





KANE COUNTY, ILLINOIS

ESTABLISHED JANUARY 16, 1836

CLIMATE ACTION IMPLEMENTATION PLAN

June 2024

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Executive Summary

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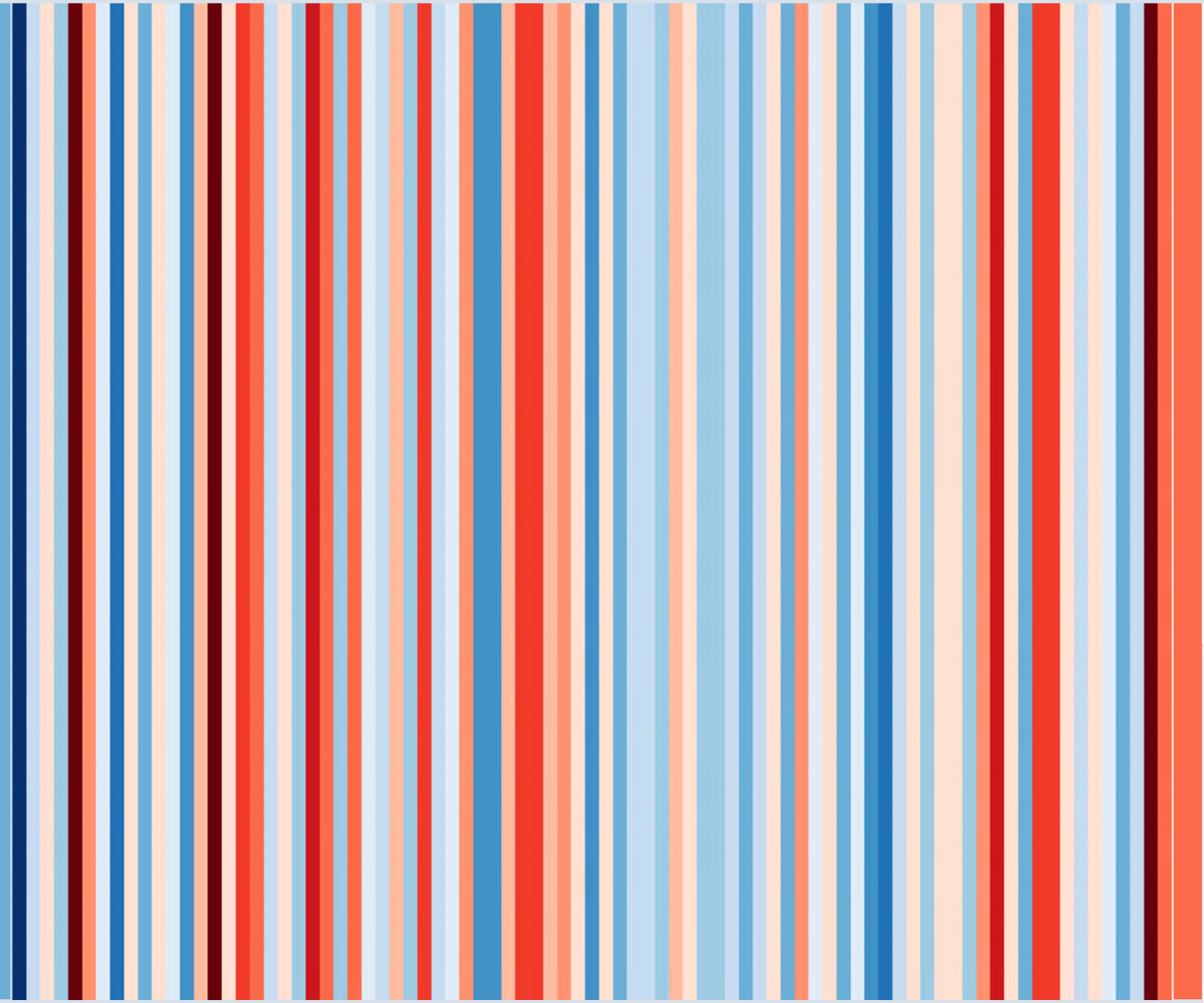


← 1895 **Illinois's Annual Temperature Trends** 2020 →

Each stripe represents the temperature Illinois averaged over a year. Blue = Below Average Red = Above Average

Our Climate Future

Unless we succeed in changing our path:

Children alive in Kane County today can expect through 2100:			
Climate Conditions	**Baseline**	**Mid-Century** (2050 annual average)	**End of Century** (2100 annual average)
Average Daily Maximum Temperature	60.1° F	64.9° F	70° F
Number of Days Per Year with Maximum > 95° F	5.4	22.5	55.3
Number of Days Per Year With Minimum < 32° F	133.4	112.7	84.2
Change in Growing, Allergy, and Vector-Borne Disease Season	14 days	26 days	56 days
Average Annual Precipitation and Projected Increases	35.5”	+2%	+9%
Increase in Heavy Precipitation Events	N/A	+24%	+47%
Baseline Air Conditioning Demand (CDD) and Projected Increases	1000	+50%	+130%
Estimated Increase In Residential Per Capita Electricity	N/A	+25%	+39%

Our Challenge

The activities of modern civilization place immense pressure on our ecosystems, particularly through fossil fuel combustion, leading to global warming and climate change. Kane County is already feeling these effects, and predictions indicate they will escalate, challenging vulnerable groups, societal foundations, and community resilience.

Climate change threatens the well-being and economic stability of our communities with more frequent and severe storms causing unprecedented damage. Historic floods and heavy rain events like those in Bloomington and Gibson City in 2021 and Olmsted and Calumet City in 2023 have led to millions in damages while wildfires in Canada and the western United States have affected Illinois's air quality. Lakes have shorter ice cover periods, affecting recreation and business; wildlife habitats, and certain tree and plant species are at risk. Health concerns arise from floods, extended allergy seasons, rising temperatures, and expanding tick habitats.

We Must Act

Science tells us that, regardless of what we are able to do to reduce our greenhouse gas (GHG) emissions, climate change impacts will increase through the middle of this century. This underscores the need to develop and implement actions to build resilience to those anticipated impacts.

Our Opportunity

We Can Make A Difference

Science also tells us that we have the power to reduce the currently projected long-term climate change impacts. Collectively we have the capacity to bend the climate change curve so that the second half of this century may avoid the more extreme projected impacts.

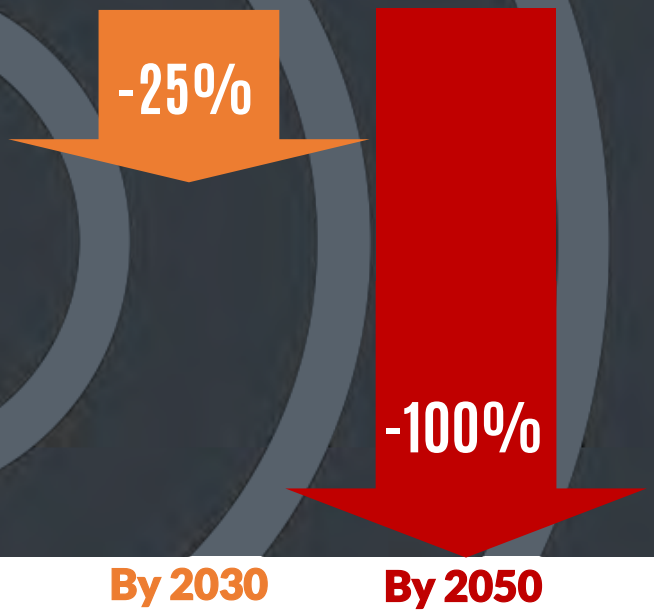
Kane County's community-wide GHG emissions have fallen nearly 5% from 7,371,645 metric tons in 2010 to 7,012,366 metric tons in 2019. Although total emissions are still above where science tells us our emissions need to be, this shows a trend towards reduction that we can build upon. Many communities across the country have sought to leverage opportunities to create a better future through the creation of a Climate Action Implementation Plan (CAIP). Climate Action Implementation Plans provide detailed blueprints highlighting specific strategies and measures to reduce GHG emissions and bolster resilience against climate-related effects.

In August, 2022, Kane County engaged paleBLUEdot for support in establishing climate action goals and in the development of a Climate Action Implementation Plan outlining strategies and actions in support of achieving those climate goals. This Plan is the result and was developed in collaboration with the County's Climate Action Implementation Team (CAIT).

The purpose of this Plan is twofold: Firstly to provide guidance for climate actions to be taken by Kane County. Secondly, to provide municipalities and other public agencies a menu of actions to support their own climate action efforts. The plan includes actions for both local government operations as well as community-wide efforts.

Our Goal

Kane County's GHG Reduction Goal:
"To reduce community-wide GHG emissions to 25% below 2019 levels by 2030, and achieve carbon neutrality by 2050"



Our Plan

addresses
9 SECTORS
of GHG emissions and climate adaptation

through
44 STRATEGIES
to achieve plan goals

supported by a menu of
264 ACTIONS
detailing steps to be taken

over a
7 YEAR
implementation timeframe

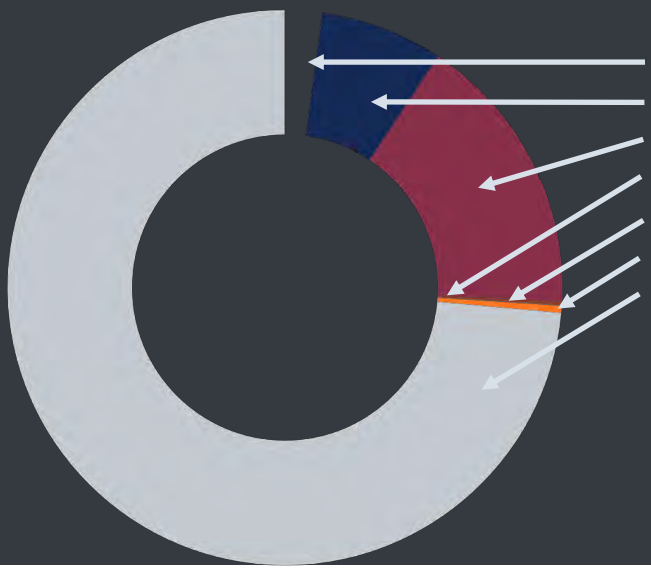
The CAIP was collaboratively crafted by an 82-person team, including community members, business representatives, and county and municipal staff. Developed from June 2023 through January 2024 through workshops, the plan is based on community input, expert analysis, and best practices from other U.S. communities. The plan, refined and prioritized by the team, is a joint effort reflecting the voices of Kane County's residents and businesses.

The plan includes actions for both local government operations as well as community-wide efforts and its purpose is twofold:

- To provide guidance for climate actions to be taken by Kane County.
- To provide municipalities and other public agencies a menu of actions to support their own climate action efforts.

The scope of the plan includes an implementation section and eight broad sectors, each of which are described in separate sections of this plan document. Each sector is organized with overarching goals for 2030 backed by strategies and actions identified for implementation. The actions for each sector focus on increasing resilience to climate change while minimizing our contribution to the future impacts of climate change by reducing our GHG emissions.

Our Impact



Reduction from Baseline		2019 Baseline GHG	2030 Projected GHG
2.2%	**Business-as-Usual Reductions**		
7.2%	**Transportation and Land Use**	2,222,807	1,596,649
16.5%	**Buildings and Energy**	4,396,045	3,239,746
0.02%	**Waste Management**	192,702	178,745
0.2%	**Water and Wastewater**	31,821	30,230
0.4%	**Agriculture**	171,729	114,391
73.6%	**Remaining GHG Emissions**	7,012,366	5,157,161

Our Next Steps

This Climate Action Implementation Plan should be viewed as the beginning of an on-going process to evaluate and advance county-wide climate resilience, GHG emissions reduction, and overall sustainability goals. The plan includes an Implementation and Actions section providing detailed actions in a framework for beginning, guiding, monitoring, and evaluating the execution of this plan. (see Section 10)

Climate Action Implementation Plan as Living Plan

This Climate Action Implementation Plan is a "living plan," designed for continual evaluation and refinement, rather than being a static document. Implementation should be marked by regular assessments of progress and necessary adjustments. The 2030 emissions reduction goal acts as a stable guide, acknowledging that initial actions cannot immediately fulfill long-term 2050 objectives. Regular plan evaluations should highlight needed additional actions, or modifications to plan actions, to ultimately reach the 2030 GHG reduction goal. A second phase of the plan should then be created by 2030 to guide the next phase of climate action progress.

