29 case studies were initiated or in-progress in 2019 and 2020, with several projects focused on increasing climate-resilient hardwood species such as oak on upland forest sites. A couple projects are exploring tamarack regeneration, a species under threat from a 20-year long outbreak of eastern larch beetle.

Climate Change Subcabinet support

DNR is actively participating at the commissioner, leadership and staff level on the Subcabinet, Senior Leaders Coordinating Team, Communications Team, Engagement Team, Tribal Coordination Team, Legislative Coordination team, and three Action teams (Natural and Working Lands (co-chair), Resiliency

and Adaptation, Green Jobs/Economy). DNR also has an internal, cross-department/functional team whose purpose is to foster agency-wide capacity and collaboration, and provide guidance, coordination and leadership for identifying and implementing climate change mitigation and adaptation strategies.

Appendix L: Minnesota Pollution Control Agency

The MPCA is the chair of the Subcabinet, and is focused on reducing GHG emissions by 80 percent by 2050, and encouraging climate adaptation by government and the public. MPCA also leads the Resiliency & Adaptation Action Team which reports to the Subcabinet and whose members represent 16 state agencies, boards, and departments, and includes both regional and county government participation. An internal MPCA Climate Adaptation Team facilitates this work with members who represent each of the agency's programs.

The MPCA is committed to integrating specific adaptation strategies and actions into its long-term and strategic plans, agency's program plans, outreach and engagement activities, and data tracking to increase Minnesota's resiliency to climate change.

MPCA Climate Mitigation Programs

Tracking Greenhouse Gas Emissions

Under Minnesota's Next Generation Energy Act (NGEA), the MPCA is responsible for calculating and tracking GHG emissions for the state. The emissions tracking system estimates statewide emissions from the transportation sector, the electric generation sector, the agriculture/forestry/land use sector, the industrial sector, the commercial sector, the residential sector, and the waste sector. MPCA develops a comprehensive emissions inventory report and submits to the legislature every two years.

As part of the MPCA's continuous improvement efforts for the state's GHG emission inventory, the MPCA updated the methods to calculate GHG impacts of certain land management practices on croplands. These land practices came from the list of practices available to protect water quality and improve soil health in Minnesota. The updated methods showed that nearly all land practices which protect water quality and build soil health also yielded climate benefits through reduced emissions and improved carbon storage. Working with the MDA and BWSR, the MPCA seeks to expand the application of these land management practices to provide these multiple benefits to Minnesotans.

To support climate change and GHG policy analysis, the MPCA periodically generates forecasting of future GHG emissions for the state. The MPCA conducts future emission modeling infrequently, due to the complexity and challenges of forecasting future emissions and constructing reasonable future climate policy conditions. To support this type of emissions modeling, the MPCA works with other agencies in the administration as well as organizations outside of state government to provide insights on potential emission reduction policies for Minnesota.

Mitigation Efforts

The MPCA works directly with EPA to implement the federal Clean Air Act in Minnesota. As the Clean Air Act agency for Minnesota, the MPCA participates in the federal regulatory development process and implements federal air regulations. The MPCA also has authorities under state statute to regulate air pollution sources.

State initiatives

The Clean Air Act and Minnesota statutes authorize the MPCA adopt vehicle emission standards that are more stringent than the federal emission standards as long as they are identical to the standards developed and implemented by the state of California. California is the only state authorized by the Clean Air Act to develop and adopt its own vehicle emission standards, as long as they are more stringent than the federal standards. The Clean Air Act authorizes other states to choose to rely on the federal emissions standards or the more stringent California standards. California's current standards are called the Low Emission Vehicle (LEV) Standard and the Zero Emission Vehicle (ZEV) Standard. Since EPA proposed in 2018 to significantly weaken the GHG emissions standards for light-duty vehicles in the U.S., Governor Walz directed the MPCA to adopt the Clean Cars Minnesota rule to make the LEV and ZEV standards applicable to vehicles sold in Minnesota. The rulemaking process is underway and the current schedule will have the LEV and ZEV standards applicable to model year 2025 vehicles sold in Minnesota.

