Minnesota's Climate Action Framework

From the Governor

Climate change is an existential threat for all people in Minnesota. That's why Lieutenant Governor Flanagan and I created the Climate Change Subcabinet and Advisory Council on Climate Change — to seek input from thousands of Minnesotans across the state and help us take action together. Through these partnerships, we can protect the things we love about Minnesota — our clean air and water, our health, our outdoor traditions, and our four seasons.

This Climate Action Framework includes ambitious goals that will harness the power of Minnesota's innovative spirit and small businesses to create thousands of well-paying jobs and develop the next generation of climate-smart technologies.

We can do this together while ensuring that everyone — including neighborhoods that have been historically marginalized — can thrive in Minnesota.

This framework is Minnesota's next step in responding to climate change, but it will not be our last. We will use the Climate Action Framework to work with tribal nations, the legislature, cities, counties, and communities to build ambitious solutions that reflect the urgency of the issue and ensure all Minnesotans benefit. We will not be moving forward alone.

We know this framework will guide us to a cleaner, safer future for all Minnesotans. I invite you to join us in making that future possible.

In solidarity,

Governor Tim Walz

ACKNOWLEDGEMENTS

The Climate Change Subcabinet is grateful to the 11 tribal sovereign nations in the state of Minnesota and their respective staff and to the Governor's Advisory Council on Climate Change for their review and input on the framework.

Thanks also to the thousands of Minnesotans who participated in the process by writing comments and participating in surveys to share what is most important to them.

The subcabinet also thanks the members of six working groups for their important contributions to each goal chapter. Teams of staff and leadership from each of the 15 subcabinet agencies wrote this framework based on their expertise and the critical input from Minnesotans. Working group members and agency staff are listed at the end of the framework.

Contents

Supporting documents   Summary of climate actions

Greenhouse gas analysis

Summary of input   These are available at **mn.gov/framework**

Acronyms and glossary

The climate vision for our state

The vision for our state embodied in this framework is:

Carbon-neutral
By 2050, Minnesota substantially reduces greenhouse gas (GHG) emissions and balances any GHG emissions with carbon storage, especially in our landscapes.

Resilient
Minnesota communities, businesses, and the natural environment can prepare, respond to, and recover from the impacts of climate change so all Minnesotans can thrive in the face of these challenges.

Equitable
Minnesotans acknowledge and address inequitable and inaccessible systems that contribute to some communities experiencing disproportionate climate change impacts; ensure fair distribution of the costs and benefits of action now and to future generations; and ensure meaningful participation in planning.

To get there, we all have a role to play.
This Climate Action Framework outlines priorities and next steps to help Minnesota achieve this vision. The framework also invites you, your organization, and your community to join us to achieve a shared vision.

Executive summary

Climate change is happening now, and we are on course for more frequent, widespread, and intense weather events with cascading and complex effects. Communities, businesses, and individuals across Minnesota are acting to reduce our climate-changing pollution and build resilience against future changes. However, there is more work to do.

We must act now. The international body that assesses the science of climate change, called the Intergovernmental Panel on Climate Change (IPCC), issued "a code red for humanity" last year, saying that urgent action is required if we are to ward off the worst consequences of a warming climate and keep global temperature increases below 1.5 degrees Celsius (about 2.7 degrees Fahrenheit). Scientists warn that exceeding this temperature increase will result in long-lasting, irreversible changes and make parts of the planet uninhabitable. In addition, once we exceed those temperature thresholds, opportunities for successful adaptation rapidly diminish.

A guide for the years ahead. The Climate Action Framework sets a vision for how Minnesota will address and prepare for climate change. It identifies immediate, near-term actions we must take to achieve our long-term vision of a carbon-neutral, resilient, and equitable future for our state. The framework is a foundational document designed to broadly guide the direction of climate action in the state for many years.

Many people and groups weighed in. The Climate Change Subcabinet is publishing this framework to advance our conversation with Minnesotans on the work we all must do to reduce greenhouse gas emissions and build resilient communities across our state. The framework is informed by public input received as a part of previous climate work, as well as specific input received throughout the framework development process beginning in 2021. The document was shaped by input from the 11 tribal nations who share Minnesota's geography and the Governor's Advisory Council on Climate Change. Through the winter and spring of 2022, the subcabinet convened workgroups to provide detailed input on each of the framework chapters. The subcabinet also shared its proposals broadly and received more than 130 written comments and nearly 3,000 responses to online surveys. (See Appendix 3 for more information.) All this input contributed to the final document.

The framework is organized around six goals

1. **Clean transportation:** Connect and serve all people through a safe, equitable, and sustainable transportation system.

2. **Climate-smart natural and working lands:** Enhance climate benefits by absorbing and storing carbon, reducing emissions, and sustaining resilient landscapes.

3. **Resilient communities:** Provide each Minnesota community with tools to plan for and become resilient to its unique climate impacts.

4. **Clean energy and efficient buildings:** Expand the use of carbon-free energy and create healthy, comfortable buildings that are cheaper to operate and pollute less.

5. **Healthy lives and communities:** Protect the health and wellbeing of all Minnesotans in the face of climate change.

6. **Clean economy:** Build a thriving carbon-neutral economy that produces goods and services with environmental benefit and equitably provides family-sustaining job opportunities.

Within each goal

- **A summary** of the challenges

- **Priority actions** and larger initiatives needed to achieve the goal

- **Measures** to help gauge our progress

- **Equity considerations** and opportunities for addressing them

Moving forward, the subcabinet will continue to seek input, report on our progress, and revisit and refine action steps as we implement the framework. Next steps include identifying lead agencies and setting priorities for the action steps in Appendix 1 and seeking authorities and funding as needed.

Interconnected goals and collaboration

The framework goals are interconnected: Work in one area of our lives may create opportunities — or challenges — in another. We must collaborate across sectors to ensure that all outcomes are considered.

What effect will electric vehicles have on demand for renewable energy? If we adopt newer, less polluting technologies, how do we manage the waste from the old technologies? Are the newer technologies being manufactured sustainably or are they creating new environmental challenges?

We need a diversity of people and perspectives to ensure thoughtful and effective action. By working together we can address trade-offs and build solutions that work for all Minnesotans.

Goals and their related initiatives

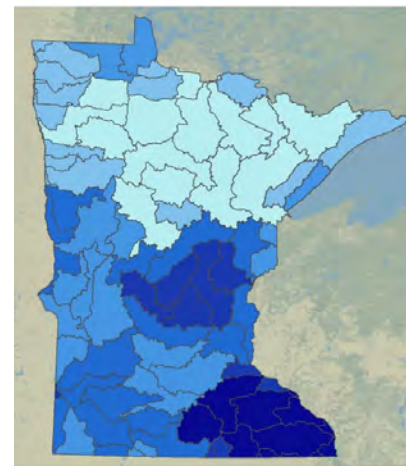|	
Clean transportation	**Connected communities:** Maintain and improve multimodal transportation connections to reduce emissions and congestion.
	Clean and efficient vehicles: Accelerate the transition to electric vehicles, alternative fuels, and greater fuel efficiency.
Climate-smart natural and working lands	**Carbon sequestration and storage in forested lands, grasslands, and wetlands:** Manage forests, grasslands and wetlands for increased carbon sequestration and storage.
	Resilient landscapes and ecosystems: Enhance the ability of plants and animals, including crops, to adapt to the effects of climate change.
	Healthy farmland: Accelerate soil health and nitrogen and manure management practices that reduce emissions and enhance carbon storage, water quality, and habitat.
	Sustainable landscapes and water management: Reduce GHGs and improve landscape resiliency through multipurpose water storage and management practices that protect farmland, water supplies, and infrastructure.
	Investments in emerging crops, products, and local economies: Support emerging agricultural and forest technologies and products that reduce waste, create jobs, and expand economic opportunities.
Resilient communities	**Climate-smart communities:** Build the capacity of Minnesota communities to protect against and withstand the effects of climate change.
	Healthy community green spaces and water resources: Expand and protect tree canopies; parks and other green spaces; and lakes, rivers, and wetlands that provide community resilience benefits.
	Resilient buildings, infrastructure, and business: Help the built environment and local economies become more resilient to climate change.
Clean energy and efficient buildings	**Clean energy:** Transition to 100% carbon-free, reliable, and affordable electrical power and heat through policies, investments, and partnerships.
	Smarter buildings and construction: Reduce GHG emissions in the building sector by promoting conservation, efficiency, and lower-carbon design, materials, and fuels.
Healthy lives and communities	**Healthy communities:** Protect communities from the direct and indirect health effects of climate change.
	Climate-smart public health and healthcare systems: Bolster public health resources and promote strategies to reduce GHGs from health care facilities.
Clean economy	**Business innovation and entrepreneurship:** Invest in research and development, innovation, and partnerships.
	Equitable access to jobs and a just transition: Support workers to adapt and evolve their skills through inclusive strategies, ensuring family-sustaining jobs.

Minnesota is changing

Minnesota's climate has changed and will continue to change, affecting the health and economy of our communities. Frequent and intense storms — now occurring more often than at any time on record — are damaging homes, businesses, infrastructure, farms, and natural resources, and the trend is projected to continue. Record-breaking floods, like those in Duluth in 2012 and Faribault in 2010 and 2016, have damaged streets, wastewater facilities, businesses, and homes, costing local governments, business owners, and residents millions of dollars in cleanup and repairs.

Huge wildfires in Canada and the western U.S., brought on by changing conditions, have caused unhealthy air quality in our state. Minnesota lakes have lost an average of 10 to 14 days of ice cover in the past 50 years, affecting lake and fish health, outdoor recreation opportunities, and business owners. Climate change effects are harming wildlife habitat, like those of trout and walleye. Beloved northern tree species such as spruce, aspen, black ash, and birch are expected to decline. Minnesota's state grain, wild rice (manoomin, psíŋ), and the habitats it supports are also affected. In addition, our health is threatened by more floods, longer allergy seasons, warmer temperatures, and expanded tick ranges.
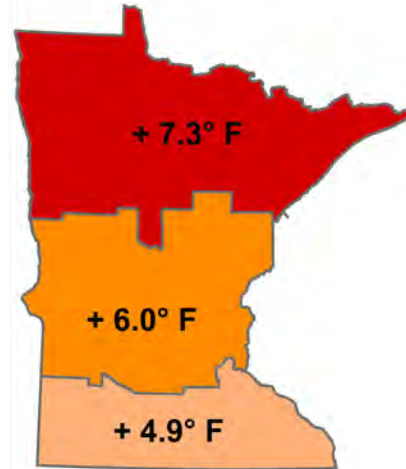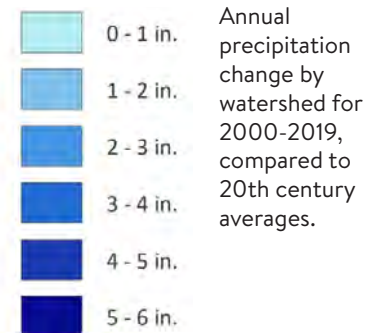

Minnesota is getting warmer, especially winter nights in the northern parts of the state.

Change in daily average minimum temperature during winter (Dec-Feb), 1895-2021.

Minnesota is getting wetter, especially the southern parts of the state.

Annual precipitation change by watershed for 2000-2019, compared to 20th century averages.

- 0 - 1 in.
- 1 - 2 in.
- 2 - 3 in.
- 3 - 4 in.
- 4 - 5 in.
- 5 - 6 in.

Leading with action

We can build climate solutions that work for Minnesota.

The Climate Action Framework identifies immediate actions to help both avoid the worst impacts of climate change and become resilient to the changes ahead. To reduce the severity of future climate-change impacts, we must reduce GHG emissions in every sector of our economy by:

- Accelerating our transition to clean energy
- Improving energy efficiency and using clean energy in buildings and industrial processes
- Developing more efficient modes of transportation and producing cleaner fuels
- Reducing emissions from activities on natural and working lands
- Building carbon storage in forests and soils

Technological tools, such as electric vehicles, wind and solar energy, and better battery storage, are helping us limit climate change, while creating jobs and boosting the economy. But technology alone won't solve our climate change challenges. We also need smart planning and new ways of working and collaborating. Investments in job training, grants to organizations to build expertise, and peer-to-peer learning among businesses are just some examples of how we build skills and create opportunities across the state. We also need to support communities planning for and implementing new technologies, so they are prepared to capitalize on innovations.

