FALCON HEIGHTS
THE CITY THAT SOARS

Climate Action Plan

A Collaborative Community Vision

May 2025

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FALCON HEIGHTS
THE CITY THAT SOARS

Plan At A Glance

6 Sectors
(Click icon to view)

- Transportation
- Buildings/Energy
- Waste
- Water
- Food
- Greenspace

focused on 23 Strategies

Transportation
- 53% lower GHG* emissions
- 5% fewer VMT**
- 40% increase in public transit
- 15% registered EVs***
- 8% increase in

Buildings/Energy
- 45% lower GHG* emissions
- 22% clean electricity
- 5% less electricity use
- 45% less fuel combustion
- 20% fuel switching from fossil

Waste
- 20% lower GHG* emissions
- 10% less solid waste
- 10% more organics diversion
- 10% more recycling diversion

Water
- 5% less water use
- 5% reduction in wastewater
- Increased stormwater resilience
- Increased water restoration

Food
- Increased access to local food
- Increased production of local food
- Decreased hunger and food waste

Greenspace
- 11% more tree canopy cover
- 15% less turf, more native grass
- 10% less dark impervious surfaces

* Greenhouse Gas Emissions (GHG)
** Vehicle Miles Traveled (VMT)
*** Electric Vehicle (EV)

To reduce our GHG* emissions

12,894 Metric tons (MT CO_2e) in 2023 from vehicle use citywide

19,681 Metric tons (MT CO_2e) in 2023 from building energy citywide

881 Metric tons (MT CO_2e) in 2023 from solid waste citywide

...and enhance our Climate Resilience

- Extreme Heat / Weather
- Flooding
- Air Quality
- Food Insecurity
- Infrastructure Failure

Achieving GHG Emission Reductions of

47% BY 2035 **100%** BY 2050

Introduction

QUICK FACTS

19,681
Metric tons (MT CO_2e) in 2023 from building energy citywide

12,894
Metric tons (MT CO_2e) in 2023 from vehicle use citywide

881
Metric tons (MT CO_2e) in 2023 from solid waste citywide

Falcon Heights has long been a leader in environmental stewardship, embracing sustainability as a core value of our community. Over the years, the City has adopted forward-thinking "green" practices—becoming one of Minnesota's first GreenStep Cities in 2009 and pioneering projects like a 40 kW solar installation on City Hall in 2012, community gardens, a native plant ordinance, and LED streetlight upgrades. This strong foundation reflects a commitment to a high quality of life through sustainable infrastructure and conservation.

Climate Emergency Resolution

Climate change is already impacting Falcon Heights, bringing warmer winters, hotter summers, and extreme weather. The City Council responded by unanimously declaring a Climate Emergency in January 2023, committing Falcon Heights to urgent action and a just transition. This Climate Action Plan (CAP), supported by a Minnesota Pollution Control Agency grant, is a key step in meeting that commitment.

Current Initiatives and Partnerships

Building on our strong foundation, Falcon Heights now holds Step 5 recognition in the GreenStep Cities program, reflecting ongoing leadership in energy savings, waste reduction, and sustainability. The City is also a Charging Smart community, recognized for electric vehicle readiness. With Xcel Energy, we've launched an Energy Action Plan to cut emissions—progress driven by residents and businesses. Falcon Heights collaborates with Ramsey County and nearby cities on recycling, composting, and resilience projects, and engages residents through events like the 2025 Sustainability Fair. These efforts show what's possible when our community works together for a sustainable future.

A Vision for the Future

This CAP outlines a clear path to a low-carbon, resilient future. It sets ambitious goals aligned with Minnesota's climate targets—cutting emissions 47% by 2035 and reaching net zero emissions by 2050. Shaped by public input, the plan calls on everyone—residents, businesses, and partners—to play a role. Together, we can protect what we value today and create a thriving, resilient Falcon Heights for generations to come.

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Co-Benefits of Climate Action Planning

The World Health Organization reports growing evidence that climate policies can deliver both cost savings and significant health improvements. Community actions to cut greenhouse gas emissions in sectors like housing, transportation, and energy create multiple co-benefits beyond mitigating climate change. These include cleaner air, better public health, reduced health risks, greater resource efficiency, stronger local economies, and increased resilience of ecosystems and infrastructure.[1,2,3,4] These outcomes not only improve quality of life and natural resources but also generate financial gains.

Common Co-Benefits of Climate Planning

Positive Financial Impacts

Many climate actions offer direct financial benefits, such as lower fuel costs, and indirect savings, particularly from improved air quality. Research shows that health and air pollution benefits can offset much of the cost of these initiatives.[5] Additional savings come from increased resilience, such as reduced reliance on fossil fuels—valued locally at $141 per metric ton (MT) of greenhouse gas reductions.[6,7,8] Health benefits may be even greater, with estimates ranging from $50 to $380 per MT of GHG reduced globally.[9]

Improved Quality of Life

Implementing climate action plans like this one can enhance quality of life by expanding mobility options, creating jobs, and reducing poverty and inequality.[10] These co-benefits strengthen community well-being as we address climate challenges.

Improved Natural Resources

Taking action on climate change also helps protect ecosystems that provide essential services.[11] For example, expanding Falcon Heights' tree canopy to meet this plan's goals could increase the annual economic value of community trees by up to $22,500. Other strategies will improve residents' access to green spaces, supporting both environmental health and quality of life.[12]

Planning Process

9 months	100+	2	2	31	5
Planning timeframe	Community members engaged	Community meetings and events	Online community input surveys	Planning team members	Foundational research documents

The Falcon Heights Climate Action Plan was developed collaboratively with a 31-member planning team, including community members, businesses, institutions, City commissions, and Falcon Heights staff. The planning team considered, created, and reviewed strategies and actions for each of the sectors included in this plan (see Plan Framework). The team participated in planning workshops from January to April 2025. The process included community engagement including community-wide surveys and input meetings and events. Goals and actions were shaped by community feedback, expert analysis, and best practices from other Minnesota and U.S. cities. Through workshops, the team refined and prioritized strategies, resulting in a co-authored plan that reflects the voices of Falcon Heights.

Research Based Climate Action Plan

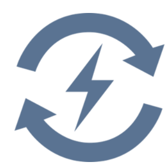
To establish the plan's goals, strategies, and actions, the planning team conducted extensive research and produced several key assessments. These included studies on climate vulnerability, ground cover and tree canopy, greenhouse gas emissions, and renewable, or "clean" energy potential, providing critical data on climate risks, carbon sequestration, emissions trends, and solar opportunities. A final Climate Action Baseline Study synthesized these findings, reviewed key community metrics, and outlined preliminary sector-specific goals to guide planning discussions. Click on the icons below to view these documents:

Climate Action Baseline Study

Climate Vulnerability Assessment

Community-Wide GHG Inventory

Ground Cover, Tree Canopy & Carbon Sequestration Study

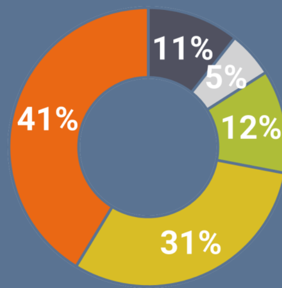


Community-Wide Renewable Energy Potential Study

What We Heard

Community input was gathered through two surveys with over 75 responses from residents and businesses.[13] The first gathered climate concerns and action ideas; the second collected feedback on draft strategies. This input shaped the plan to reflect local priorities.

How concerned are you about climate change?



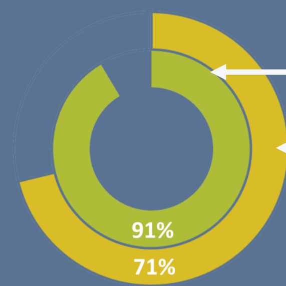
- Not at all concerned
- Slightly concerned
- Moderately concerned
- Very concerned
- Extremely concerned

The City's Role in Climate Action

Respondents reported that they agree or strongly agree…

It is important for Falcon Heights to take action to prepare for the projected impacts of climate change.	83%
It is important for Falcon Heights to take action to reduce greenhouse gas emissions.	82%
It is important for Falcon Heights to be a leader in proactively addressing climate change.	74%

Climate Experience



91% have noticed signs of climate change

71% have been personally impacted

Key Themes

Key themes that emerged from the community included:

Support for Municipal Action and Leadership

84% of respondents are concerned about climate change. Additionally, 83% support the City preparing for impacts, 82% back reducing emissions, and 74% want Falcon Heights to lead on climate.

Clean Energy

79% support rental properties meeting energy efficiency standards to reduce costs while 67% support incentives for efficiency and solar readiness, and 61% support solar installation incentives.

Impacts on Vulnerable Populations

Over 80% of respondents are concerned about climate change risks to vulnerable groups.

Protect Resources

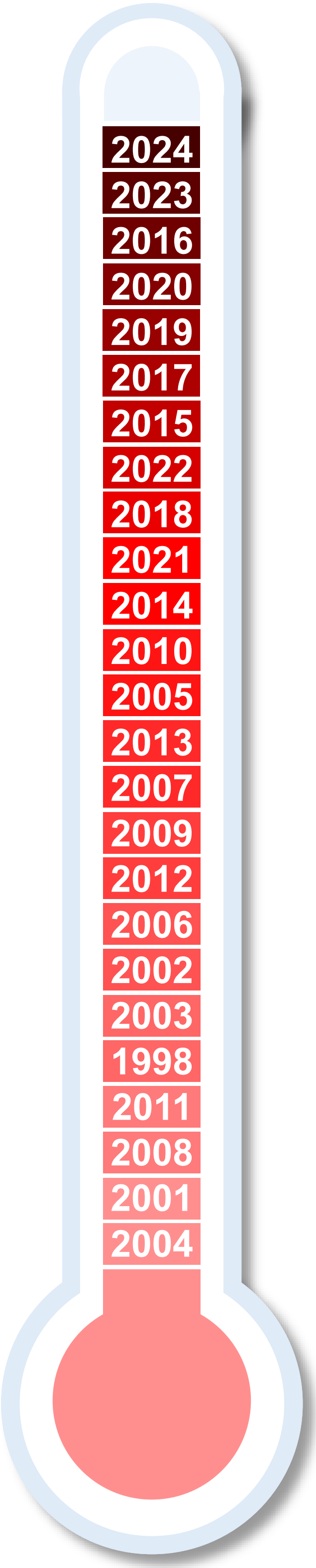
84% are concerned about air quality, 82% about impacts on ecosystems, and 77% about risks to clean water.

Survey Summary

For Additional Information (click icon)

The Hottest

25 Hottest Global Years on Record[27]



Climate Change Impacts

Climate change is a global issue with serious local impacts. Scientists agree that rising greenhouse gas emissions are destabilizing Earth's climate. Twenty-four of the 25 hottest years on record have occurred since 2000. In Minnesota, much of the state has warmed nearly 3°F over the past century, causing drier soils and a 20% increase in heavy rain events.[14,15,16]

Climate Change in Falcon Heights

Falcon Heights is already experiencing these changes. Between 1980 and 2018, the city saw rising average temperatures, more days above 95°F, more heavy rain events, and fewer days below 32°F.[17,18] One of the most notable shifts is in precipitation patterns. While overall annual precipitation has increased, the change is uneven. Fall and winter precipitation rose up to 15.5%, while spring and summer levels remained largely unchanged.[19]

Climate Projections for Falcon Heights[7]

Over their lifetime, a child in Falcon Heights can expect:[20,21]

Climate Conditions	Baseline	Mid-Century (2050 average)	End of Century (2100 average)
Average Daily Maximum Temperature	55° F	62°F	62°F - 67°F
Number of Days Per Year with Maximum > 95° F	2	23	23 - 52
Number of Days Per Year With Minimum < 32° F	154	131	130 - 107
Change in Growing, Allergy, & Tick/Mosquito Season[22,23]	9 days	23 days	24-37 days
Average Annual Precipitation[24]	26"	32"	28-35"
Increase in Heavy Precipitation Events (Days with > 1" Rainfall)	N/A	27%	27-55%
Air Conditioning Demand (Cooling Degree Days)	700	1500	1500-2200
Heat Related Increase In Per Capita Electricity[25]	N/A	36%	36-53%

Falcon Heights' Climate Risks

The anticipated climate changes in Falcon Heights over the next few decades pose potential risks to residents, with certain populations—such as children, seniors, and individuals with disabilities—being more vulnerable to these impacts. Below are some of the most notable risks to the community.[7]

Extreme Heat and Weather

Certain individuals face higher risks of stress, health issues, or even death from extreme weather events like severe storms, hail, heavy rain events, and heat waves.[26,27] Susceptibility to heat stress increases with pre-existing conditions such as diabetes and heart disease, as well as demographic, socioeconomic, and environmental factors like land cover.

Flooding

The latest National Climate Assessment shows that heavy precipitation events are already on the rise across the U.S. and in Minnesota. These intense rainfall events are expected to continue increasing throughout the state. The growing frequency of both extreme and total precipitation is likely to contribute to more frequent over-bank flooding (river and lake flooding) and flash floods.

Air Quality

Climate change is anticipated to impact air quality through various channels, including higher levels of allergens and pollen, increased regional ozone concentrations, greater risks of smoke from wildfires, and elevated particulate pollution and dust.

Food Insecurity

Climate change is likely to destabilize cropping systems, interrupt transportation networks, and trigger food shortages and spikes in food cost.

Infrastructure / Power Failure

Extreme weather events, flooding, flash flooding, and the growing daily challenges from climate variability all pose risks to the stability of our aging infrastructure. Power outages, road damage, bridge collapses, and water system failures are significant physical climate risks to the community, particularly for those most vulnerable to climate impacts.

Greenhouse Gas Emissions

Measuring, tracking, and reducing greenhouse gas (GHG) emissions is essential for effective climate action. Understanding our emissions helps us focus efforts on minimizing our community's climate impact.

In Falcon Heights, community-wide emissions decreased from 37,466 MT CO_2e in 2019 to 33,457 MT CO_2e in 2023, a reduction of nearly 11%.[6]

2022 GHG EMISSIONS IN Falcon Heights[6]

38.5%	37.4%	21.4%	2.6%
12,894 MT CO_2e from transportation	**12,514** MT CO_2e from natural gas	**7,168** MT CO_2e from electricity	**881** MT CO_2e from solid waste

Inside The Numbers:

Total Vehicle Miles Traveled (VMT): 27,333,000

Gasoline consumed (est): 1,035,911 gallons

Diesel fuel consumed (est): 398,464

Electric Vehicle (EV) share of total: 2.7%

Non-residential therms used: 1,186,300

Residential therms used: 1,175,347

Non-residential kWh used: 17,215,000

Residential kWh used: 12,964,000

Customer-owned clean energy share: 0.58%

Total solid waste generated: 6,160 tons

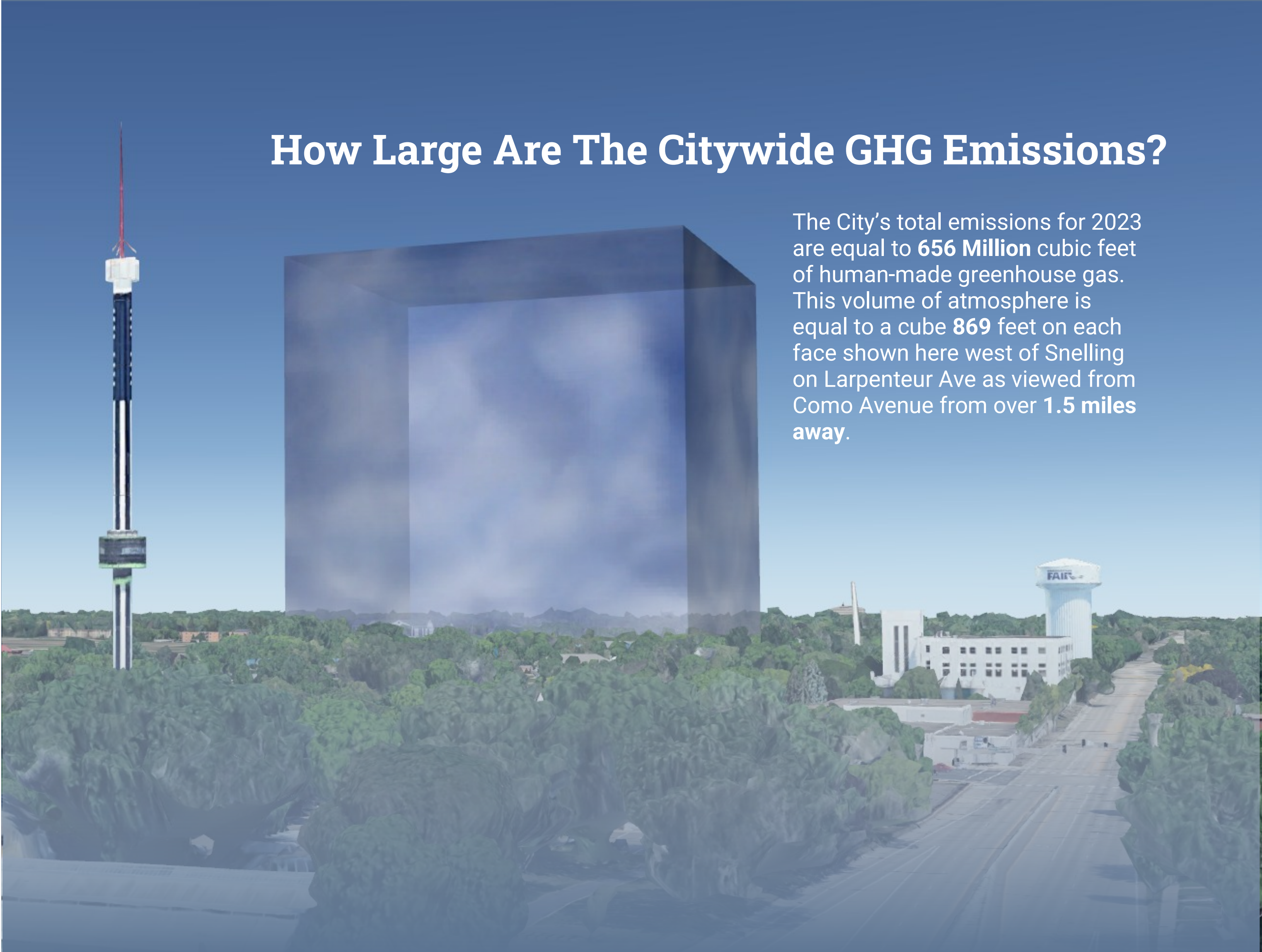
Solid waste landfilled: 669 tons

Solid waste used for waste-to-energy: 2,330 tons

Solid waste recycled: 1,936 tons

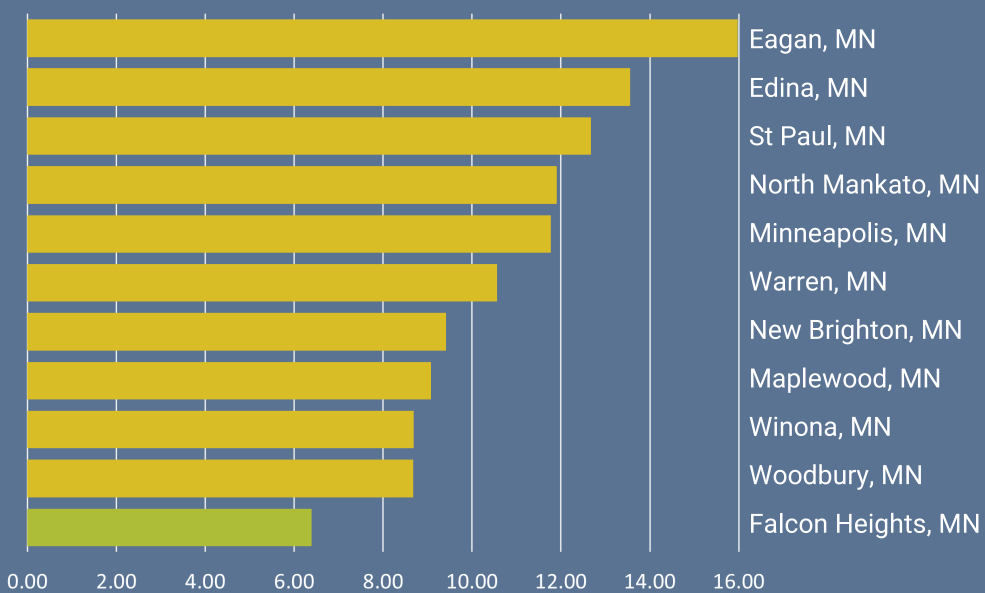
Organic solid waste recycled/composted: 1,224 tons

How Large Are The Citywide GHG Emissions?



The City's total emissions for 2023 are equal to **656 Million** cubic feet of human-made greenhouse gas. This volume of atmosphere is equal to a cube **869** feet on each face shown here west of Snelling on Larpenteur Ave as viewed from Como Avenue from over **1.5 miles away**.

Emissions Per Capita



How Do We Stack Up?

Falcon Heights emits 6.73 MT CO_2e per person, significantly below the U.S. average of 20.7 MT CO_2e.[6] The chart on the left compares Falcon Heights' emissions to other Minnesota communities.

GHG Inventory

For Additional Information (click icon)

Plan Framework

The plan guides Falcon Heights' municipal operations and citywide climate action, covering GHG reductions and climate resilience. It includes an implementation section and six sectors, each with goals and detailed actions for implementation.

Transportation and Land Use

Click here for section

Strengthening Falcon Heights' mobility resilience while reducing emissions and environmental impacts.

Sector Strategies:

- Reducing vehicle use
- Increasing public transit use
- Increasing population density (within already developed land)
- Increasing zero emission vehicle registration
- Increasing community "EV Readiness"

Buildings and Energy

Click here for section

Increasing building resilience through energy efficiency, clean energy adoption, and decreased on-site fuel use.

Sector Strategies:

- Reducing energy use
- Switching from fossil fuel combustion
- Increasing clean energy use

Waste Management

Click here for section

Reducing GHG emissions by increasing recycling and organic diversion, and decreasing overall waste.

Sector Strategies:

- Reducing amount of solid waste produced
- Recycling more of our waste
- Sending less organic waste to landfills

Water and Wastewater

Click here for section

Decreasing water consumption and wastewater effects while improving resilience to flooding and stormwater.

Sector Strategies:

- Using less water
- Preparing for more and heavier rainfall
- Keeping water clean and protecting it

Local Food and Agriculture

Click here for section

Strengthening the resilience, accessibility, and security of the community's local food system.

Sector Strategies:

- Making it easier to get locally grown food
- Growing more food in the community
- Cutting down on food waste and reducing hunger

Greenspace and Ecosystems

Click here for section

Encouraging community adaptation by increasing green infrastructure and strengthening ecosystem resilience.

Sector Strategies:

- Planting more trees to increase shade and tree coverage
- Planting more pollinator-friendly native plants instead of lawns
- Reducing the amount of pavement

GHG Reduction Goal

This plan aligns with science-based greenhouse gas reduction targets to limit global warming to 1.5°C above pre-industrial levels. Meeting this target would greatly reduce climate risks and impacts.[29,30] The CAP sets both interim and long-term goals.

Interim Goal

City of Falcon Heights' GHG interim reduction goal:

"To reduce citywide GHG emissions by 47% below 2019 levels by 2035."*

Long-Term Goal

City of Falcon Heights' long-term GHG goal:

"To achieve net zero emissions by 2050."**

This citywide goal guides sector-specific strategies. Sector goals aim to evenly distribute greenhouse gas reductions and meet the community's overall emissions targets. They are designed to be achievable yet ambitious, surpassing business-as-usual outcomes.

* Goal aligns with IPCC recommended reduction targets which use 2019 as the baseline year[31]

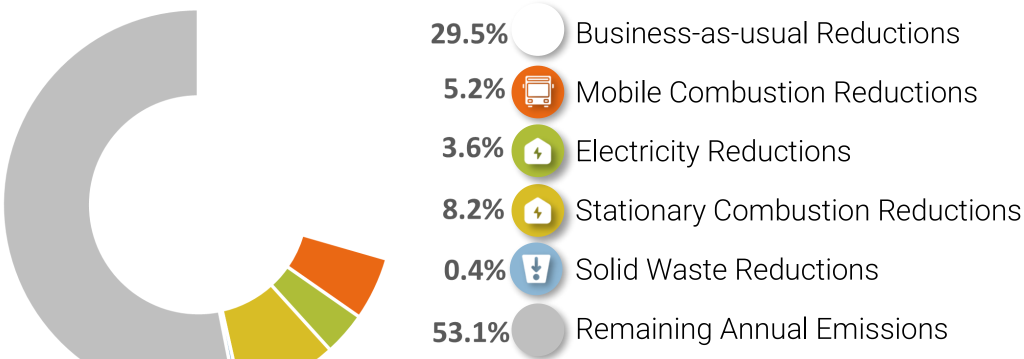
** A community, business, institution, or building that produces the same amount of energy it consumes through renewable GHG emission-free sources ("clean energy"), resulting in zero net emissions over a year. See Glossary of Terms for more information.

Survey of Peer Community Carbon Reduction Goals

Burnsville	Reduce community-wide GHG emissions 40% below 2005 levels by 2030 and 80% below 2005 levels by 2050.
Eagan	To reduce community-wide GHG emissions 55% below 2014 levels by 2035, and net zero emissions by 2050 .
Edina	To reduce community-wide GHG emissions 45% below 2019 levels by 2030, and net zero emissions by 2050 .
Maplewood	Reducing greenhouse gas emissions to 20 percent of the City's 2015 baseline levels by 2050 (an 80 percent reduction).
Minneapolis	100% renewable energy for city operations by 2022 and citywide electricity by 2030.
New Brighton	To reduce community-wide GHG emissions 42% below 2013 levels by 2030, and achieve carbon neutrality by 2050 .
St Louis Park	100% renewable electricity citywide by 2030, carbon neutrality by 2040.
St Paul	Carbon neutral municipal operations by 2030, carbon neutral citywide by 2050.

Plan Impacts

This plan includes strategies and actions designed to reduce emissions over the long term. Their potential impact has been modeled using projections for reduced energy and fuel use. The modeling also accounts for expected adoption rates of clean energy and low- or zero-emission transportation options. From this modeling, we know that with the successful implementation of the strategies outlined in this CAP, citywide annual GHG emissions are projected to drop to 19,892 MT CO_2e by 2035, a 46.9% decrease below 2019 levels. The potential cumulative GHG emissions reductions over the 10 year implementation period are estimated at over 42,498 MT CO_2e. This is equal to the elimination of over 834 million cubic feet of greenhouse gases by 2035.[6]



Note: Reductions Achieved refer to emissions reductions that have occurred since 2014 based on the City of Falcon Heights Community GHG Inventory. 'Business-as-usual' (BAU) Reductions are anticipated reductions resulting from existing requirements or commitments, such as federal vehicle fuel efficiency standards and electric utility carbon-reduction commitments, which are outside the scope of this plan.

Potential Economic Savings

Below is an estimate of the cumulative community-wide economic savings potential of implementing the plan through 2035.

Transportation Economic Potential*:

Sector Savings:	$9,517,233
Sector Cost Increases:	-$1,564,585

Potential Sector Net Cost Savings:

$7,952,649

Buildings and Energy Economic Potential*:

Sector Savings:	$3,526,485
Sector Cost Increases:	-$2,543,594

Potential Sector Net Cost Savings:

+ $982,892

Waste Reduction Economic Potential*:

Residential Savings:	$463,869
Commercial Savings:	$1,531,208

Potential Sector Net Cost Savings:

+ $1,995,078

Social Cost of Avoided Carbon:

+ $6,002,051

Estimated Localized Social Cost of Carbon: $141

Cumulative Community Savings Potential:

= $16,932,669

* Estimated community-wide costs and savings are calculated based on achieving goal statements and are not calculated on an individual action basis. Values do not include economic potential of job creation and new business potential represented in the plan actions. See Appendix for a detailed illustration of how cumulative costs and savings are arrived at.

QUICK FACTS

38.5%
of community-wide GHG emissions in 2023 from transportation

27,333,000
Vehicle Miles Traveled in 2023

45.9%
Commuters drove alone in 2023

10.3%
Commuters use public transit

87
Battery Electric Vehicles (BEV) registered in 2023

For More Information (click icon):

Vulnerability

GHG Inventory

The Plan:

Transportation and Land Use

Transportation is energy- and resource-intensive. Beyond road vehicles, off-road equipment (such as construction machinery and gas-powered lawn mowers) also burns significant fossil fuel. Globally, transportation accounts for nearly one-third of all energy use and roughly one-quarter of energy-related carbon emissions.[1] In Falcon Heights, transportation contributes about 38% of the city's greenhouse gas emissions.[2] As electricity gets cleaner, transportation's share of emissions could grow—making it a key focus for climate action.

There are many ways to make transportation more sustainable while improving quality of life and equity, including:

- Shared and Public Transportation: Riding together on buses, trains, or carpools means fewer single-occupancy cars on the road. This cuts traffic and pollution while improving access to transportation for everyone.
- Bicycle-sharing stations like Nice Ride Minnesota offer a clean and active way to get around. Encouraging walking, biking, or e-scooter use reduces air pollution and improves public health.
- Electric Vehicles and Clean Fuels: Transitioning to electric vehicles (EVs) and renewable fuels can dramatically reduce transportation emissions. EVs produce no tailpipe pollution, improving air quality for everyone.

The Link Between Land Use and Transportation Emissions

Transportation emission strategies often focus on technology and low-carbon fuels, but studies show smart growth and compact development are also key. Denser, well-planned communities reduce driving and support more energy-efficient housing. In the 125 largest U.S. urban areas, a 10% increase in population density could cut CO_2 emissions by 4.8% from travel and 3.5% from residential energy use.[3]

Click here to return to TOC

STRATEGY TL1:

Decrease community-wide Vehicle Miles Traveled (VMT) by 5% by 2035.

Strategy Co-Benefits

In 2023, Falcon Heights' total vehicle miles traveled (VMT) was 27.3 million miles. VMT rose 1% from 2014 to 2019 but then fell, ending 2023 20% below 2014 levels.[2]

Reducing VMT by 5% would eliminate 1.7 million miles and cut annual greenhouse gas emissions by over 640 MT CO_2e[4,5] Expanding safe, accessible bike and walking routes to schools, shops, and recreation areas can help reduce vehicle use for daily trips.

ACTIONS

TL 1-1	Adopt and implement a Living Streets policy. (Note: Living Streets are green, multimodal streets that enhance walking and biking conditions, safety, and neighborhood livability while reducing environmental impacts and maintenance costs.)
TL 1-2	Create an Active Mobility Plan emphasizing multimodal transportation, transit access, bike/pedestrian safety, and infrastructure improvements. Prioritize protected bike lanes. Review Ramsey County's bike/pedestrian plan and partner with adjacent communities, the University of Minnesota and State Fair on connected routes.
TL 1-3	Establish a policy for a Transportation Demand Management (TDM) plan, which includes a transit component, applicable to all new developments and redevelopments projects.
TL 1-4	Collaborate with partners on a branded campaign and incentives to promote alternative transportation, focusing on short trips and equity-driven support for bike and eBike adoption.
TL 1-5	Develop and distribute a resident-focused brochure through landlords that highlights local parks, transit options, bike and walk routes, sustainability resources, waste and recycling programs, clean energy opportunities, and related incentives, including links to the current City information.

STRATEGY TL2:

Increase public transit commuter ridership 4% by 2035.

Strategy Co-Benefits

Since 2013, Falcon Heights' 6,100 workers have averaged a 19.9-minute commute. About 97% commute in from outside the city, while 87% of employed residents work elsewhere.[6,7] With vehicle operating costs at $0.81 per mile, each 1% shift to public transit could reduce driving by 273,000 miles and save commuters over $200,000 annually.[8]

ACTIONS

TL 2-1	Collaborate with Metro Transit and partners to secure funding for free or reduced fares for Falcon Heights residents and expand transit access through fare reductions, Bus Rapid Transit, and other strategies.
TL 2-2	Collaborate with Metro Transit and partners to enhance bus stop infrastructure according to industry best practices, including pullouts, shelters, and safe pedestrian crossings.
TL 2-3	Partner with Metro Transit and others to develop and distribute educational materials about public transit options and resources
TL 2-4	Work with local businesses to promote and expand Metro Transit's Guaranteed Ride Home and Employer Sponsored Pass programs for employees and students

STRATEGY TL3:

Increase average population per developed acre by 8% by 2035.

Strategy Co-Benefits

The city has 875 acres of developed land, covering 61% of its total area and supporting 5,232 residents—an average of 6 residents per developed acre.[9,10] Falcon Heights' population could grow by up to 12.8% by 2035.[18] Research shows that every 1% increase in population-weighted urban density reduces household travel CO_2 emissions by 0.12% to 0.48%.[3,11] Zoning policies and incentives that promote higher density in developed areas, while ensuring affordable housing and preventing gentrification, can help reduce citywide emissions.*

ACTIONS

TL 3-1	Amend zoning ordinances to support higher-density, walkable neighborhoods by increasing building heights, allowing approved densities, encouraging Accessory Dwelling Units (ADUs), promoting Transit-Oriented Development (TOD) near transit stations, and supporting mixed-use developments.
TL 3-2	Use the Comprehensive Plan process to identify vacant or underutilized land suitable for higher-density development, walkability improvements, transit access, or greenspace.
TL 3-3	Attract and support mixed-use, multimodal redevelopment projects on priority sites identified through the Comprehensive Plan.