The MPCA received $47 million as part of a national settlement with Volkswagen for the company's vehicle emissions violations. The agency also manages grants under the federal Diesel Emission Reduction Act (DERA) program. Both of these programs are aimed at reducing diesel pollution from vehicles and equipment. The agency is leveraging its Volkswagen settlement and DERA funds to reduce GHG emissions from heavy-duty vehicles and equipment and install electric vehicle charging infrastructure. The MPCA has dedicated portions of the funds to replacing diesel vehicles and equipment with electric alternatives and has committed the maximum allowable funding amount for EV charging. Most of the EV charging funds are targeted at installing EV fast charging stations along highway corridors and a smaller portion is dedicated to lower-speed, level 2 chargers.

The agency offers other grants and loans to encourage private businesses and organizations to reduce pollution, including their GHG emissions. For instance, one recent grant opportunity offered funding to reduce the use of refrigerants that have high global warming potentials. Another grant opportunity provided funds to help small businesses purchase more electric landscaping equipment to replace gasoline equipment and more hybrid-electric vehicles to replace gasoline only vehicles.

The MPCA seeks to reduce climate and GHG impacts through the prevention and reduction of waste generation in Minnesota. These efforts include reducing food waste, reducing the energy and waste impacts from buildings, reducing pollution and waste through government purchasing, and encouraging sustainable practices by organizations and individuals. These efforts can reduce GHG emissions upstream from the production of materials and downstream from the disposal of the materials. In 2019, the MPCA received grant funds to reduce food waste in Minnesota, which can reduce methane emissions by ensuring less food goes to landfills.

The MPCA is responsible for the permanent oversight of 110 closed landfills in Minnesota. The state accepted responsibility for these closed landfills to avoid the costly and time-consuming process of applying Superfund regulations to the landfills. As part of ensuring the protection of Minnesota's environment from the landfills, the MPCA either captures or destroys methane gas created by the waste at many of the landfills in the program.

Within its agency operations, the MPCA seeks to reduce GHG emissions and model sustainability. The agency encourages employees to drive electric vehicles for work purposes when the situation allows and has installed workplace EV charging stations for the public and employees to use. The MPCA also uses hybrid vehicles when possible and encourages the use of E85 in its vehicles that can use E85. The MPCA

also seeks to reduce its GHG emissions by reducing electricity use in our buildings, purchasing renewable energy, pursuing reductions in water consumption and waste generation, and practicing sustainable purchasing practices.

The MPCA actively participates in many organizations and collaborations to maximize climate related information sharing across U.S. states, sub-national governments from other countries, the private sector, and the non-profit sector. The most prominent examples of these collaborations include participation in the U.S. Climate Alliance and the Under 2 Coalition.

Responding to federal regulations

As the Clean Air Act agency for Minnesota, the MPCA is also responsible for participating in the federal rulemaking process, developing plans for implementing federal regulations at the state level, and implementing and enforcing federal regulations in Minnesota. For example, between 2012 and 2015, the MPCA led Minnesota's analysis and public engagement regarding how the federal Clean Power Plan would impact Minnesota sources covered by the regulation and to develop a state plan for implementing the federal regulation.

The MPCA tracks federal actions to climate change and provides comments into the regulatory process. In recent years, the MPCA has coordinated with other agencies to provide a strong Minnesota voice against federal deregulation related to climate change. The MPCA also provides expertise to support the Attorney General's Office in participating in multi-state litigation against federal climate regulation rollbacks.

Current federal regulations on GHG emissions that apply to sources in Minnesota that the MPCA implements include the Affordable Clean Energy (ACE) Rule, the Carbon Pollution Rule, the methane emission standards for the oil and natural gas industry, and the methane emission standards for landfills. Implementing these federal rules in Minnesota requires the MPCA to adopt state rules or permits, and then submit plans to EPA demonstrating the MPCA has the authority to enforce the regulations for covered sources in the state.