Partners across Minnesota are already leading with action. Local and tribal governments are prioritizing climate adaptation planning, expanding urban and community forests, and transitioning to clean energy. Our utilities are taking bold steps to phase out coal plants and increase investments in renewable energy. Large and small businesses have committed to reducing their emissions and developing the technology that will help others worldwide reduce their emissions.

Climate change affects everyone, but some are hit harder.

Let's acknowledge: Some people carry a bigger burden.

People at higher risk from climate change due to social, economic, historical, and political factors have less ability to prepare for, cope with, and recover from climate change impacts. Groups at greater risk from the effects of climate change include:

- People of color
- Indigenous people and tribal nations
- Older adults and children
- People with disabilities and chronic illnesses
- People in rural areas
- People without housing

- People who are socially and economically disadvantaged
- Pregnant people
- People who are incarcerated
- Future generations

For instance, people with lower incomes; Black, Indigenous, and people of color; and tribal nations are exposed to higher levels of pollution due to ongoing structural racism and inequitable policies and decision-making processes. Conversely, some Minnesotans will benefit from economic opportunities related to climate change and have greater access to climate-change decision-making. Addressing these inequities and understanding the experiences of high-risk communities is essential to making Minnesota more resilient and prosperous.

Inequalities & climate change

Unequal exposure to pollution: Black, Indigenous, people of color, and residents with low incomes are more likely to live near industrial sites and highways, with elevated exposure to air pollution that increases their vulnerability to climate-related health impacts. Children, older adults, and people with underlying health conditions may also see poor health outcomes from degraded air quality, excessive heat, increased pollen, and wildfire smoke.

Technology deficits: Rural communities may lack access to broadband and other technologies, impeding their full participation in the economy, education, and decision-making.

Barriers to energy-efficient housing and improvements: Long-term discrimination against Minnesotans of color in home buying has limited their access to money-saving home weatherization programs and energy-efficiency upgrades. Rental property owners have little incentive to invest in these upgrades that benefit tenants.

Uncertain access to resources: Climate change threatens many of the natural resources and landscapes that Indigenous communities, recent immigrant groups, and others depend on for subsistence foods and deep cultural connections.

Higher costs: Higher home energy bills during very hot summers disproportionately affect people with low incomes.

Working together to meet global goals

Along with many other states and countries, Minnesota will work to meet the Intergovernmental Panel on Climate Change (IPCC) greenhouse gas reduction goals. This includes:

- Reducing GHG emissions by 50% by 2030
- Achieving net-zero emissions by 2050

The IPCC also recognizes that climate adaptation reduces risk, enhances resilience, and provides co-benefits. The next 10 years is the most effective timespan to get this done. Once temperatures escalate over 1.5 degrees Celsius, opportunities for successful adaptation rapidly diminish.

These global goals are ambitious. Meeting them will require Minnesota to increase efforts to better understand current conditions, improve data on GHG emissions and storage, implement the Framework's action steps, and identify new approaches, technologies, and partnerships. The framework lays the foundation to meet these targets, but will not get Minnesota all the way there. To achieve these reductions, we will need the efforts of federal, tribal, state, and local governments, businesses, nonprofits, and individuals all working together to rapidly cut climate pollution.

The opportunity

Acting to prevent and prepare for climate change is a chance to make Minnesota a better place to live for all. It is a once-in-a-generation opportunity to create new jobs for Minnesotans, support innovation, and protect our health and environment.

We have already seen our state economy grow while decreasing GHG emissions. We know that investing in clean energy and a sustainable future will help Minnesota continue to grow and become more resilient and equitable for all Minnesotans. Climate action can help create well-paying jobs and save consumers, businesses, and taxpayers money.

- **Weatherizing homes and buildings** will employ workers, reduce energy use, and lower Minnesotans' energy costs.

- **Increasing wind production** could lower property taxes and provide additional revenue for rural Minnesota counties.

- Installing and maintaining thousands of new **electric vehicle charging stations** will bring more jobs to communities across Minnesota.

- **Expanding our forests and urban tree canopy** to reduce the impacts of rising temperatures will require the expertise of foresters.

The farms, forests, grasslands, and wetlands that stretch across our state are natural parts of our climate solutions. Expanding sustainability initiatives, voluntary action incentives, and emerging

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markets provide opportunities to strengthen rural economies, build climate resilience, deliver ecosystem benefits, protect water quality, improve soil health, and help our farmers and forest landowners continue to meet the demand for food and natural resources. We can't meet our goals without climate-smart land management practices. Storing more carbon in both natural and working lands can help us slow the carbon buildup in our atmosphere.

There will be many jobs in sectors commonly considered part of the growing clean economy, such as electric vehicles, energy efficiency, and sustainability, and expanded job opportunities in more traditional areas of Minnesota's economy, such as agriculture, forest products, manufacturing, natural resource management, and construction. Across these sectors, workers will be needed to develop new products, implement new land management practices, grow and maintain trees, improve our heating and cooling systems, retrofit our existing buildings, engineer interconnected alternative energy systems and efficiency improvements, upgrade our electricity transmission grid, and more.

Acting on climate change is also an opportunity to protect our environment and improve our health. Preserving and growing our forestland will store carbon and improve access to the outdoors for all Minnesotans. Reducing pollution from our cars can help reduce asthma rates and other illnesses. Building local food systems will decrease the climate impact of making meals while providing healthier food options for our communities.

Integrating policies across all levels of government, coordinating public and private efforts, and including people across diverse communities will amplify the impact of our actions. Making progress towards our carbon-neutral, resilient, and equitable future is critical and depends on everyone making choices that meet our economic goals while reducing emissions and prioritizing risk reduction.
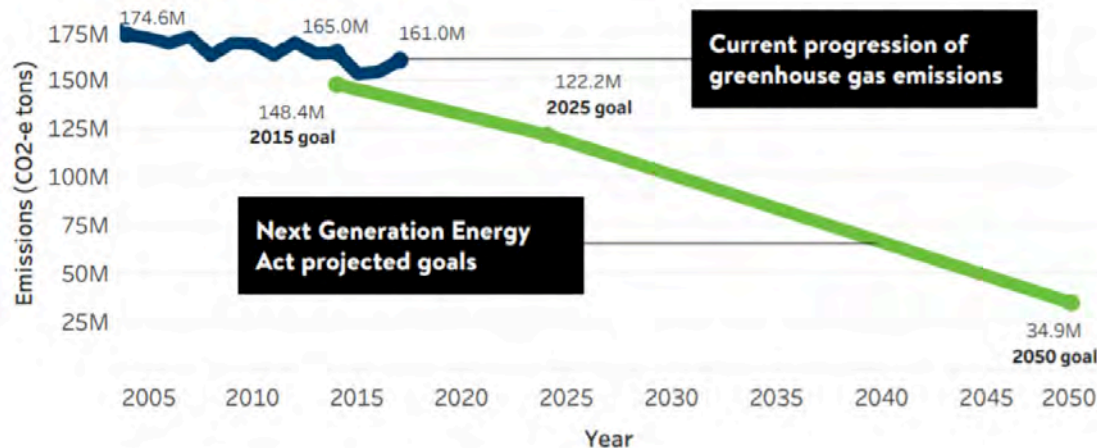
More benefits of climate action

⊕ Reducing the number of fossil-fuel vehicles on the road will have an immediate impact on air quality, especially in urban areas.

⊕ Incentivizing regenerative agricultural helps farmers meet consumer demands and protects water quality.

⊕ Growing native plants and shade trees reduces heat islands and improves air quality.

⊕ Developing our clean economy, especially in underserved communities, helps bridge long-standing wealth gaps.

Minnesota today

Reclaiming our role as climate leaders.

In 2007, Minnesota was a national leader in climate action with the adoption of the bipartisan Next Generation Energy Act, setting statutory goals to reduce GHG emissions by 15% from 2005 levels by 2015, 30% by 2025, and 80% by 2050. Minnesota missed its goal in 2015 and is not on track to meet future goals. Since 2005, overall GHG emissions have declined by just 8%.

The Next Generation Energy Act also launched Minnesota's efforts to track and analyze GHG emissions across all parts of our economy. Understanding emissions sources and trends helps the state identify priorities and challenges in reducing GHGs.

Minnesota was once a leader on climate solutions, and by taking the actions included in this framework, we will be again.

In Minnesota, the largest sources of GHG emissions are transportation, electricity generation, and agriculture. While Minnesota has made important progress towards these goals in some sectors, we must do more to achieve our Next Generation Energy Act goals and reduce our contribution to global climate change.

Each sector has its own challenges and opportunities for reducing emissions, and each is at a very different place in planning and implementing strategies. Electricity producers have made important progress towards the Next Generation Energy Act goals. In contrast, other sectors are just now beginning to understand and implement opportunities for reductions.

20 years of climate action in Minnesota

Minnesota has a strong foundation for climate action, and now is the time for our state to accelerate our work.

2003: Minnesota Climate Change Action Plan: A Framework for Climate Action published.

2007: Next Generation Energy Act created GHG emission reduction goals for the state.

2008: Minnesota Climate Change Advisory Group publishes its final report recommending a comprehensive set of state-level climate policies.

2016: Climate Solutions and Economic Opportunity report identifies near-term emission reduction opportunities between 2016 and 2030.

2017: Adapting to Climate Change in Minnesota 2017 report identifies efforts by Minnesota state agencies to address climate change impacts. Minnesota hosts the National Adaptation Forum biennial conference.

2019: Climate Change Subcabinet and Governor's Advisory Council on Climate Change established. Governor Walz directs state agencies to engage communities and identify policies to reduce emissions and build resiliency. In addition, Executive Order 19-27 affirmed the State of Minnesota's goals to reduce greenhouse gas emissions, waste, energy and fuel consumption, water usage, and the sustainable procurement of goods and services in government operations.

2021: Legislature passes the ECO Act, a critical update to Minnesota's Conservation Improvement Program, creating additional energy efficiency opportunities. Legislature also funds climate adaptation planning grants for local stormwater, wastewater, and other community-focused resilience projects.

2021: Clean Cars Minnesota rule adopted, preserving access for Minnesotans to the cleanest, most efficient vehicles and increasing access to EVs.

What's next

The framework will continue to accelerate climate action in Minnesota. The conversations and collaboration in developing the framework have helped identify key priorities and critical next steps in Minnesota's climate work.

The framework will guide the state agencies' priorities in the coming years. From the actions identified in the document, we will develop legislative proposals for new policies, programs, and grants. We will identify new data and analyses that must be developed and more conversations we need to have with Minnesotans.

The following are some of the initial priorities for action from the state agencies as we begin implementing the framework.

Building momentum

The Climate Change Subcabinet is charged with ensuring meaningful public engagement, collaboration, and involvement in policy and strategy development and implementation. To build momentum for climate action, we need all Minnesotans to be informed, invested, and involved in the effort. Together, we must:

- Foster a better understanding of climate change and its effects, and develop skills for addressing it

- Harness the potential economic, environmental, and social benefits that come from taking climate action

- Seek climate solutions informed by the creativity and knowledge of people of all ages and walks of life

To get there, we need to:

- Build capacity at the state, local, and individual levels for climate action through education and training opportunities

- Raise public awareness about the urgency of climate change and ways to respond

- Provide access to information and resources

- Ensure consistent and meaningful opportunities for participation in decision-making and implementation especially for communities who are often left out of decisions that impact them

- Strengthen opportunities for partnerships and knowledge exchange to maximize our impact

- Ensure information, opportunities for participation and decision-making, resources, and training are equitably distributed and actively include disproportionately impacted communities

The good news is that these efforts can be great or small. They can happen at the State Capitol, city halls, boardrooms, or at the dinner table. Building momentum for climate action will require a diversity of skills, where everyone has something to contribute.

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Moving forward, the state agencies will continue to engage Minnesotans to drive progress on the framework as well as look for ways to deepen and improve engagement and partnerships to ensure that climate action in Minnesota is collaborative, equitable, and effective.

Measuring progress

Achieving our vision will require that we track and report on our progress. The state agencies have identified key progress indicators with measurable targets associated with each goal chapter that will help us understand in real time whether our efforts are making a difference.

We will also report on the outcomes of our proposed action. Which actions are being implemented and what progress is being made? What results did we achieve?

As part of its annual update required under Executive Order 19-37, the subcabinet will report progress on implementing the framework to inform our action planning, demonstrate success, and identify areas that need greater investment and leadership. As we tackle the complexities of mitigating and adapting to climate change, we will continue to develop the data and information streams that best describe the work.