* Note: a significant portion of vacant land within the boundary of Falcon Heights is owned by the Minnesota State Fair and University of Minnesota over which the City does not have jurisdictional control.

STRATEGY TL4:

Increase battery electric vehicle (BEV) use to 15% of vehicles on the road by 2035.

Strategy Co-Benefits

Shifting vehicles communitywide from fossil fuels to low- and zero-emission alternatives is key to cutting long-term emissions. Electric vehicles (EVs) reduce vehicle emissions by 50–70%, with battery production impacts offset within two years.[12]

Falcon Heights has about 3,200 vehicles but only 87 battery electric vehicles (BEVs) as of January 2024.[4,13] Nationally, EV sales have grown fivefold in three years, showing strong potential for local adoption.[14] Each 1% shift to EVs in the city could reduce annual emissions by up to 112 MT CO_2e, even with added electricity use.[2,5]

ACTIONS

TL 4-1	Collaborate with Xcel Energy and partners to expand incentives for electric vehicles (EVs), residential chargers, and eBike adoption, including low-cost loan or bulk-purchase programs to reduce costs.
TL 4-2	Provide information to the community through workshops, an EV guide, and enhanced website content highlighting EV technology, incentives, and available programs.
TL 4-3	Partner with Ramsey County Environmental Health to host and promote a Falcon Heights EV Fair, providing education, test drives, and vendor interaction.
TL 4-4	Through trash hauler permitting, promote or require fleet efficiency improvements such as fuel-efficient practices, optimized routing, zero-emission vehicles or low-emission fuels, and advanced technologies. Include a provision for annual reporting on progress.

STRATEGY TL5:

Make the community "EV-ready" with electric vehicle charging stations in every public and private parking lot or ramp by 2030.

Strategy Co-Benefits

As a core climate action strategy, communities are prioritizing EV readiness by expanding Level 2 and DC fast charging infrastructure across public and private parking areas. This widespread access reduces range anxiety, increases EV adoption, and cuts transportation emissions.[15] Benefits include cleaner air, improved public health, and economic growth through job creation and cost savings.[16] Making all parking EV-ready also supports equitable access, strengthens transportation systems, and supports community resilience.

ACTIONS

TL 5-1	Implement an "EV Ready" building ordinance for new developments that includes EV charging infrastructure and dedicated parking.
TL 5-2	Create an Electric Vehicle Infrastructure Readiness Plan that assesses current and future charging needs, maps existing stations, identifies expansion opportunities in public, commercial, and multi-family residential areas, and prioritizes equitable access in low/moderate-income neighborhoods.
TL 5-3	Promote funding opportunities and resources for local businesses to provide electric vehicle charging stations.
TL 5-4	Identify an existing or develop and distribute an "EV Ready Guide" with building readiness standards and fleet conversion resources.

STRATEGY TL6:

Convert 100% of the municipal non-emergency fleet and equipment to EVs and improve remaining combustion vehicle fuel efficiency by 10% by 2035.

Strategy Co-Benefits

Falcon Heights can lead in sustainable transportation by transitioning its fleet to EVs, reducing emissions, costs, and supporting EV adoption. In 2023, gasoline made up 43% of fleet fuel use (1,141 gallons). Converting to EVs by 2035 could cut emissions by 10 MT CO_2e annually, with a 10% increase in efficiency of remaining vehicles saving another 2 MT CO_2e.[2, 17]

ACTIONS

TL 6-1	Conduct phased fleet analyses to transition to electric and alternative fuel vehicles and equipment. Identify replacements, infrastructure requirements, and facility upgrades.
TL 6-2	Adopt a policy for new City fleet vehicles to be electric or use low/no-carbon fuels by 2030 for light-duty and by 2040 for medium/heavy-duty vehicles.
TL 6-3	Implement and enforce a city operations anti-idling policy of combustion vehicles.
TL 6-4	Create an "Eco Driving Guide" to promote fuel efficiency, distribute it to City employees, include it in new employee training, and make it available to Falcon Heights residents and businesses.

The Plan:

Buildings and Energy

QUICK FACTS

58.8%
of community-wide GHG emissions in 2023 from buildings and energy

30,240,951
kWh or electricity used in 2023

2,361,647
Therms of natural gas used in 2023

78.9%
of all homes were built before 1980

52
solar arrays community-wide in 2023

Energy use in buildings is a major contributor to greenhouse gas (GHG) emissions from both residential and commercial properties. Emissions come from direct on-site fossil fuel use, like heating and cooking, and from off-site power generation. Prioritizing efficient building design improves long-term energy performance and comfort. Increasing efficiency reduces emissions, lowers energy costs for households and businesses, and strengthens climate resilience. Improving Falcon Heights' built environment also creates environmental, economic, and social benefits for the community.

Residential Energy

In 2023, Falcon Heights' residential sector consumed over 12.9 million kWh of electricity (6,324 kWh per household) and 1.175 million therms of natural gas (573 therms per household). This resulted in 9,059 MT CO_2e of GHG emissions, about 46% of citywide building energy emissions.[1]

Non-Residential Energy

The non-residential sector consumed over 17.2 million kWh of electricity (2,816 kWh per job) and 1.186 million therms of natural gas (194 therms per job) in 2023. This resulted in 10,607 MT CO_2e of GHG emissions, about 54% of citywide building energy emissions.[1]

For More Information (click icon):
Vulnerability
GHG Inventory
Renewable

Click here to return to TOC

STRATEGY BE1:

Improve total Citywide building energy efficiency 5% for electricity and 15% for natural gas by 2035.

Strategy Co-Benefits

Homes built between 2000 and 2009 use 15% less energy per square foot than 1980s homes.[2] Retrofitting older homes offers significant potential to reduce citywide energy use, especially natural gas. In Falcon Heights, 85% of owner-occupied and 69% of renter-occupied homes were built before 1980, making energy upgrades a key opportunity.[3,4] Building permits suggest up to 20% of residential units could be added, renovated, or replaced over 10 years.[3]

ACTIONS

BE 1-1	Collaborate with partners to establish a program achieving deep energy retrofits for 80% of low/moderate-income households by 2030. Goal: 100 households annually, each achieving 15% energy reductions. (Comprehensive Plan)
BE 1-2	Offer and promote fully subsidized Home Energy Squad visits for income-qualified residents.
BE 1-3	Adopt an energy benchmarking ordinance (Comprehensive Plan)
BE 1-4	Establish a policy for City-funded projects to meet energy efficiency standards (e.g., SB2030, LEED Gold, Enterprise Green Communities, ICC/ASHRAE 700). Encourage other developments needing PUD, CUP, and zoning approval to meet the same standard. (Comprehensive Plan)
BE 1-5	Consider establishing a Mayor's Home Energy Challenge to encourage and incentivize residential energy-efficiency upgrades.
BE 1-6	Adopt and promote a voluntary net-zero energy code through the building permit process (Comprehensive Plan)
BE 1-7	Consider adopting a "Dark Sky" lighting ordinance to promote ecosystem and human health and reduce exterior lighting energy consumption.

STRATEGY BE2:

Achieve 30% building "fuel switching" from on-site fossil fuel combustion to electrification or renewable fuels by 2035.

Strategy Co-Benefits

64.7% of the city's residential heating is provided by natural gas and 28.5%.[5] As Falcon Heights' electric grid nears carbon neutrality, building heating fuel will become an increasingly important target for emission reductions.[6] Reduction, and ultimately the elimination of all fossil fuel heating (oil, propane, natural gas), in the buildings sector will be required in order to achieve community wide carbon reductions.[1,7]

ACTIONS

BE 2-1	Coordinate an annual group purchase campaign for residents and small businesses to reduce costs of electrification, energy efficiency, and weatherization upgrades (e.g., air and ground source heat pumps). Prioritize equity in program design, support local contractors, and consider integration with clean energy purchase programs. Goal: 30 households and 10 businesses annually.
BE 2-2	Collaborate with partners to expand and promote incentives for low-income residents to electrify their homes. Goal: 15 households annually.
BE 2-3	Address misconceptions and promote new technologies through educational materials and City communications.

STRATEGY BE3:

Increase customer-owned or purchased clean electricity to 22% of total building electricity use citywide by 2035.

Strategy Co-Benefits

Grid electricity emissions are expected to decline, but increasing consumer clean energy purchases remains essential to meet GHG reduction goals as well as offering cost savings and increased resilience.[1,6,8,9] As of 2023, Falcon Heights had 52 customer-owned solar systems generating 1 MW.[10] Those unable to install solar can buy clean energy from their utility to reduce their emissions and support grid decarbonization.[11,12,13]

ACTIONS

BE 3-1	Collaborate with partners to implement and promote an annual Residential Solar Group Purchase program, supported by a program administrator such as the Midwest Renewable Energy Association or others experienced in solar group purchase programs. Goal: 15 participants and 100 KW installed Annually.
BE 3-2	Establish a policy to incorporate clean energy standards into the PUD ordinance. (Comprehensive Plan)
BE 3-3	Identify top privately-owned sites for Solar PV installations (rooftop, ground, carport) and develop site assessments detailing estimated costs, energy generation, and 20-year economic payback. Provide assessments to additional property owners biennially through 2032 to maximize solar incentives. Coordinate with the Commercial property and Industrial property Solarize program.
BE 3-4	Organize an annual group solar purchase program for commercial and industrial properties, coordinating with the City's "Top Solar Potentials" initiative. Goal: 5 participants installing 150 kW annually.
BE 3-5	Organize education and outreach promoting net-zero energy development, clean energy rebates, and tax credits; provide resources on the City's Energy Hub website. (Comprehensive Plan)

STRATEGY BE4:

Improve total municipal building energy efficiency by 5% for electricity and 15% for natural gas by 2035.

Strategy Co-Benefits

In 2023, the City of Falcon Heights municipal buildings and operations consumed over 151 thousand kWh of electricity and 8,238 therms of natural gas. Building energy consumption represents over 76% of GHG emissions associated with municipal operations.[1] Increasing energy efficiency of municipal operations by 5% for electricity and 15% for natural gas would save as much as 7,500 kWh and 1,200 therms, eliminating 8.5 MT CO_2e of GHG emissions annually.[1,14]

ACTIONS

BE 4-1	Establish a policy for City-owned buildings to achieve and maintain ENERGY STAR ratings of 75 or higher, meet or exceed IGCC standards, and publicly report energy use. All facility design and construction RFPs for new or major renovation projects must also evaluate opportunities to achieve Net Zero Energy.
BE 4-2	Conduct energy audits of all City facilities, including Dark Sky LED outdoor lighting guidance. Use audit results to prioritize facility improvements in the Capital Improvement Plan, with implementation within 5 years.

STRATEGY BE5:

Achieve 100% municipal building clean electricity use and "fuel switching" from on-site fossil fuel combustion to electrification by 2035.

Strategy Co-Benefits

By expanding clean energy and reducing fossil fuel use, the city can model sustainable, resilient energy systems. Reaching 100% municipal electric use through on-site generation and green energy purchases could cut emissions by up to 36 MT CO_2e annually.[1] Switching City facilities to electric heating as the grid decarbonizes could reduce emissions by another 44 MT CO_2e each year.[1]

ACTIONS

BE 5-1	Identify and assess City facilities to prioritize for electrification and schedule improvements.
BE 5-2	Establish a policy for all new City-owned buildings to be 100% electric (or have zero onsite fossil fuel combustion).
BE 5-3	Conduct a City Facility Solar and Clean Energy Master Plan study assessing on-site solar feasibility, options for achieving 100% clean electricity including ownership options, community solar, RECs, and solar+storage microgrids. Establish an implementation timeline. (Comprehensive Plan)

The Plan:

Waste Management

QUICK FACTS

2.6%
of community-wide GHG emissions in 2023 from solid waste

669
tons of landfilled waste in 2023 - 10.9% of all solid waste

2,330
tons of waste used for waste-to-energy in 2023 - 37.8% of all solid waste

1,224
tons of organics diversion in 2023 - 19.9% of all solid waste

52
tons of recycling diversion in 2023 - 37.8% of all solid waste

Waste management—including solid waste, recycling, and organics—plays a key role in reducing climate impacts. Landfills emit methane, a greenhouse gas over 25 times more potent than carbon dioxide, as organic waste like food, paper, and yard trimmings decomposes without oxygen.[1] Reducing landfill waste, especially organics, is critical to lowering these emissions.

Waste collection also produces carbon emissions from diesel-powered trucks. Cutting waste through recycling and composting reduces collection trips and transportation emissions.[2] Recycling conserves natural resources and lowers emissions from raw material extraction and manufacturing.[3] Composting prevents methane emissions, enriches soil, and helps sequester carbon.[4]

Waste reduction is the most effective strategy, cutting emissions throughout a product's life cycle.[5] In Minnesota, waste reduction and recycling already prevent nearly 4.9 million metric tons of CO_2 annually—the equivalent of removing one million cars from the road.[6] Expanding recycling, composting, and waste reduction can help Falcon Heights cut climate pollution, conserve resources, and build healthier, more sustainable systems.

Solid Waste in Falcon Heights[7]

Total solid waste handled in 2019 was 6,598 tons. By 2023 the total was 6,160 for a 6.6% decrease. On a per-capita basis, however, the decrease in total solid waste handled is lower at 2.1%. The share of solid waste being diverted for recycling has decreased from 33% in 2019 to 31.4% in 2023. Organics diversion, however, has increased from 17.2% in 2019 to 19.9% in 2023. These numbers highlight a significant opportunity to divert more waste from landfills, especially organic materials, which generate the most greenhouse gas emissions.

For More Information (click icon):

GHG Inventory

Renewable

Click here to return to TOC

STRATEGY WM1:

Decrease total annual municipal solid waste generated by 10% by 2035.

Strategy Co-Benefits

The Minnesota Pollution Control Agency (MPCA) ranks waste management strategies by environmental impact, prioritizing reduction, reuse, recycling, and organics recovery.[8] Reducing waste conserves resources, cuts emissions, and can save homes and businesses hundreds of dollars annually.[9,10,11] Strengthening waste reduction policies offers a major environmental opportunity for Falcon Heights.

ACTIONS

WM 1-1	Establish a Zero Waste policy for City operations with clear annual waste reduction targets to achieve Zero Waste. External users of City facilities to comply with the Zero Waste policy, and event permit applications must be updated to mandate recycling and composting at events.
WM 1-2	Explore waste hauling improvements to support CAP goals, including updates to the City's licensing process and the implementation of organized waste hauling strategies.
WM 1-3	Establish a policy for all construction and demolition projects to submit waste management plans demonstrating how they will meet specific waste diversion targets aligned with the City's Climate Action Plan goals
WM 1-4	Collaborate with partners such as Reuse MN to promote material reuse and waste reduction, including community events like swaps and garage sales.
WM 1-5	Collaborate with partners to create a comprehensive communication campaign to provide standardized information and communications on waste reduction, recycling, and organics collection options to reach the residential sector.

STRATEGY WM2:

Increase organics and compostable diversion from 19.9% to 22% of total MSW handled by 2035.

Strategy Co-Benefits

Most landfill gas arises from bacterial decomposition when organic waste breaks down by bacteria. Organic wastes include food, garden waste, street sweepings, textiles, wood, and paper products.[12] The State's 2013 Waste Characterization study shows that over 50% of Falcon Heights' landfill and waste-to-energy stream is organic material, including paper—presenting a major emissions reduction opportunity.[13,14]

ACTIONS

WM 2-1	Promote participation in the Ramsey/Washington Recycling and Energy Center's Food Scraps Pickup Program when available for Falcon Heights residents. Goal 75% household participation by 2035.
WM 2-2	Incorporate zoning standards for commercial and multi-family buildings that ensure convenient organics and recycling collection, making diversion as easy as garbage disposal.
WM 2-3	Collaborate with partners to promote backyard composting by providing residents with low-cost or free compost bins and educational materials.
WM 2-4	Collaborate with partners such as Ramsey County Urban Agriculture Coordinator to promote use of the community compost drop off site for residents unable or unwilling to compost at home.

STRATEGY WM3:

Increase recycling diversion from 31.4% to 35% of total MSW handled by 2035.

Strategy Co-Benefits

The 2013 State Waste Characterization study identifies significant potential to boost recycling, estimating that up to 48% of landfilled waste could be recycled.[14] The largest opportunities lie in paper and plastics, with additional potential in metals and glass.

ACTIONS

WM 3-1	Collaborate with partners on a comprehensive communication campaign providing standardized education and guidance on waste reduction, recycling, organics collection, hazardous waste management, and available waste diversion programs for residential and commercial sectors.
WM 3-2	Partner with Ramsey County and the Recycling Ambassador program to reduce barriers to recycling participation at multifamily and commercial properties.
WM 3-3	Through waste hauler permitting or organized waste collection processes, incentivize or include conditions for haulers to educate customers on recycling, waste reduction, and diversion.
WM 3-4	Adopt an ordinance that ensures all "to-go" packaging is recyclable, compostable, or reusable.