For the 2019 ACE Rule, which replaced the Clean Power Plan, the MPCA is working with coal-fired power plants in Minnesota covered by the rule to develop a State Plan to meet the federal requirements for approval by EPA. The Clean Power Plan set carbon emission standards for existing coal-fired and natural gas-fired power plants operating in each state, and included practices as the expanded use of renewable energy. The ACE Rule, on the other hand, establishes a set of efficiency practices applied only to coal-fired power plants and does not include actual carbon emission standards for these types of power plants. Each utility operating coal-fired power plants covered by the ACE Rule must analyze whether these efficiency practices are justified, based on past changes made to their individual facilities and their plans for the future operations of their facilities.

The Carbon Pollution Rule was adopted by EPA in August 2015 and established emission standards for new coal-fired and natural gas-fired power plants in the U.S. In March 2020, the MPCA adopted the carbon pollution standards from the federal Carbon Pollution Rule into state rules, making these standards applicable to any new coal-fired or natural gas-fired power plant built in Minnesota.

EPA originally adopted the methane emission standard for the oil and natural gas industry in 2012, in order to reduce the emissions of methane from the extraction of natural gas and oil in the U.S. In March 2020, the MPCA adopted the rule into state rules, to make the emission reduction requirements

enforceable against any covered operations within Minnesota. While Minnesota does not currently have any facilities or operations covered by this rule, the MPCA deemed it importation to adopt the regulations into state rules to combat the rollback of GHG emission rules at the federal level.

In March 2020, the MPCA adopted into state rules the 2016 federal methane emission standards for municipal solid waste landfills in Minnesota. The landfills in Minnesota covered by the federal rule were already achieving the requirements. Adopting the standards into state rules ensures methane emission control at Minnesota's municipal solid waste landfills remain effective.

MPCA Climate Resiliency & Adaptation Programs

GreenStep Cities

Recently celebrating its ten year anniversary, this challenge, recognition and assistance program coordinated by MPCA provides specific best practice actions for cities to become more resilience to climate change through better planning and preparation for extreme weather, adapting to changing climatic conditions, and fostering stronger community connectedness and social and economic vitality.

MPCA Climate Adaptation 2018-2022 Strategic Plan Goal

MPCA adopted its first cross agency five-year goal related to climate adaptation: Act on opportunities to increase resilience of communities and the environment to climate change impacts. This goal is driving most of the internal climate adaptation work at the agency, including the role of the MPCA Climate Adaptation Team (MCAT), risk assessment, program planning, and data tracking.

MPCA Climate Adaptation Team

MPCA's internal climate adaptation team created in 2013 was refreshed with adoption of the Strategic Plan Goal. A Climate Adaptation Lead is designated by each program manager to serve on the team and provide technical expertise for agency and inter-agency projects such as development of the 2020 State Water Plan, incorporation of climate adaptation into the environmental review process, climate adaptation grant review, climate change risk assessments, data dashboards, and more.

Climate Change Risk Assessments

Consultant-facilitated climate change risk assessments have been completed for twenty (20) MPCA programs, with a program-specific report, which included potential climate adaptation actions, provided to each. In addition, an agency-wide Climate Change Risk Assessment Summary Report was prepared and presented broadly within the agency. This report identifies key categories of risk and potential action for the agency.

Program Planning & Tracking

Starting in 2018, MPCA began requiring all agency programs to incorporate information about climate adaptation strategies, actions, and methods of measurement in their annual program plans. A series of climate adaptation data dashboards is being created to visualize select program data through the lens of climate change trends in Minnesota. In addition, MPCA is evaluating the best method(s) to track program-specific and cross-agency climate adaptation actions implemented as part of the strategic plan goal.