Implementation is For Everyone

Addressing the widespread causes and impacts of climate change requires equally comprehensive solutions. This plan seeks to spur county-wide climate action. Its success hinges on the endorsement and implementation of this or similar plans by municipalities, residents and businesses throughout the county.

Key actions must be spearheaded by various stakeholders, such as elected officials, county and municipal staff, the business community, households, students, and individuals. Achieving the goals laid out in this plan needs active participation from all sectors of the county. Continued involvement, advocacy, and efforts towards implementing priority actions are crucial components for all stakeholders involved.

Introduction

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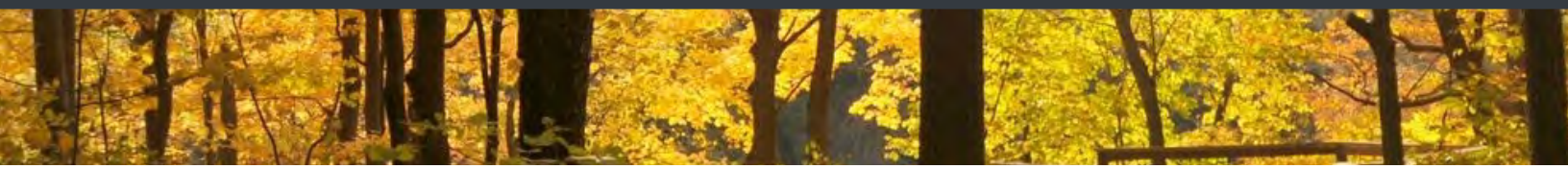


Kane County has actively engaged in Climate Action Planning, collaborating with nearby communities and addressing local concerns. In 2019, the county adopted the Greenest Region Compact developed by the Metropolitan Mayors Caucus (MMC), syncing its sustainability efforts with regional objectives. In August, 2022, the county engaged paleBLUEdot for support in establishing climate action goals and in the development of the first Kane County Climate Action Implementation Plan. This plan establishes Kane County specific goals and detailed actions grounded in the MMC Climate Action Plan and Greenest Region Compact.

The purpose of this plan is twofold: first, to provide guidance for climate actions to be taken by Kane County, and second, to provide municipalities and other public agencies a menu of actions to support their own climate action efforts. The plan includes actions for both local government operations as well as community-wide efforts.

The Role of Local Governments in Climate Action

Local government plays a crucial role in addressing the issue of climate change. Although the environmental impact of each individual community on global greenhouse gas emissions is relatively modest, the leadership demonstrated by municipalities in driving change can have a profound and meaningful impact.

The United Nations' Intergovernmental Panel on Climate Change (IPCC) calculates that over 40% of the needed global emissions reductions can be met by municipal governments taking action. And, according to a survey conducted by the US Conference of Mayors, more than half (53%) of local governments have committed to reducing GHG emissions. Kane County's Climate Action Implementation Plan represents an important step towards taking a leadership role in supporting climate action throughout the county.

What is a Climate Action Implementation Plan (CAIP)

Climate Action Implementation Plans are comprehensive road maps that outline the specific Strategies and Actions to implement for GHG emission reductions and to build resilience to related climatic impacts. The Kane County CAIP addresses both climate mitigation and climate adaptation actions.

Why Create a Climate Plan

A Climate Action Implementation Plan offers a structured approach for communities to combat global climate change, while enhancing resilience against climate impacts. The actions in this plan can spur investment in innovative jobs and cost-saving measures, improving quality of life -especially for vulnerable community members, who often bear the brunt of climate change impacts.

What is Climate Mitigation

Mitigation actions limit the magnitude or rate of long-term global warming and its related effects. Climate change mitigation generally involves reductions in human emissions of greenhouse gases (GHG).

What is Climate Adaptation

Adaptation refers to the capacity of a natural environment or community to withstand, respond to, and recover from a disruption. Adaptation is achieved through actions taken to increase resilience to climate change impacts by reducing vulnerability of populations, ecosystems, and infrastructure.



Economic Risk of Climate Change to Kane County by 2100

Future economic and social impacts of climate change include impacts to agriculture (including food costs), energy costs, labor impacts, death rates, and crime impacts among others. The estimated economic impacts for Kane County are:

$408,000,000
Annual Cost Impact
(in 2018 dollars)*

Social Cost of Carbon

"Social Cost of Carbon" measures the share of climate change economic harm and impacts from emitting one ton of carbon dioxide into the atmosphere. For Kane County it can be calculated as follows:

Estimated Economic Risk of Climate Change:

$408,000,000
Annual Cost Impact

÷

Annual GHG Emissions:
7,012,366
Metric Tons

=

Estimated Localized Social Cost of Carbon:

$58*
Per Ton

* See the Kane County Vulnerability Assessment for more information. Figure does not include increased healthcare costs due to increased illness and disease, nor increased property damage due to increased extreme weather events.

Kane County is Changing

Illinois' climate is experiencing ongoing alterations, which impacts the well-being and economic stability of our neighborhoods. Storms of increasing frequency and severity, unprecedented in recorded history, are inflicting harm on residences, businesses, utilities, infrastructure, agricultural lands, and the environment, a trend that's expected to persist unless action is taken. Historic floods and heavy rain events, like those in Gibson City in 2021 and Olmsted in 2023, have devastated streets, wastewater systems, businesses, agricultural fields, and houses, burdening local authorities, entrepreneurs, farmers, and citizens with millions in recovery and repair costs.

Wildfires in Canada and the western U.S. have degraded Illinois' air quality. Climate change threatens wildlife habitats and native plant and tree species. Health risks include more frequent and longer-duration heatwaves, increased likelihood of floods, air and water quality impacts, extended allergy seasons, and increased populations and species of pests which can carry disease such as ticks and mosquitos.

Climate Change in Kane County

The climate in the County has already changed. Since 1980, the County has experienced an increase in annual average temperature, an increase in the number of days above 95 degrees, an increase in the number of heavy rain events, and a decrease in the number of days below 32° F.

Climate fluctuations are notably linked to variability. Variability in the climate is evident in the shifts in the county's yearly rainfall. While there's been a general rise in yearly rainfall, it's not consistent throughout all seasons. The state's total annual precipitation has increased by 5 inches, equivalent to a 12-15% increase in annual precipitation. In northern and central Illinois, most of the change has come in summer. The number of very heavy precipitation events over the last 120 years has increased by 40%.

The County's climate is anticipated to continue to warm through this century and beyond. Meanwhile, the associated trends in climate change patterns and impacts are anticipated to increase in frequency, variability, and overall impact.

Climate Risks To

The projected changes to Kane County's climate in the coming decades represent potential risks to residents. These risks are inequitably felt and particularly acute in vulnerable populations such as children, seniors, and those with disabilities (see the Kane County Climate Vulnerability Assessment for more information). Below are some of the significant risks to the community's population (not including the destruction of native ecosystems and the continued loss of species).

Extreme Heat and Weather
Certain groups of people are more at risk for stress, health impacts, or death related to heatwaves, extreme weather events including tornadoes, wind storms, lightning, winter storms, hail storms, and cold waves. Vulnerability to heat stress can be increased by the presence of health conditions like diabetes and heart conditions, demographic and socioeconomic factors, and surrounding land cover.

Air Quality
Climate change is expected to affect air quality through several pathways including production and potency of allergens and pollen, and increased regional concentrations of ozone, increased potential of smoke from wildfires, and increased particulate air pollution and dust.

Flooding
According to the latest National Climate Assessment, the frequency of heavy precipitation events is already increasing for the nation as a whole as well as for Illinois specifically. These heavy rain events are projected to increase throughout Illinois. Increases in both extreme precipitation and total precipitation are likely to increasingly contribute to over-bank flooding (river and lake flooding) as well as flash flooding.

Food Insecurity
Climate change is likely to impact crops and agricultural systems and interrupt transportation networks. These may trigger food shortages and spikes in food cost.

Infrastructure Failure
Extreme weather events, flooding and flash flooding, as well as increasing daily stresses caused by increasing climate variability, all represent potential causes of failure of our aging infrastructure. Power outages, road damage, bridge collapse, and water infrastructure failure each represent significant physical climate risks to the community.

Kane County Climate Risk Sensitivity Ranking Summary

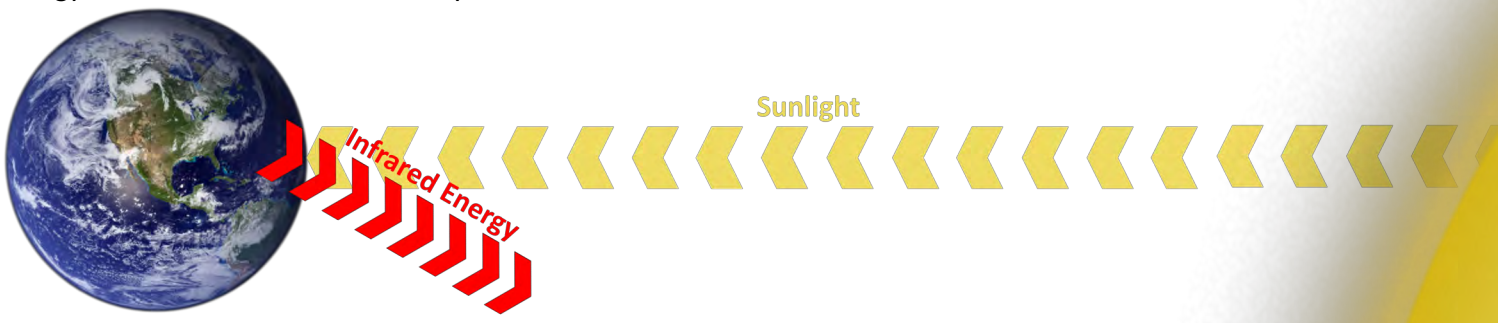
According to the Climate Vulnerability Assessment, the county's population vulnerabilities range from highest to lowest sensitivity. However, risks with lower sensitivity shouldn't be deemed irrelevant for the community.



What Causes Climate Change

Earth's Infrared Energy

When sunlight strikes the Earth, it warms the surface and becomes heat energy – or **infrared energy**. This infrared energy then radiates back towards space.



How Greenhouse Gases (GHGs) Trap Heat

GHGs such as carbon dioxide and methane are central in creating the "greenhouse effect" that traps the sun's heat. These gases interact with the infrared energy radiating from the Earth. Human activities like burning fossil fuels and deforestation have increased GHG concentrations, amplifying this effect. The additional trapped heat leads to global warming, affecting weather patterns, melting ice, and raising sea levels, all contributing to climate change.

Greenhouse Gases trap Earth's heat energy and reflect it back, warming the Earth.

Greenhouse Gases

- Carbon Dioxide CO_2
- Methane CH_4
- Nitrous Oxide N_2O
- Water Vapor* H_2O

1930
307.5 ppm

1975
331.4 ppm

2023
422.4 ppm

Global Levels of **Greenhouse Gas:**
in Parts Per Million (ppm)
1850
285.2 ppm

Non-Greenhouse Gases

- N_2 Nitrogen
- O_2 Oxygen
- Ar Argon

Non-Greenhouse Gases allow Earth's heat energy to radiate into space

The more **Greenhouse Gases** in our atmosphere, the more global warming we experience.