The Plan:

Water and Wastewater

Climate change directly impacts water and wastewater systems, affecting availability, quality, and infrastructure capacity in Falcon Heights.[1] Rising temperatures and shifting rainfall patterns increase water risks, requiring strategies like conservation, efficient irrigation, and drought-resistant landscaping to protect limited resources.[2,3]

Heavier rainfall can overload wastewater systems, causing overflows.[4] Adaptive strategies include increasing wastewater facility capacity, using green infrastructure like rain gardens and bioswales to manage stormwater, and preventing contamination. Integrating climate projections into planning supports proactive adaptation and strengthens the long-term sustainability of water and wastewater systems. By prioritizing resilience, Falcon Heights can protect public health, the environment, and the local economy while ensuring safe water and reliable wastewater treatment.[5]

Regional Water Stress

By 2025, an estimated 1.8 billion people will live in areas plagued by water scarcity, with two-thirds of the world's population living in water-stressed regions. Since 1985 the Falcon Heights area has had a reduction in water yield of approximately 10%. Through 2050, the City can anticipate an increase in water demand of 20%.[6]

QUICK FACTS

36%
annual precipitation increase projected by 2100

27-55%
heavy precipitation event increase projected by 2100

144
flood and severe storm events in Ramsey County reported since 2000

$30,869,000
in flood and storm damage reported by NOAA since 2000

For More Information (click icon):

Vulnerability

GHG Inventory

Ground Cover

Click here to return to TOC

STRATEGY W1:

Promote a 5% reduction in water use and wastewater generation Citywide by 2035.

Strategy Co-Benefits

Reducing water use and wastewater is key to cutting emissions and building climate resilience. Using less water eases pressure on freshwater resources, supports ecosystems, and lowers energy demand for treatment and transport, reducing greenhouse gases. Minimizing wastewater further conserves energy and cuts emissions. Together, these actions strengthen sustainability and water security.

ACTIONS

W 1-1	Collaborate with regional partners, including Saint Paul Regional Water Services, Capitol Region, Rice Creek Watershed Districts, and Met Council, to help Falcon Heights' largest water users reduce consumption through an opt-in program. Offer technical resources or grants for water-efficient equipment to assist large institutions and businesses in conserving water internally.
W 1-2	Promote community-wide adoption of WaterSense fixtures by accelerating installation in homes and expanding to commercial properties. Goal: achieve 30 households and 10 businesses upgraded annually.
W 1-3	Evaluate adopting a Lawn and Landscaping watering policy that provides clear irrigation guidelines and promotes water conservation.
W 1-4	Implement a policy establishing rainwater collection systems and WaterSense fixtures and appliances as standard for all City facility projects, including modeling best practices in the anticipated new park building. Encourage projects receiving City financing or public funds to adopt similar practices and offer technical support as needed.
W 1-5	Partner with Ramsey County, Saint Paul Regional Water Services, and others to establish a reduced-cost or giveaway program for rain barrels.

STRATEGY W2:

Identify flood-prone areas and develop plans to address future stormwater and climate-related impacts.

Strategy Co-Benefits

Falcon Heights can expect as much as a 36% increase in annual precipitation and 55% more heavy downpours by 2100.[1,7,8] These trends are likely to lead to more runoff and flash flooding on less absorbent ground.[9] Infrastructure is often based on past rainfall, but climate-ready designs must use projections from NOAA and others to account for increased precipitation and heavier storms.

ACTIONS

W 2-1	Incorporate anticipated increases in precipitation and extreme weather into the City's stormwater management plans, including addressing redevelopment of currently exempt properties. Collaborate with Capitol Region and Rice Creek Watershed Districts.
W 2-2	Conduct a pavement analysis and permeable pavement conversion study, prioritizing flood-vulnerable areas identified in the City's 2024 Ground Cover Study. Develop an implementation master plan and replacement schedule. (Consider integration with the Land Conversion Opportunity Study.)
W 2-3	Explore zoning adjustments to reduce impervious surfaces citywide, emphasizing pavement removal, permeable pavement installation, floodplain preservation, and green stormwater infrastructure. Collaborate with Capitol Region and Rice Creek Watershed Districts.
W 2-4	Partner with Capitol Region and Rice Creek Watershed Districts to create or expand incentive programs encouraging rain garden installations, prioritizing areas vulnerable to stormwater impacts.

STRATEGY W3:

Increase groundwater, stream, river and wetland water quality protection and restoration.

Strategy Co-Benefits

Protecting aquifers, lakes, and natural water bodies is vital for climate adaptation, as they store freshwater, support ecosystems, and meet human needs.[10] Climate change harms water quality through evaporation, flooding, and contamination. Groundwater management, land use planning, and riparian restoration are key. Green infrastructure like permeable pavements and rain gardens reduces runoff and improves water quality.[11]

ACTIONS

W 3-1	Partner with Capitol Region and Rice Creek Watershed Districts to assess the percentage of impervious surface runoff treated by Best Management Practices (BMPs) and set a 2035 improvement goal.
W 3-2	Strengthen ordinances and enforcement to protect riparian areas, streams, and wetlands that store and filter floodwaters.
W 3-3	Adopt a no-fertilizer, no-pesticide policy for all City-owned or managed properties and encourage reduced fertilizer and pesticide use by residents and businesses.
W 3-4	Collaborate with partners to educate residents on environmentally safer alternatives to road and sidewalk salt for ice control.

QUICK FACTS

1
community gardens within the city

0
farmers markets within the city

10.5%
average food insecurity rate in Ramsey County

19.0%
child food insecurity rate in Ramsey County

For More Information (click icon):

GHG Inventory

Ground Cover

Click here to return to TOC

The Plan:

Local Food and Agriculture

Transporting food across long distances relies heavily on fossil fuels, contributing significantly to greenhouse gas emissions. The extended travel time also increases the need for energy-intensive refrigeration, further adding to the environmental impact. By minimizing transportation and refrigeration, we can make our food systems more sustainable.[1]

Choosing locally grown food helps reduce the carbon footprint associated with our meals while also strengthening the local economy. Studies indicate that local produce markets support approximately 32 jobs per $1 million in sales, compared to just 10.5 jobs generated by wholesale distribution channels. Additionally, community gardens and neighborhood gardening provide social and environmental benefits.[2] These spaces can foster a sense of community, create opportunities for people of all ages to engage in shared activities, encourage low-impact outdoor exercise, and support biodiversity by creating habitats for plants, animals, and pollinators.[3]

At the same time, our food systems face increasing threats from climate change.[4] Extreme weather events, rising temperatures, and changing precipitation patterns put crops and livestock at risk. Challenges range from animal heat stress to increased pest infestations and disruptions to natural cycles. These physical impacts are compounded by social and economic consequences. Food insecurity—when access to adequate nutrition is limited by factors like income or availability—disproportionately affects low-income households, who are nearly three times more likely to experience it.[5] As climate change intensifies, it is likely to deepen these existing inequities and further strain food security in many communities.[6]

STRATEGY LF1:

Enhance access to local food, especially for low-income and food-insecure individuals.

Strategy Co-Benefits

U.S. agriculture faces regional climate risks.[7] Pacific states face less water, warmer winters, and variable springs. Extreme weather, heat, and flooding threaten Plains and Midwest grain. Livestock in the Plains and Southeast faces weather and supply risks.

Low-income and food-insecure groups will be hit hardest by the effects of these impacts. Strong local food systems boost resilience, food security, jobs, and community wealth.[8,9]

ACTIONS

LF 1-1	Collaborate with the Saint Paul–Ramsey County Food and Nutrition Commission to complete a Food Security Assessment, identify underserved areas, and develop strategies to improve food access—especially for vulnerable populations.
LF 1-2	Partner with organizations like Good Acre, the University of Minnesota, Gibbs Farm, and St. Paul Farmer's Market to create or expand farmers market access in Falcon Heights. Pursue grant opportunities to support these efforts.
LF 1-3	Work with partners to promote subsidy programs that provide local produce at reduced prices for qualifying residents.
LF 1-4	Offer City facilities or parking lots as pickup sites for Community Supported Agriculture (CSA) programs that accept SNAP and EBT payments.

STRATEGY LF2:

Increase production of local food, particularly serving low-income and food-insecure individuals.

Strategy Co-Benefits

Some Falcon Heights residents face economic stress, limited transportation, and live over ½ mile from a grocery store (see the Falcon Heights Climate Baseline Assessment).[10] Others face food insecurity from lack of money, culturally appropriate foods, or resources. Improving food access reduces insecurity and strengthens climate resilience.

ACTIONS

LF 2-1	Identify and map potential sites for community gardens or farms, prioritizing underserved populations and food-insecure areas. Include parks and public lands, and collaborate with partners to implement garden locations.
LF 2-2	Plant fruit and nut trees on City-owned land, boulevards, and rights-of-way. Partner with groups like Every Meal to collect and distribute the harvest.
LF 2-3	Establish a "Grow Falcon Heights" program to expand community garden plots and create a market garden that offers youth training and internships. Collaborate with local restaurants, food shelves, and organizations to distribute produce to food-insecure residents.

STRATEGY LF3:

Reduce food waste and hunger, achieve a 50% decrease in food insecurity Citywide by 2035.

Strategy Co-Benefits

Nationally, 30-40% of food is wasted.[11] Falcon Heights generates about 480 tons of food waste yearly, based on the State's 2013 Waste Study.[12,13] This waste emits greenhouse gases and costs $1 million annually.[14] It also wastes resources like land, water, and energy, and could have helped families in need. Reducing food waste supports sustainability and may reduce food insecurity.

ACTIONS

LF 3-1	Collaborate with the Saint Paul–Ramsey County Food and Nutrition Commission to complete a Food Security Assessment. Identify food-insecure areas, especially vulnerable populations, and develop strategies to improve food access in the city.
LF 3-2	Work with Ramsey County, the University of Minnesota, and the State Fair to explore creating a Food Recovery Network that improves surplus food collection and distribution from large events and facilities to food-insecure and elderly populations.
LF 3-3	Coordinate with local food banks to support edible food donations from City and community events. Expand partnerships with food retailers and restaurants, and share food bank resources on the City's website.

The Plan:

Greenspace and Ecosystems

Trees and natural vegetation are vital to community well-being, helping improve air and water quality, lowering building energy use, and supporting climate action efforts.[1] Research also links exposure to nature, like time spent in parks, with better physical and mental health and reduced stress.[2] Additionally, trees help clean the air by removing pollutants such as carbon dioxide, particulate matter, and ground-level ozone—substances that can worsen asthma and other respiratory conditions when present at high levels.[3]

Prairie Grass and Climate Action

Switching from traditional lawns to native grasses and wildflowers strengthens climate resilience. Native plants require less water and upkeep, cutting down on irrigation, chemical fertilizers, pesticides, and emissions from lawn maintenance.[4] Their deep roots enhance soil stability, improve water absorption, reduce flooding risks, and sequester carbon. Native grasses also promote biodiversity by providing essential habitats for wildlife.[5]

Impervious Surfaces and Heat

More pavement and buildings increase the urban heat island effect, where cities become hotter than surrounding rural areas due to heat absorption by man-made surfaces. This effect worsens extreme heat events, raising health risks and discomfort. Research shows that areas with more impervious surfaces and fewer trees experience significantly higher temperatures.[6]

QUICK FACTS

22.5%
average tree canopy coverage citywide

38.7%
average impervious surface coverage citywide

27.8%
manicured lawn coverage citywide

7.7 °F
Falcon Heights is hotter than nearby rural areas on hot days.

For More Information (click icon):

Vulnerability

Ground Cover

Click here to return to TOC

STRATEGY GE1:

Increase tree cover, particularly in the priority neighborhoods, from 22.5% to 25% by 2035.

Strategy Co-Benefits

Our tree canopy reduces runoff, cleans water, cools urban heat islands, lowers building energy use, stores carbon, and supports economic growth.[7,8,9] Expanding canopy coverage boosts climate adaptation.[10,11]

Prioritizing tree canopy expansion enhances equity, benefits more households, and reduces heat island effects. Suggested neighborhood increases and criteria are outlined in the City's 2024 Ground Cover Study.

ACTIONS

GE 1-1	Adopt a No Net Loss policy that ensures every removed public street or space tree is replaced with a seedling or sapling. If replanting on-site isn't feasible, a tree should be planted in a nearby space or within a tree bank established by or designated by the City.
GE 1-2	Partner to create or expand an annual tree giveaway or discount program for residents. Example: grow and distribute 400 seedlings or saplings each year.
GE 1-3	Update the City's Landscape Ordinance to establish minimum tree and native/pollinator planting coverage standards based on lawn or impervious surface area. Ensure planting islands are included in parking lots for new or expanded developments. Promote diversity in native trees, shrubs, and pollinator-friendly groundcovers.
GE 1-4	Collaborate with partners to share educational resources on climate-adaptive trees, promotion of tree and plant diversity, carbon gardening, tree care, and other sustainable greenspace practices such as reducing fertilizer use, biochar amendments, and polyculture lawns. Post resources on the City website.

STRATEGY GE2:

Enhance pollinator habitats and replace 15% of turf with native grasses and wildflowers citywide by 2035.

Strategy Co-Benefits

Replacing lawns with native grasses and wildflowers creates a natural landscape and helps address climate change. Native plants support wildlife, improve water quality, reduce air pollution, protect biodiversity, and increase carbon sequestration.[12,13,14]

In Falcon Heights, 99% of grasslands are lawns, presenting turf reduction opportunities. Replacing turf boosts stormwater uptake, reduces water use, and increases soil carbon.[15,16,17] Areas with more grass have the greatest potential for native plant restoration.[18]

ACTIONS

GE 2-1	Complete a Land Conversion Opportunity Study to identify turf and impervious areas suitable for conversion to native grasslands, wetlands, shrubs, or forests. Develop an implementation plan by census tract, explore incentives, and launch outreach to promote turf conversion.
GE 2-2	Establish a policy for City properties to reduce impervious surfaces and enhance natural diversity by incorporating pavement reduction, permeable pavement, green roofs, and replacing turf with native wildflowers and prairie grasses to support pollinators.
GE 2-3	Collaborate with partners like the University of Minnesota Bee Lab, Capitol Region and Rice Creek Watershed Districts to develop and share resources on selecting appropriate native and pollinator-friendly plants.
GE 2-4	Partner with the University of Minnesota Master Gardeners to create a greenspace ambassador and education program.

STRATEGY GE3:

Reduce heat island effect by decreasing dark impervious surfaces 10% citywide by 2035, prioritizing high-impact neighborhoods.

Strategy Co-Benefits

The heat island effect causes urban areas to be warmer than nearby rural regions due to human activities and infrastructure. This increases discomfort and health risks, especially during heat waves, which are expected to grow more frequent and intense in Falcon Heights.[19,20] Dark-colored impervious surfaces contribute significantly to this effect.[21] Reducing these surfaces can help lessen heat island impacts.

ACTIONS

GE 3-1	Collaborate with partners to create an incentive program supporting the conversion of underutilized paved and turf areas into sustainable green spaces, following the City's Land Conversion Opportunity Study.
GE 3-2	Encourage or require commercial developments receiving City funding, PUD approval, or Conditional Use Permits to implement heat island reduction strategies, including cool surfaces, solar-friendly shading, impervious surface reduction, and breeze capture.
GE 3-3	Collaborate with partners to develop and promote best practices for reducing heat island effects on commercial properties.
GE 3-4	Collaborate with partners to create a cool roofs and pavements incentive program and develop a Falcon Heights demonstration project featuring a cool roof, green roof, green/live wall, or vertical garden.

Implementation

QUICK FACTS

6
Climate Action Plan Sectors

23
strategies to achieve GHG reduction and climate resilience goals

92
detailed actions outlining a menu of steps that can be taken to support strategies

10 Year
implementation timeframe

The initial years following the adoption of the Falcon Heights Climate Action Plan (CAP) are crucial for setting a successful trajectory. Clarifying roles and securing funding early will be essential to achieving ambitious greenhouse gas reduction and climate resilience goals.

Everyone Has a Role

Climate change affects many aspects of community life, requiring a comprehensive response. Some actions will be led directly by Falcon Heights' elected officials, city leadership, or municipal departments. Other efforts will depend on local government support and active participation from residents, families, and businesses. Building a resilient future demands commitment from both city officials and the entire community.

Climate Action is a Continuous Process

Implementing a multi-year plan comes with uncertainties, especially regarding future technologies and opportunities. To accommodate this, the CAP will follow annual or biennial implementation cycles. Each cycle will identify and prioritize actions across sectors for the upcoming period, ensuring alignment with city initiatives, current projects, and budget planning. Actions will be flexible and adaptable, with refinements made as implementation progresses. Policy changes, new ordinances, or city-funded initiatives will require City Council approval.