Guiding action

The framework is a foundational document designed to broadly guide the direction of climate action in the state for many years to come. The The state agencies will use the Framework to prioritize legislative proposals, administrative actions, and engagement efforts to advance our climate goals. We will use our measures of progress as well as public input to guide action planning.

As the subcabinet identifies priorities and state agencies begin implementation of the Framework, we will weigh critical elements of our climate effort, including:
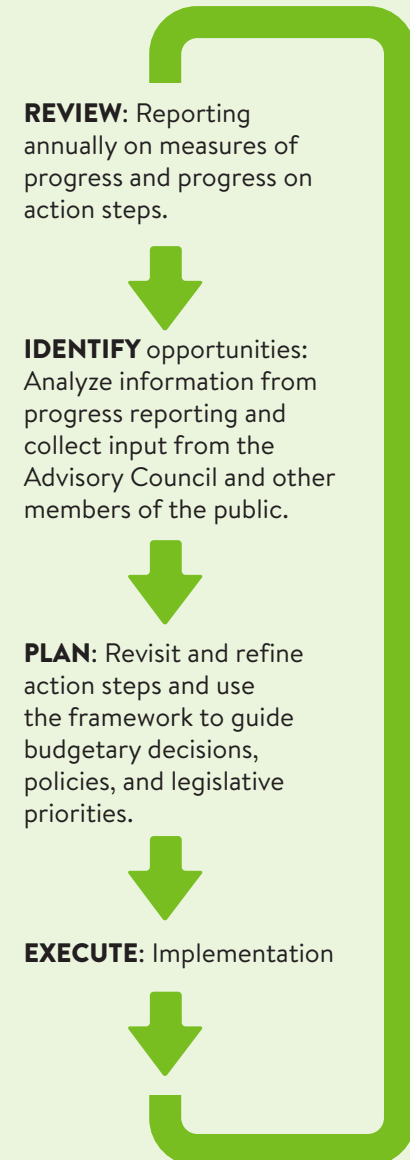
Impact: We will use analysis and the best science to identify actions with substantial GHG reduction potential and that address the greatest resiliency needs.

Equity: We will review policies and strategies with an equity lens, seek input and collaboration from disproportionately impacted communities, and prioritize actions with the greatest opportunity for improving equity.

Economy: We will seek opportunities to grow our clean economy, support a just transition for workers and communities impacted by this transition, and expand well-paying jobs.

Health and environment: We will prioritize actions that address climate change while also reducing other harmful pollutants that damage our environment and our health.

How the state agencies will approach our work

REVIEW: Reporting annually on measures of progress and progress on action steps.

IDENTIFY opportunities: Analyze information from progress reporting and collect input from the Advisory Council and other members of the public.

PLAN: Revisit and refine action steps and use the framework to guide budgetary decisions, policies, and legislative priorities.

EXECUTE: Implementation

Ongoing priorities

The subcabinet has been leading on climate action over the past several years by advancing policy and budget priorities in the Legislature and integrating climate action into the operations of state government. These priorities will continue in the upcoming year and beyond:

Carbon-free electricity by 2040: It is an ongoing priority for Walz-Flanagan Administration to achieve 100% carbon-free electricity and 55% renewable electricity by 2040.

Stormwater management: The state agencies, led by the Pollution Control Agency (MPCA), will continue to prioritize support for local governments and tribal nations as they adapt to major rainfall events by providing funding for stormwater planning and infrastructure investments.

Electric vehicle adoption: The MPCA and Department of Transportation (MnDOT) will continue to help expand EV adoption through grants to electrify heavy- and medium-duty vehicles and equipment, installation of EV charging infrastructure, and implementation of the Clean Cars Minnesota rule.

Enterprise sustainability: The state agencies lead by example and aim to reduce GHG emissions by 30% by 2025 from a 2005 baseline. Priorities include purchasing EVs, installing solar on state properties, and improving energy efficiency of state buildings.

Transportation options: MnDOT will finalize and implement the Statewide Multimodal Transportation Plan to expand options for Minnesotans to bike, walk, roll, and take transit.

Sustainable land management: Continue to manage state-owned lands and provide technical and financial assistance to other landowners to promote sustainable land management practices, which enhance climate mitigation and resiliency while providing additional benefits.

Foundational steps

There are key areas where the subcabinet agencies will work to further their understanding of the current baseline, opportunities for action, and potential costs and benefits of action. Improving our understanding in these areas will provide critical foundational understanding for future action. The following are priorities for further exploration:

Natural and working lands data: The MPCA, Department of Natural Resources (DNR), Department of Agriculture (MDA), and the Board of Water and Soil Resources (BWSR) will work to refine and standardize methodologies for tracking GHG emissions and carbon sequestration and storage on our landscapes. This is an emerging field of understanding and Minnesota has an opportunity to be a leader.

Measures of resiliency: The state, with leadership from the MPCA, DNR, and the University of Minnesota Climate Adaptation Partnership, is working to further develop metrics to measure success of adaptation and resiliency strategies, which will help the state and local communities understand the impacts of adaptation actions and guide future implementation.

Setting goals for our landscapes: In collaboration with partners and stakeholders, the DNR, BWSR, MDA, and other state agencies must establish landscape-level goals for strategic restoration and management of our forests, grasslands, wetlands, and peatlands to maximize benefits to the climate, our environment, and our economy. Working with tribes, local governments, landowners, and others will be a critical part of setting goals.

Leveraging federal action

The federal government has recently adopted major climate-related statutes, namely the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act. These critical climate actions direct substantial new funds towards both reducing GHG emissions and adapting to our changing climate. These new investments are in addition to existing federal funding — such as Farm Bill programs, Pittman-Robertson Act funding, and the Land and Water Conservation Fund – that support conservation activities with multiple climate benefits. The subcabinet will use the framework to guide us as we develop plans and direct funds from the federal government. Some of the major federal policy and funding activities occurring in the near term include:

National Electric Vehicle Infrastructure Program (IIJA): MnDOT developed and will begin implementing a plan that will direct $68 million of federal funds over the next five years to develop a long-distance EV fast charging network across the state.

Transportation resiliency and emissions (IIJA): MnDOT will be developing plans for the Carbon Reduction Program and the Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation Program to increase resiliency and reduce emissions from transportation, especially through multimodal transportation options.

Community forestry (IIJA): The federal government is providing increased funding to the DNR to expand community tree canopy, as well as partner training and engagement.

Advancing critical policy and programs

The state agencies continue to enhance existing policies and programs, as well as explore, analyze, and engage on possible new policies and programs. Some of these critical state actions include:

Sustainability in affordable housing: Minnesota Housing will enhance the Qualified Allocation Plan and existing sustainability standards for buildings the agency finances to improve energy efficiency and access to renewables, while reducing utility bills for residents and providing a healthier place to live.

Building codes: The Department of Labor and Industry is conducting a rulemaking process to adopt the most current building codes for commercial and large multi-family residential dwellings, which will improve the energy efficiency of these buildings.

Soil health: MDA and BWSR are increasing technical and equipment assistance to farmers to implement practices that improve soil health and support a healthy climate.

Support emerging farmers: MDA will explore opportunities to expand and strengthen existing programs that support access to suitable farmland for emerging farmers.

Assistance to local and tribal governments: The MPCA plans to increase opportunities to develop and share resiliency and adaptation strategies, as well as best practices and expand community capacity through programs such as GreenStep Cities and Minnesota GreenCorps.

Clean fuels standard: The subcabinet, with leadership from MnDOT and MDA, continues to analyze and discuss with stakeholders the opportunities and challenges of possibly adopting a clean fuels standard to support the use of cleaner transportation fuels.

Next generation highways: MnDOT will explore the opportunities and challenges of possibly locating transmission lines in highway right of ways to efficiently expand the transmission of clean energy.

The important role and leadership of Minnesota tribal nations

Mni Sota Maḳoce

Minnesota comes from the Daḳota name for this region, Mni Sota Maḳoce — "the land where the waters reflect the clouds."

The Daḳota and Anishinaabe, whose cultural, spiritual, and economic practices are intrinsically woven into this landscape, hold this land sacred. The relationship that the Anishinaabe and Daḳota people have with the natural environment is interwoven in cultural identity and traditional practices. The State of Minnesota recognizes tribal nations as original stewards of this land and all the relatives within it, who had thriving and vibrant communities prior to European settlement.

A shared climate fate

Today, the State of Minnesota shares geography with 11 tribal nations: Bois Forte Band of Chippewa, Fond du Lac Band of Lake Superior Chippewa, Grand Portage Band of Lake Superior Chippewa, Leech Lake Band of Ojibwe, Lower Sioux Indian Community, Mille Lacs Band of Ojibwe, Prairie Island Indian Community, Red Lake Band of Chippewa, Shakopee Mdewakanton Sioux Community, Upper Sioux Community, and the White Earth Nation. In addition, the Ho-Chunk, Cheyenne, Oto, Iowa, Hidatsa, Arikara, A'aninin, Cree, Blackfeet, Assiniboine, and the Sac and Fox Tribes all also acknowledge Minnesota as important to their tribal histories. The State recognizes and respects tribal sovereignty and holds itself accountable to counter the historical and contemporary injustices that continue to impact Indigenous people.

Due to shared geography, history, and people, the climate fate of the State of Minnesota and tribal nations are deeply intertwined. Treaties are nation-to-nation agreements among sovereign entities — political groups with the ability to set rules for their own communities, determine their own membership, care for their own territory, and enter agreements with other sovereign entities. Dakota and Anishinaabe are inherently sovereign as Indigenous people of this land; sovereignty isn't given, nor can it be taken away. As sovereign governments, tribal nations have a unique relationship with the State of Minnesota and each tribal nation in Minnesota has their own individual priorities, practices, and histories. The State recognizes and respects the need to consult and coordinate with each individual tribal nation on climate actions.

Honoring our responsibility

Tribal nations and their communities cannot remove themselves from their homeland and move to another location due to impacts from climate change. Most of the land in what is now Minnesota was ceded by the Anishinaabe and Dakota people to the United States through treaties that allowed the United States to remove Indigenous people from their original homelands and move them to smaller land bases. These land bases are federally and state recognized to this day, but the connection that Anishinaabe and Dakota people have to their original homelands remains. As part of these treaties, the Anishinaabe and Dakota people reserved rights to hunt, fish, and harvest from ceded lands and waters. The ability to exercise those treaty rights depends on clean water, air, and healthy ecosystems. The State of Minnesota must uphold treaty responsibilities in all State decisions, public processes, and policies by protecting the land, native foods, and the cultural heritage of Indigenous Minnesotans, including from the ravages of climate change.

Indigenous knowledge about the interconnectedness of place, subsistence lifeways, and the natural world has been passed on for generations. In Anishinaabe and Dakota knowledge systems, the earth is sacred and all living beings — plants, animals, land, and water — are relatives and ancestors. Actions and decisions made by tribal nations are based on this holistic knowledge and also consider potential impacts to the next seven generations. The interconnectedness that tribal nations have with everything that surrounds them and the related teachings passed down from generation to generation, can be found in the principles of science, sustainability, resiliency, resource protection, and environmental health. The state respects and acknowledges these principles from Indigenous knowledge and will work with tribal nations on how to apply this knowledge to address climate change.

Consultation and collaboration

State policies have impacts on tribal nations and their members living within and outside of reservation and community boundaries. The State of Minnesota is committed to working with tribal governments both though formal consultation between government leaders and informal coordination and collaboration. Consultation is required by Minnesota Statutes 10.65, Government-to-Government Relationship with tribal governments, and informal coordination between tribal and state government staff is founded on those same principles.

Climate change policies have the potential to impact tribal nations, and timely and meaningful consultation at the beginning of policy or program development, along with ongoing collaboration, establishes mutually beneficial outcomes. State and tribal governments both develop, review, and implement their own policies, programs, rules, and laws related to climate change with their jurisdiction. Consultation helps improve interactions across these interconnected regulatory structures.

Supporting tribal priorities

Each tribal nation has its own climate, environmental, health, and economic priorities. Often these priorities may be shared with the state government and are an opportunity to collaborate. In addition, as the State prioritizes its climate actions, it can elevate those that align with the priorities of tribal nations.