*Water vapor cycles through the atmosphere rapidly via precipitation, however, warmer air can hold more water vapor. As the atmosphere warms from other greenhouse gases, increased water vapor can lead to heightened warming and extreme storms. Learn more: https://cutt.ly/XwBaWEAk

Kane County's GHG Emissions

Measuring, tracking, and reducing GHG emissions are vital for any climate planning or implementation. County-wide total emissions for Kane County decreased from 7,371,645 metric tons (MT) in 2010 to 7,015,103 MT in 2019. This represents a decrease in GHG emissions of over 4.8% while the County's population increased 3.1% and the county's economy grew over 18% during the same timeframe.

2010 By The Numbers		2019 By The Numbers		9 Year Trend		
GHG Emissions (MT)		**GHG Emissions (MT)**		**GHG Emissions (MT)**		
Electricity	3,381,680	Electricity	2,406,129	Electricity	-975,551	-28.8%
Natural Gas	1,554,513	Natural Gas	1,989,916	Natural Gas	435,403	28.0%
Transportation	1,999,012	Transportation	2,222,807	Transportation	223,795	11.2%
Waste+Water	281,628	Waste+Water	224,522	Waste+Water	-57,106	-20.3%
Agriculture	154,812	Agriculture	171,729	Agriculture	16,917	10.9%
Total (MT)	**7,371,645**	**Total (MT)**	**7,015,103**	**Total (MT)**	**-356,542**	**-4.8%**
MT Per-Capita	14.28	MT Per-Capita	13.18	MT Per-Capita	-1.11	-7.7%
MT / Job	37.88	MT / Job	32.17	MT / Job	-5.71	-15.1%
MT / $1,000 GDP	0.35	MT / $1,000 GDP	0.28	MT / $1,000 GDP	-0.07	-19.6%
Population	**516,060**	**Population**	**532,293**	**Population**	**16,233**	3.1%
Employment	**194,627**	**Employment**	**218,068**	**Employment**	**23,441**	12.0%
GDP ($Billion)	**$21.29**	**GDP** ($Billion)	**$25.19**	**GDP ($Billion)**	**$3.89**	18.3%
GDP Per-Capita	$41,270	GDP Per-Capita	$47,330	GDP Per-Capita	$6,060	14.7%



2019 GHG EMISSIONS IN KANE COUNTY

2,222,807 MT
from vehicle use

4,396,045 MT
from building energy

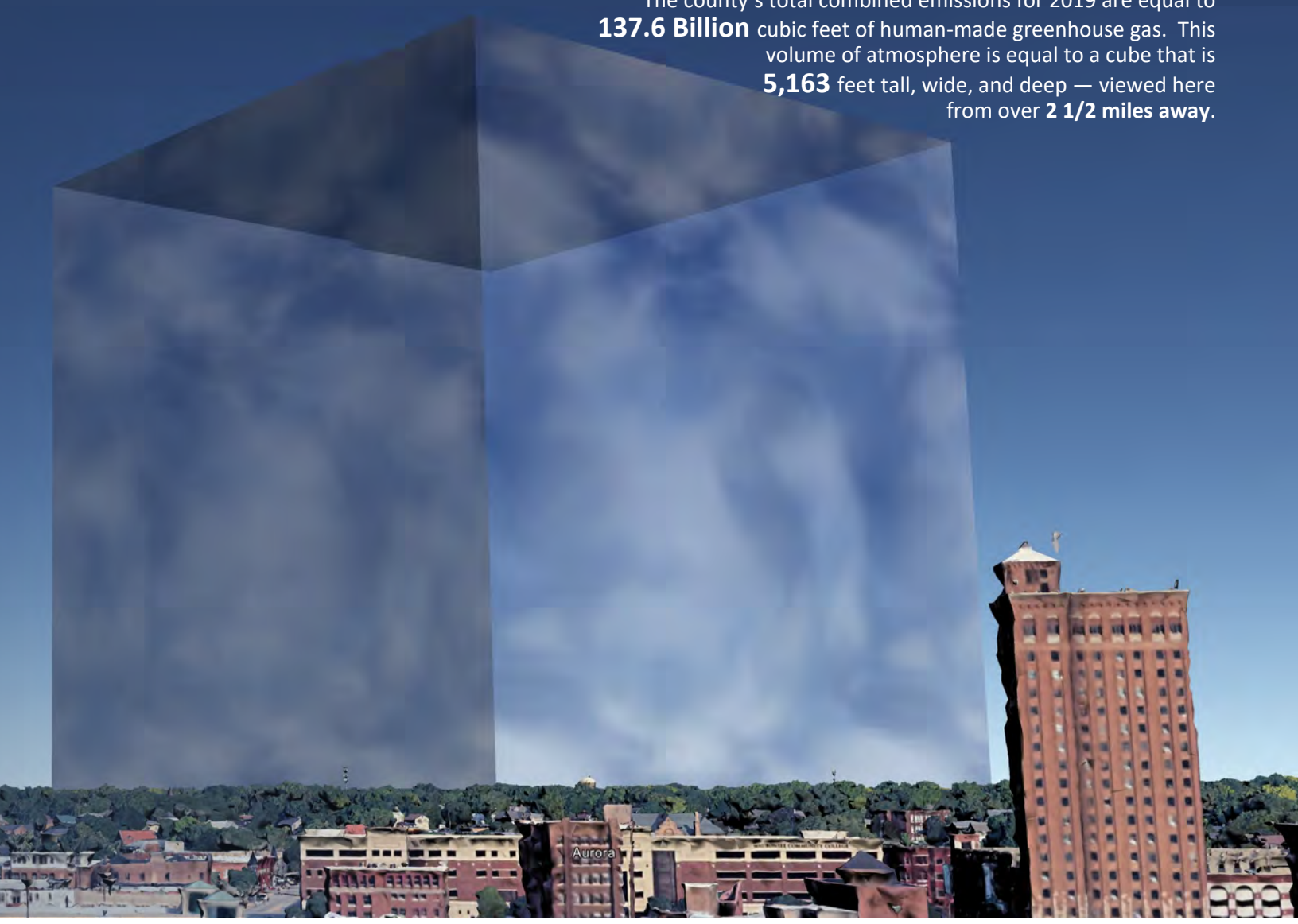
192,702 MT
from solid waste

31,821 MT
from water & wastewater

171,729 MT
from agriculture

How Large Are County-Wide GHG Emissions?

The county's total combined emissions for 2019 are equal to **137.6 Billion** cubic feet of human-made greenhouse gas. This volume of atmosphere is equal to a cube that is **5,163** feet tall, wide, and deep — viewed here from over **2 1/2 miles away**.



Our GHG Reduction Goal



"To reduce county-wide GHG emissions to 25% below 2019 levels by 2030, and achieve carbon neutrality by 2050."*

The plan aims to reduce county-wide GHG emissions in line with the Intergovernmental Panel on Climate Change (IPCC) recommendations. Our goal is reflected in strategies established for individual sectors. Sector goals related to GHG emissions reductions are designed to balance reduction across all sectors and achieve the overall emissions goals set forth for the County. The goals aim for achievability while also seeking to challenge ourselves for improvement beyond business-as-usual.

Survey of Peer Community Carbon Reduction Goals

Chicago, IL	Reduce GHG emissions 80% from 1990 levels by 2050
Deerfield, IL	Reduce GHG emissions by 45% by 2030 and become carbon neutral by 2050
Elgin, IL	Community-wide carbon neutrality* by 2050
Evanston, IL	Community-wide carbon neutrality by 2050, zero waste by 2050 and 100% renewable electricity by 2030. Carbon neutrality for municipal operations by 2035 .
La Crosse, WI	40% to 50% below 2019 levels by 2030 and achieve carbon neutrality by 2050.
Milwaukee, WI	Reduce community-wide net greenhouse gas emissions by at least 45% and net zero GHG emissions By 2050, or sooner
Northbrook, IL	35% below 2010 levels by 2030 and 80% below 2010 levels by 2050
Oak Park, IL	Reduce community-wide GHG emissions by 60% by 2030, carbon neutral by 2050. Achieve carbon neutral municipal operations by 2035.
Skokie, IL	To reduce community-wide GHG emissions by 35% below 2020 levels by 2030, and achieve carbon neutrality by 2050
Urbana, IL	25% reduction in greenhouse gas emissions by 2020 and an 80% reduction in greenhouse gas emissions by 2050 from a 2007 baseline

* Carbon Neutrality refers to a community for which, on an annual basis, all GHG emissions resulting from community-wide operations are offset by carbon-free energy production. See Glossary of Terms for additional information on Carbon Neutrality and Net Zero.

The Process

The work that went into the Kane County Climate Action Implementation Plan:

19 month
planning timeframe

82
planning team members

1,200
community members providing input

5
foundational research study documents

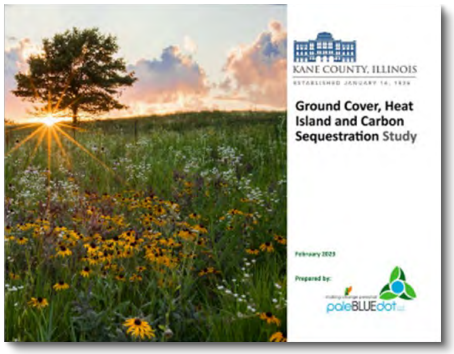
2
online surveys for community input

The CAIP was developed in collaboration with an 82-person planning team (CAIP Team) of community members, institutional representatives, and county and municipal staff. The planning team was organized into sub-teams aligned with each of the sectors included in this plan (see Plan Framework).

The goals and actions identified in the CAIP are grounded in the MMC Climate Action Plan and Greenest Region Compact, community input, expert analysis, and best practices from other cities throughout the United States. Strategic goals and detailed actions were developed, refined, prioritized, and finalized by the Planning Team through a series of workshop meetings from June 2023 through January 2024. The result of this process is a collaboratively created, co-authored CAIP which directly integrates the voices of Kane County residents, businesses, and local government staff from many sectors of the County.









Research Based Climate Action Implementation Plan

In support of establishing the goals, strategies, and actions included in this plan, paleBLUEdot also produced a Greenhouse Gas Inventory document, a Climate Vulnerability Assessment, a County-wide Renewable Energy Potentials Study, a community-wide Ground Cover, Tree Canopy, and Carbon Sequestration Study, and a Climate Action Baseline Assessment. These assessments created the foundation of the Climate Action Implementation Planning process (see Appendix for more)

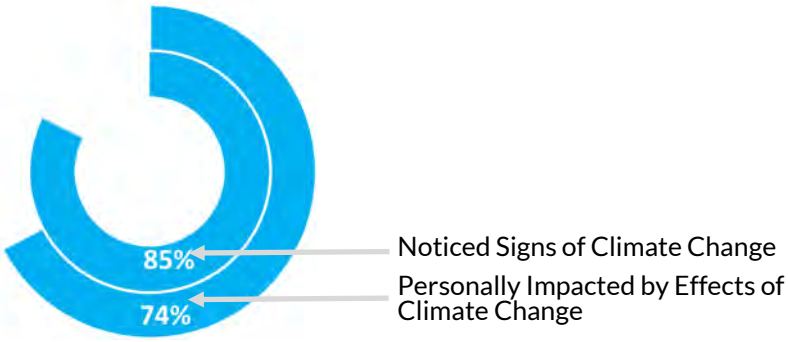
Community Engagement

The Kane County CAIP community engagement initiative aimed to foster shared ownership by involving the community consistently, diversely, and in multiple capacities, while promoting their involvement in decisions. The engagement efforts for this plan included county-wide surveys, community presentations and listening sessions, and the participation of community members from a broad range of backgrounds within the collaborative planning team.

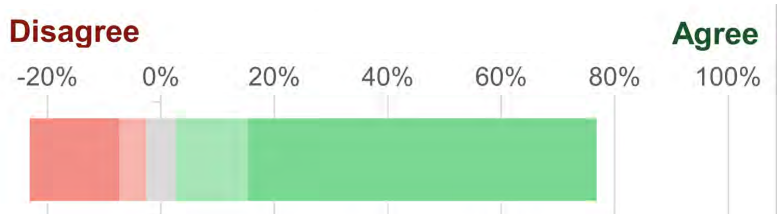
Community Input

The Climate Action Implementation Planning effort began in June 2022 with distribution of a Climate Action Survey open to every resident of Kane County. The survey assisted in defining climate-related issues of relevance and concern to the people in the county. The survey was made available through October 6th, 2023 and received 1,100 responses. Below are some key take-aways from the survey.