The City will prioritize CAP implementation through collaboration among city departments, the Environment Commission, and community stakeholders. This approach ensures integration of climate actions into annual planning and budgeting processes, promoting consistency with broader city efforts.

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Organizational Actions

The following actions outline steps the City can take to organize the implementation of the climate action plan:

I 1-1	Create a City "CAP Implementation Team" comprised of the Environment Commission with the Staff/Council liaisons to meet quarterly, prioritize and track progress, and develop two-year work plans outlining tasks, timelines, resources, and staffing needs. The team will provide annual progress updates to the Environment Commission and City Council.
I 1-2	Explore the potential and benefits of the Environment Commission forming a Falcon Heights Climate Action Collaboration Team with members from local government, nonprofits, community groups, and residents. The team could meet regularly to coordinate CAP implementation, pursue joint initiatives, share lessons, support cross-jurisdictional projects, and identify funding opportunities.
I 1-3	Create a process to review city policies and plans for consistency with the Climate Action Plan. Resource: paleBLUEdot example CAP Alignment Memo
I 1-4	Implement a cohesive annual communication and education campaign that addresses the communication and educational needs of each CAP section. Enhance the City's Energy Action Hub to disseminate CAP resources and foster community action.
I 1-5	Regularly evaluate CAP progress and impacts (every 1-2 years), including updated community-wide and municipal GHG inventories. Review strategies for effectiveness and relevance, adjusting actions as necessary.

Implementation Support Tools

To aid the City's initial implementation, the paleBLUEdot team has developed supportive tools:

Implementation Matrix:
Excel tool for action implementation and monitoring.

Example Programs, Policies and Ordinances
Example programs, policies, and ordinances supporting the City's Climate Action Plan strategies: https://palebluedot.llc/falcon-heights-cap-policies

Example Policy Alignment Memo

For use in reviewing policy items against Climate Action Plan goals: Plan Alignment Statement Memo Falcon Heights.pdf

What You Can Do

Our success in building a sustainable and resilient future depends on all of us. The City has initiated this planning effort, but now we need everyone's involvement to keep the momentum going. Here are some simple steps you can start taking today!

Transportation and Land Use

- Keep vehicles tuned and tires properly inflated.
- Limit idling to 30 seconds, even in winter.
- Walk or bike instead of driving short distances.
- Use public transit regularly for commuting or errands. Plan your trip here.
- Telecommute or carpool to reduce driving.
- Fly less; vacation locally or use remote meetings.
- Consider becoming a one-car household. Explore how to make the change here.
- Choose an electric or hybrid vehicle for your next car. Search models available here.

Buildings and Energy

- Switch all home lighting to energy-efficient LED bulbs.
- Adjust your thermostat slightly higher in summer, lower in winter.
- Check out State of Minnesota's energy savings tips for summer and winter.
- Get a home energy audit to identify efficiency improvements.
- Weatherize your home by sealing drafts and adding insulation.
- Replace older appliances with ENERGY STAR® efficient models.
- Take advantage of incentives from Xcel, the State of Minnesota, and the US Government.
- Replace gas appliances with efficient electric alternatives.
- Install rooftop solar or subscribe to clean electricity through Xcel or a community solar garden.

Waste Management

- Follow Ramsey County recycling guidelines.
- Purchase durable, reusable products to reduce waste.
- Choose reusable bags, bottles, and containers to avoid single-use plastics.
- Repair items instead of discarding; donate or sell usable goods.
- Buy second-hand or borrow items rather than purchasing new.
- Plan meals carefully and shop to reduce food waste.
- Dispose of hazardous waste like batteries and electronics at proper facilities.
- Participate in Ramsey County food scraps program to easily divert scraps from the landfill.
- Participate in Ramsey County's yard waste drop off program.

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Water and Wastewater

- Reduce indoor water use by shortening showers and turning off faucets promptly. See other tips here.
- Repair leaks immediately to avoid unnecessary water loss.
- Keep gutters and storm drains clear to keep your home storm ready. Check out other rain-ready tips here.
- Use rain barrels to collect rainwater for gardening or lawn care.
- Water lawns and gardens infrequently and only during cool parts of the day.
- Install WaterSense water efficient fixtures like low-flow toilets, faucets, and showerheads.
- Install a rain garden to absorb stormwater runoff and reduce flooding.
- Understand your home's flood risk and have a preparedness plan.

Local Food and Agriculture

- Plan meals to use groceries fully and minimize waste.
- Incorporate more plant-based meals into your diet.
- Choose seasonal foods grown locally to reduce transport emissions.
- Select ethically-produced climate-friendly items, such as fair-trade coffee or chocolate.
- Support restaurants and stores selling locally-grown food products.
- Purchase food directly from local farmers through markets or CSA programs.
- Start a small garden at home to grow fruits, vegetables, or herbs.
- Join or start a community garden if space at home is limited.
- Plant fruit or nut trees and shrubs suitable for Minnesota's climate.

Greenspace and Ecosystems

- Avoid chemical pesticides and herbicides; use natural yard-care methods.
- Volunteer locally to assist with tree plantings or gardens.
- Create a pollinator-friendly garden with native plants and wildflowers.
- Reduce lawn size by planting drought-tolerant grasses and native species. Apply for funding to help.
- Plant and care for trees to provide shade and absorb carbon emissions.
- Design your yard to support local wildlife habitats.
- Replace unnecessary pavement with permeable surfaces or greenery.
- Consider installing a green roof to manage stormwater and reduce heat.

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Appendix A

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Appendix B

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Potential Cumulative Community Cost Savings From Plan Implementation

The following documents the calculations and source references used for estimating the potential cumulative communitywide cost savings of the actions included in the Climate Action Plan.

Summary of Estimated Cumulative Savings of Modeled Reductions

City of Falcon Heights

Notes

Transportation

VMT Reductions (public transit, bike, walk, etc)

Formula:

Cumulative vehicle miles saved x Average vehicle operation cost per mile = Gross VMT savings

Notes		
	VMT saved (goal year)	1,366,663
	Cumulative vehicle miles saved (through goal year):	8,199,979
1	Average vehicle operating cost per mile:	$0.820
	Gross VMT savings	**$8,199,979**

1 Savings per VMT based on AAA estimates (https://newsroom.aaa.com/wp-content/uploads/2023/08/YDC-Fact-Sheet-FINAL-8.30.23-1.pdf , https://www.slashgear.com/aaa-says-it-costs-about-74-cents-per-mile-to-drive-23496316/)

Increased Public Transit Use

Formula:

Cumulative increased public transit mileage x Average public transit cost per mile = Increased spending on public transit

Notes		
	Increased public transit miles (goal year)	1,093,331
	Cumulative increased public transit miles (through goal year):	6,559,983
2	Annual increased public transit pass costs (goal year):	-$230,208
	Cumulative increased public transit pass costs (through goal year):	-$1,381,248
	Increased spending on public transit	**-$1,381,248**

2 Annual increased public transit pass costs calculated based on increased percentage of population using public transit (target increased public transit percentage) multiplied by cost of monthly transit pass. Negative numbers indicate increased consumer spending. (https://www.census.gov/programs-surveys/sis/resources/data-tools/quickfacts.html https://www.metrotransit.org/fares-passes)

EV and Alt Fuel Conversions

Formula:

Cumulative VMT converted to EV/alt fuel x Average vehicle operation cost savings per mile = Gross EV VMT savings - Gross EV purchase spending difference = Net EV VMT Savings

Notes		
	VMT converted to EV/Alt fuel (goal year)	1,366,663
	Cumulative VMT converted to EV/alt fuel (through goal year)	8,199,979
3	Average fuel savings per mile:	$0.121
4	Average vehicle maintenance savings per mile:	$0.040
	Cumulative Gross EV VMT savings (through goal year)	$1,317,255
5	Spending difference per vehicle on EV purchase vs ICE purchase	-$390
	New electric vehicle purchases	470
	Gross EV purchase spending difference (through goal year)	-$183,337
	Net EV VMT savings	**$1,133,918**

3 Fuel Savings per VMT based on average reported gasoline costs (https://gasprices.aaa.com/state-gas-price-averages/) divided by current average MPG (Federal Highway Administration: https://www.fhwa.dot.gov/policyinformation/quickfinddata/qftravel.cfm) compared against average fuel cost per mile using current kWh rate (https://www.electricitylocal.com/) and average kWh/100 mile data (https://www.fueleconomy.gov/feg/byfuel/EV2024.shtml ; https://ev-database.org/cheatsheet/energy-consumption-electric-car)

4 Maintenance savings per mile based on US Department of Energy FOTW #1190, June 14, 2021: Battery-Electric Vehicles Have Lower Scheduled Maintenance Costs than Other Light-Duty Vehicles: (https://www.energy.gov/eere/vehicles/articles/fotw-1190-june-14-2021-battery-electric-vehicles-have-lower-scheduled)

5 Average EV purchase price increse per vehicle on Kelly Blue Book average EV purchase price compared to average gasoline vehicle purchase price (https://www.coxautoinc.com/market-insights/february-2025-atp-report/) with a $7,500 tax credit applied. The total cost difference is then divided by an assumed 5-year financing term to arrive at an estimated annualized cost difference. Negative numbers indicate increased consumer spending (https://www.nerdwallet.com/article/taxes/ev-tax-credit-electric-vehicle-tax-credit)

Potential Total Cumulative Transportation Cost Savings

Formula:

Transportation sector savings - Transportation sector cost increases = Potential Total Cumulative Transportation Cost Savings

Transportation Sector Savings		
Gross VMT savings		$8,199,979
Gross EV VMT savings		$1,317,255
	Total Gross Transportation Savings	$9,517,233
Transportation Sector Cost Increases		
Increased spending on public transit		-$1,381,248
Gross EV purchase spending difference		-$183,337
	Total Gross Transportation Cost Increases	-$1,564,585
Potential Total Cumulative Transportation Cost Savings		**$7,952,649**

Summary of Estimated Cumulative Savings of Modeled Reductions

City of Falcon Heights

Notes

Energy - Residential

Residential Savings - grid electricity to customer owned solar

Formula:

Cumulative kWh converted to solar x Average cost savings per kWh = Residential solar savings

Notes		
	Residential kWh converted (goal year)	1,166,795
	Cumulative residential kWh converted (through goal year)	7,000,768
	Average net solar cost savings per solar kWh	$0.058
6a	Average solar installation cost per KW	$3,116.50
7	Average kWh produced annually per solar pv KW installed	1,287
	Estimated installed solar PV KW installed (goal year)	907
	Estimated total solar installation costs	$2,825,420
8	Est average lifespan kWh produced per solar pv KW installed	38,429
8	Estimated cumulative lifespan kWh produced	34,839,759
9	Estimated value of cumulative lifespan kWh produced	$4,840,145
	Average solar cost savings per kWh produced	$0.058
	Residential solar savings	**$404,843**

6a Recent average cost per KW is 1000x the per watt cost reported by Solar Reviews https://www.solarreviews.com Value includes assumed financing costs based on 20% initial payment and 80% financed through 10 year loan with 3.5% annual interest rate. Potential savings from tax credits, depreciation, or grants are not included and would reduce these costs.

7 Calculations are based on the geographic energy production factor (https://www.nrel.gov/docs/fy04osti/35297.pdf) multiplied by an average performance ratio of 78% (https://www.nrel.gov/docs/fy13osti/57991.pdf)

8 Based on an assumed average useful life of 32.5 years according to NREL research with an average degradation rate of 0.5% (https://www.nrel.gov/docs/fy24osti/90042.pdf)

9 Savings per kWh based on average electricity cost per kWh (https://www.electricitylocal.com/) calculated to the solar array's midlife (year 16) using an estimated average electrical cost inflation of 2% annually

Residential Savings - community solar

Formula:

Cumulative kWh converted to community solar x Average cost savings per kWh = Residential community solar savings

Notes		
	Residential kWh converted (goal year)	0
	Cumulative residential kWh converted (through goal year)	0
10	Average community solar cost savings per kWh	$0.010
	Residential solar savings	**$0**

10 The average cost savings per kWh of community solar subscription is estimated at 10%.

Residential Savings - utility purchased renewable

Formula:

Cumulative kWh converted to utility purchased renewable x Average cost/savings per kWh = Residential utility purchased cost/savings

Notes		
	Residential kWh converted (goal year)	1,166,795
	Cumulative residential kWh converted (through goal year)	7,000,768
11	Average utility purchased cost/savings per kWh	-$0.013
	Residential utility purchased cost/savings	**-$88,840**

11 The average cost/savings per kWh of utility purchased renewable energy subscription is based on utility fee information. Negative numbers indicate increased consumer spending

Residential Savings - electrical energy efficiency

Formula:

Cumulative kWh saved from energy efficiency x Average cost per kWh = Gross Residential electrical energy efficiency savings - Residential Efficiency Upgrade Costs = Net Residential Electrical Energy Efficiency Savings

Residential kWh saved (goal year)	648,219
Cumulative residential kWh saved (through goal year)	3,889,316

12a	Average cost per kWh	$0.101
	Gross Residential electrical energy efficiency savings	**$393,599**
13	Residential Electrical Efficiency Upgrade Costs	-$346,367
	Net Residential Electrical Energy Efficiency Savings	**$47,232**

12a Energy efficiency savings per kWh saved based on average electricity cost per kWh: (https://www.electricitylocal.com/)

13 Assumed energy efficiency upgrade costs are calculated assuming an average ROI of12% (https://www.aceee.org/blog/2019/05/existing-homes-energy-efficiency) Negative numbers indicate increased consumer

Residential Savings - natural gas energy efficiency

Formula:

Cumulative therms saved from energy efficiency x Average cost per therm = Gross Residential natural gas energy efficiency savings - Residential Natural Gas Efficiency Upgrade Costs = Net Residential Electrical Natural Gas Efficiency Savings

14	Residential therms saved (goal year)	58,767
14	Cumulative residential therms saved (through goal year)	352,604
15	Average cost per therm	$1.848
	Gross Residential natural gas energy efficiency savings	**$651,612**
14, 16	Residential Natural Gas Efficiency Upgrade Costs	-$573,419
	Net Residential Electrical Natrual Gas Efficiency Savings	**$78,193**

14 Includes fuel switching from fossil fuel heat to electric

15 Energy efficiency savings for natural gas is based on average natural gas cost per therm (https://naturalgaslocal.com/)

16 Assumed energy efficiency upgrade costs are calculated assuming an average ROI of12% (https://www.aceee.org/blog/2019/05/existing-homes-energy-efficiency) Negative numbers indicate increased consumer spending

Potential Total Cumulative Residential Energy Cost Savings

Formula:

Residential solar savings + Residential community solar savings + Residential utility purchased renewable + Residential electrical efficiency savings + Residential natural gas energy efficiency savings - Residential increased electrical costs = Potential Total Cumulative Residential Energy Savings

Residential solar savings	$404,843
Residential community solar savings	$0
Residential utility purchased renewable cost/savings	-$88,840
Residential electrical efficiency savings (net)	$47,232
Residential natural gas energy efficiency savings (net)	$78,193
Potential Total Cumulative Residential Energy Savings	**$441,428**

Summary of Estimated Cumulative Savings of Modeled Reductions

City of Falcon Heights

Notes

Energy - Non Residential

Non-Residential Savings - grid electricity to solar

Formula:

Cumulative kWh converted to solar x Average cost savings per kWh = Non-Residential solar savings

Notes		
	Non-Residential kWh converted (goal year)	1,554,891
	Cumulative Non-Residential kWh converted (through goal year)	9,329,346
	Average solar cost savings per kWh	$0.050
6b	Average solar installation cost per KW	$1,978.00
7	Average kWh produced annually per solar pv KW installed	1,287
	Estimated installed solar PV KW installed (goal year)	1,208
	Estimated total solar installation costs	$2,389,724
8	Estimated average lifespan kWh produced per solar pv KW installed	38,429
8	Estimated cumulative lifespan kWh produced	46,428,071
9	Estimated value of cumulative lifespan kWh produced	$4,712,200
	Average solar cost savings per kWh produced	$0.050
	Non-Residential solar savings	**$466,683**

6b Recent average cost per KW is 1000x the per watt cost reported for commercial solar arrays by NREL (https://www.nrel.gov/docs/fy21osti/77324.pdf https://www.nrel.gov/solar/market-research-analysis/solar-installed-system-cost.html) Value includes assumed financing costs based on 20% initial payment and 80% financed through 10 year loan with 3.5% annual interest rate. Potential savings from tax credits, depreciation, or grants are not included and would reduce these costs.