Environmental Assistance Grants for Climate Adaptation

A legislative appropriation of $119,000 annually is provided to MPCA for environmental assistance grants. As a one-time effort in 2020, the biennial amount was pooled in a request for proposals seeking community climate adaptation projects. Funding of approximately $250,000 has been awarded to 11 small projects representing several Minnesota cities, small towns, a tribe, a regional development commission, and a watershed district. Applicant funding requests greatly exceeding resources by tenfold.

Regional Resiliency Workshops

MPCA facilitated an EPA grant to organize three (3) workshops on regional resiliency in southern Minnesota with EPA, FEMA, and the State Department of Public Safety's Homeland Security & Emergency Management (HSEM) in August and September. Over 150 participants attended the online sessions which were kicked off by a live stream speech by Minnesota Department of Agriculture Commissioner Thom Petersen from his farm's front porch. A regional task force will focus on funding and implementing regional resilience strategies in southern Minnesota, and will build upon the workshops' success. A second series of online regional resiliency workshops is being planned for northeastern Minnesota in spring of 2021.

Climate Adaptation in Environmental Review

MPCA is leading an interagency environmental review climate adaptation workgroup as part of a broader interagency effort directed by the EQB to integrate climate change into the environmental review process. Draft revisions to the general Environmental Assessment Worksheet (EAW) Form and Item-by-Item Guidance for projects in all mandatory categories which do not have their own customized EAW Form (e.g. Feedlots) will be presented by the EQB Climate Technical Team to EQB for review and external engagement.

Minnesota Climate Adaptation Partnership

MPCA is a key planning committee member that organizes the Minnesota Climate Adaptation Partnership (MCAP) annual one day conference on adaptation and resilience at the end of January. Next year's conference will be January 20th and will transition into a half day morning online conference with a focus on promoting equity in climate adaptation work.

MPCA is working with MNIT and DNR, to define, identify, inventory, and develop specific tools, case studies and climate change data currently on state agency websites, as well as how best to create the infrastructure for an one-stop online portal to provide easier access to Minnesota's climate change information.

MPCA is co-leading an interagency workgroup to survey agencies, partners and stakeholders on the need, value, and usefulness of having access to Minnesota-specific high-resolution dynamical downscaled climate information (DDCI).

Minnesota's recently revised State Hazard Mitigation Plan includes recommended actions for climate change adaption due to MPCA teamwork with the HSEM. The Plan's integration of adaptation to help mitigate the impacts of extreme weather was recognized by the MCAP in 2020, and will serve as a template for Minnesota County Hazard Mitigation Plans, as well as a national model for hazard mitigation planning in other states.

Appendix M: Department of Public Safety

The Division of Homeland Security and Emergency Management (HSEM) helps Minnesotans prevent, prepare for, respond to, and recover from disaster. The HSEM Recovery and Hazard Mitigation branch is tasked with reducing the risk to people and property from the effects of natural hazards by developing and implementing long-term mitigation measures that will reduce or eliminate future impacts of extreme weather events.

In order to improve the disaster resilience of communities, HSEM incorporated climate change and adaptation into the 2014 State of Minnesota All-Hazard Mitigation Plan. Local multi-jurisdictional hazard mitigation plans are encouraged to analyze their hazards and implement hazard mitigation actions to reduce and avoid future damages using Climate Resilient Mitigation Actions as available through Federal Emergency Management Agency (FEMA) grants.

FEMA's new Building Resilient Infrastructure and Communities (BRIC) grant program provides funding for community-wide mitigation of critical lifelines, capacity and capability building and support for building code efforts. State, local or tribal hazard mitigation projects that utilize public/private partnerships are prioritized.

Minnesota's most common natural hazard threat is severe weather, including torrential rains and the resulting flash flooding. Post Presidential Disaster Declarations, HSEM implements the FEMA Hazard Mitigation Grant Program (HMGP). Acquisition and demolition of flood-damaged homes is a priority project for the state and many local governments. The land is deed restricted to open space in perpetuity, with the goal of returning the floodplain to fully function and remove the possibility of future damages.