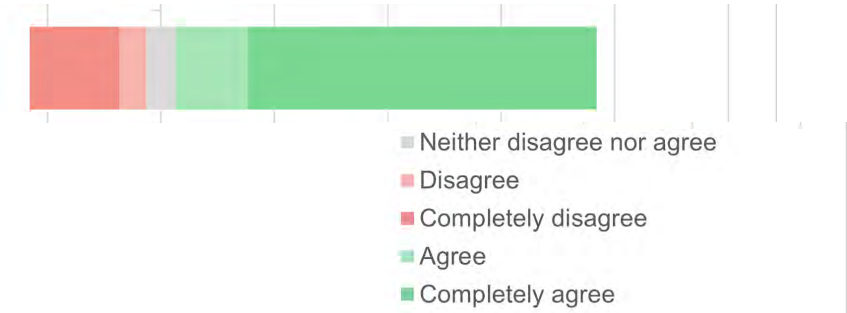
Over **85%** of respondents have noticed signs of Climate Change while **74%** reported being personally impacted by the effects of Climate Change.



How much do you agree with the following statement:
"It is important for Kane County and my community to take action to reduce greenhouse gas emissions from energy use or land use "?



How much do you agree with the following statement:
"It is important for Kane County and my community to take action to prepare for the projected impacts of climate change like more heat waves, heavier rain events, and more days of poor air quality"?



Cumulative Economic Savings Potential of Implementing the Plan Through 2030

Transportation Economic Potential*:
Sector Savings: $1,275,907,627
Sector Cost Increases: -$67,964,035
Potential Sector Net Cost Savings:
$1,207,943,592

Buildings + Energy Economic Potential*:
Sector Savings: $377,947,918
Sector Cost Increases: -$297,416,444
Potential Sector Net Cost Savings:
+ **$80,531,474**

Waste Reduction Economic Potential*:
Residential Savings: $281,914,200
Commercial Savings: $36,183,181
Potential Sector Net Cost Savings:
+ **$318,097,382**

Social Cost of Avoided Carbon:
+ **$86,805,605**

Cumulative Community Savings Potential:
= **$1,693,378,052**

* Value does not include economic potential of job creation and new business potential represented in the plan actions. (see Appendix for more)

Plan Framework

Using This Plan

Each of these sector areas is described in a separate section with background considerations on the subject covered. Sectors have over-arching strategies established to meet 2030 goals and detailed actions for implementation. Sector actions primarily focus on Climate Mitigation, Climate Adaptation, or both.

Strategies: are specific statements of direction that expand on the sustainability vision and GHG reduction goals and guide decisions about future public policy, community investment, and actions.

Actions: are detailed items that should be completed to carry out the vision and strategies identified in the plan.

This Climate Action Implementation Plan includes an implementation framework designed to achieve County-wide goals for GHG reduction and climate adaptation and resilience. The plan includes goals and a menu of detailed actions for local government use structured around a unifying framework organized into nine community-wide sectors:



Transportation and Land Use

Addressing the resilience of on- and off-road vehicles and equipment while reducing their GHG emissions.



Buildings and Energy

Addressing the resilience of our building inventory and energy supply while reducing their GHG emissions.



Waste Management

Addressing GHG emissions from solid waste management and improved community resilience through waste reduction.



Water and Wastewater

Enhancing flood and stormwater resilience while reducing GHG emissions from water usage and wastewater treatment.



Local Food and Agriculture

Reducing GHG emissions and increasing resilience of food systems while improving community food security.



Greenspace and Trees

Supporting community adaptation through expanded green infrastructure and enhanced ecosystem conservation.



Health and Safety

Improving community resilience through healthy community connections, infrastructure, and systems.



Climate Economy

Increasing the preparedness of our businesses and workforce and leveraging economic advantage of climate action.



Implementation

Implementation Actions are foundational or organizational recommendations that apply to multiple Sectors.

Transportation and Land Use

Click here to return to TOC



CURRENTLY IN KANE COUNTY

31.7%
of community-wide GHG emissions in 2019 from transportation

4,229,958,835
Vehicle Miles Traveled in 2019

76.9%
Commuters drove alone in 2020

2.2%
Commuters use public transit

3,851
Battery Electric Vehicles (BEV) registered in January 2024

Sector Goals

	-28.2% drop in GHG emissions (metric tons)	-5% fewer vehicle miles traveled	+190% Increase in public transit use	39x more registered electric vehicles
2019	2,222,807 MT	4.23 Billion mi	2.4%	2,550
2030 Targets*	1,596,649 MT	4.02 Billion mi	6.5%	99,000

* Includes impacts associated with population increases. See Appendix A for research compiled during plan development which supported planning team in goal finalization.

In Kane County, 31.7% of countywide GHG emissions originate from the transportation and land use sector. Despite projected Vehicle Miles Traveled (VMT) increases, emissions could decrease with the shift from fossil fuels to electricity in transportation and the electricity sector's transition towards renewable sources. Additionally, studies indicate a 1% increase in urban density can reduce household travel CO_2 emissions by 0.48% and residential energy use emissions by 0.35%. With Chicago Metropolitan Agency for Planning predicting a 6.5% population increase in Kane County by 2030, such emissions reductions become increasingly important.

79%
of survey respondents support changes in development rules to favor walkable neighborhoods and business districts.

Transportation and Mobility Challenge and Opportunity for Rural Areas

As of 2017, households in rural areas are traveling significantly longer distances per trip compared to 2001, especially for work-related journeys. These extended trips impose greater burdens on rural Americans, impacting their economic opportunities, quality of life, and healthcare access. Furthermore, limited transportation options are compounded by inadequate internet access in rural communities, where providing infrastructure is costly and private providers lack motivation, limiting the ability to work from home. Conversely, households in densely developed areas, whether urban or rural, have shorter daily trips.

The higher percentage of seniors 65 and above in rural areas combined with lack of transportation options can also result in isolation. The 2004 study "Aging Americans: Stranded without Options" revealed that elderly individuals who no longer drive make significantly fewer trips for medical appointments (59% less), shopping or dining out (59% less), and visiting loved ones (65% less) compared to those who can still drive. This limited mobility negatively impacts their access to essential services and social connections, underscoring the difficulties faced by rural seniors.

Policymakers representing rural areas have a vested interest in promoting shorter trips to save time and money, reduce emissions, and cater to the needs of millions of rural residents who lack vehicle access or opt for alternative modes of transportation. Key opportunities to improve rural mobility include:
1. Make substantial investments in rural transit infrastructure.
2. Give priority to projects that enhance accessibility and decrease travel distances.
3. Emphasize safety measures for pedestrians, cyclists, and other active transportation modes, particularly within and between town centers.
4. Focus on preserving rural highways rather than expanding them.
5. Foster remote working opportunities and connectivity among rural communities by continuing to make significant investments to improve internet access.

Rural vs. Urban Driving Trends

Change in Average Driving Distance by Trip Purpose in Rural Areas 2001 to 2017



Average Distance per Trip by Community Type

Low Density vs. Compact, Rural vs. Urban





Source: Graphic made by paleBLUEdot using data from the Federal Highway Administration's National Household Travel Survey HTTPS://nhts.ornl.gov



Transportation and Land Use

Equity Considerations

Equity in transportation climate actions ensures a fair distribution of costs, benefits, and burdens in mitigating climate change within the sector. Marginalized communities are often disproportionately affected. Key equity considerations include:

Access: Equitable access to affordable, reliable, and sustainable transportation options, improving public transit, bike lanes, and addressing transportation gaps in marginalized areas.

Affordability: Minimizing financial barriers, providing incentives, subsidies, and financing for low-income individuals transitioning to low-carbon transportation.

Jobs: Ensuring impacted workers have retraining, job opportunities, and fair wages during the transition to a green economy.

Climate Impacts

This sector impacts climate change through the combustion of fossil fuels (gasoline, diesel, propane) for on-road cars and trucks and off-road vehicles and equipment.

Climate Hazards

Hazards to transportation and land use include increased damage to roads and transportation infrastructure due to increased freeze and thaw cycles, flooding, and extreme weather and temperatures.

Strategies

The strategies on the next pages show how we achieve our climate goals for Transportation and Land Use. Each strategy has detailed actions explained in the Implementation section of this plan.

Click the double arrow symbol below each strategy description to view these detailed actions for each strategy.

Transportation and Land Use

STRATEGIES

Strategy TL 1

Decrease community wide Vehicle Miles Traveled (VMT) by 5% by 2030.

Community-wide vehicle miles traveled (VMT) in Kane County was 4.2 billion miles in 2019. The county has seen some change in commuter modes with commuters driving alone dropping from 80% in 2013 to 77% in 2020. Decreasing total countywide vehicle miles by 5% will decrease vehicle miles traveled by up to 210 million miles and reduce countywide GHG emissions by over 111,000 metric tons annually. Increasing availability and safety of bike and walking routes to schools, retail hub, and recreation centers can support reduced vehicle use for other types of daily trips.

Go to **Implementation and Actions** for supporting actions.

Strategy TL 2

Increase public transit commuter ridership from 2.4% to 6.5% by 2030.

The average commute in Kane County is 29.2 minutes. Of the nearly 204,000 jobs in the county, over 79,000 are filled by employees who live in the county. In total, commuters in the county generate an estimated 1.9 billion vehicle miles commuting to and from work. Meanwhile, AAA estimates that the cost per mile for operating a vehicle is $0.74. Consequently, every 1% increase in commuter utilization of public transit in Kane County may decrease vehicle miles traveled by 19 million miles, saving an estimated $14 million annually.

Go to **Implementation and Actions** for supporting actions.

Strategy TL 3

Increase average population per developed acre by 4.5% by 2030 (from 6.07 to 6.35 ppl/acre).

The county has 85,532 acres of developed land, which is 25.5% of the county's total area. According to the US Census, this land is home to 518,648 people, with an average of 6.07 people per acre. The Chicago Metropolitan Agency for Planning (CMAP) predicts a 9.7% population increase in Kane County by 2030.

Studies indicate that for every 1% increase in population-weighted urban density, household travel CO_2 emissions decrease by 0.48%, and emissions related to residential energy use decrease by 0.35%. Therefore, implementing zoning ordinances and incentives to encourage future growth in ways that increase the density of existing developed land will help reduce total communitywide emissions per household.

Go to **Implementation and Actions** for supporting actions.

Strategy TL 4

Increase battery electric vehicle (BEV) use to 15% of vehicles on the road by 2030. (from approximately 2,550 vehicles to 99,000 vehicles community-wide)

According to the US Census data there are an estimated 660,000 vehicles total in the county. Transitioning community-wide vehicle stock from fossil fuel combustion to low and no emission alternatives is critical in meeting significant long-range emissions reductions in this sector. As of January 2024, Kane County had 3,851 battery electric vehicles (BEV). For every additional 1% of vehicles converted to EV over 17,000 metric tons of GHG emissions can be eliminated annually (including emissions associated with increased electricity consumption).

Go to **Implementation and Actions** for supporting actions.

Strategy TL 5

Establish viable renewable fuels in the economy and support infrastructure expansion and fuel adoption. Achieve 20% diesel consumption replacement by 2030. (Renewable fuels include hydrogen, renewable diesel, and bio diesel)

Transitioning to electric vehicles is a key climate solution, but it's challenging for some specialized diesel-powered equipment due to performance and infrastructure issues. Immediate alternatives are crucial for fast emission reductions. Biodiesel, made from organic matter, can cut emissions by over 70% compared to regular diesel. Renewable diesel, often produced with green electricity, can reduce emissions by 60-80% and also store excess renewable energy. Using bio and renewable diesel can significantly reduce climate pollution from Kane County's equipment as we shift to zero-emission vehicles.

Go to **Implementation and Actions** for supporting actions.