7 Calculations are based on the geographic energy production factor (https://www.nrel.gov/docs/fy04osti/35297.pdf) multiplied by an average performance ratio of 78% (https://www.nrel.gov/docs/fy13osti/57991.pdf)

8 Based on an assumed average useful life of 32.5 years according to NREL research with an average degradation rate of 0.5% (https://www.nrel.gov/docs/fy24osti/90042.pdf)

9 Savings per kWh based on average electricity cost per kWh (https://www.electricitylocal.com/) calculated to the solar array's midlife (year 16) using an estimated average electrical cost inflation of 2% annually

Non-Residential Savings - community solar

Formula:

Cumulative kWh converted to community solar x Average cost savings per kWh = Non-Residential community solar savings

Notes		
	Non-Residential kWh converted (goal year)	0
	Cumulative Non-Residential kWh converted (through goal year)	0
10	Average solar cost savings per solar kWh	$0.01
	Commercial solar savings	**$0**

10 The average cost savings per kWh of community solar subscription is estimated at 10%.

Non-Residential Savings - utility purchased renewable

Formula:

Cumulative kWh converted to utility purchased renewable x Average cost/savings per kWh = Non-Residential utility purchased cost/savings

Notes		
	Non-Residential kWh converted (goal year)	1,554,891
	Cumulative Non-Residential kWh converted (through goal year)	9,329,346
11	Average utility purchased cost/savings per kWh	-$0.013
	Non-Residential utility purchased cost/savings	**-$118,389**

11 The average cost/savings per kWh of utility purchased renewable energy subscription is based on utility fee information. Negative numbers indicate increased consumer spending

Non-Residential Savings - electrical energy efficiency

Formula:

Cumulative kWh saved from energy efficiency x Average cost per kWh = Gross Non-Residential electrical energy efficiency savings - Non-Residential Efficiency Upgrade Costs = Net Non-Residential Electrical Energy Efficiency Savings

	Commercial kWh saved (goal year)	2,591,485
	Cumulative commercial kWh saved (through goal year)	15,548,909
12b	Average cost per kWh	$0.074
	Gross Commercial electrical energy efficiency savings	**$1,149,583**
13	Commercial Electrical Efficiency Upgrade Costs	-$1,011,633
	Net Commercial Electrical Energy Efficiency Savings	**$137,950**

12b Energy efficiency savings per kWh saved based on average electricity cost per kWh reported for commercial and industrial with a weighted average (2/3rds commercial rate, 1/3rd industrial rate) reflecting typical non-residential electric consumption patterns (https://www.electricitylocal.com/)

13 Assumed energy efficiency upgrade costs are calculated assuming an average ROI of12% (https://www.aceee.org/blog/2019/05/existing-homes-energy-efficiency) Negative numbers indicate increased consumer spending

Non-Residential Savings - natural gas energy efficiency
Formula:

Cumulative therms saved from energy efficiency x Average cost per therm = Gross Non-Residential natural gas energy efficiency savings - Non-Residential Natural Gas Efficiency Upgrade Costs = Net Non-Residential Electrical Natural Gas Efficiency Savings

14	Non-Residential therms saved (year 10)	177,945
14	Cumulative Non-Residential therms saved	1,067,670
15	Average cost per therm	$0.431
	Gross Non-Residential natural gas energy efficiency savings	**$460,166**
14, 16	Non-Residential Natural Gas Efficiency Upgrade Costs	-$404,946
	Net Non-Residential Natural Gas Energy Efficiency Savings	**$55,220**

14 Includes fuel switching from fossil fuel heat to electric

15 Energy efficiency savings for natural gas is based on average natural gas cost per therm https://naturalgaslocal.com/

16 Assumed energy efficiency upgrade costs are calculated assuming an average ROI of12% (https://www.aceee.org/blog/2019/05/existing-homes-energy-efficiency) Negative numbers indicate increased consumer spending

Potential Total Cumulative Non-Residential Energy Cost Savings

Formula:

Non-Residential solar savings + Non-Residential community solar savings + Non-Residential utility purchased renewable + Non-Residential electrical efficiency savings + Non-Residential natural gas energy efficiency savings - Non-Residential increased electrical costs = Potential Total Cumulative Non-Residential Energy Savings

Non-Residential solar savings	$466,683
Non-Residential community solar savings	$0
Non-Residential utility purchased renewable cost/savings	-$118,389
Non-Residential electrical efficiency savings	$137,950
Non-Residential natural gas energy efficiency savings	$55,220
Potential Total Cumulative Non-Residential Energy Savings	**$541,463**

Potential Total Cumulative Energy Cost Savings (Residential + Non-Residential)

Formula:

Energy sector savings - Energy sector cost increases = Potential Total Cumulative Energy Cost Savings

Energy Sector Savings	
Total solar energy savings	$871,526
Total community solar energy savings	$0
Total energy efficiency savings - electricity	$1,543,181
Total energy efficiency savings - natural gas	$1,111,778
Total Gross Energy Savings	$3,526,485
Energy Sector Cost Increases	
Total solar PV installation costs	(included in estimated Total Solar Energy Savings)
Total utility purchased renewable cost/savings	-$207,229
Total energy efficiency upgrade costs - electricity	-$1,358,000
Total energy efficiency upgrade costs - natural gas	-$978,365
Total Gross Energy Cost Increases	-$2,543,594
Potential Total Cumulative Energy Cost Savings	**$982,892**

Summary of Estimated Cumulative Savings of Modeled Reductions

City of Falcon Heights

Notes

Solid Waste - Residential

Residential savings - Food Waste Reduction

Formula:

Cumulative tons of food waste reduced and diverted x Average cost savings per ton = Residential food waste savings

Notes		
	Residential food waste reduced (goal year)	31
	Cumulative residential food waste reduced (through goal year)	188
17	Average cost savings per ton reduced	$2,469
	Residential food waste savings	**$463,869**

17 Value per ton of residential food waste avoided is based on average for Prevent and Recover strategies by ReFED "A Roadmap To Reduce U.S. Food Waste" (https://refed.com/downloads/the-roadmap-to-reduce-u-s--food-waste/). Food waste share of total organics diverted is calculated based on available waste sort data (see Baseline Assessment document)

Potential Total Cumulative Residential Solid Waste Reduction Cost Savings

Residential food waste savings **$463,869**

Notes

Solid Waste - Non-Residential

Non-Residential savings - Solid Waste Reduction

Formula:

Cumulative participant/years x Average reported cost savings per participant/year = Non-Residential solid waste savings

Notes		
	Participating businesses (goal year)	50
	Cumulative participant/years (through goal year)	550
18	Average cost savings per participant/year	$431
	Commercial solid waste savings	**$1,422,300**

18 Savings per business engaged in waste reduction programs are based on MN WasteWise reported average business savings ($431) escalated to 5 year (mid point) Cumulative savings assume businesss reduction strategies remain in force (https://www.mnchamber.com/your-opportunity/waste-wise)

Commercial savings - Food Waste Reduction

Formula:

Cumulative tons of food waste reduced and diverted x Average cost savings per ton = Non-Residential food waste savings

Notes		
	Commercial food waste reduced (goal year)	37
	Cumulative non-residential food waste reduced (through goal year)	221
19	Average cost savings per ton reduced	$494
	Commercial food waste savings	**$108,908**

19: Average cost savings per ton of food waste avoided is based on an assumed 20% wholesale share of value per ton of residential food waste average for Prevent and Recover strategies by ReFED "A Roadmap To Reduce U.S. Food Waste" (https://refed.com/downloads/the-roadmap-to-reduce-u-s--food-waste/) Additionally, the World Resources Institute conducted a study which found that for every $1 invested in food waste reduction, businesses saved $14 in operational costs (https://www.wri.org/news/release-new-research-finds-companies-saved-14-every-1-invested-reducing-food-waste)

Potential Total Cumulative Solid Waste Savings

Formula:

Residential Food Waste Savings + Commercial Solid Waste Savings + Commercial Food Waste Savings = Potential Total Cumulative Solid Waste Savings

Residential Food Waste Savings	$463,869
Non-Residential Solid Waste Savings	$1,422,300
Non-Residential Food Waste Savings	$108,908
Potential Total Cumulative Solid Waste Savings	**$1,995,078**

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Appendix C

Abbreviations and Glossary of Terms

The following are abbreviations and terms used in the Climate Action Plan as well as others common to sustainability and climate action concepts.

Abbreviations

ADU	Accessory Dwelling Unit
BAU	Business as usual forecast
BEV	Battery electric vehicle
BIPOC	Black, Indigenous, people of color
C&D	Construction and demolition
CAP	Climate Action Plan
CE	Carbon Equivalent
CDP	Carbon Disclosure Project
CFC	Chlorofluorocarbons
CH_4	Methane
CHP	Combined Heat and Power
CO_2	Carbon dioxide
CO_2 e	Carbon dioxide equivalent
CSG	Community Solar Garden
DCFC	Direct Current Fast Charger
DOE	U.S. Department of Energy
EMS	Emergency medical services
EPA	U.S. Environmental Protection Agency
EV	Electric vehicle
EVSE	Electric vehicle supply equipment
FEMA	Federal Emergency Management Agency
FTE	Full-time equivalent
GCoM	Global Covenant of Mayors
GDP	Gross Domestic Product
GHG	Greenhouse gas
GWP	Global warming potential
HFC	Hydrofluorocarbons
HVAC	Heating, Ventilation, and Air Conditioning
ICE	Internal Combustion Engine vehicle
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt-hour
LEED	Leadership in Energy and Environmental Design
LEV	Low emission vehicle
LIDAC	Lower Income and Disadvantaged Community
MWH	Megawatt hour – 1,000 Kilowatt-hours
MSW	Municipal Solid Waste
MT	Metric ton equivalent to 1,000 kg (also known as Metric Tonne)
MMT	Million Metric tons
MMBTU	Million British Thermal Units
MT CO_2 e	Metric tons of carbon dioxide equivalent
NGO	Non-Governmental Organization
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxides
NOAA	National Oceanic and Atmospheric Administration
NZE	Net-Zero Emissions
O_3	Ozone
ODS	Ozone Depleting Substances
PACE	Property Assessed Clean Energy
PFC	Perfluorocarbons
PHEV	Plug-in hybrid electric vehicle
PM2.5	Particulate matter of 2.5 micrometer diameter or less
POC	People of color
PPA	Power Purchase Agreement
PUB	Public Utilities Board
PV	Photovoltaic (solar photovoltaic)
REC	Renewable Energy Credit
RCP	Representative Concentration Pathway
SO_2	Sulfur Dioxide
SF_6	Sulfur Hexafluoride
SULEV	Super ultra-low emission vehicle
t	Ton equivalent to 2,000 lbs (United States)
TOG	Total Organic Gasses
USGS	U.S. Geological Survey
VMT	Vehicle miles traveled
VHT	Vehicle hours traveled
ZEV	Zero emission vehicle
ZNEB	Zero Net Energy Building

A

Accessory Dwelling Unit (ADU)
Accessory dwelling unit means a second dwelling unit contained within a single-family dwelling or within a detached building located on the same lot as a single-family dwelling.

Action
Specific tasks set out to realize the objectives and methods highlighted in a given plan.

Activity Data
Information regarding the scale of human actions that lead to emissions or removals within a specified timeframe. This includes data like energy consumption, metal production, land coverage, management procedures, and usage of lime, fertilizers, and waste generation.

Adaptation
Refer to “Climate Readiness or Resilience”

Adaptive Capacity
The combination of societal, technological, and monetary abilities that individuals or groups possess to initiate and sustain actions against climate change.

Aerosols
Airborne particles, either solid or liquid, typically ranging between 0.01 and 10 micrometers. These particles, which can be of natural or human-made origin, can persist in the atmosphere for extended periods. They can affect climate by directly interfering with radiation or indirectly by influencing cloud properties.

Afforestation
The process of establishing forests on lands that weren't previously forested.

Air Pollutant
Any substance, either originating from human activities or naturally, present in the atmosphere that might have detrimental impacts on humans, fauna, flora, or materials.

Anthropogenic
In relation to greenhouse gas records, "anthropogenic" denotes emissions and removals directly stemming from human actions or from natural processes influenced by human activities.

Atmosphere
The layer of gases encasing the Earth. It mainly consists of nitrogen and oxygen, along with trace gases like argon, helium, and certain greenhouse gases like carbon dioxide and ozone. The atmosphere also encompasses varying amounts of water vapor and contains other components like clouds and aerosol particles.

B

Baseline Emissions
A reference point, either through measurement, calculation, or a specific timeframe, for making comparisons. It represents emission levels in scenarios devoid of policy changes or project implementations. Such evaluations are crucial to gauge the impact of emissions-reducing measures.

Base Year
The initial year used for data gathering. Emission-reducing goals are often set with this year as a reference.

Beneficial Electrification
Beneficial electrification is the process of replacing fossil fuels with electricity to reduce energy costs and greenhouse gas emissions. It can be applied to many sectors, including transportation, residential buildings, and commercial buildings.

Biogenic
Derived from the biological activities of living entities. The term "biogenic" exclusively pertains to recently formed biological materials. The IPCC suggests categorizing peat as fossil carbon due to its lengthy replacement cycle.

Biogeochemical Cycle
The continuous transfer of essential chemicals, crucial for life, within Earth's systems, including carbon, nitrogen, oxygen, and phosphorus.

Biomass
Refers either to (1) the combined weight of all living organisms within a designated area or species, usually represented as dry weight or (2) Organic substances originating from or recently derived from

living beings, excluding peat, and encompasses derived products and waste.

Biomass Waste
Biological, non-fossil substances of biological origin that are either residual or discarded. This definition includes biogenic municipal waste, landfill gas, and other forms of biomass but excludes certain fuels and biofuels. EIA's data on "biomass waste" also count energy crops produced specifically for power generation.

BIPOC
Defined as "Black, Indigenous, and people of color", this U.S.-specific term emphasizes the experiences of Black and Indigenous communities, showcasing or influencing the broader socio-economic dynamics encountered by all non-white individuals.

Black Carbon
A type of aerosol characterized based on its capacity to absorb light, its chemical reactivity, and/or thermal resistance; comprises elements like soot and charcoal.

Blue Carbon
Carbon that's absorbed and retained by coastal ecosystems and wetlands, aiding in countering climate change impacts.

British Thermal Unit (BTU)
A conventional measure of thermal energy, representing the energy needed to elevate the temperature of a pound of water by a single degree Fahrenheit.

Business As Usual Forecast (BAU)
The Intergovernmental Panel on Climate Change (IPCC) describes this as the predicted emission levels if upcoming trends emulate historical ones and no additional policy amendments are enacted. This projection presumes no further emission-curbing actions will be adopted beyond existing or committed measures. BAU forecasts do include anticipated reductions resulting from existing requirements or commitments, such as federal vehicle fuel efficiency standards and electric utility carbon-reduction commitments, which are outside the scope of this plan.

C
Carbon Cycle
The systematic flow and storage of carbon across different reservoirs. This involves four primary carbon storage areas: the atmosphere, the terrestrial environment (including freshwater systems), oceans, and sediments (which encompass fossil fuels). The carbon exchanges between these reservoirs are driven by a mix of chemical, physical, geological, and biological factors. Though the ocean holds a significant amount of near-surface carbon, its exchange with the atmosphere is relatively slow.

Carbon Dioxide (CO_2)
A gas found naturally in the environment, but also produced from burning fossil fuels, biomass, through land-use alterations, and various industrial activities. As the main human-induced greenhouse gas, it impacts the Earth's ability to reflect heat. Other greenhouse gases are often measured relative to CO_2, which has a Global Warming Potential set at 1.

Carbon Dioxide Equivalent (CO_2 e)
A standard for comparing the emissions from different greenhouse gases based on their potential to warm the planet. It's determined by equating the amount of a gas emitted to the amount of CO_2 that would have the same global warming impact.

Carbon Disclosure Project (CDP)
A global initiative allowing organizations and cities to publicly share their environmental impacts, notably related to climate risks. CDP stands as one of the recognized disclosure platforms endorsed by GCoM.

Carbon Emissions
The process of releasing carbon dioxide into the atmosphere, primarily through human activities like burning fossil fuels for energy.

Carbon Equivalent (CE)
A metric for comparing emissions from various greenhouse gases based on their capacity to influence global warming. Carbon equivalents are derived from carbon dioxide equivalents using a specific conversion factor related to molecular weights.

Carbon Free
Activities, systems, or products that don't emit carbon dioxide or other greenhouse gases. Often

associated with sustainable or renewable energy discussions, not every "carbon free" source is renewable. For instance, while both wind and nuclear energy are carbon-free, only wind is renewable.

Carbon Intensity
The ratio of carbon emitted for every unit of energy used. A typical measure of this is the carbon weight per British thermal unit (Btu) of energy. When considering a single fuel type, carbon intensity and the emission coefficient are the same. With multiple fuels, it's an aggregate value.