Many jurisdictions in the state of Minnesota have used the HMGP and other federal, state, and local programs to remove homes in the floodplain. HSEM Recovery and Mitigation will continue to work with local communities to plan for and act to remove properties out of harm's way, whether it's from intense rainfall, wind, wildfire, or other extreme weather events.

Hazard mitigation planning is an effective instrument to reduce losses by reducing the impact of disasters upon people and property. Although mitigation efforts cannot completely eliminate impacts of disastrous events, the state shall endeavor to reduce the impacts of hazardous events to the greatest extent possible.

The State of Minnesota Hazard Mitigation Plan including Recommended Actions for Climate Change Adaption is approved by FEMA.

The plan evaluates, profiles and ranks natural and human-caused hazards effecting the State of Minnesota as determined by frequency of event, economic impact, deaths and injuries. The plan:

- Assesses hazard risk.
- Reviews current state and local hazard mitigation and climate adaption capabilities.
- Develops strategies and identifies state agency (and other entities) potential actions to address needs.

Recommendations are based on input from federal, state and local agencies as well as national best practices. The plan identifies existing resources that may be used as a tool to assist communities to

succeed in their mitigation and climate adaption efforts. This is accomplished by providing technical resources for mitigation and climate adaption through:

- Federal, state and local agency expertise and support.
- Providing financial assistance through various programs.
- Offering training and education.
- Other agency initiatives.

Appendix O: Minnesota Department of Transportation

Transportation is the #1 source of carbon pollution in Minnesota and the U.S. MnDOT was the first state agency to apply the carbon reduction goals of the NGEA to all agency operations and the first state department of transportation in the US to apply carbon reduction goals to the state highway construction program and the state transportation sector. MnDOT also actively prepares for climate impacts we already experience and works to improve the future resilience of the transportation sector. The agency believes there is a direct connection between our investments and the impacts of climate change on public health, especially for lower income communities and people of color who are disproportionately impacted by climate change.

In addition to working to achieve carbon reduction goals in the NGEA, MnDOT has explicit direction in state statute (174.01) to "reduce greenhouse gas pollution from the transportation sector" and "promote low emission vehicles." MnDOT tracks progress on over 30 climate change and sustainability performance measures in the annual MnDOT Sustainability Report. (http://www.dot.state.mn.us/sustainability/sustainability-reporting.html)

Reduce Carbon Pollution from Agency Operations

MnDOT leads by example in reducing carbon pollution from our operations by reducing fuel use in the agency vehicle fleet and energy use in our facilities. The following are some examples.

More Efficiently Use Energy in MnDOT Facilities

- Developed **facility temperature set point standards** to reduce heating and cooling needs.
- Created a **retro-commissioning schedule for all MnDOT facilities**.
- Piloting **adding solar to truck stations** around the state.

Reduce Agency Fleet Emissions

- Added over **40 EV chargers for public and agency fleet use** and partnering with Xcel Energy to fully electrify the MnDOT passenger vehicle fleet in their service territory.
- Piloted **B20 use beyond the summer mandated months** in MnDOT snowplows.

Promote Renewable Energy at MnDOT

- Subscribed to 23 community solar gardens to **offset electricity bills for 7.4 million kWh or 24% of MnDOT electricity use** and leased properties for use as Community Solar Gardens.
- Leased underused properties for **Community Solar Gardens development on MnDOT-owned land**.
- **Developing Energy Plans** for the 8 MnDOT Districts, including updates and needs for building automation, HVAC, and lighting upgrades.

Reduce Emissions from the Transportation Sector

Pathways to Decarbonizing Transportation (http://www.dot.state.mn.us/sustainability/pathways.html) engaged Minnesotans around the state to develop the foundation for efforts to reduce carbon pollution from the transportation sector.

Example Actions from the *Pathways to Decarbonizing Transportation* project that have been advanced.