Strategy TL 6

Achieve 100% conversion of gasoline passenger vehicles within local government and public fleets to EV's by 2030 (excludes law enforcement patrol). **Achieve 100% conversion of all gasoline vehicles within local government and public fleets to EV by 2040 and all diesel vehicles by 2050.**

Local governments can lead the transition to electric vehicles (EVs), showcasing the benefits and feasibility of sustainable transportation. By converting municipal fleets to EVs, governments can significantly reduce their carbon footprint, demonstrate their role as climate leaders, and increase community awareness and acceptance of electric mobility.

Go to **Implementation and Actions** for supporting actions.

Transportation and Land Use

Strategy
TL 7

Increase fuel efficiency of remaining combustion engine vehicles in local government and public fleets by 5% by 2030.

Boosting the fuel efficiency of non-electric vehicles is vital for immediate climate action. Lower fuel use per mile means fewer greenhouse gas emissions. This serves as an interim step as electric vehicle technology advances. This can be achieved through efficient driving practices, maintenance, and high-efficiency parts. As older vehicles are replaced, those that are not yet suited for EVs should be replaced with plug-in hybrids or highly fuel-efficient ones. These steps will enhance fuel economy and advance sustainable transportation.

Go to **Implementation and Actions** for supporting actions.

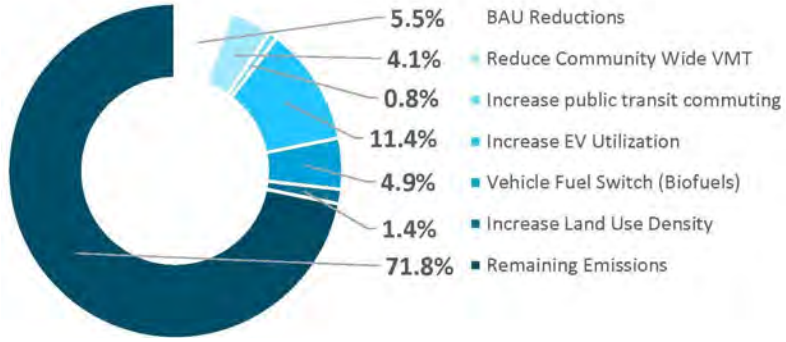
Planned Sector Emission Reductions Through 2030

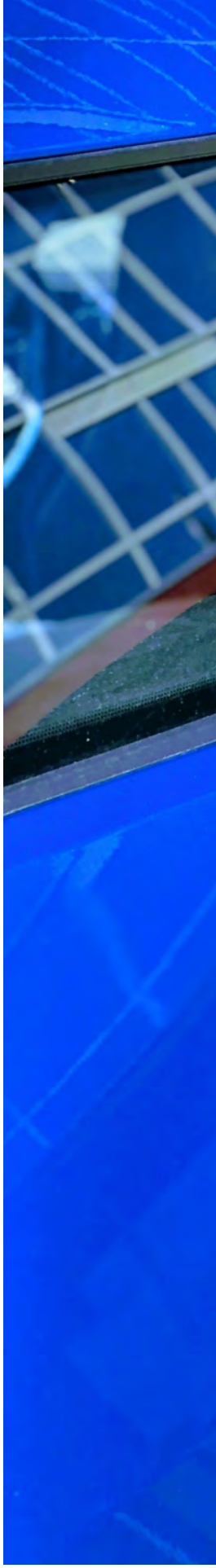
The strategies and actions included in this section of the Climate Action Implementation Plan are projected to reduce countywide annual GHG emissions by 503,983 metric tons (MT) annually by 2030 - a 22.7% reduction. In addition there is an anticipated reduction of 122,175 MT in "business-as-usual" transportation changes . The result is a total countywide Transportation and Land Use sector reduction of 28.2% below 2019 levels.

When compared to 2019 emissions, this is equivalent to eliminating over 186,000 of the county's current vehicles from the road, or **12.3 billion** cubic feet of human-made GHG atmosphere annually by 2030.

Sector Emissions Reduction below 2019 by 2030

The total change to sector emissions include CAIP reductions and business-as-usual emission changes as follows:





What You Can Do

You can support the goals of the Transportation and Land Use section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:



Reduce car use

- Walk or bike when traveling short distances.
- Take public transit to work or to run errands. Plan your trips here.
- If possible, telecommute or carpool to avoid transportation emissions.
- Consider becoming a one-car household and save thousands of dollars annually. Explore how to make the change here.



Reduce your ride's impact

- Keep your personal vehicle well-tuned and tires inflated properly, saving up to 20% in gasoline use.
- Don't idle your car – even in the winter. The best way to warm up your car in the winter time is by driving it. No more than 30 seconds of warm-up is needed.
- Drive an electric, plug-in hybrid or low-emission vehicle. Explore incentives here and here.



Reduce lawn equipment impact

- Ditch your grass lawn and plant native pollinators that support our wildlife and don't require mowing.
- Refuel your car and mow your lawn after 7pm, which helps prevent ground-level ozone.
- Replace your gas-powered lawn equipment with electric and minimize use.



Reduce your business's impact

- Use video conferencing rather than traveling for meetings and promote telecommuting where possible. See City of San Francisco Telework Toolkit.
- Work with your employer/business to be designated as a Bike Friendly Business and encourage your peers to participate.
- Explore how you can offer your employees alternative commute incentives .
- Make - and implement - a Fleet Transition Plan to convert your vehicle fleet to electric vehicles.

Buildings and Energy

Click here to return to TOC



CURRENTLY IN KANE COUNTY

62.7%
of community-wide GHG emissions in 2019 from buildings and energy

5,487,181,100
kWh of electricity used in 2019

374,609,012
Therms of natural gas used in 2019

46.5%
of all homes were built before 1980

59.3%
of renter-occupied homes were built before 1980

Sector Goals

	-26.3% drop in GHG emissions (metric tons)	25% renewable energy (on-site and purchased)	-12% less electricity use	-12% less on-site fuel combustion
2019	4,396,045 MT	3 Million kWh	5.5 Billion kWh	375 M Therms
2030 Targets*	3,239,746 MT	275 Million kWh	4.8 Billion kWh	330 M Therms

* Includes impacts associated with population increases. See Appendix A for research compiled during plan development which supported planning team in goal finalization.

Building energy use is a major contributor to GHG emissions. Greenhouse gas emissions from this sector come from direct emissions such as fossil fuels burned *on-site* for heating or cooking needs—as well as indirect emissions such as fossil fuels burned *off-site* to supply the building with electricity. Building energy use contributes significantly to GHG emissions. Direct emissions include fossil fuels burned on-site for heating or cooking needs. Indirect emissions can consist of fossil fuels burned off-site to supply the building with electricity. A building's design and maintenance impact how much GHG it emits. Increasing energy efficiency can help reduce GHG emissions, increase comfort, and result in significant cost savings for homes and businesses.

82%
of survey respondents support one or more strategy advancing renewable energy in Kane County.

Residential Energy

The residential sector in Kane County consumes nearly 1,619 million kWh annually. This is equal to 3,041 kWh per capita, 118% of the metro area average. The sector also consumes over 217 million therms of natural gas annually, 119% of metro area per capita average.

Commercial / Industrial Energy

This sector consumes over 3,868 million kWh, equal to 17,740 kWh per job—more than 145% of metro area average—and 157 million therms of natural gas annually, 98% of metro area average.

Saving Money and Reducing Emissions Through the Inflation Reduction Act

The 2022 Inflation Reduction Act offers tax credits to promote cleaner energy adoption, combat climate change, and potentially reduce energy expenses for many. It includes credits like the used electric vehicle credit (up to $4,000), energy-efficient home improvement credit (up to $1,200 annually), and residential clean energy credit. These provisions stabilize energy costs, boost savings, and create clean energy jobs.

The Act complements existing programs, enhancing the benefits of clean energy adoption, with a focus on helping disadvantaged communities through outreach and support. These credits cut costs, stimulate quality clean energy jobs, and ensure equitable distribution of benefits.

Saving Money and Reducing Emissions At Home

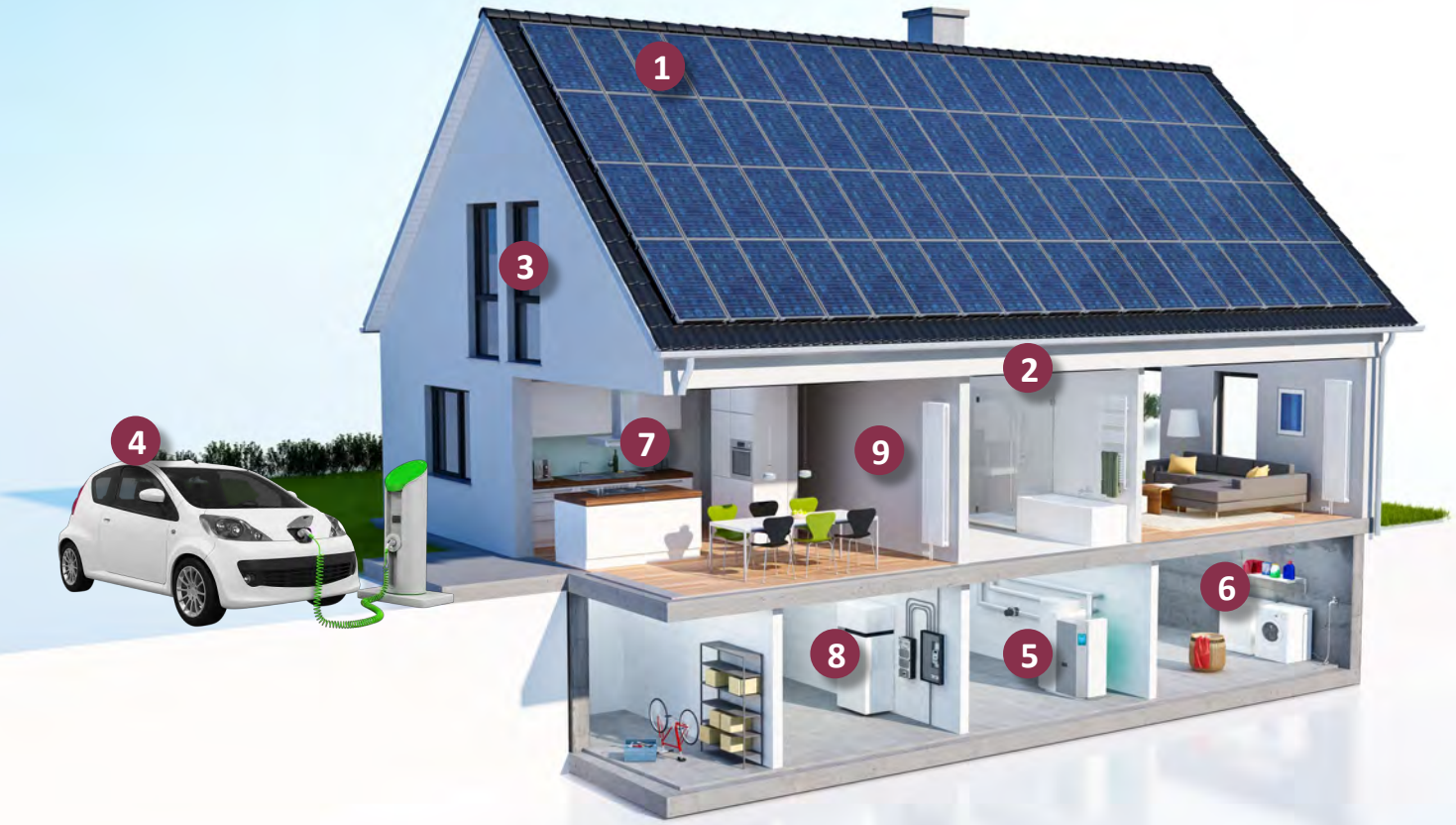
Transition to high-efficiency electric heating, cooking, hot water systems, appliances, and electric vehicles, all powered by renewable electricity, to effectively reduce pollution and carbon emissions to zero. For many households, rebates and incentives can help make pay for upgrades to reduce your energy consumption and greenhouse gas emissions.