Carbon Neutral / Carbon Neutrality
Achieving a balance where the amount of CO_2 produced annually is equal to the amount removed or offset, leading to net-zero CO_2 emissions by a specific date. Carbon Neutrality is also sometimes applied to all greenhouse gas emissions. In those instances the term is sometimes used interchangeably with "Net Zero" or "Climate Neutral"

Carbon Offsets
Mechanisms to counterbalance carbon dioxide or other greenhouse gas emissions by funding equivalent reductions elsewhere. They are quantified in metric tonnes of CO_2 -equivalent and can be traded to neutralize emissions from an entity's operations.

Carbon Sinks
Natural environments, such as forests or oceans, recognized for their ability to absorb and store carbon dioxide from the atmosphere.

Carbon Sequestration
The process of capturing and storing CO_2, either in oceans, terrestrial environments like forests and soils, or in geological formations underground.

Chlorofluorocarbons (CFCs)
Gases, regulated under the 1987 Montreal Protocol, used in several applications like refrigeration and air conditioning. Since they don't break down in the lower atmosphere, they reach the upper atmosphere and can deplete ozone. Their usage is being phased out in favor of alternative compounds, some of which are greenhouse gases under the Kyoto Protocol.

Circular Economy
A sustainable economic model that deviates from the traditional linear approach (produce, use, discard) by focusing on reducing resource inputs and waste. It emphasizes durable product design, repair, reuse, and recycling to minimize waste.

Clean Energy
Clean, or "carbon-free," energy is electricity produced by facilities that do not release greenhouse gases, like carbon dioxide, during the generation process.

Climate
Often described as the "typical weather" of an area, climate is a statistical representation of weather patterns over extended periods, typically 30 years as per World Meteorological Organization (WMO) standards. It encompasses averages and variability of factors like temperature and precipitation. On a broader scale, climate is the comprehensive state of the climate system, including statistics.

Climate Adaptation or Resilience
The ability of ecosystems or communities to anticipate, stand against, respond, and recover from disruptive events. It involves adjusting to changing climate conditions to lessen risks and vulnerabilities.

Climate Action Plan
A comprehensive strategy detailing steps that a municipality, business, or government will take to decrease greenhouse gas emissions and prepare for climate change, fostering sustainable and resilient growth.

Climate Change
Any significant, lasting change in the average or variability of climate conditions over extensive periods. It can stem from natural processes, persistent changes in atmospheric composition due to human activities, or alterations in land use.

Climate Hazard
A climate event or situation that can negatively affect human health, resources, or livelihoods, encompassing sudden shifts in climate systems like heavy rainfall or prolonged droughts.

Climate Migration
The relocation of individuals due to the effects of climate change impacting their way of life or degrading their living conditions. This can result from changing water supplies, altered agricultural yields, or factors like rising sea levels and increased storm intensity.

Climate Model
A mathematical representation used to simulate the key components of climate, including the atmosphere, oceans, land, and ice. These models are used to forecast potential future climate changes.

Climate Neutral / Climate Neutrality
Achieving a balance where the amount of all GHG emissions produced annually is equal to the amount removed or offset, leading to net-zero GHG emissions by a specific date. "Climate Neutral" is sometimes used interchangeably with "Carbon Neutral", however, "Carbon Neutral" often interpreted as addressing CO_2 emissions only, whereas "Climate Neutral" is intended to address all GHG gases.

Climate Scenario
A structured and logical narrative of potential future climatic conditions, built on a set of assumptions about potential future events.

Climate Risk
The potential negative outcomes due to climatic changes, where valuable assets are at risk. The risk is calculated based on the likelihood of certain climate events or changes happening and the potential impact of those changes. It is a product of the system's vulnerability and the climate hazards faced.

Climate Vulnerability
The extent to which a system is at risk from adverse climate changes, including climate variability and extremes. It depends on how exposed the system is to these changes, its inherent sensitivity, and its ability to adapt. Vulnerability can be described as the potential negative impact minus the system's adaptive capacity.

Climate Vulnerability Assessment
An analysis aiming to pinpoint and categorize the threats posed by climate change. It guides the creation of strategies to address these threats and can cover diverse areas like food security, socio-economic factors, and extreme weather patterns.

Co-Benefit
Additional advantages or benefits (e.g., health, economic, societal) that arise indirectly from climate adaptation and mitigation measures.

Co-generation
A facility or system that simultaneously and efficiently produces multiple forms of energy, usually heat and power, in an integrated manner.

Community Choice Aggregation (CCA)
CCA programs, or sometimes known as "Community Power Aggregation", empower local governments to source power for their citizens, businesses, and municipal facilities from alternative providers, while still utilizing the distribution services of their existing utilities. Setting up a CCA generally needs state-level legislation. For more details, one can visit EPA's dedicated CCA website: [EPA's CCA webpage https://www.epa.gov/green-power-markets/community-choice-aggregation]

Combined Heat and Power (CHP)
A system designed to concurrently generate electricity and useful heat, aiming for optimal energy use. Some utilities might sell the heat produced for public use, while certain industries might sell surplus electricity to other businesses or utility companies.

Community Power Aggregation
Refer to "Community Choice Aggregation"

Community Solar / Community Solar Garden (CSG)
Shared solar installations that allow community members to benefit from solar energy without installing panels on individual properties. Participants receive bill credits based on their share of the generated power. Generally, the electricity from community solar farms is priced lower than traditional utility rates.

Complete Streets
A street design concept that ensures streets are made to accommodate all users safely and efficiently, regardless of their mode of transportation or age.

Consistency
Ensuring that an inventory remains uniform in its methodologies and data over time. If the same methods and datasets are consistently applied over years, then the inventory is considered consistent.

Continuous Emission Monitor (CEM)
A monitoring system placed within smokestacks or other emission sources that continuously measures and reports air emissions.

Cool Roof
Roofing materials engineered to reflect more sunlight and absorb less heat, thereby reducing the heat transferred to the building or its surroundings.

Cool Pavement
Pavement materials designed to reflect sunlight and decrease heat absorption, minimizing heat transfer to the nearby environment.

Criteria Air Pollutant
Specific air pollutants for which permissible exposure levels are determined, and corresponding air quality standards are established. Examples include carbon monoxide, ozone, and various particulates. The term arises from the U.S. EPA's obligation to define these pollutants and their impacts on health and the environment. Standards can be reviewed and updated based on new scientific information.

D

Decarbonization
The transition towards reducing carbon emissions by adopting cleaner energy sources, enhancing energy efficiency, or capturing and storing released carbon. The ultimate aim is to minimize the climate impact and move towards a carbon-neutral society.

Deforestation
The conversion of forested areas into non-forest uses. Deforestation is often linked to the amplified greenhouse effect for two main reasons: the combustion or decay of wood releases carbon dioxide, and the removed trees no longer absorb atmospheric carbon dioxide through photosynthesis.

Demand Side Management (DSM)
Initiatives designed to modify consumer energy consumption patterns using methods like education and financial incentives. DSM seeks to reduce energy consumption, particularly during peak demand periods, and shift usage to times when demand is typically lower.

Direct Current Fast Charger (DCFC)
DCFC charging is designed to deliver more power at faster speeds than Level 2 chargers with outputs ranging from 50 kW to 350 kW. They can recharge an EV battery to 80% in anywhere from 15 minutes to 45 minutes, depending on the vehicle's voltage capacity. DCFC is also sometimes known as “Level 3 charging”, or “Rapid Charging”.

Distillate Fuel Oil
A category of petroleum products obtained through standard distillation processes. This encompasses diesel fuels and fuel oils, including types like No. 1, No. 2, and No. 4 diesel fuel. These products are used in various engines, from road vehicles to trains and agricultural equipment. Additionally, No. 1, No. 2, and No. 4 fuel oils are typically employed for heating spaces and generating electricity.

District Heating
A system that distributes heat, generated at a centralized point, via a network of pipes to provide heating for homes and businesses in a specified area or community.

E

Ecosystem Services
The benefits ecosystems offer to human welfare. These benefits range from tangible resources like water and food to services like air purification, flood control, and climate stabilization.

Electric Vehicle (EV)
A vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source. An EV includes both a vehicle that can only be powered by an electric motor that draws electricity from a battery (all-electric vehicle) and a vehicle that can be powered by an electric motor that draws electricity from a battery and by an internal combustion engine (plug-in hybrid electric vehicle).

Electric Vehicle Supply Equipment (EVSE)
The infrastructure that allows electric vehicles to charge from an electricity source. It's also known as

an EV charging station, EV charger, or charging dock. EVSE takes electrical power from the grid and transfers it to the vehicle's battery.

Emissions
The act of discharging certain substances, often gases in the context of climate change, into the environment.

Emission Factor
A value that signifies the amount of a gas emitted or removed per unit of activity. This coefficient is usually derived from a collection of measurement data and provides a representative emission rate for a set of specific conditions.

Emission Inventory
A calculation of the total pollutants released into the atmosphere from various significant sources, measured over a defined period, such as daily or annually.

Emission Rate
The quantity of a specific pollutant released over a set duration, commonly expressed in units like tons per year.

Energy Burden
The fraction of a household's total income spent on energy costs. An "high" energy burden is identified when energy costs comprise 6% or more of the household income, while it's deemed "severe" if above 10%.

Energy Savings / Energy Efficiency
Refers to the sustainable reduction in the amount of energy consumed for the same level of output or performance. For instance, a modern heater that requires less energy to provide the same warmth results in energy efficiency improvements.

Energy Tariff
A pricing structure, or utility tariff, that dictates how consumers are charged by energy providers for their electric or gas consumption. Energy tariffs are subject to government approval and review.

Environmental Justice
The equitable treatment and active participation of all individuals, regardless of their race, ethnicity, income, or origin, in the processes related to environmental laws, policies, and regulations.

Equity
Being just and fair in treatment, acknowledging that people have diverse circumstances and providing them with the necessary resources and opportunities to achieve equal outcomes. In terms of climate change, equity encompasses both shielding from environmental hazards and ensuring access to environmental benefits, irrespective of socio-economic factors.

F

Federal Emergency Management Agency (FEMA)
A federal agency that leads the country's response to disasters, including natural disasters, man-made incidents, and terrorist events.

Fluorocarbons
Molecules made up of carbon and fluorine, which can also include elements like hydrogen, chlorine, or bromine. Some well-known types are chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

Flux
(1) Materials, like limestone and dolomite, used to moderate the heat or energy demands of mineral processing, like metal smelting. They can also function as agents to produce slag. (2) The rate or volume of a liquid or gas moving across a specific area over time, such as the " CO_2 absorption rate by forests".

Fossil Fuel
Deposits of hydrocarbons formed from ancient organic matter, including coal, oil, and natural gas.

Fuel Combustion
The intentional burning of materials in a device designed to provide heat or mechanical energy. This process can be for direct application or use elsewhere.

Fuel Switch (see also "Beneficial Electrification")
The process of transitioning from one energy source to another, commonly from non-renewable sources

like fossil fuels to renewable ones like wind or solar, to reduce both costs and emissions.

Fugitive Emissions
Unintentional leaks of gases from surfaces such as seals or underground pipelines due to deterioration or faults.

G

Geologic Carbon Sequestration
The practice of capturing CO_2, often from sources like coal-powered plants, and injecting it deep underground for storage. With careful site selection and management, this approach has potential in reducing atmospheric CO_2 levels.

GHG
Refer to "Greenhouse Gas"

Global Environmental Change
Significant, accelerated alterations to Earth's natural systems, encompassing climate shifts, biodiversity loss, resource depletion, pollution, and other large-scale environmental disruptions.

Global Warming
The average rise in atmospheric temperature near the Earth's surface and within the troposphere, which can lead to shifts in global climate. This warming can arise from both natural phenomena and human activities. Typically, "global warming" is used to refer to the temperature increase resulting from the enhanced emissions of greenhouse gases due to human actions. See also Climate Change.

Global Warming Potential (GWP)
An index that calculates the radiative effects of greenhouse gases, considering their ability to trap heat compared to carbon dioxide over a specified timeframe. The GWP evaluates the cumulative effect of these gases in the atmosphere based on their longevity and their potential to absorb infrared radiation. The Kyoto Protocol uses GWPs derived from 100-year timespan emissions.

GCoM Global Covenant of Mayors
GCoM represents the world's largest alliance dedicated to urban climate leadership. Comprising over 10,000 city and local governments, GCoM's goal is to encourage and support action on climate and energy at the grassroots level globally.

Green Streets
An urban design approach that incorporates plant life, soil, and engineered structures to manage, slow, and purify stormwater runoff from surfaces that don't absorb water.

Greenhouse Effect
A natural process where specific gases in the atmosphere trap heat near the Earth's surface, leading to a warming effect. If concentrations of these greenhouse gases increase, this effect intensifies, leading to a gradual increase in the Earth's temperature.

Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories
A comprehensive and transparent framework adopted globally for cities and local governments to consistently measure, calculate, and report their greenhouse gas emissions.

Greenhouse Gas
A gas that can absorb and emit infrared radiation, contributing to the greenhouse effect. Some common greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide, and certain industrial gases like hydrofluorocarbons.

Greenhouse Gas Reduction
Efforts aimed at diminishing the amount of greenhouse gases released into the atmosphere, thereby mitigating potential adverse climate impacts.

Green Infrastructure
Green infrastructure encompasses a diverse array of green spaces and features, both in urban and rural areas, that serve to enhance the well-being of communities and provide environmental advantages. It extends beyond traditional open spaces like parks and playing fields to include a range of measures that use plant or soil systems, permeable pavement and surfaces, stormwater harvest and reuse, or landscaping to manage stormwater and reduce flows to sewer systems or to surface waters. This approach helps counter water pollution in urbanized areas caused by stormwater carrying contaminants.

Green Roof
A roof that incorporates vegetation over a waterproof layer. Green roofs can be categorized as extensive, intensive, or semi-intensive based on the depth of planting medium and amount of maintenance they require. They offer benefits like mitigating the heat island effect, managing stormwater, and enhancing green space in urban areas.

Green Wall
This is a vertical extension of the green roof concept, where vegetation is grown on building exteriors.

Gross Domestic Product (GDP)
The total value of goods and services produced within a country's borders in a specific timeframe, typically a year. It doesn't account for the depreciation of assets or depletion of natural resources.

Groundwater
Water located beneath the Earth's surface, filling the spaces between soils and rocks.

H

Halocarbons
A group of organic compounds composed partially of halogens. They encompass chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), halons, and more. Many halocarbons have significant Global Warming Potentials and some also contribute to ozone layer depletion.

Hazard
The potential for an event, whether natural or human-induced, to cause harm to people, property, infrastructure, or the environment.

Heat Island
An urban area that exhibits higher temperatures than its surrounding rural areas due to human activities. This phenomenon is attributed to factors like heat-absorbing surfaces and structures. See also "Micro Heat Island".

Heating, Ventilation, and Air Conditioning (HVAC)
Systems that regulate and move heated and cooled air throughout buildings. HVAC systems are used to improve air quality and maintain a comfortable indoor climate.

Hydrocarbons
Compounds made up of only hydrogen and carbon atoms. The term can also refer to petroleum compounds which might contain elements like sulfur, nitrogen, or oxygen. Unsaturated hydrocarbons contain either double or triple carbon-carbon bonds.

Hydrofluorocarbons (HFCs)
Molecules made up of hydrogen, fluorine, and carbon. These were developed as replacements for ozone-depleting substances and are used in a variety of industrial processes. While HFCs don't deplete the ozone layer, they are potent greenhouse gases with varying Global Warming Potentials.

I

ICLEI Local Governments for Sustainability
An association of local governmental entities focused on reducing carbon emissions and fostering sustainable urban growth. ICLEI members, along with a team of specialists, collaborate through capacity building, partnerships, and peer interaction to effect change towards urban sustainability.

Impact
A consequence or effect that arises due to climate change on any system's structure or functioning. Examples include severe heatwaves, sea-level rise, or alterations in rainfall causing floods or droughts.

Indicator
A numerical representation highlighting a specific facet of vulnerability to climate change. For instance, a forecasted alteration in annual average temperature or the count of species at risk.

Internal Combustion Engine Vehicle (ICE)
Vehicles which ignite and combust fuel within an internal combustion engine. Fuels used in ICE vehicles are typically gasoline and diesel.

Intergovernmental Panel on Climate Change (IPCC)
Founded in 1988 by the World Meteorological Organization and the United Nations Environment Programme, the IPCC is tasked with evaluating scientific and technical information related to all aspects of climate change. The IPCC informs

governments about the state of knowledge of climate change by examining all the relevant scientific literature on the subject. The IPCC is scientific entity and is not a legislative body.

K

Kilowatt Hour (kWh)
A unit representing electrical energy consumption, equivalent to using 1,000 watts continuously for an hour.

Kyoto Protocol
A supplement to the United Nations Framework Convention on Climate Change (UNFCCC) ratified in Kyoto, Japan, in 1997. This protocol incorporates legally binding obligations to reduce greenhouse gas emissions. Countries listed in the Protocol's Annex B pledged to reduce their emissions of six major greenhouse gases by at least 5% from 1990 levels between 2008 and 2012. The Protocol became effective on February 16, 2005.