- **Created the Sustainable Transportation Advisory Council** to advise the state on ways to reduce transportation GHG emissions, while promoting safety, equity, environmental justice, economic development, and multimodal transportation options. STAC includes leaders from local governments, frontline communities, the public, private, and nonprofit sectors, and elected officials. (http://www.dot.state.mn.us/sustainability/advisory-council.html)
- **Recommended Minnesota further promoting biofuels** by strengthening Petroleum Replacement Goals (Minn. Stat Sec. 239.7911), expanding biofuel infrastructure, using higher blends of biodiesel beyond the summer mandate period, and create incentives to reduce the carbon impact of biofuels.
- **Developed a pilot project for MnPASS customers** who purchase or lease a new or used EV to give a one-time credit to pay charges for using MnPASS lanes. (https://www.dot.state.mn.us/mnpass/mnpassnews.html)
- **Analyzed greenhouse gas emissions in transportation projects** as part of environmental review. http://www.dot.state.mn.us/sustainability/ghg-analysis.html)

Other MnDOT Actions to Reduce Transportation Sector Carbon Pollution

- **Updating the Complete Streets Policy** to include biking, walking, and transit infrastructure on more MnDOT projects.
- Coordinated with MPCA to **develop the state's first EV Vision** to plan for EV use in Minnesota. (http://www.dot.state.mn.us/sustainability/docs/mn-ev-vision.pdf)
- **Created a tool to evaluate and reduce emissions from highway construction projects** and promote use of sustainable pavements.
- **Developed Clean Transportation Pilot Funding program** to promote clean transportation technologies throughout Minnesota, with a focus on low income communities, environmental justice populations, and tribal governments. (http://www.dot.state.mn.us/sustainability/clean-transportation.html)
- Coordinated with other states on interstate 94 to **create the Great Lakes Zero Emission Corridor**. (http://www.dot.state.mn.us/sustainability/electric-vehicles.html)
- **Host the state EV Dashboard** to inform Minnesotans about the rapid growth of EVs in the state. (http://www.dot.state.mn.us/sustainability/electric-vehicle-dashboard.html)

Prepare the Transportation System for Climate Change Now and into the Future

MnDOT is already seeing impacts of climate change on our transportation system, especially from more frequent heavy rains and slope failures. The agency is actively working with public and private sector partners to increase the resilience of our system to climate change and extreme weather.

- Coordinate with state and local agencies in Minnesota and national partners to improve climate resilience in transportation planning, design, operations and maintenance, including leading a 10-state peer exchange to help **MnDOT incorporate resilience into transportation planning**.
- Update policies to reduce climate risk, including **guidance to allow for repairs that address future climate conditions**.
- **Analyze vulnerability of transportation infrastructure** to future climate precipitation and slope vulnerability, changing freeze thaw patterns on pavement longevity, and urban stormwater management.
- **Created the transportation resilience report** to identify existing data and research on transportation resilience, identify gaps in data, and outline future resilience needs for the transportation system in Minnesota.

Potential State Actions to Evaluate as part of the Governor's Climate Change Subcabinet

MnDOT leads the multi-agency Transportation Action Team (TAT) that is part of the Governor's Subcabinet. The TAT has identified the following potential actions to reduce carbon pollution from the transportation sector that will be explored in 2021. Early external coordination through an online survey and listening session helped informed the items below.

- Increase the frequency and coverage of transit along high demand corridors and prioritize routes in environmental justice communities.
- Develop a clean fuels standard (i.e., low carbon fuel standard)
- Direct part of the existing $75 EV registration fee toward public EV charging.
- Update the state EV plan to advance medium- and heavy-duty EVs, including electric busses.
- Establish consumer rebates for electric vehicles, including e-bikes.
- Apply a carbon price to transportation fuels.
- Allocate $10-30 million to fund the Active Transportation Program (MN Statute 174.38) and increase funding in the Minnesota State Highway Investment Plan to address non-motorized transportation needs on the state trunk highway system.
- Conduct modeling and engagement to identify 2025 and 2050 VMT reduction targets, strategy, and reporting requirements for state transportation projects

Appendix P: Board of Water and Soil Resources

BWSR's mission is to improve and protect Minnesota's water and soil resources by working in partnership with local organizations and private landowners.