Tribal governments also often pursue environmental, energy, housing, and other policy priorities that reduce emissions and build resiliency, even when climate change may not be the primary purpose of the policy. Some tribal environmental, energy, housing, or other policy priorities may not be pursued explicitly to address climate change, but contribute to reducing emissions and building resiliency. Supporting tribal-led efforts across all sectors including energy, waste management, air quality, forestry, wildlife, carbon sequestration, fisheries, and others contributes to mitigating impacts of climate change and benefits all residents of Minnesota.

Through coordination meetings with tribal environmental staff, review of tribal climate assessments and plans, and formal tribal comments on the framework and other of State actions, the State recognizesseveral priorities of many tribal nations where there are particular opportunities for collaboration:

Water quality is a shared priority of all tribal nations. Water supports and connects all life, including culturally significant wild rice, aquatic species, and others that support subsistence lifeways.

Ensuring affordable housing and renewable energy access for all tribal communities and members.

Protecting and restoring native ecosystems and important habitats and species where they are threatened, degraded, or have been lost due to climate change.

Funding is necessary for both the state and tribes to minimize the impacts of climate change. The state and tribes have the opportunity to collaborate and support each other in pursuit of funding. In addition, when the state creates a grant

opportunity, it will work to ensure tribal governments are eligible to apply, and that the requirements for reporting, matching funds, and eligibility consider Tribal needs and constraints.

Collaborative data gathering, analyzing, and sharing can improve outcomes for both state and tribal governments. The state also recognizes the importance of tribal data sovereignty, protection, and respectful data collection processes which will be determined in consultation with each respective tribal nation.

Memorandums of agreement are an important tool to formalize collaboration between state and tribal governments that recognize and respect tribal sovereignty.

The state recognizes the value of the time and energy that tribal nations and their respective tribal staff spend working on climate change strategies. The state will continue to share information with tribal nations early and often regarding climate actions and will continue to strive for just and equitable outcomes while recognizing and respecting tribes' sovereign status. Climate change directly impacts tribal nations and communities, their members, and their lifeways. As the State of Minnesota works toward solutions to limit the impacts of climate change, these solutions must include the knowledge and voices of tribal nations.

Clean transportation

Connect and serve all people through a safe, equitable, and sustainable transportation system

SHORT FORM

The challenges Transportation is the number one source of greenhouse gases in Minnesota. Land use patterns and unsafe, inconvenient, and unaffordable alternatives to driving alone make car travel the first choice for many. Most cars are powered by fossil fuels and produce health-harming air pollution with disproportionate effects on communities close to traffic corridors. Climate change impacts are also damaging transportation infrastructure.

The vision Minnesota's transportation system is sustainable, resilient to a changing climate, and supports equitable transportation options for all Minnesotans. Air pollution is reduced, especially in communities most affected by it. Walking, biking, rolling, and transit options are accessible, safe, and plentiful.

Priority actions

Increase funding for non-motorized transportation. Direct resources towards a statewide pedestrian and bicycle network.

Increase transit services. Create more reliable and convenient transit networks, prioritize services in communities where transit is essential and residents are disproportionately affected by air pollution.

Plan land use and transportation together. Prioritize land use that facilitates multimodal transportation options.

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Priority actions

Continue exploring opportunities for a clean fuels standard. Incentivize investment and create markets for cleaner fuels, such as advanced biofuels, renewable natural gas, sustainable aviation fuels, and electricity.

Expand regional charging. Coordinate with neighboring states, tribes, and other partners to establish a Midwest regional EV charging network.

Develop a Minnesota EV plan. Create a strategy to increase EV-charging infrastructure and EV access and availability. Educate communities about the benefits of EVs.

Measures of progress

Reduce GHG emissions from the transportation sector 80% by 2040.

Decrease vehicle miles traveled 20% per capita by 2050.*

*This target was proposed as part of the Statewide Multimodal Transportation Plan and will be finalized after public input on that plan.

Reach 20% EVs on Minnesota roads by 2030.
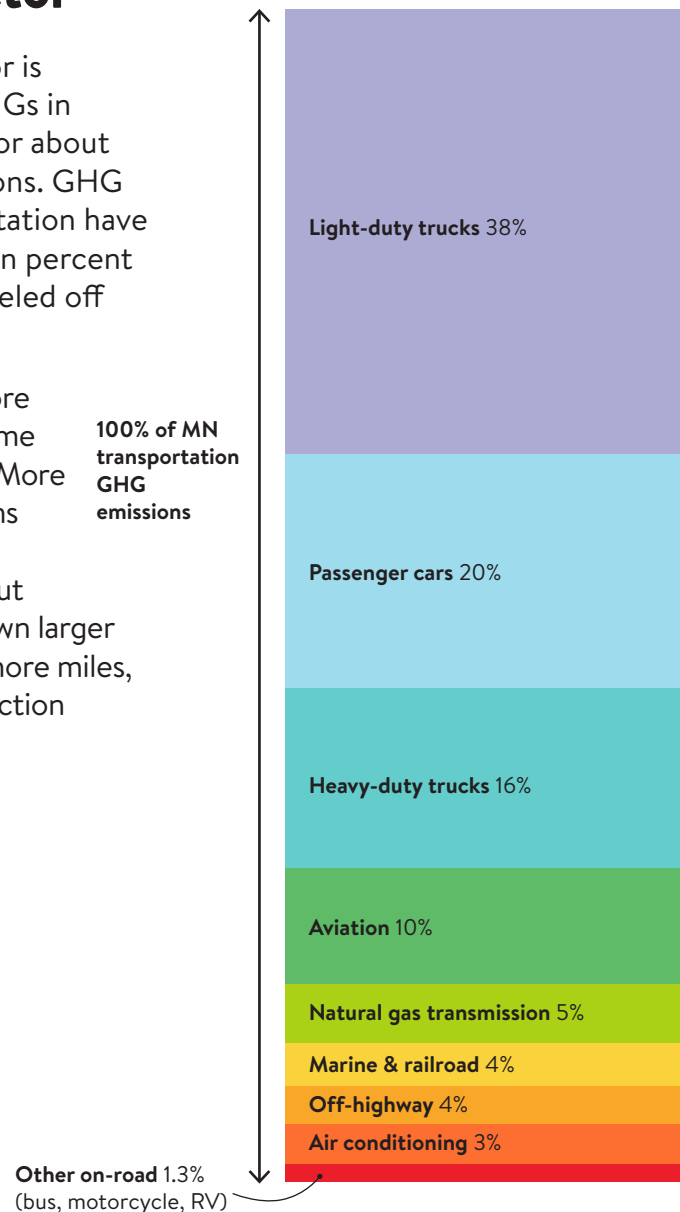
CONTEXT

The largest sector

The transportation sector is the largest source of GHGs in Minnesota, accounting for about a quarter of total emissions. GHG emissions from transportation have decreased by about seven percent since 2005, but have leveled off since 2016.

Within transportation, more than 70% of emissions come from passenger vehicles. More stringent tailpipe emissions standards helped lower vehicle GHG emissions, but consumers increasingly own larger vehicles and drive them more miles, hampering emission-reduction efforts.

Transportation sector 2018
by source of GHGs

100% of MN transportation GHG emissions

Light-duty trucks 38%

Passenger cars 20%

Heavy-duty trucks 16%

Aviation 10%

Natural gas transmission 5%

Marine & railroad 4%

Off-highway 4%

Air conditioning 3%

Other on-road 1.3% (bus, motorcycle, RV)

Multimodal transportation options
Supporting different modes of transportation, like walking, biking, and transit, as well as access to high-quality broadband can reduce emissions. Increased access to diverse types of transportation facilities and networks supports those who rely on driving alternatives due to disability, age, economics, or personal preference. We can add new and complete existing walking, biking, and transit networks in our state.

Electric vehicles
Replacing vehicles with electric versions will reduce carbon pollution. EV sales will increase as more manufacturers transition to producing only EVs. Minnesota has more than 1,300 EV chargers, but more are needed for a fast and reliable charging network that supports EV users in all parts of the state. We must also explore ways to power EVs with clean energy and recycle EV batteries, to further reduce their impact on the environment.
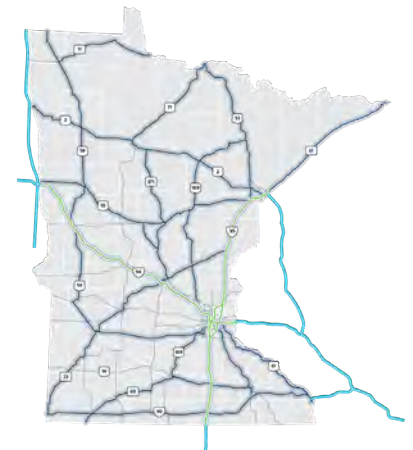
Minnesota is building out a network of EV fast chargers along highway corridors.

WHAT WE WILL DO TOGETHER

Make a cleaner, low-carbon transportation future
Minnesota's future transportation system will be safer, cleaner, and more comfortable, affordable, and convenient for all users, whether they drive, bike, walk, roll, or meet their needs virtually without transportation.

Initiative 1.1

Connected communities

Maintain and improve multimodal transportation connections to reduce emissions and congestion.

▶ **Create more opportunities for biking, walking, transit, and telecommuting**
Improving infrastructure for biking, walking, transit, and telecommuting will make these options more reliable, safe, convenient, and affordable. For example, building bike lanes with increased separation from vehicles make them safer and more comfortable for riders of all skill levels. Expanding high-speed internet coverage can enable telecommuting and less driving. Safe walking environments and expanded transit networks with increased service will benefit everyone. To successfully encourage multimodal transportation, we must understand Minnesotans' needs and preferences, provide education, and demonstrate success.

▶ **Plan land use that supports multimodal transportation**
Climate-smart land use can make both communities and transportation safe, pleasant, convenient, and affordable to bikers, pedestrians, and transit riders.

▶ **Maximize resiliency and GHG mitigation in infrastructure projects**
Choosing the right materials, equipment, and work practices can minimize the carbon footprint of transportation construction projects. Coordinating other improvements, such as broadband expansion and stormwater management, with those projects provides added benefits.

Initiative 1.2

Clean and efficient vehicles

Accelerate the transition to electric vehicles, alternative fuels, and greater fuel efficiency.

▶ **Increase the use of clean fuels, including lower-carbon biofuels**
Cleaner fuels such as electricity, hydrogen, and advanced biofuels, can reduce GHGs and other emissions from vehicles. Hydrogen and advanced biofuels may be particularly helpful in reducing emissions from heavy-duty vehicles and other hard to electrify modes, such as air travel. Both electricity and biofuels can get cleaner with investments in renewable energy and advanced industrial technology.

▶ **Expand EV charging infrastructure**
To enable all Minnesotans to drive electric, we need to expand the network of EV charging stations across the state using public and private investments.

▶ **Increase EV availability and access**
EVs must be widely available and affordable to encourage consumers to make the switch. Providing incentives and supporting dealerships in supplying a wide variety of EVs will encourage EV adoption.

▶ **Accelerate the transition to EVs and clean transportation**
Opportunities for EV ownership, EV-related jobs, and clean transportation investment are expanding. Supporting the transition will require educating consumers about EVs in partnership with auto dealers, especially in underserved communities, training the clean transportation workforce, and attracting transportation investment.

▶ **Improve vehicle efficiency and emissions standards**
State and federal rules can require improved vehicle efficiency and reduced emissions from new vehicles. GHG emissions go down over time as older vehicles are replaced with new, cleaner ones. Programs can encourage more rapid replacement of older vehicles.
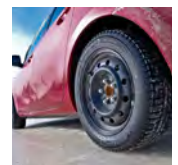
We all have a role

Transportation touches all Minnesotans and all parts of our economy. We all have a role to play in achieving a cleaner transportation system.

- Federal, state, tribal, and local governments must work together to plan, fund, and build a resilient transportation system that prioritizes safe, affordable, and clean multimodal transportation options.

- Governments, businesses, and non-profits must invest in expanding the infrastructure needed to support active transportation, low-carbon fuels and electric vehicles.

- Organizations can use education and incentives to encourage employees and visitors to choose cleaner transportation options.

- Individuals can walk, roll, bike, take transit, telecommute, consolidate short trips, rideshare, and prioritize electric options. Individuals can also call on government bodies to implement infrastructure improvements.

Benefits of shared action

Connected communities, low-carbon fuels, and clean vehicles support many additional benefits:

- Jobs in clean fuel infrastructure and clean transportation manufacturing

- Healthier communities from more active transportation and reduced pollution

- Safer communities with fewer traffic crashes

- More accessible transportation that supports people of all physical abilities

- Cleaner air and water

- Economic growth in rural communities

Big impacts

Which actions will achieve the largest GHG reductions?