L

Land Use and Land Use Change
Land use pertains to the human activities performed on a certain type of land cover. Meanwhile, land use change denotes alterations in how land is managed or utilized by humans, which can influence land cover. Changes in land cover and land use can affect climate properties such as surface albedo and greenhouse gas sources/sinks, potentially influencing climate on various scales.

Leadership in Energy and Environmental Design (LEED)
LEED is a certification system for evaluating and promoting sustainable building and design practices. Developed by the U.S. Green Building Council (USGBC), LEED provides a framework for environmentally responsible construction, aiming to improve energy efficiency, reduce water usage, and decrease greenhouse gas emissions. Buildings can earn LEED certification at different levels (Certified, Silver, Gold, or Platinum) based on their performance across several criteria, including energy use, indoor environmental quality, and sustainable site development.

Level 1 Charger
An electric vehicle charging device that provides charging through a common residential 120-volt (120V) AC outlet. Level 1 chargers can take 40-50+ hours to charge a BEV to 80 percent from empty and 5-6 hours for a PHEV.

Level 2 Charger
An electric vehicle charging device with a higher AC charging capacity than Level 1 chargers. They typically operate at 240V for residential use or 208V for commercial use. Level 2 chargers can charge a BEV to 80 percent from empty in 4-10 hours and a PHEV in 1-2 hours.

LIDAC Communities
Low Income / Disadvantaged Communities (LIDACs): Communities where residents have low incomes, limited access to resources, and face disproportionate environmental or climate burdens.

Living Streets
"Living streets" amalgamate the principles of green streets and complete streets while emphasizing the enhancement of residents' life quality in urban areas.

LULUCF
An abbreviation for "Land Use, Land Use Change, and Forestry," a category in greenhouse gas inventory documentation.

M

Megawatt Hour (MWH)
An electrical energy unit denoting the consumption of a million watts over an hour.

Methane (CH_4)
A hydrocarbon that acts as a greenhouse gas with a global warming potential estimated to be 28 times stronger than carbon dioxide. Methane arises from several sources, including decomposition in landfills, flooded rice fields, digestion in animals, and fossil fuel production. The GWP value is sourced from the IPCC's Fifth Assessment Report (AR5).

Metric Ton
Equivalent to a Megagram or 1,000 kilograms, a metric ton, sometimes referred to as a metric tonne, is a standard international unit for mass.

Micro Heat Island
Smaller localized zones within urban environments experiencing elevated temperatures in comparison

to surrounding areas. Such hotspots might include asphalt roads, non-green roofs, or barren parking lots. The microclimate and unique built environment conditions heavily influence these micro heat islands. Refer also to "Heat Island".

Million Metric Tons (MMT)
A standard measurement often utilized in greenhouse gas documentations, equivalent to a Teragram (Tg).

Mitigation
Efforts to reduce or curb the extent or speed of long-term climatic warming and its associated effects. Mitigation typically encompasses the reduction of human-induced greenhouse gas emissions.

Mobile Sources
Transportation means that emit pollutants, including cars, motorbikes, trucks, off-road vehicles, boats, and planes.

Mode Share
The proportion of travelers opting for a specific mode of transportation. Mode share serves as a vital metric when shaping sustainable transportation strategies in a city or region, as it highlights the prevalent use of different transport options. This metric showcases the effectiveness of infrastructures, policies, investments, and urban designs in facilitating various transport modes.

Model
A model serves as a numerically-based representation of real-world scenarios, often omitting or simplifying certain details to emphasize core elements.

Municipal Power Aggregation
Refer to “Community Choice Aggregation.”

Municipal Solid Waste (MSW)
Waste originating from homes and certain non-hazardous industrial, institutional, and commercial sources. Typically, this waste is directed to municipal disposal sites.

N

National Oceanic and Atmospheric Administration (NOAA)
A US agency responsible for weather forecasting, monitoring oceanic and atmospheric conditions, charting the seas, conducting deep-sea exploration, and managing fishing and protection of marine mammals and endangered species in the US exclusive economic zone.

Natural Sources
Emission sources that aren't human-induced, including biological, geological sources, wildfires, and dust carried by the wind.

Net Energy Metering (NEM)
Net Energy Metering, commonly referred to as Net Metering, enables residential and business consumers generating their own solar energy to sell their surplus electricity back to the grid. The rate schedule for NEM determines compensation for this electricity. While net metering laws exist in many states, in others, utilities may offer these programs either voluntarily or due to regulatory decisions.

Net Zero Emissions (NZE)
Pertains to a community, business, institution, or building that produces the same amount of energy it consumes through renewable and GHG emission-free sources, resulting in zero net emissions over a year. With a net zero target, only a small portion of residual emissions, no more than 5-10%, should be offset using high-quality carbon removal methods.

Nitrogen Fixation
The process where atmospheric nitrogen gas transforms into forms beneficial for plants and other organisms, achieved through lightning, bacteria, and blue-green algae. This process is integral to the nitrogen cycle.

Nitrogen Oxides (NOx)
Gaseous compounds comprising nitrogen and oxygen. These gases emerge from vehicle exhaust and power generation. As they can form photochemical ozone, impact visibility, and harm health, they're deemed pollutants.

Nitrous Oxide (N_2O)
A potent greenhouse gas with a warming potential 265 times greater than carbon dioxide. Key sources

encompass soil management practices, fossil fuel burning, and biomass combustion. Its global warming potential is derived from the IPCC's Fifth Assessment Report (AR5).

Non-Governmental Organization (NGO)
A group that works independently of governments to improve social conditions. NGOs are often non-profit institutions that are established at the community, national, or international level.

O

Ozone (O_3)
A gaseous compound composed of three oxygen atoms. In the troposphere, ozone forms naturally and through photochemical reactions involving human-produced gases. In the stratosphere, it forms when solar UV radiation interacts with diatomic oxygen. While tropospheric ozone is a greenhouse gas, stratospheric ozone is vital for blocking harmful UV radiation.

Ozone Depleting Substances (ODS)
Compounds causing the depletion of the stratospheric ozone layer. This category includes substances like CFCs, HCFCs, halons, and more. These substances, predominantly stable in the troposphere, degrade in the stratosphere under UV radiation, releasing ozone-depleting chlorine or bromine.

P

Perfluorocarbons (PFCs)
Man-made compounds solely composed of carbon and fluorine. Used as substitutes to ozone-depleting substances and emitted during certain industrial processes. Despite not depleting the ozone, they are formidable greenhouse gases. (IPCC's Fourth Assessment Report (AR4))

Phantom Load
Refers to the power consumed by electronic devices and appliances even when switched off. Devices drawing "phantom loads" constantly utilize electricity.

Photosynthesis
A biological process where plants absorb carbon dioxide to produce carbohydrates, releasing oxygen in the process. The mechanism varies based on different atmospheric carbon dioxide concentrations.

Plug-in hybrid electric vehicle (PHEV)
A type of vehicle that combines features of both gasoline-powered and electric vehicles. PHEVs use batteries to power an electric motor, and another fuel, such as gasoline or diesel, to power an internal combustion engine or other propulsion source. PHEVs can charge their batteries through charging equipment and regenerative breaking.

Plug Load
Refers to the energy consumption of devices plugged into electrical outlets. In offices, major plug loads include computers, printers, and copiers. As buildings become more energy efficient, the relative importance of plug loads increases.

POC
An acronym for “people of color” or “person of color”, encompassing all non-white demographic groups. See also “BIPOC.”

Point Sources
Specific locations emitting pollutants into the atmosphere, like industrial smokestacks.

Power Purchase Agreement (PPA)
A contract where one party, the generator, produces electricity, and the other, the buyer, agrees to purchase it. Individual or grouped customers can forge PPAs with energy developers. PPAs enable long-term renewable energy commitments and can serve as direct renewable energy investments.

Property-Assessed Clean Energy (PACE)
A financial structure allowing property owners to fund renewable energy and energy efficiency improvements. Eligible properties include residential, commercial, and industrial sites. Upgrades can be geared toward energy efficiency, renewable energy, and water conservation.

Process Emissions
These are emissions resulting from chemical transformations in industrial processes that are distinct from burning.

R

RCP 8.5
A Representative Concentration Pathway climate model frequently considered the climate model representing “business as usual” forecasts if global GHG emissions are not reduced and fossil fuels are continued to be used.

Radiative Forcing
A shift in equilibrium between incoming sunlight and outgoing infrared radiation. Ordinarily, the Earth's incoming and outgoing radiations are almost balanced. However, the introduction of greenhouse gases captures more infrared radiation, reflecting it back to Earth's surface, leading to a warming effect.

Reforestation
The act of reintroducing forests on lands that once held forests but were later repurposed.

Regeneration
The process of reestablishing young trees, either naturally or through human intervention, typically preserving the existing forest type after the previous forest has been removed.

Renewable Energy
Energy sourced from naturally renewable elements such as the sun, wind, water, and geothermal heat.

Renewable Energy Credits (RECs)
Certificates representing the benefits and attributes of electricity generated from renewable sources. Each REC represents one megawatt-hour (MWh) of renewable electricity dispatched to the grid. The largest reduction in Evanston's emissions is attributed to REC purchases.

Representative Concentration Pathway (RCP)
climate change scenarios to project future greenhouse gas concentrations. These pathways describe future greenhouse gas concentrations and have been formally adopted by the IPCC. There are a range of RCP climate models from RCP 2.6 to RCP 8.5 reflecting a range of potential human-made GHG emission scenarios. The numbers represent the expected change in radiative forcing through the end of the 21st century.

Residence Time
The typical duration a single atom or molecule remains in a particular storage area. In the context of greenhouse gases, it generally refers to the duration a molecule lingers in the atmosphere.

Resilience / Resiliency
The capacity to foresee, ready for, counteract, and promptly bounce back from climate-induced threats, ensuring minimal damage to society, economy, and natural settings.

Resilience Hub
A resilience hub is a community-serving facility that supports residents and communities before, during, and after emergencies. Resilience hubs can also provide resources to support communities in reducing greenhouse gas emissions.

Reservoir
Either (1) a part of the climate system where a greenhouse gas or its precursor is housed; or (2) human-manipulated water bodies where significant variations in water area might occur due to water regulation.

Respiration
A biological process where living entities transform organic substances into carbon dioxide, using up oxygen and releasing energy in the process.

Retro-commissioning
A comprehensive approach to enhance a building's operational efficiency by ensuring its control systems operate optimally and align with the building's intended and actual usage.

Ride-share
A system where individuals share transport means, usually through carpooling or joining a vanpool. Typically facilitated by a platform connecting drivers with potential riders.

S

Scope 1
Refers to emissions discharged directly within the city's boundaries due to fossil fuel combustion and the decomposition of waste in landfills and wastewater facilities.

Scope 2
Refers to emissions generated outside the city resulting from the city's consumption of electricity.

Scope 3
Pertains to emissions linked to local government functions that can be quantified and disclosed but don't fall under Scope 1 or 2. Examples include outsourced activities and commuting of employees.

Short Ton
A standard ton measurement in the U.S., equivalent to 2,000 lbs or about 0.907 metric tons.

Sink
Any activity, process, or mechanism responsible for removing a greenhouse gas, aerosol, or their precursor from the atmosphere.

Social Cost of Carbon
An estimation of the economic damage due to climate change effects, calculated as the monetary value of total damages arising from emitting a single ton of carbon dioxide.

Solar Radiation
The sun's emitted electromagnetic waves. This radiation, also known as shortwave radiation, has wavelengths mainly in the visible spectrum due to the Sun's temperature.

Solar Photovoltaic (PV)
A system that directly transforms sunlight into electricity using semiconductors, primarily silicon. Suitable for homes, businesses, and large-scale operations, solar PV systems can be roof-mounted, ground-based, or integrated into building structures to produce renewable energy.

Source
Any process or activity that introduces greenhouse gases, aerosols, or their precursors into the atmosphere.

Stationary Sources
Fixed locations like power stations, manufacturing plants, and refineries that emit pollutants into the air.

Strategy / Strategic Goal
Detailed directions built upon the foundation of the sustainability vision and GHG reduction objectives that guide future policy decisions, community investments, and initiatives.

Sulfur Dioxide (SO_2)
A molecule made of one sulfur atom and two oxygen atoms. Released both naturally and by human activity, it can transform into sulfate aerosols in the atmosphere. These aerosols can cool the Earth's surface, contribute to acid rain, and decrease visibility.

Sulfur Hexafluoride (SF_6)
A colorless gas that mixes well with alcohol and ether but less so with water. It's an extremely potent greenhouse gas, with a global warming potential much higher than carbon dioxide (CO_2). SF6 is predominantly used in electricity transmission and as an insulator in electronics. Its global warming potential is derived from the IPCC's Fourth Assessment Report (AR4). It is a potent greenhouse gas with a warming potential 23,500 times greater than carbon dioxide.

T

Terrestrial Carbon Sequestration
The process where trees, plants, and crops absorb carbon dioxide (CO_2) from the atmosphere through photosynthesis and store it as carbon in biomass (like tree stems, branches, and roots) and soil. This stored carbon creates "sinks" which counteract emissions when the absorbed carbon is greater than the released carbon over time.

Therm
A unit of energy equivalent to 100,000 British Thermal Units, roughly akin to the energy in 100 cubic feet of natural gas. Commonly used to gauge natural gas consumption for billing.

Total Organic Gases (TOG)
Organic gases that encompass both reactive and relatively non-reactive compounds, such as methane.

Transparency
Clear presentation of methodologies and assumptions used in an inventory so users can easily replicate and evaluate the inventory. Transparency is

crucial for effective communication and consideration of information.

Tree Bank
A designated location, such as a school or public park, where property owners or developers may donate and plant a portion of zoning ordinance-required trees if planting them within their own project site is not practical.

Trend
A measure of a quantity's change over time. A positive trend signifies growth, while a negative one indicates a decline. It’s expressed in percentage or fractional terms concerning the quantity's initial value.

U

Urban Tree Canopy
The composition and traits of trees in urban settings.

U.S. Department of Energy (DOE)
A federal agency that oversees the nation’s nuclear infrastructure, energy policy, and funds scientific research in the field.

U.S. Environmental Protection Agency (EPA)
A federal agency tasked with safeguarding human health and the environment. It offers technical support for recovery planning, long-term cleanup, and environmental surveillance. This includes assistance with public health infrastructure, such as wastewater treatment plants, and addressing threats through monitoring, assessment, and decontamination efforts.

V

Vehicle Miles Traveled (VMT)
Represents the distance traveled by vehicles, be it cars, trucks, or motorcycles. Each mile is counted as one vehicle mile, irrespective of the number of passengers.

Vision Zero
A strategy focused on eliminating severe injuries and fatalities from traffic accidents, aiming to provide safe and equal mobility for all individuals.

Vulnerability
The extent to which a system is exposed to, sensitive to, or unable to handle the adverse impacts of climate change. This encompasses:

- Exposure: The presence of assets or organisms in areas potentially adversely impacted by climate change.
- Sensitivity: The level at which assets or organisms are impacted by climate change.
- Adaptive capacity: The capability of systems, assets, or organisms to adjust to detrimental impacts.

W

Water Vapor
The predominant greenhouse gas present in the form of water in its gaseous state in the atmosphere. Water vapor is a natural part of the greenhouse effect. Its concentration is not significantly altered by human activities, but it amplifies the greenhouse effect due to positive feedback mechanisms. Water vapor also plays a vital role in climate regulation by forming clouds and precipitation.

Weather
Weather represents the immediate atmospheric conditions at a specific time and place, while climate refers to the long-term average of these conditions in a particular region over an extended period. In simpler terms, weather is what you experience outdoors on any given day, while climate describes the typical weather patterns you'd anticipate for a particular season and location.

Z

Zero Emission Vehicles (ZEV)
A vehicle that doesn't release harmful pollutants during its operation. Examples include electric cars, hydrogen-fueled vehicles, and bicycles. These emissions, when released, can have detrimental effects on both the environment and human health.

Zero Net Energy Building (ZNEB)
Also known as a Net-Zero Energy Building is one that is optimally efficient, and over the course of a year, generates renewable energy onsite equal to or greater than the total amount of energy consumed onsite.

Zero Waste
An approach focusing on the efficient utilization of resources through responsible production, consumption, and recovery. This means products, packaging, and materials are reused and recycled without causing harm to the environment or health, and without resorting to incineration or releases to land, water, or air.

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Appendix D
Acknowledgements

We are deeply grateful for the community collaboration and input that went into this plan. Below are some of the main contributors that made the City of Falcon Heights' Climate Action Plan possible:

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making change personal
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MINNESOTA POLLUTION CONTROL AGENCY

Funding for this project was provided through a 2024 State of Minnesota Pollution Control Agency (MPCA) Local Climate Action Planning Grant

FALCON HEIGHTS
THE CITY THAT SOARS