BWSR is focused on using current climate change science and climate adaptation solutions to protect Minnesota's natural resources. The board recently updated its Climate Change Trends and Action Plan to identify and quantify the climate mitigation and adaptation benefits provided by agricultural conservation practices, retirement of marginal agricultural lands, and wetland conservation and restoration.

Many of the water and soil conservation programs BWSR administers are designed to protect and improve water quality and soil health, but also offer many complementary climate-related benefits, summarized here:

Program	Climate-related benefits
Cost-Share and Grant Programs	Promote and support agricultural best management practices (BMPs) that enhance carbon sequestration and reduce fuel and fertilizer use.
Local Water Management Planning / One Watershed One Plan	Incorporate design standards to increase resilience to larger precipitation events. Include relevant climate data and improved guidance as a basis for goals and strategies in all watershed-scale planning efforts.
Conservation Easement Programs (CREP and RIM)	Enhance carbon sequestration through creation and restoration of natural habitat on marginal cropland, shorelands and woodlands.
Wetland Restoration and Wetland Banking	Improve wetland functioning, with potential reductions in CO_2 emissions from wetland drainage.
Pollinator Programs / Lawns to Legumes / Habitat-Friendly Solar Program	Enhance carbon sequestration through creation and restoration of natural habitat and renewable energy production (solar program).

Program Profiles: Mitigation Focus

Cost-Share and Grant Programs provide funding to local governments and landowners for on-the-ground projects that keep water on the land, maintain healthy soils, reduce pollutants in surface and groundwater, ensure biological diversity and support healthy streams.

These programs mitigate the effects of climate change by storing carbon in the soil and by reducing the amount of fertilizers, fuel, and other inputs needed for agriculture. Examples of conservation practices that mitigate greenhouse gas emissions and increase resiliency include cover crops, field terraces, no-till and reduced till, buffer strips, and nutrient management.

Local Water Management Planning. Programs include One Watershed One Plan, Metro Watershed District Management Plans, and other county and district-level plans. BWSR supports and promotes integrated water resources management that uses a watershed approach to solve soil and water

resource issues and considers the potential for more extreme weather events and their implications for the water and land resources. This includes the use of design standards for stormwater and conservation projects that address larger precipitation events. One Watershed One Plan guidance recommends consideration of climate change impacts, and many plans address climate resilience and adaptation.

Conservation Easement Programs. Since the program began in 1987, almost 290,000 acres of land, much of it marginal farmland, have been restored to grasslands, wetlands, or forestland (or CRP conversion to agriculture has been prevented) through easement programs, primarily the MN Conservation Reserve Enhancement Program (CREP) and the Reinvest in Minnesota (RIM) Reserve Program. Reduction of nitrous oxide and carbon dioxide entering the atmosphere from fertilization, fertilizer production, and consumption of fossil fuels for farming marginal agricultural fields also contribute to total emission reductions.

Wetland Restoration and Wetland Banking. Wetlands contain significant amounts of carbon that can be released to the atmosphere with wetland losses. Drainage of wetlands and conversion to cropland can release significant amounts of long-stored carbon through organic matter decomposition. However, wetlands also emit methane, making it difficult to assess their role relative to GHG emissions. Methane emissions are highest in wetlands that are permanently or frequently inundated, while less frequently inundated wetland types such as wet meadows appear to sequester more GHGs than they emit. More research is needed in this area.

Estimated Greenhouse Gas Reductions Due to Conservation Programs*

Program Category	Estimated GHG Reductions
Soil and Water Conservation Grants: 500,000 acres	±300,000 metric tons (MT)/year
Conservation Easements (RIM, CREP, permanent): 180,000 acres (partial)	±232,400 MT/year
Wetland Protection: 11,800 acres (restored bank sites only)	±13,500 MT/year
TOTAL	± 550,100 MT/year = 2.2% of cropland emissions

* Sources: eLINK system, easement database, wetland banking database; MPCA per-acre estimates. 2018 data.