- ★ Transitioning to cleaner fuels, including electricity and biofuels, through incentives and policies such as a low carbon fuel standard

- ★ Increasing EV adoption by making EVs more affordable, requiring and incentivizing manufacturers to sell EVs in Minnesota, and expanding charging infrastructure

- ★ Increasing efficiency of vehicles fueled by traditional fuels, such as gasoline and diesel, so they pollute less

EQUITY

Transportation is critical for Minnesotans to access jobs, education, healthcare, recreation, family, and more. An equitable transportation system would fairly and justly distribute the benefits and burdens of transportation spending and services, and ensure that all Minnesotans can travel safely, conveniently, and affordably. Understanding how transportation services and decision-making help or hinder people in underserved communities is necessary to create equitable clean transportation strategies.

Rural areas have fewer reliable, safe, and practical options for transportation, such as public transit and non-motorized transport. More older adults and those with lower incomes live in rural areas, and they need reliable and affordable transportation options. Investments in cleaner fuels, EV infrastructure, and alternative modes of transportation, where feasible, can help rural communities thrive and transition away from internal combustion engines. Supporting cleaner-fuel development can ignite new businesses in rural areas and create new jobs.

Historically and today, low-income communities and communities of color disproportionately bear the burdens of our transportation system without having fair and just access to its benefits. In Minnesota, Black, Indigenous, people of color, and lower-income individuals are exposed to higher levels of air pollution as a result of an ongoing history of structural racism. Inequitable policies such as racial covenants, redlining, the destruction and division of Black neighborhoods to build Interstates 94 and 35W, and zoning and permitting decisions that concentrate pollution sources in marginalized communities continue to cause harm. As a result, the health of residents in these communities is at risk from traffic pollution, noise, and physical hazards, such as crashes.

As Minnesota plans for climate action, we must address these inequities and redress past harms by prioritizing investments in infrastructure and improved transportation options for populations that have historically been underserved or harmed by our transportation system.
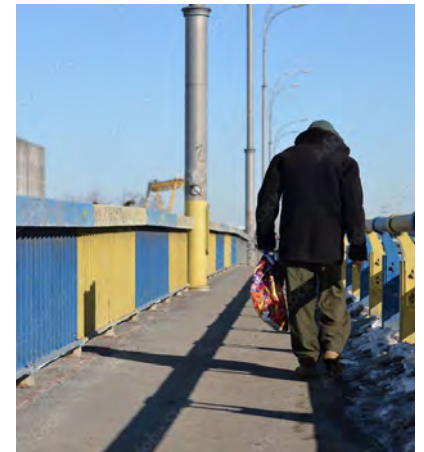
Climate-smart natural and working lands

Enhance climate benefits by absorbing and storing carbon, reducing emissions, and sustaining resilient landscapes

SHORT FORM

The challenges Long-term trends in climate and weather patterns, such as increasing temperatures and more extreme rain events, present formidable challenges to management of natural and working lands. Certain activities on our working lands, as well as conversion of our native landscapes to more intensive uses are also significant sources of GHGs.

The vision Healthy natural and working lands absorb and store more carbon, produce food and other products, sustain local economies, enhance climate resiliency, and improve the quality of life for Minnesotans.

Priority actions

Accelerate forest, grassland and wetland restoration to store more carbon in our landscapes, and avoid conversion to other land uses that reduce carbon storage.

Store more carbon. Promote actions that store more carbon on croplands, in yards and open spaces, and on public lands.

Restore and expand habitat complexes and corridors. Increase species diversity to promote climate resiliency and adaptation of natural landscapes.

Priority actions

Expand climate-resilient agriculture and forestry. Incentivize beneficial practices and assist in implementation, including increased access to technologies, equipment, and seed and plant material.

Manage agricultural lands in a way that reduces GHG emissions, particularly potent gases such as methane and nitrous oxide.

Increase water storage and infiltration, and manage drainage. Reduce runoff and minimize downstream flooding, erosion, and habitat loss.

Prioritize groundwater and drinking water protection in vulnerable areas.

Invest in new markets and supply chains for crops and that keep soil covered year-round, and for wood products that increase carbon storage and substitute for more fossil fuel-intensive materials.
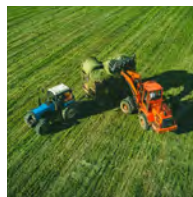
Promote local and community-based agriculture to reduce transportation needs and increase food access, especially in underserved communities.

Measures of progress

By 2035, increase by 25% the amount of carbon sequestered and stored annually in natural and working lands, compared to 2014-2018 average levels.

By 2035, reduce annual GHG emissions in the working lands sector by 25% from 2018 levels.

By 2030, all state-funded or sponsored land, water, and species management plans identify actions to increase adaptation.

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CONTEXT

Storing carbon and reducing emissions

Minnesota's varied landscapes — croplands, pastures, forests, woodlands, prairies, wetlands, and our more than 10,000 lakes — are part of our identity. They are also an essential part of our climate solution. An acre of grassland can hold as much as 78 tons of carbon while an acre of mature evergreen forest can hold up to 140 tons. Harvested forest products store carbon — sometimes for long periods of time — and can replace fossil-fuel-intensive products. We also have opportunities to reduce GHG emissions on agricultural lands from fertilizer, livestock, and energy use, while storing carbon in healthy soils.

Economically viable solutions

The expense of changing land management practices and adopting new technologies can be prohibitive, particularly for family-owned farms. We must identify innovations that benefit the climate and avoid undue financial risks for landowners. We must also choose the best solutions for all types of landscapes, based on site conditions, climate vulnerability, market conditions (for timber and agricultural lands), and government policies and practices.

Additional research

Our understanding of how land use practices affect climate change is rapidly evolving, though we have a solid basis for immediate actions. We need further research to explain how GHGs flow into and out of landscapes, and to identify effective ways to make natural and working lands more resilient to climate change. Filling these gaps in our knowledge will help support strategic decision-making, investments, policy development, and goal setting.

Land and water stewardship

The actions we take to reduce GHG emissions and sequester carbon on natural and working lands — such as soil health initiatives, water retention projects, and certain forestry practices — also enhance our ongoing land and water protection efforts. The added benefits include improving habitat for wildlife, pollinators, and endangered species; protecting food production; and safeguarding water quality.

Many landscapes are both "working" and "natural." Natural lands may provide critical fishing, hunting, and gathering resources, especially for tribal nations and Indigenous communities. Agricultural and other developed landscapes, including yards, can support native plant and animal species. Integrating tribal perspectives, traditional ecological knowledge, and culturally important species and foodways into our efforts to address climate change will ensure that we consider both the needs of people and the needs of landscapes and ecosystems.

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WHAT WE WILL DO TOGETHER

Innovative approaches to create a more resilient landscape
Minnesota's agricultural and natural lands will increasingly absorb and store more carbon while producing food and other products, sustaining local economies, and improving quality of life around the state.

Initiative 2.1

Carbon sequestration and storage in forested lands, grasslands, and wetlands

Manage forests, grasslands, and wetlands for increased carbon sequestration and storage.

▶ **Maintain, expand, and actively manage forestlands**
Active forest management promotes carbon uptake, adapts forests to current and future climate stressors such as pests and diseases, and reduces emissions from wildfires. Maintaining existing forests and expanding forest cover where appropriate strengthens the carbon sink.


▶ **Protect, restore, and manage peatlands and other wetlands**
Peatlands (bogs and fens) hold some of Minnesota's largest carbon reserves, but emit large quantities of carbon when ditched and drained. Protecting existing peatlands and other wetlands, and restoring drained, farmed or pastured peatlands and wetlands will increase carbon storage.

▶ **Protect, restore, and manage grasslands**
Grasslands with high native plant diversity are more beneficial for wildlife and pollinators, and store more carbon, than low-diversity grasslands. Grasslands are important to ecosystems and to livestock production.
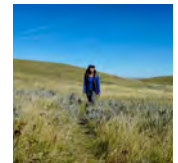
▶ **Encourage individual actions that increase carbon storage**
Most landowners and managers can take steps to store more carbon and boost climate resilience, with pollinator plantings, neighborhood gardens, community boulevard trees, woodland stewardship projects, and more. The improvements can be accomplished almost anywhere, from residential and commercial landscaping to small woodlots or city parks.

Initiative 2.2

Resilient landscapes and ecosystems

Enhance the ability of plants and animals, including crops, to adapt to the effects of climate change.

▶ **Conserve and enhance biodiversity**
Landscapes with high native plant diversity provide the best wildlife and pollinator habitat, the most resistance to invasive species, and the greatest adaptability to climate change.

▶ **Use land management practices that enhance climate resilience**
Certain timber harvest, soil health, grazing, and other land management practices can enhance climate resiliency, create wildlife habitats, and contribute to the economy. Strategic habitat restoration helps connect plant and wildlife populations.

▶ **Promote the benefits of natural lands in climate adaptation**
Natural landscapes that effectively store and filter water, reduce erosion, and support habitats also provide economic and cultural benefits to the state, including livestock, timber, recreation, and tourism.


Initiative 2.3

Healthy farmland

Accelerate soil health and nitrogen and manure management practices that reduce emissions and enhance carbon storage, water quality, and habitat.

▶ **Increase organic carbon content and reduce erosion**
Practices such as cover crops, conservation tillage, diverse crop rotations, buffers, shelterbelts, and hedgerows can help to store carbon in soils, reduce use of nitrogen fertilizers, and improve resilience to precipitation fluctuations. Emerging practices such as the use of green fertilizers and biochar on cropland and pastureland are promising options.
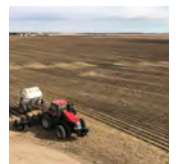
▶ **Manage fertilizer and manure to reduce emissions**
The nitrous oxide produced from nitrogen fertilizer and manure is about 300 times more powerful as a GHG than carbon dioxide. The methane in manure is about 30 times more powerful. Precision agriculture, plant selection, and breeding, soil amendment technologies, nitrification inhibitors, split nitrogen fertilizer applications, and similar nutrient management practices can reduce nitrous oxide emissions. Advanced technologies for manure management,

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such as acidification and anaerobic digestion, can reduce methane emissions. Proper nutrient management also provides agronomic benefits and improves profitably.

▶ **Manage land for multiple benefits**
Helping farmers combine climate-resilient best management practices through programs such as the Minnesota Agricultural Water Quality Certification Program and various state and USDA conservation programs can improve profitability while decreasing emissions and improving soil health, water quality, and wildlife habitat.

Initiative 2.4   Sustainable landscapes and water management

Reduce GHGs and improve landscape resiliency through multi-purpose water storage and management practices that protect farmland, water supplies and infrastructure.

▶ **Manage agricultural landscapes to hold nitrogen and retain rainfall and snow melt**
Planting native vegetation, cover crops, and perennial crops in source water protection areas can promote infiltration, store more carbon, reduce nitrous oxide emissions, and protect drinking water supplies.

▶ **Manage agricultural landscapes to hold water and reduce runoff**
Climate change is making Minnesota's climate wetter, with more frequent and higher-intensity storms. Water storage and treatment in targeted areas can reduce downstream flooding and erosion. Practices such as wetland and floodplain restoration, drainage water management, and buffer establishment can build resiliency by reducing flow rates and velocities, improving stream stability, and enhancing wildlife habitat.

Initiative 2.5

Investments in emerging crops, products, and local economies

Support emerging agricultural and forest technologies and products that reduce waste, create jobs, and expand economic opportunities.

► **Invest in climate-smart agriculture and develop markets for climate-benefitting products**
Supporting end markets for cover crops and perennial crops that keep soil covered in spring and fall, increase carbon storage, and decrease use of nitrogen fertilizer can encourage farmers to plant them and boost local economies. Minnesota can be a leader in developing technologies and products for climate-smart agriculture, such as plant and soil amendments that decrease nitrous oxide while increasing nitrogen use efficiency; manure management practices that decrease methane emissions; and fuel, fertilizer, and fiber products that capture, repurpose, or sequester carbon.

► **Promote forest products that store carbon and reduce GHG emissions**
Long-lived wood products, such as building materials, store carbon for the life of the product. Many emerging forests products — engineered wood, biochemicals, biofuels, and environmental remediation products — are low-carbon substitutes for fossil-fuel-intensive products. Extracting energy from waste wood and wood residuals can diversify forest-product markets and reduce the need for energy from other sources.