Below are key steps you can take and links to information on federal tax incentives supporting them included in the 2022 Inflation Reduction Act:

1. Solar Panels
   30% tax incentive
2. Insulated Walls, Floors and Attic
   Up to $8,000 in rebates
3. Energy Efficient Windows & Doors
   Up to $600 in rebates for windows and up to $500 for doors
4. Electric Vehicle
   Up to $4,000 for a used car
   Up to $7,500 for a new car
5. Heat Pump Water Heater
   Up to $2,000 in tax incentive
6. Heat Pump Dryer
   Up to $840 in rebates
7. Induction Stove
   Up to $840 in rebates
8. Heat Pump Heating and Cooling
   Up to $8,000 in rebates
9. Smart Thermostat

Find other Inflation Reduction Act incentives, curated by the Climate Reality Project here.

Calculate what your household can get from the Inflation Reduction Act here:





Buildings and Energy

Equity Considerations

The shift to sustainable energy demands hefty investments in sectors like infrastructure and waste management. However, this transition risks exacerbating social disparities within Kane County communities. Lack of funds for home upgrades, inability to participate in renewable energy ventures, or inability to afford electric vehicles might marginalize certain groups. As the world pivots away from fossil fuels, these traditional systems might become more expensive to fuel and maintain and less reliable, thereby intensifying the financial strain. Economically disadvantaged individuals may be more vulnerable to climate change effects, having limited resources to manage weather extremes.

- **Home Energy Efficiency Retrofitting**: Without financial resources, individuals can't upgrade their homes to be energy efficient.
- **Renewable Energy Projects**: Many can't participate due to financial constraints.
- **Electrification:** High upfront costs of switching from fossil fuel to electric heating systems are a barrier for many.

Climate Impacts

This sector impacts climate change through the combustion of fossil fuels (gasoline, diesel, propane) for on-road cars and trucks and off-road vehicles and equipment.

Climate Hazards

Hazards to buildings and energy involve extreme weather and flood-induced infrastructure damage, more frequent power outages, and increased energy demand and costs due to weather fluctuations and rising temperatures.

Strategies

The strategies on the next pages show how we achieve our climate goals for Buildings and Energy. Each strategy has detailed actions explained in the Implementation section of this plan.

Click the double arrow symbol below each strategy description to view these detailed actions for each strategy.

STRATEGIES

Strategy BE 1

Improve total community wide residential, commercial, institutional, and industrial building energy efficiency by 12% for electricity and natural gas by 2030.

The US Energy Information Administration reports that homes constructed after 2000 consume 15% less energy per square foot compared to those built in the 1980s, and 40% less than those pre-1950. This illustrates the considerable scope for enhancing energy efficiency by retrofitting older homes with modern technologies. There are over 84,000 homes built before 1980 throughout the county, making up 56.4% of owned and 59.3% of rented homes. Upgrading the energy efficiency of these older structures could significantly curb community energy use and reduce energy costs for households.

Go to **Implementation and Actions** for supporting actions.

Strategy BE 2

Increase adoption of high performance building construction technology, achieving 1% Net Zero households and commercial properties community wide by 2030. (Net Zero buildings are energy efficient buildings that produce as much energy on-site as they consume in a year)

High-performance buildings, 30% more energy-efficient than standard ones, bring many benefits. They cut energy use, carbon emissions, and costs. Advanced materials reduce maintenance. Better indoor conditions boost well-being and productivity. Net Zero buildings, part of this group, use minimal energy and produce on-site power, often via renewables like solar or wind. This enhances resilience and saves money, making them ideal for a sustainable future.

Go to **Implementation and Actions** for supporting actions.

Strategy BE 3

Achieve 10% residential and commercial and industrial building "fuel switching" from on-site fossil fuel combustion to electrification by 2030.

The US Census shows most County homes use natural gas (87.9%) or electricity (10.9%) for heating. As the regional electric grid expands its renewable electricity share, reducing and ultimately eliminating on-site fossil fuel use becomes increasingly important. This is where building heating fuel switch to electrification or other zero emission fuels plays a key role. This process involves replacing traditional fossil fuel-based heating systems with electric ones. By doing so, it not only reduces carbon emissions but also improves energy efficiency. Moreover, this transition is a central requirement to achieving regional GHG reduction goals in the building sector.

Go to **Implementation and Actions** for supporting actions.

Strategy BE 4

Increase renewable energy to 25% of community-wide residential, commercial, institutional, and industrial building electric use by 2030. (on-site and green source purchase)

Anticipated GHG reductions from grid electricity shouldn't divert attention from consumer-driven renewable energy choices for meeting GHG reduction goals. Those property owners who are unable to install solar panels can purchase renewable energy from utilities or community solar programs to achieve Net Zero electricity, contributing to a cleaner grid. For properties suitable for solar, on-site renewables bring not only GHG cuts but also cost savings and energy resilience. These benefits emphasize the significance of more renewable energy use for the county's sustainable future.

Go to **Implementation and Actions** for supporting actions.

Strategy BE 5

Increase resilience of community-wide buildings to potential impacts of climate change. (impacts include increased flooding risk, increased extreme weather events, and increased extreme temperature events)

By 2100, Kane County can anticipate an increase of up to 15% in total annual precipitation and an increase in heavy precipitation events of up to 30%. The timeframe between rains is expected to continue to increase, meaning dryer ground conditions and increased stormwater runoff. In addition, the county can anticipate an increased risk of extreme temperature and weather events. In anticipation of these impacts, actions to increase the resilience of our homes, businesses, and institutions is a central need to ensure climate resilience.

Go to **Implementation and Actions** for supporting actions.

Strategy BE 6

Improve total government building energy efficiency by 15% by 2030. (electricity and natural gas, including water and wastewater infrastructure)

Strategy BE 7

Achieve 25% government building thermal "fuel switching" from on-site fossil fuel combustion to electrification by 2030.

Strategy BE 8

Increase renewable energy to 100% of government building electric use by 2030. (on-site and green source purchase)

Local governments can lead in energy efficiency, fuel switching, and renewables, cutting GHG emissions and setting adoption examples.

Go to **Implementation and Actions** for supporting actions.

Buildings and Energy

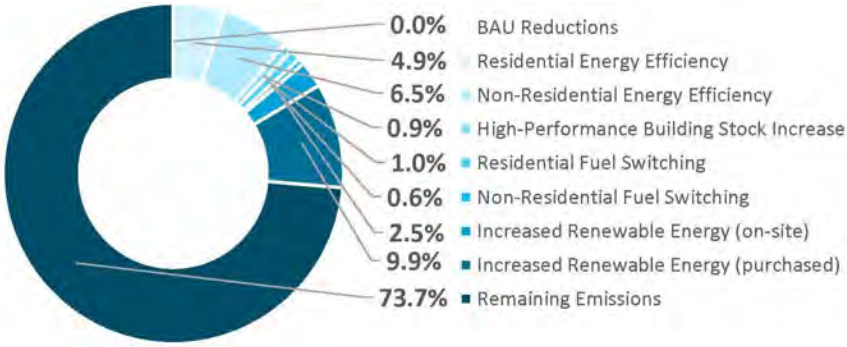
Planned Sector Emission Reductions Through 2030

The strategies and actions included in this section of the Climate Action Implementation Plan are projected to reduce countywide annual GHG emissions by 1,156,299 metric tons (MT) annually by 2030. The result is a total countywide Buildings and Energy sector reduction of 26.3% below 2019 levels.

When compared to 2019 emissions, this is equivalent to eliminating over 343,000 of the county's current vehicles from the road, or **22.7 billion** cubic feet of human-made GHG atmosphere annually by 2030.

Sector Emissions Reduction below 2019 by 2030

The total change to sector emissions include CAIP reductions and business-as-usual emission changes as follows:





What You Can Do

You can support the goals of the Buildings and Energy section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:

Use less energy

- Set your thermostat 2° or more higher during cooling season, lower during heating season.
- Turn down your water heater to 120°.
- Replace an older home thermostat with a "smart," programmable model.
- Schedule a home energy audit through ComEd or a licensed contractor.
- Install, or have a licensed contractor install, more insulation in your home.
- Install energy-efficient windows and doors, working with a licensed contractor.
- Use ENERGY STAR certified energy-efficient appliances.
- Learn more about other ways you can save energy year-round.

Go Renewable

- Install solar photovoltaic (PV) or solar thermal panels at your home, working with a licensed contractor.
- If possible, participate in a residential solar group purchasing program
- If you don't own your home (or if your home is not suitable for solar) support solar development by subscribing to community solar.

Reduce on-site fossil fuel use

- Replace your clothes dryer with a heat pump dryer or line dry your clothes.
- Replace your gas range with an induction cooktop.
- Replace your home's heating and cooling system with a low carbon option.

Save Money

- Become familiar with tax incentives, credits and rebates you may qualify for.

Waste Management

Click here to return to TOC



CURRENTLY IN KANE COUNTY

3.2%
of community-wide GHG emissions in 2019 from solid waste

506,223
tons of landfilled waste county-wide in 2020

39,837
tons of organics collection county-wide in 2019

Sector Goals

	-7.2%	-2.5%	2.3x	-26.5%
	drop in GHG emissions (metric tons)	less solid waste generated	increase in organics diversion	decrease in total landfilled waste
2019	192,702 MT	797,714 tons	39,837 tons	506,223 tons
2030 Targets*	178,745 MT	774,846 tons	91,000 tons	371,900 tons

* Includes impacts associated with population increases. See Appendix A for research compiled during plan development which supported planning team in goal finalization.

Municipal solid waste (MSW) affects climate change, mainly via landfill methane emissions and transport carbon emissions. Waste reduction, recycling, and organic collection mitigate these impacts. Less waste means lower methane emissions from landfills. Recycling reduces resource extraction, saves energy, and cuts carbon emissions. Composting organic waste lowers methane emissions, sequesters carbon, and offers eco-friendly fertilizer alternatives.

Solid Waste in Kane County

Community-wide municipal solid waste (MSW) handled has been estimated based on the County's GHG Inventory. In 2019, county-wide MSW totaled 797,714 tons. According to the Kane County Solid Waste Management Plan (2020), of the total MSW handled, an estimated 5.0% was separated organics, 31.5% was separated recycling, and the remaining 63.5% was landfilled. According to CMAP data, per capita organics collection has increased 36% in Kane County since 2010. However, the same data indicates a 21% increase in per capita landfilled solid waste over the same period indicating strategies to reduce overall waste generation as well as strategies to increase recycling and organics diversion are likely to reduce county-wide solid waste emissions.

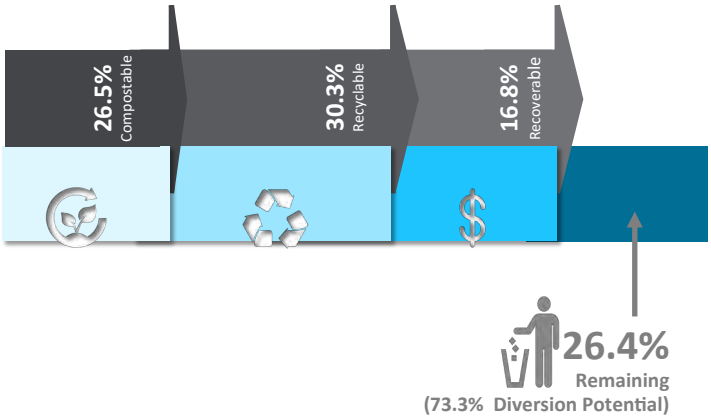
Kane County Landfill Waste Characteristics

According to the Chicago Metropolitan Agency for Planning (CMAP) and the 2015 Illinois Waste Characterization Study, compostable organics (food and yard waste) comprise 26.5% of landfilled waste streams from urban areas, while recyclable paper, plastic, glass and metal make up 30.3%. Potentially recoverable materials such as wood, construction materials and textiles comprise 16.8% of urban landfilled waste streams. The remaining 26.4% includes various inorganic items, hazardous waste, plastics that are not accepted for recycling, and various other non-recoverable materials.