Program Profiles: Adaptation Focus

The following programs are primarily oriented toward adaptation to climate change and extreme weather events, but most also contribute to greenhouse gas mitigation efforts by sequestering soil carbon and reducing fossil fuel consumption.

Pollinator Initiative / Lawns to Legumes. The BWSR Pollinator Initiative integrates pollinator habitat across BWSR programs to support awareness about declining pollinator populations, support local government partners in enhancing pollinator habitat, and meet legislative requirements to provide pollinator habitat throughout the growing seasons for all prairie restorations on state land or funded with state dollars. The Lawns to Legumes Program is a pilot program funded by the Minnesota Legislature that offers a combination of workshops, coaching, planting guides and cost-share funding for installing pollinator-friendly native plantings in residential lawns through individual grants and demonstration neighborhood projects.

Habitat-Friendly Solar Program. This program promotes the planting and management of wildlife habitat with an emphasis on pollinator, songbird, and gamebird benefits on solar projects in compliance with Minnesota legislative requirements (Minn. Stats. 216B.1642).

For both programs, pollinator-friendly plants and wildlife habitat plantings increase carbon sequestration, increase infiltration rates, and store water on the landscape.

Wetland Protection and Restoration. Wetland and upland buffer restoration and protection conducted through the RIM Reserve Program and federal partnerships, Wetlands Conservation Act implementation, and Clean Water Fund projects, help to restore and maintain water retention, runoff reduction, wildlife habitat, and water quality in Minnesota. This, in turn, enhances adaptation to climate change. The ecosystem services provided by wetlands also protect against intense storm events and periods of drought. Associated upland buffers protect wetland ecosystems and provide landscape connectivity and other functions that promote landscape resiliency. Restoration projects also increase carbon sequestration that can increase infiltration rates and store water on the landscape.

Landscape Resiliency Programs and Strategies. A variety of restoration and land management strategies are promoted for all conservation projects to increase resiliency to extreme storms and other landscape stressors. Examples include:

- Restoring healthy natural systems where they can have the greatest landscape benefits.
- Decreasing fragmentation of intact plant communities and creating habitat corridors.
- Restoring plant communities and vegetation that fit current and expected project site conditions.
- Promoting individual species for projects that can handle expected conditions and provide ecological functions.
- Promoting species diversity to increase resiliency and promote habitat for a wide range of wildlife species including pollinators.
- Using deep-rooted plants to promote infiltration and groundwater recharge.
- Restoring high quality habitat for pollinators and other beneficial insects.

Adaptive landscape management. Disturbances associated with climate change can give invasive species a competitive advantage over native species. BWSR's Cooperative Weed Management Area (CWMA) program is focused on forming local organizations that share invasive species management expertise and resources across ownership boundaries.

CWMAs are also focusing on controlling emerging weed threats that benefit from warming climate such as woody invasive species that are invading northern forests. By promoting adaptive landscape management practices such as forest management and prescribed burning, BWSR is also working to increase the landscape's ability to sequester carbon and withstand large rain events.

Northern forest management. BWSR is working through partnerships to protect the integrity of northern forests. Recent efforts include:

- Protection of wild rice lakes and surrounding forests through the RIM Program.
- An effort to protect and restore white cedar wetlands that are becoming less common.
- Support of CWMAs in northern Minnesota to address emerging weed threats.

BWSR also promotes managing forests for high diversity to adapt to climate variation, large storms, diseases, and pathogens.

Disaster response. Flooding has caused significant damage to private lands and conservation practice infrastructure in Minnesota. Since 2000, BWSR has provided $53 million for flooding in southeast, northeast and northwest Minnesota with a focus on rebuilding infrastructure that will be resilient to future flooding by detaining water from large storms.