► **Support local food markets, urban agriculture, and emerging farmers**
Food produced and consumed locally can reduce emissions from transportation of goods. It can also support local farmers and entrepreneurs, promote economic vitality, and provide underserved communities with access to healthy, fresh food, and economic opportunities.

► **Reduce waste and promote beneficial use of materials**
Increasing composting as an agricultural practice will enhance soil health. Supporting local and regional composting programs, zero waste challenges, and beneficial uses of waste wood will contribute to emission reductions.

Big impacts

Which actions will achieve the largest GHG reductions?

★ Applying agricultural practices to reduce emissions and sequester carbon.

★ Protecting, restoring, and managing grasslands and wetlands to sequester more carbon.

★ Increasing carbon sequestration and storage in forests and harvested wood products.

We all have a role

How our parks, yards, agricultural lands, forests, wetlands, and grasslands are managed affects our climate and our quality of life. We all have a role to play in managing, protecting, and restoring our natural and working lands.

- Businesses, educational institutions, and governments must fund research to find and develop climate-smart land practices, educate landowners on their use and benefits, and support workforce training and development in these areas.

- Governments and organizations can protect key natural lands and implement best practices such as green infrastructure on developed lands.

- Individuals can purchase locally produced food and consumer goods, reduce food waste, and plant and tend trees and native plants.

Benefits of shared action

Climate-smart natural and working land management supports a broad array of additional benefits, including:

- Reduced surface and groundwater pollution, which helps protect drinking water and keeps lakes and rivers swimmable and fishable

- Stronger agricultural, forest, recreation, and tourism economies, especially in rural communities

- A more resilient food supply that supports healthy lives, especially in underserved communities

- Healthy native plant and animal communities

- Natural lands that serve our cultural, recreational, health, and spiritual needs

EQUITY

Opportunities to benefit from Minnesota's natural and working lands are not equitably distributed. Structural injustices have historically influenced land access, ownership, management, and protection. Tribal nations have lost treaty-protected resources and rights due to inequitable policies such as the 1889 Nelson Act. Underserved racial and ethnic populations have also been disproportionately affected by limited access to nature, exposure to pollution, lack of shared decision-making, and inequitable land ownership and land use laws and practices. Agricultural opportunity has not been equally accessible to all Minnesotans due in part to laws and programs, such as the 1862 Homestead Act, which distributed essentially free land to mostly white Americans and immigrants, and 20th-century U.S. Department of Agriculture grant and loan programs, which had documented racial bias in their distribution. Challenges continue today, including access to capital, government programs, and land.

While acting to address climate change, we must also address these inequities by:

- Removing barriers to participation in sustainable farming and timber production, such as lack of access to capital and land.

- Developing career paths and employment programs for urban populations who are underrepresented in agriculture, forestry, and natural resource conservation professions.

- Increasing access to healthy food, especially in underserved communities, to improve community health, reduce emissions, and support local economies.

- Ensuring all Minnesotans have access to, and feel welcome in, natural lands and open spaces, especially publicly owned lands.

- Preserving and protecting traditional cultural resources and outdoor spaces.

Resilient communities

Provide each Minnesota community with tools to plan for and become resilient to its unique climate impacts

SHORT FORM

The challenges Communities experience a variety of climate-change effects, including wastewater releases, stormwater flooding, shoreline erosion, drought, and more. Solutions must be tailored to each community's needs.

The vision Communities across Minnesota have the resources and support to plan for and implement projects to build a more resilient future for themselves. Physical infrastructure, natural systems, and communities are more prepared for climate impacts and can recover from extreme events.

Priority actions

Provide more resources for adaptation. Expand funding, staff capacity, technical support, and training for planning and implementation of adaptation and resiliency projects.

Increase capacity of the GreenStep Cities program. Share resilience best practices and adaptation resources and expand pilot programs that include tribal nations, schools, counties, and townships.

Plant climate-ready trees and preserve mature trees. Climate-ready tree species are well-adapted to challenges such as heat, drought, extreme weather, and pests. Along with mature trees, they decrease energy use in homes and buildings and mitigate heat islands. They should be used to replace diseased trees.

Priority actions

Expand green infrastructure and stormwater management control flooding, restore lost habitat, and improve water quality.

Adopt resilient building policies. Adopt provisions in construction and remodeling codes that prioritize adaptive reuse, and create resilient design standards.

Assess vulnerabilities at critical facilities. Use climate projections to predict future hazards and make plans to ensure continuity of operation.

Combat heat islands. Provide funding and technical assistance to help communities reduce their urban heat island effect.

Measures of progress

By 2030, 100% of Minnesotans live in communities with plans that identify climate risks and actions to build resiliency.

By 2026, at least 25 adaptation projects that increase community resiliency are fully funded.

Achieve 30% overall tree canopy cover in Minnesota communities by 2030 and 40% by 2050.

CONTEXT

Extreme weather effects

Communities must manage the cleanup and repair of the flood damage, infrastructure failure, downed trees, and other destruction that comes with increasingly frequent and intense storms. Climate adaptation strategies can be implemented at the individual and community levels. Collective adaptation action protects and sustains local assets and services that are fundamental to a community's prosperity.

Aging infrastructure

Many communities have aging and inadequate water infrastructure (stormwater systems, sewers, septic systems, and wastewater treatment plants) that can't handle this extreme precipitation. The result is flooded streets, sewage backing up into homes and businesses, wastewater treatment system overflows, and millions of dollars in damages to public and private property. Development of resilient design standards can help communities build and upgrade infrastructure to better handle current and future climate impacts.

Urban heat

In urban space, hard surfaces and buildings absorb and radiate heat, which can increase temperatures significantly. This is called the heat island effect. Green infrastructure, including growing and maintaining trees and making smart land use decisions, can help offset and lower temperatures and reduce the heat island effect.

Land surface temperature
Twin Cities Metro

July 22, 2016, 12 p.m.

High: 125F

Low: 74F
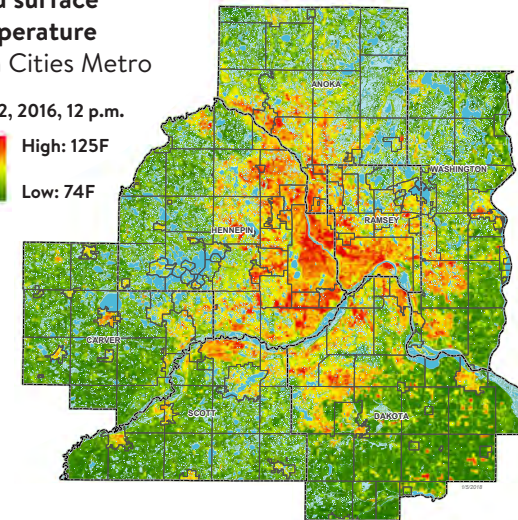
Support for communities

Cities, towns, and residents need support to assess vulnerabilities and identify, plan, and implement climate resiliency projects. We must provide data, resources, and technical assistance.

WHAT WE WILL DO TOGETHER

Minnesota communities will be prepared for the effects of climate change
Local planners will have the data, tools, and technical expertise they need to implement community-specific adaptation actions and increase resilience, including equity-based solutions.

Initiative 3.1

Climate-smart communities

Build the capacity of Minnesota communities to protect against and withstand the effects of climate change.

▶ **Provide needed technical assistance, tools, maps, and data**
Communities need resources and support for asset management, risk assessment, adaptation, and resilient metrics and performance measurements. Adaptation technical assistance and tools provide communities with access to expertise, enable them to evaluate and implement strategies, and expand their capacity to pursue funding. Maps show flood-prone areas, key infrastructure, community assets like hospitals and parks, and areas most vulnerable to climate change. High quality climate-projection data, along with data on past and current temperature, humidity, precipitation, air quality, and drought, also help communities with resilience planning.

▶ **Deliver necessary funding**
Federal, state, and local funds will be invested in building community resilience, and supplemented by private funding sources.

▶ **Share best practices through learning networks**
Create community connections to circulate successful adaptation strategies and project results. Build community capacity through GreenStep Cities, Minnesota GreenCorps, and the University of Minnesota Climate Adaptation Partnership. Expand pilot programs with tribal nations, schools, counties, and townships.
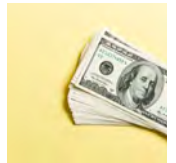
Initiative 3.2

Healthy community green spaces and water resources

Expand and protect tree canopies; parks and other green spaces; and lakes, rivers, and wetlands that provide community resilience benefits.

▶ **Expand tree planting and preservation**

Planting and preserving shade trees in urban areas is a remedy for heat island effects that helps decrease energy use in homes and buildings. Increasing tree canopy — and engaging residents in planning and decision-making — is especially important in low-income and marginalized communities. Planting climate-ready trees and managing tree stressors, such as emerald ash borer, are important parts of the overall strategy.

▶ **Plant beneficial vegetation on urban land**

Parks, community gardens, yards, and other public and private green spaces have underused potential for lowering temperatures, providing habitat, and managing stormwater. Growing native and climate-adapted species in these areas can also support pollinators, protect biodiversity, and boost ecosystem resiliency and the food web.

▶ **Protect and improve water quality and quantity**

Minnesota's groundwater and our many lakes, rivers, and wetlands support ecosystems, provide drinking water, offer recreation, sustain industries and food producers, and bear important cultural and spiritual significance for us. We must take action to counteract the precipitation and temperature changes and other climate change effects that threaten water quality and quantity.

Initiative 3.3

Resilient buildings, infrastructure, and business

Help the built environment and local economies become more resilient to climate change.

▶ **Plan for climate adaptation in residential and commercial development**

Buildings must be able to withstand the extreme precipitation, flooding, extended heat waves, urban heat islands, and grid failures caused by climate change. Building codes, permits, and policies for land use, new construction, and rehabilitation should encourage or require adaptive planning. New research, innovation, and design standards are needed to ensure buildings are climate resilient.

▶ **Fund resilient infrastructure and critical facilities**

We must support the building and maintenance of climate-ready water and wastewater treatment facilities, hospitals, energy infrastructure, roadways, and other critical facilities and infrastructure, to ensure they are accessible and continue to operate during and after extreme weather.

▶ **Expand green infrastructure and stormwater management**

Using plants, soils, and permeable surfaces to reduce runoff and divert it from storm drains can help restore lost habitat, control flooding and manage intense rain events, improve water quality and watershed health, protect infrastructure, and provide other benefits to vulnerable people.

▶ **Reduce the urban heat island effects**

Cities and towns of all sizes need funding and technical assistance to reduce urban heat island effects. Replacing or limiting hard surfaces, adding green infrastructure, and preserving mature trees will significantly lower temperatures and reduce the impacts of excessive heat. Investments should be prioritized to address local vulnerabilities, equity, and impact.

▶ **Support adaptation for local businesses**

Providing better access to capital and technical expertise will help small businesses plan for effects such as unseasonable conditions, flooding, or supply chain disruptions due to extreme weather. Some industries, such as construction and remodeling, may see opportunities in building climate-resiliency knowledge and skills and supporting community adaptation efforts.

We all have a role

Building resiliency will require localized planning, and action and expertise from federal, state, tribal, and local governments, researchers, businesses, and community members.

- Federal, state, tribal, and local governments need to collaborate to develop, share, and use the data necessary for analyzing and planning for climate impacts.

- Educational institutions and organizations can provide training and technical expertise to help communities understand their vulnerabilities to climate change and implement strategies to build resilience.

Benefits of shared action

Action to build resilience and adapt to climate change can also support:

- Resilient ecosystems that provide habitat, protect water quality, promote the inherent value of wildlife and plants and their right to exist, and support tribal hunting and gathering.

- Jobs in emergency preparedness, community resource and asset management, and planning and implementing resilience projects, particularly for stormwater and wastewater systems.

- Parks, natural areas, and community forests that nurture community well-being and require less energy to maintain.

- Well-designed buildings, critical facilities, and infrastructure that require less ongoing funding and repair.

- Residents feeling safe and healthy in their communities.

EQUITY

Communities of color and lower income communities are often least able to invest in adaptive strategies. Historical policies of housing segregation, such as redlining and mortgage discrimination, have caused housing insecurity in these communities, which are often located on land vulnerable to flooding, erosion, and other climate change impacts. Minnesotans with fewer financial resources and renters are less able to make home upgrades, maintain their indoor air quality, and safely and affordably heat and cool their homes.