90%
of survey respondents support one or more strategy advancing waste reduction and diversion in Kane County.

Waste Diversion Potential (Idealized)

Based on the 2015 Illinois Waste Characterization Study, there may be waste diversion potential of up to 73.6% in the current landfilled materials (idealized maximum). Below is the breakdown of the estimated total maximum potential waste diversion (excluding waste reduction):



RECYCLING AND COMPOSTING HELPS
SAVE NATURAL RESOURCES

RECYCLING *and* COMPOSTING
10,000 TONS of Municipal Solid Waste

Save more than
126 BILLION
BTU OF ENERGY
(British Thermal Units)

THAT'S THE SAME AMOUNT

OF ENERGY USED BY
530 HOMES
IN THE COUNTY

EVERY
TON
OF PAPER RECYCLED

CAN SAVE AS MUCH ENERGY

AS
165
GALLONS
OF GASOLINE

RECYCLING
1 TON
OF ALUMINUM
CONSERVES

OVER
153
MILLION
BTUs

EQUIVALENT TO
26 BARRELS OF OIL
OR **1,665** GALLONS OF GASOLINE



Waste Management

Equity Considerations

Incorporating fairness into solid waste management, such as waste minimization, recycling, and collection of organic waste, guarantees all sectors of the community can access and reap benefits from these services. Overcoming challenges like language, cost, or logistical issues is crucial to encourage widespread participation. Furthermore, food waste reduction could alleviate strains on economically disadvantaged households by redirecting surplus food. Ensuring equity in waste management strategies enhances environmental sustainability while fostering social justice.

Equity Program Examples:

1. **San Francisco's Zero Waste Program** provides equitable recycling and composting services to all community sectors, overcoming language barriers with multilingual resources.
2. **Surplus Food Redistribution Programs** like Northern IL Food Bank reduce food waste by redistributing surplus food from various sources to the needy, aiding low-income households.
3. **The RecycleBank Program** incentivizes recycling with rewards, overcoming cost barriers and indirectly supporting economically disadvantaged households.

Climate Impacts

This sector affects climate change through fossil fuel combustion during material collection, production, and processing, and methane generation from organic material decomposition in landfills.

Climate Hazards

Hazards to the waste management system include damage to infrastructure from extreme weather and flooding.

Strategies

The strategies on the next pages show how we achieve our climate goals for Waste Management. Each strategy has detailed actions explained in the Implementation section of this plan.

Click the double arrow symbol below each strategy description to view these detailed actions for each strategy.

Waste Management

STRATEGIES

Strategy WM 1

Decrease total municipal solid waste handled 2.5% by 2030. (-17.5% estimated per household decrease)

"Reduce, reuse, recycle" has been a well known slogan since the beginning of the Earth Day movement in the 1970's. Though simple, it successfully outlines what we can and must to do reduce the impacts of our material use and waste. By decreasing the amount of materials we create, use, and throw away, we reduce energy consumption and greenhouse gas emissions from landfills. Households and businesses practicing waste reduction can save substantial sums each year. The ongoing creation of policies and enhancements to operations that facilitate substantial landfill diversion and productive waste stream utilization present a major environmental prospect for Kane County.

Go to **Implementation and Actions** for supporting actions.

Strategy WM 2

Achieve 35% organics landfill waste diversion by 2030. (from 6.7% to 15% of total MSW)

Organic compound breaks down in landfills. This decomposition is the largest generator of methane in the waste management sector. Meanwhile, when organics are diverted from landfills in strategies like composting, that waste becomes a valuable soil amendment, helping to increase the carbon and overall productivity of soil. According to the 2015 Illinois Waste Characterization Study, compostable organics make up 26.5% of landfilled waste streams from urban areas (this excludes paper and construction wood waste). Increasing the diversion of these materials from landfills to composting and other organics recycling applications represents a significant opportunity for Kane County to reduce its waste related GHG emissions while increasing overall sustainability.

Go to **Implementation and Actions** for supporting actions.

Strategy WM 3

Increase recycling from 31% to 37% of total MSW handled by 2030.

Creating a circular economy through recycling requires less extraction of resources, generates less waste, increases energy savings, reduces greenhouse gas emissions, and supports local job creation and economic investment. Portions of Kane County have good participation rates for recycling. However, the 2015 Illinois Waste Characterization Study indicates opportunities for increased capture of recyclables, especially paper and food and beverage containers made from plastic and glass.

Go to **Implementation and Actions** for supporting actions.

Waste Management

Strategy
WM 4

Decrease municipal solid waste from government operations 15% by 2030.

As with other aspects of government operations, local governments can provide important leadership in reducing the impacts of waste management. By focusing on decreasing solid waste generated and increasing diversion of organic and recycling materials, local governments can reduce GHG emissions and set waste reduction examples. In addition, reduction of waste can mean operational cost savings. The Minnesota WasteWise program reported average business savings of $431 for participants in their waste reduction program while ReFED's report "A Roadmap to Reduce U.S. Food Waste" calculates over $2,400 in savings for every ton of food waste eliminated.

Go to **Implementation and Actions** for supporting actions.





Waste Management

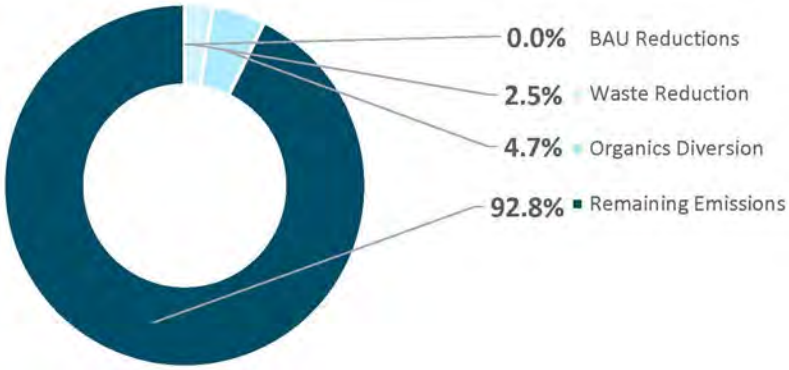
Planned Sector Emission Reductions Through 2030

The strategies and actions included in this section of the Climate Action Implementation Plan are projected to reduce countywide annual GHG emissions by 13,956 metric tons (MT) annually by 2030. The result is a total countywide Waste Management sector reduction of 7.2% below 2019 levels.

When compared to 2019 emissions, this is equivalent to eliminating over 3,700 of the county's current vehicles from the road, or **274 million** cubic feet of human-made GHG atmosphere annually by 2030.

Sector Emissions Reduction below 2019 by 2030

The total change to sector emissions include CAIP reductions and business-as-usual (BAU) emission changes as follows:





What You Can Do

You can support the goals of the Waste Management section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:



Increase Organics Diversion

- Compost food and yard waste.
- Eat seasonally and shop local to ensure fresher, higher-quality produce with longer shelf life.
- Drop off yard and organic waste at a Kane County drop off site, or participate in an organics collection program.
- Work with your employer/business to compost, or start organics recycling on site.
- Aim to eliminate food waste. Eat existing fridge contents first. Plan meals and shop accordingly. Learn more here.
- Become familiar with organic waste drop off locations near you and what you can bring there.



Reduce what you throw away

- Use LEDs and rechargeable batteries to reduce eWaste.
- Upgrade, donate, or recycle old electronics.
- Use reusable bags for all shopping.
- Swap single-use plastics for durable, reusable alternatives.
- Choose items with no, minimal, compostable, or fully recyclable packaging.
- Repair or donate reusable or repairable items instead of discarding.
- Become familiar with recycling drop off locations near you and what you can bring there.
- Learn more about how and what you can recycle in Kane County.

Water and Wastewater

Click here to return to TOC



CURRENTLY IN KANE COUNTY

0.4%
of community-wide GHG emissions in 2019 from Water and Wastewater management

27,034,100,000
gallons of wastewater treated in 2019

60
flood events in Kane County reported by NOAA since 2000

$11,950,000
in flood damage in Kane County reported by NOAA since 2000

Sector Goals

-5%
drop in GHG emissions (metric tons)

-5%
reduction of wastewater

2019	**31,821** MT	**27** Billion Gallons
2030 Targets*	**30,230** MT	**25.6** Billion Gallons

* Includes impacts associated with population increases. See Appendix A for research compiled during plan development which supported planning team in goal finalization.

Climate change adaptation in the Midwest is closely tied to water and wastewater management. As global warming alters temperature and rainfall patterns, it affects water availability and quality, posing challenges for wastewater management. To address the region's water risks, climate adaptive measures are crucial.

With a changing climate affecting water supply, practices like water conservation, efficient irrigation, and drought-tolerant landscaping (Xeriscape) are essential for the agriculturally dominant Midwest. Efficient water usage can help meet needs amid climate fluctuations.

Increased rainfall can overwhelm wastewater infrastructure, leading to untreated sewage entering water sources. Adaptive strategies include expanding capacity at wastewater facilities, implementing green infrastructure like rain gardens and bioswales for stormwater management, and preventing contamination.

Changes in water availability and quality also impact water supply treatment plants. Adaptation may involve using advanced treatment technologies or adjusting processes to handle varying water quality, find alternative water sources, and drill deeper into the aquifer.

Incorporating climate forecasts into planning supports proactive adaptation, enhancing the long-term sustainability of water and wastewater management. Prioritizing resilience through strategies that anticipate climate change impacts can secure safe water and effective wastewater treatment, safeguarding public health, the economy, and the environment in Kane County.

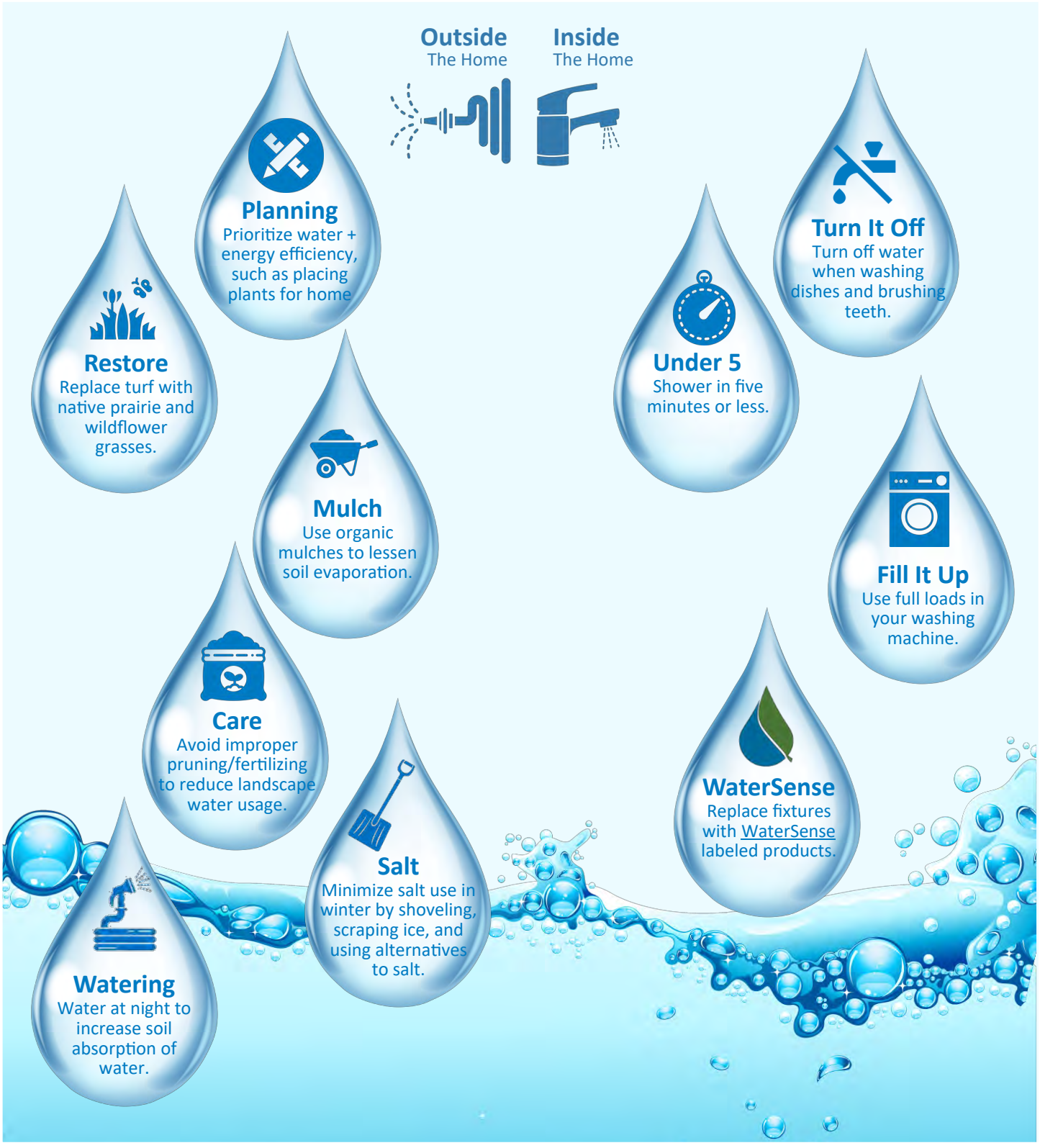
78%
of survey respondents are moderately, very, or extremely concerned about potential impacts on water quality.