Under-investment in these communities means that they often have fewer trees and parks and are more vulnerable to urban heat islands. We must prioritize the needs of climate-vulnerable communities and ensure their meaningful involvement and fair treatment at all stages of adaptation planning and implementation.

An equitable transition to a more resilient Minnesota will:

- Prioritize engagement of front-line communities in work to assess climate risks and identify priority actions to mitigate risks.

- Fund resiliency planning and infrastructure improvements in communities that have been under invested in historically through use of a climate & equity index and other resources.

- Prioritize clean-up strategies and climate adaptation investments in neighborhoods with fewer resources and that are disproportionately affected by unhealthy water, soil, and air.

Clean energy and efficient buildings

Expand the use of carbon-free electricity and create healthy, comfortable buildings that are cheaper to operate and pollute less

SHORT FORM

The challenges Electrical utilities are producing less carbon and more renewable energy, yet we still must address the energy burdens of low-income households, energy grid inadequacies, and equitable access to clean energy. Most existing buildings pre-date the current efficiency standards, and buildings' GHG emissions are rising. Reducing emissions from electricity and heating will drive reductions from buildings.

The vision Minnesotans have reliable, clean, and lower-cost energy through equitable investments in energy efficiency, clean energy, and low-carbon technology. The transition creates more jobs and more comfortable homes and businesses.

Priority actions

Establish a standard to achieve 100% carbon-free electricity and 55% renewable electricity by 2040.

Adapt the grid. Promote electrical grid and transmission upgrades and research and development to enable greater reliability and renewable energy access and integration.

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Priority actions

Reduce emissions related to heating and cooling homes and businesses. Explore and evaluate new regulatory and policy options such as, but not limited to, a clean thermal standard and incentive programs. Maximize emission reductions through implementation of the Energy Conservation Optimization Act and the Natural Gas Innovation Act.

Reduce energy use and waste. Support opportunities for additional incentives, loans, and policies for existing homes, businesses, government, and schools in order to reduce energy use for all Minnesotans as well as to improve health through better air quality. Investigate supply-side supports, or pricing supports, for energy-efficient appliances, heating and air conditioning equipment, and domestic water heaters so that the low-cost-choice is also an energy-efficient choice.

Improve codes and standard for all new commercial and large multi-family buildings to achieve net-zero by 2036.

Measures of progress

By 2040, all of Minnesota's electricity is carbon-free.

By 2030, weatherize a quarter of dwellings where occupants earn 50% or less of the state median income.

By 2035, reduce GHG emissions from existing buildings by 50% compared to 2005 levels.

By 2030, reduce thermal GHG emissions by at least 20%, compared to 2005 levels.

By 2030, reduce energy use by 10% and total waste heat and waste electricity by 15%, compared to 2005 levels.

By 2030, reduce the energy burden so at least 80% of Minnesotans spend less than 5% of their household income on energy costs.

By 2030, reduce statewide primary energy usage by 10%, compared to 2005 levels.
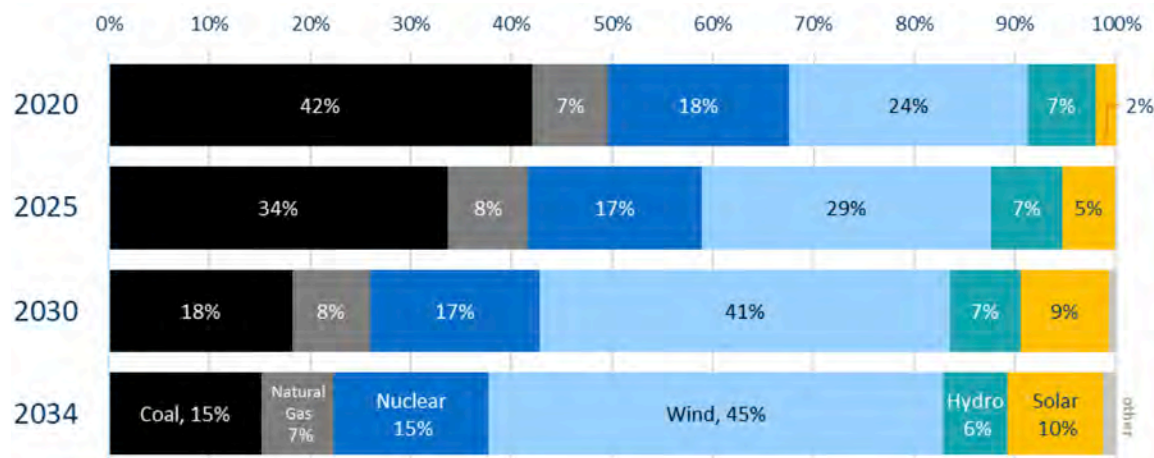
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CONTEXT

Making strides in electricity generation and distribution

Electricity generation in Minnesota is getting cleaner as coal plants retire and renewable energy grows, and we need to continue the trend. Tribal nations and many other communities need better access to energy conservation opportunities and renewable energy. We must also address energy-grid reliability, transmission, and distribution costs and barriers.

Rising GHG emissions from buildings

Since 2005, GHG emissions from commercial buildings have risen 15%, and 32% from residential buildings. Reversing this trend will require low-carbon and energy-efficient building technology, investing in building electrification, and retrofitting existing buildings.

Projected electricity generation by source Minnesota, 2020-2034

Year	Coal	Natural Gas	Nuclear	Wind	Hydro	Solar	Other
2020	42%	7%	18%	24%	7%		2%
2025	34%	8%	17%	29%	7%	5%	
2030	18%	8%	17%	41%	7%	9%	
2034	15%	7%	15%	45%	6%	10%	

Utilities are already planning to transition to an energy mix that is over 75% carbon-free by 2034.

WHAT WE WILL DO TOGETHER

Transitioning to clean energy and more efficient buildings
Investments in renewable energy, electrification, energy efficiency, lower-emitting technologies and materials, and building resiliency will help mitigate climate change, create jobs, and improve our quality of life.

Initiative 4.1

Clean energy

Transition to 100% carbon-free, reliable, and affordable electrical power and heat through policies, investments, and partnerships.

▶ **Transition to 100% carbon-free electricity**
By 2040, Minnesota's electricity generation will add no carbon to the atmosphere. The transition will lay the groundwork for emission reductions in other sectors as they move towards electric vehicles and other electric alternatives. We must also ensure the power grid is reliable and affordable and has adequate capacity, and that all Minnesotans have equitable access to renewable energy and energy efficiency opportunities.

▶ **Utilize waste heat**
The machines used to produce electricity and the systems that heat and cool buildings generate by-product "waste heat" that can be captured and utilized. Currently, more than half of this energy is not captured. Introducing new mechanisms to trap and use the heat can lower costs, improve efficiency, and reduce GHG emissions.

Initiative 4.2

Smarter buildings and construction

Reduce GHG emissions in the building sector by promoting conservation, efficiency, and lower-carbon design, materials, and fuels.

▶ **Increase efficiency and reduce emissions in existing buildings**

Support opportunities for energy-efficient upgrades by providing tools to assess building performance and promoting energy and emissions benchmarking. Target investments in lower-income communities that are challenged by older buildings and a lack of resources. Train building professionals on energy-efficient and low-carbon equipment and strategies.
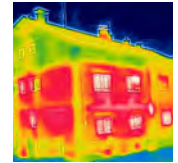
▶ **Design and build climate-smart new buildings**

Ensure new buildings are energy efficient, climate-resilient, and powered by renewable energy. We must also update building codes and construction standards to mandate net-zero energy construction; incorporating energy efficiency in new buildings is much less expensive than retrofitting existing structures.

▶ **Building reuse and preventing waste**

Incentivize the rehabilitation of existing buildings that include energy, resilience, and efficiency upgrades. Provide tools to assess buildings' adaptive reuse potential. Promote the reuse and recycling of demolition materials.

Big impacts

Which actions will achieve the largest GHG reductions?

Electricity generation:

★ Producing only carbon-free electricity in Minnesota by 2040

★ Increasing the renewable energy standard

Buildings sector:

★ Updating building codes to ensure the highest possible efficiency and lowest possible emissions in new buildings

★ Providing tools and incentives to improve the efficiency and reduce emissions from existing buildings

We all have a role

Many partners must contribute to the efforts to advance energy efficiency, increase the availability of renewables, and make buildings more efficient and resilient.

- Individuals can lower their energy use though new technologies, behavior changes, and home upgrades using utility and government-offered weatherization programs.

- Government units can provide weatherization and energy-efficiency education, funding, and implementation assistance for homeowners and renters.

- Businesses, nonprofits, governments, and utilities can work together to improve energy efficiency and reduce GHG emissions in their existing and new buildings.

Benefits of shared action

Actions to reduce emissions and improve efficiency in the power sector and buildings have other benefits:

- Cost savings for businesses and residents from lowered energy use.

- Improved health from less indoor and outdoor air pollution and from home-weatherization efforts, and lower medical costs, along with fewer missed school and work days.

- New jobs in energy efficiency and clean energy industries.

EQUITY

Power generation and building efficiency affect everyone, but not all Minnesotans are able to access the available benefits. People with lower incomes pay a larger portion of their income on energy and housing than those earning more. Due to decades of housing segregation, redlining, and other harmful policies, Minnesotans of color are more likely to rent homes rather than own them, which limits their access to energy efficiency and renewable energy opportunities. These communities also suffer disproportionate rates of utility disconnection, which can be life-threatening during extreme weather.

Renewable Energy Partners in Minneapolis does solar installation and skill training in an underserved part of the city.

An equitable transition to our clean energy future would include:

- Expanding incentives and other mechanisms for businesses in overburdened communities to transition to renewable energy.

- Invest in energy efficiency programs, and ensure that communities of color, tribal nations, and lower-income communities have access to them. Eliminate inequities by fuel used or area of the state.

- Help lower-income households access local and affordable renewable energy, with options such as community and rooftop solar.

- Support job training in rural and low-income communities for work in energy-efficiency retrofits of current housing stock.

- Promote community-driven solutions to affordable housing that incorporate energy efficiency, address gentrification, and prevent climate-related displacement.

Healthy lives and communities

Protect the health and wellbeing of Minnesotans in the face of climate change

SHORT FORM

The challenges Changes in Minnesota's climate threaten the health of all our communities, but not everyone contributes to nor experiences these impacts equally. Existing inequities based on race, age, gender, geography, economic status, and more place some communities at greater risk.

The vision Minnesotans are healthy, safe, and resilient in the face of climate change, especially those that live in the communities that are most affected.

Priority actions

Raise awareness of health impacts. Build partnerships to improve education and raise awareness of the health impacts of climate change.

Fund and support community-led initiatives across Minnesota that address health risks from climate change and improve health outcomes.

Prepare for diseases. Build the capacity of public health agencies and communities to prepare for and respond to new and current diseases that are increasing due to climate change.

Priority actions

Track, monitor, and compile a regular report on the health impacts of climate change in diverse populations in Minnesota.

Adapt outdoor recreation on public lands for a changing climate and to serve changing demographics.

Assess healthcare resilience. Ensure hospitals and other facilities can withstand extreme weather and other hazards. Plan and implement adaptation projects.

Provide proactive health services. Deliver culturally-appropriate, affordable, and responsive healthcare and mental health services to protect public health and create a foundation for climate resiliency.

Measures of progress

By 2030, reduce the age-adjusted rate of heat-related ER visits to 10 per 100,000.

By 2025, ensure at least 40% of the benefits of certain state and federal climate investments are in disadvantaged communities.

Increase the diversity of state agencies' leadership to reflect the state's changing demographics.

CONTEXT

Our greatest health challenge

Climate change has been called the greatest health challenge because it threatens the very basics we depend upon for life, including safe and available drinking water, clean air, and a reliable food supply. Some of the known direct health impacts of climate change:

- More heat-related illnesses due to extreme heat waves

- Injuries and death from extreme precipitation and flooding

- Increasing societal and healthcare costs from more emergency department visits, hospitalizations, and premature deaths

- Increase in diseases transmitted by animals to humans that may then spread from humans to humans and diseases transmitted by ticks and mosquitoes

- Respiratory and cardiovascular impacts from increased wildfire smoke and pollen

- Mental health impacts from experiencing extreme weather events, climate-related instability, and other changes

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Impacting things that support our health

Climate change also impacts our health indirectly, by affecting the many things that create our health, such as safe housing, reliable transportation, nutritious and affordable foods, and job stability. Indirect impacts can make other health conditions worse. For example, if increased precipitation creates problems with mold in a family's home, this could increase their child's allergies. Other indirect health impacts include:

- Disruptions to transportation systems from extreme weather making it more difficult to access grocery stores, jobs, and medical care.

- Loss of neighborhood tree canopy from invasive pests making extreme heat worse.

- Loss of income to families when businesses and farms are impacted by drought or extreme weather.

Health is affected by all parts of our society

All parts of our economy and society affect our health, including transportation, jobs, energy, housing, and agriculture. The rest of the actions in the framework will support healthier communities as we address climate change and build resiliency across Minnesota. It is also necessary to specifically focus on supporting community health, public health infrastructure, healthcare systems, and other ways climate change impacts our health.

WHAT WE WILL DO TOGETHER

Protect health and improve health equity
Minnesota will invest resources and implement policies and strategies that address the health impacts of climate change on individuals and communities.

Initiative 5.1

Healthy communities

Protect communities from the direct and indirect health effects of climate change.

▶ **Support healthy communities and workplaces**
Help workplaces protect employees who are vulnerable to climate-related health risks, such as those working outdoors in extreme heat. Ensure communities have access to safe places during climate-related disasters. Educate Minnesotans on the health effects of climate change, and help communities address them.

▶ **Protect culturally important activities**
Conserve species and habitats that are critical to tribal nations and other communities. Safeguard outdoor recreation opportunities, such as ice fishing, hunting, ricing, swimming, hiking, biking, and skiing, that are important to Minnesotans' health and wellbeing.


Initiative 5.2

Climate-smart public health and healthcare systems

Bolster public health resources and promote strategies to reduce GHGs from healthcare facilities.

▶ **Increase public health capacity and adaptation resources**
Increase capacity of public health agencies to prepare for and respond to changing and novel diseases and illnesses related to climate change, collect and develop climate-related data, track the health impacts of climate change, implement health-protection strategies, and ensure healthcare and mental health services are available through climate-related disasters.
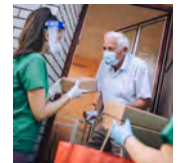
▶ **Support climate-smart healthcare systems**
Encourage healthcare facilities and organizations to lower their GHG emissions and reduce waste.

We all have a role

Working together with climate-vulnerable communities, businesses, nonprofits, faith-based organizations, educational agencies and institutions, public health, healthcare systems, and others, we can build resiliency while reducing health disparities for those most impacted by climate change.

- Local governments and organizations can create resiliency hubs to protect people during extreme weather events.

- Employers can protect workers from extreme weather and offer telecommuting options that reduce greenhouse gas emissions and support families.

- Public health organizations can track the health impacts of climate change and partner with communities in implementing health-protective strategies.

- Educational institutions and universities can prepare future generations by raising awareness of climate change and resiliency strategies and researching the health effects of climate change.

- Healthcare systems can reduce their carbon footprint and prepare for extreme weather to ensure delivery of services.

Benefits of shared action

Addressing the health impacts of climate change through mitigation and adaptation actions serves to:

- Protect public health and reduce health disparities

- Protect the environment and culturally important places

- Improve community climate resiliency

EQUITY

Many Minnesota communities have demonstrably poorer health due to unequal access to health care, biased housing practices that placed them closer to sources of pollution, and other factors. These health disparities are made worse by climate change. For example, American Indian and African American middle and high school-aged kids are more likely than other students to have been diagnosed with asthma. Asthma is exacerbated by poor air quality and wildfire smoke. Historically racist housing policies (such as redlining) are associated with urban heat islands and lack of tree canopy in low-income neighborhoods of color, which suffer more from extreme heat as a result. Communities that already lack resources are burdened by the costs of increased healthcare and of withstanding or recovering from climate-related events.

Climate change amplifies existing health and economic inequities. Protecting the health of our communities requires protecting communities at the greatest risk of health burdens.
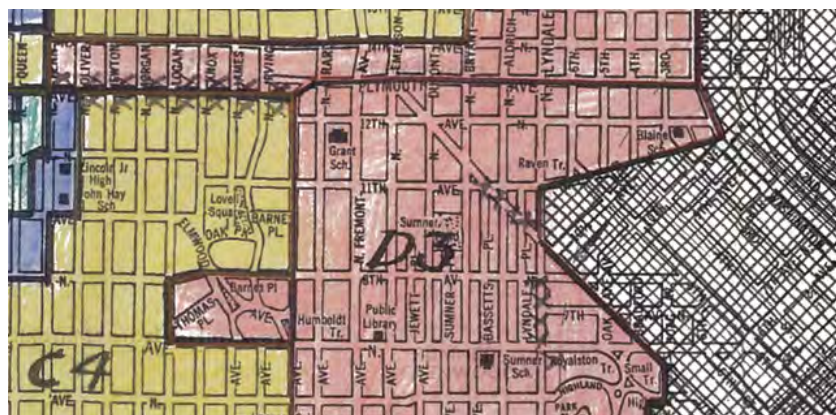
Clean economy

Build a thriving carbon-neutral economy that produces goods and services with environmental benefit and equitably provides family-sustaining job opportunities

SHORT FORM

The challenges Minnesota's economic activity produces GHG emissions and other air pollutants, while climate change is threatening jobs and our economy. Some Minnesotans have limited access to well-paying careers and the training that allows entry to career paths that help mitigate and adapt to climate change. The clean economy future will require workers, communities, and businesses to acquire new skills and build resiliency.

The vision Minnesota has a strong economy, aided by public and private investments in emerging research, technology, and businesses. Tens of thousands of people are employed in mitigating and adapting to climate change. Minnesota companies sell sustainable products made with green processes. Labor, businesses, and educational institutions collaborate to support skills training for in-demand jobs.

Priority actions

Complete a clean economy workforce and economic development plan.
Assess high-growth sectors, potential job losses, and workforce and skill set needs, using an inclusive definition of clean jobs.

Encourage innovation.
Work with tribal nations, universities, commercial consortiums, and private labs to nurture new technologies and clean economy businesses.

Develop worker skills.
Create workforce strategies that train, upskill, and reskill workers to adapt to changing technologies and job needs.

Priority actions

Support power-plant host communities. Assist communities with aging fossil fuel-run power plants to ensure a successful transition. Provide long-term planning and support to retrain workers and promote economic development.

Identify and remove barriers to employment and training for women, people of color and individuals with disabilities. In addition, diversify the clean economy workforce in both leadership positions and frontline careers.

Assist businesses moving toward sustainability. Identify supply chain needs and support environmental goals.
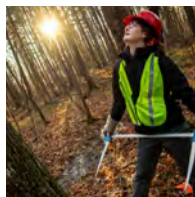
Measures of progress

In 2023, create a clean economy workforce and economic development plan with trackable metrics.
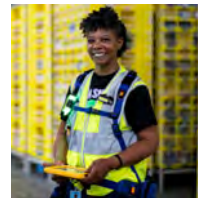
Increase the number of apprentices in the construction trades' registered apprenticeship programs and the percentages of people of color and women who enroll in and complete the programs.

Increase jobs in all sectors of the clean economy, including new and emerging sectors such as land management, transportation, long-lived wood products, etc.


Increase the number of clean technology businesses and the number of jobs they provide.

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CONTEXT

An economy in transition

Climate change is negatively affecting jobs, natural environments, and our economy. Customers and businesses are increasingly asking for energy efficient, lower-carbon products, and building owners want options to reduce their carbon footprint and save money. Businesses need help adapting to remain competitive. Workers also need support to transition or retrain to successfully adapt to new technologies and in-demand job skills.

Several communities host large electric-generating power facilities that are retiring in the coming years, which will impact jobs, tax base, and community prosperity.
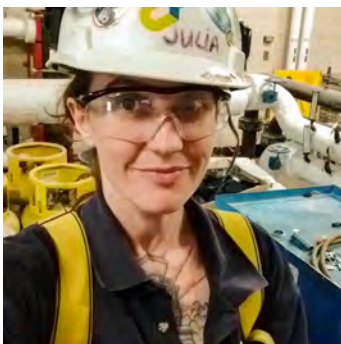
Clean economy opportunities

Existing careers will be the foundation of a carbon-neutral economy, many requiring new skills or functions as they become more sustainable. Blue-collar work and the construction industry will be major components. In energy efficiency, renewable energy, clean transportation, power grid, and clean fuels alone Minnesota boasts more than 55,000 jobs — more than a third of which are in Greater Minnesota —and there are many jobs beyond the energy sectors that contribute to sustainability. People of color and women are largely underrepresented in these careers, and employers must address this lack of diversity. Workforce training for the clean economy should ensure access by communities disproportionately impacted by climate change and workers disadvantaged by systemic racism and other barriers.

Adaptation and growth

Minnesota businesses and workers will need more economic development and training assistance to power the transition to a clean economy. Business innovation and entrepreneurship spurs job growth, and a well-trained workforce is needed to fill those jobs. The movement towards an inclusive clean economy is a win-win-win for employees, consumers, and businesses.

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WHAT WE WILL DO TOGETHER

Grow clean economy jobs and businesses that provide equitable opportunities for all Minnesotans
Minnesota will support the businesses and workers that are part of the clean economy with training, research, incentives, and partnerships.

Initiative 6.1 — Business innovation and entrepreneurship

Invest in research and development, innovation, and partnerships.

▶ **Become a national leader in clean innovation**
Attract new industries and innovative thinkers through multi-sector partnerships and technical and financial support for entrepreneurs. Invest in research and development. Support businesses owned by women, people of color, veterans, people with disabilities, and others who have historically been left out of investment opportunities.

Initiative 6.2 — Equitable access to jobs and a just transition

Support workers to adapt and evolve their skills through inclusive strategies, ensuring family-sustaining careers.

▶ **Support transitions as industries evolve**
Plan how to connect people with workforce training and apprenticeship opportunities to prepare them for the carbon-neutral economy, and gain skills that will adapt to new, cleaner technologies as they develop. Help workers in declining industries adapt and redevelop their skills. Assist communities where large power plants will be retired to plan for a prosperous future. Ensure training and work opportunities are accessible to all. Transition planning and support should be long-term and take into account the amount of time it may take to train workers, execute economic development strategies, and other considerations.

▶ **Develop career pathways**
Outreach, education, and training should lead to employment in clean economy jobs that pay a family-sustaining wage with skills that can be adapted to new and cleaner technologies as they develop.

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▶ **Ensure good wages and benefits for workers and address systemic barriers**
Engage with businesses, educational institutions and policymakers to develop strategies to ensure jobs provide family-sustaining wages and benefits. Make job opportunities and training accessible for communities that have faced structural bias and discrimination that are disproportionately impacted by climate change.

We all have a role

Helping Minnesota's workforce and businesses to succeed and transition to a clean economy will require partnerships across government, unions, industry, trades, colleges and universities, training programs, and businesses of all sizes.

- Local governments offer incentives for economic development — and can help link businesses with communities to retain and create homegrown jobs.

- Businesses and industry will develop and seek clean technologies, participate in energy efficiency programs, and optimize supply chain and production proficiencies.

- Educational institutions and labor training programs can work with governments and businesses to train Minnesotans for clean economy jobs that pay family-sustaining wages.

Benefits of shared action

Growing clean economy jobs and businesses and ensuring a just transition have other benefits:

- Vibrant and healthy communities across the state

- Reduced income disparities

- More innovative business practices

- More Minnesota workers with adaptable skills to meet workforce demand

EQUITY

Many clean economy jobs are and will continue to be in the construction trades. While overall construction jobs tend to provide good wages and benefits, the industry continues to be dominated by white men. Attracting and retaining women and people of color in the trades — such as through outreach in schools career guidance programs to align education and training; safe, hands-on learning opportunities; mentoring; and financial support during seasonal layoffs — will be critical to achieving an inclusive and equitable clean economy.

We know that health, environmental, and economic crises disproportionately affect overburdened communities and can displace workers. Job training and job placement efforts should focus on reaching communities disproportionately impacted by climate change and communities that have faced structural bias and discrimination.

Other key activities will include:

- Ensuring unique regional needs are addressed and there is equitable access to training.

- Identifying potential high-demand clean economy sectors, and training resources and needs by region. Targeting training to populations that are underrepresented in the trades.

- Consulting and coordinating with tribal nations, to support and learn from their workforce development efforts and clean economy initiatives.

- Exploring the multifaceted opportunities to grow a clean economy with strategies such as educating consumers on sustainable options.

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