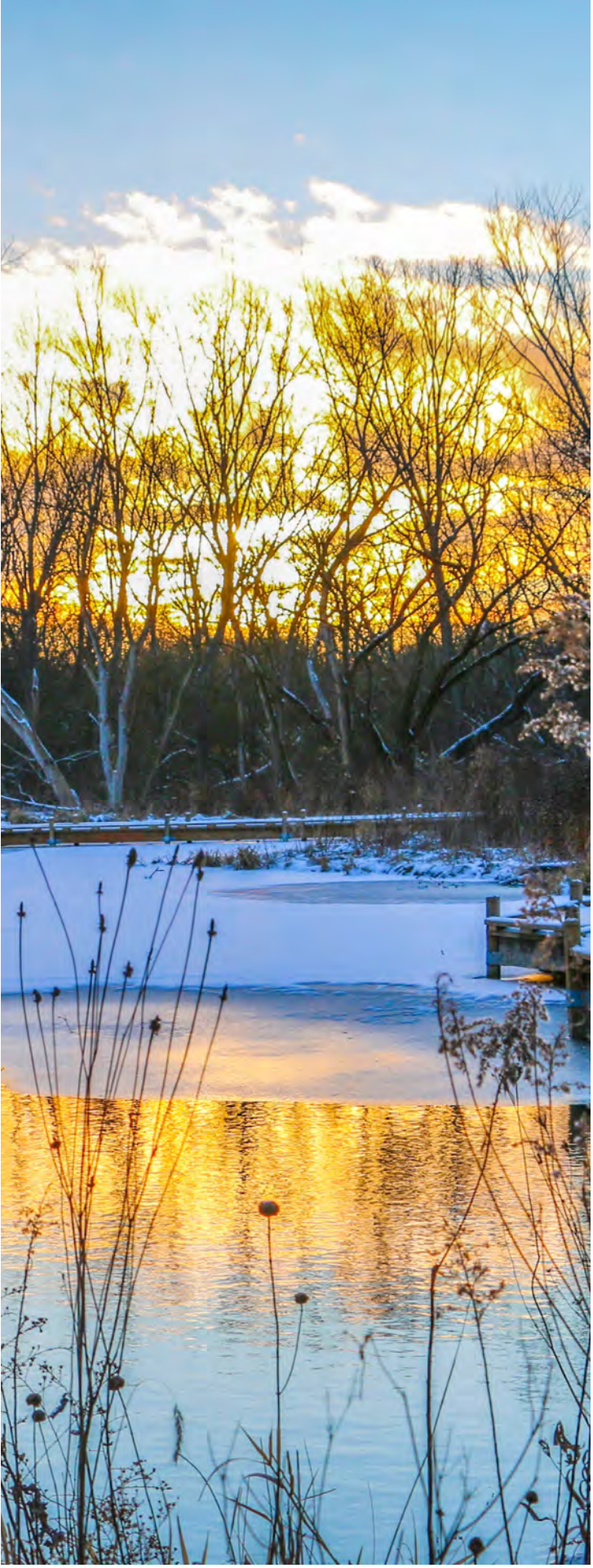
Regional Water Stress

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 Kane County region has had a reduction in water yield of approximately 10%. Through 2050, the County can anticipate an increase in water demand of 20%.

(Sources: "Adaptation to Future Water Shortages in the United States Caused by Population Growth and Climate Change", World Resources Institute, USGS).

THE INS AND OUTS OF SAVING WATER





Water and Wastewater

Equity Considerations

Climate change impacts water scarcity and quality, disproportionately affecting underserved communities lacking resources for adaptation. They often reside in flood-prone areas, risking exposure to untreated sewage. Equity in climate adaptation entails inclusive strategies benefiting all communities. This includes extending resilient infrastructure investment to all regions, supporting lower-income households' access to water-saving technologies, and prioritizing public engagement in decision-making.

Equity Program Examples:

1. **Disadvantaged Communities Involvement** – a program in California which allocates funding for water infrastructure in vulnerable areas.
2. **Denver Water's Assistance Program** - supports low-income households in acquiring water-efficient appliances, promoting water conservation.
3. **Flint, Michigan's Community Engagement and Citizen Advisory Committee** - ensures residents participate in decision-making affecting their water security.

Climate Impacts

This sector impacts climate change through fossil fuel use to generate the electricity required to process and distribute water and treat wastewater. Water bodies that are high in pollutants like Nitrous Oxide can also emit GHG.

Climate Hazards

Hazards to the water and wastewater system involve extreme weather and flood-induced infrastructure damage. Countywide, the potential for intensified flooding and flash floods has increased.

Strategies

The strategies on the next pages show how we achieve our climate goals for Water and Wastewater. Each strategy has detailed actions explained in the Implementation section of this plan.

Click the double arrow symbol below each strategy description to view these detailed actions for each strategy.

Water and Wastewater

STRATEGIES

Strategy W 1

Promote increased water conservation and wastewater generation community-wide with a targeted reduction of 5% by 2030.

Cutting water use and reducing wastewater is crucial for addressing climate change by linking water, energy, and emissions. Water scarcity is a global concern exacerbated by climate change, and Kane County will be equally impacted . Using less water eases pressure on freshwater resources, benefiting ecosystems and biodiversity. It also lowers energy needs for water treatment and transportation, cutting greenhouse gas emissions. Minimizing wastewater is vital too, saving energy and reducing emissions from treatment. These practices support sustainable development, boost water security, and enhance resilience to climate impacts.

Go to **Implementation and Actions** for supporting actions.

Strategy W 2

Update design standards and implement plans to meet projected climate change storm water and flood mitigation requirements.

Kane County expects a 15% increase in annual precipitation and 30% more heavy downpours by 2100. Meanwhile, changing rainfall patterns with increased number of days between rain events could raise Illinois' drought potential severity index by 40%, leading to more runoff and flash flooding on less absorbent ground. Infrastructure in the state is typically designed based on Illinois State Water Survey's Bulletin 75 precipitation estimates which analyze the historical frequency of heavy rainfall events through 2011. To prepare for climate change, we must use projections, like those from NOAA and others, that consider increased precipitation and heavier rainfall events.

Go to **Implementation and Actions** for supporting actions.

Strategy W 3

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

Preserving aquifers, natural water bodies, and lakes is essential for effective climate adaptation. These water sources play a key role in storing freshwater, sustaining ecosystems, and supporting human needs. They contribute to water security, bolster ecosystem resilience, and assist in managing stormwater. To protect them, it's vital to implement sustainable groundwater management, practice land use planning that prevents contamination, and preserve riparian zones. Enforcing water pollution regulations and educating communities about their importance are crucial for long-term protection and improved climate adaptation. Meanwhile, bolstering existing partnerships, collaborations, and projects will ensure continued progress.

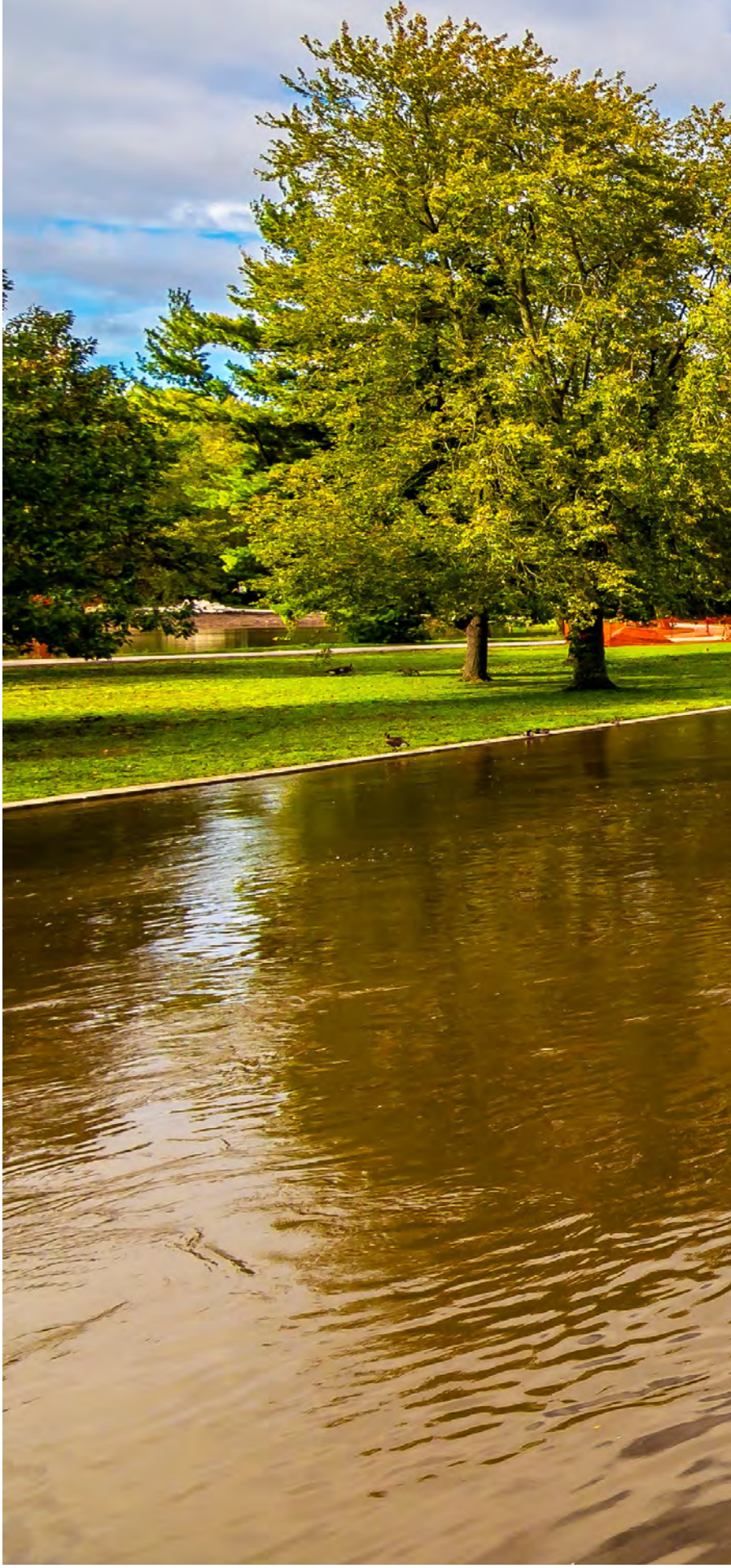
Go to **Implementation and Actions** for supporting actions.

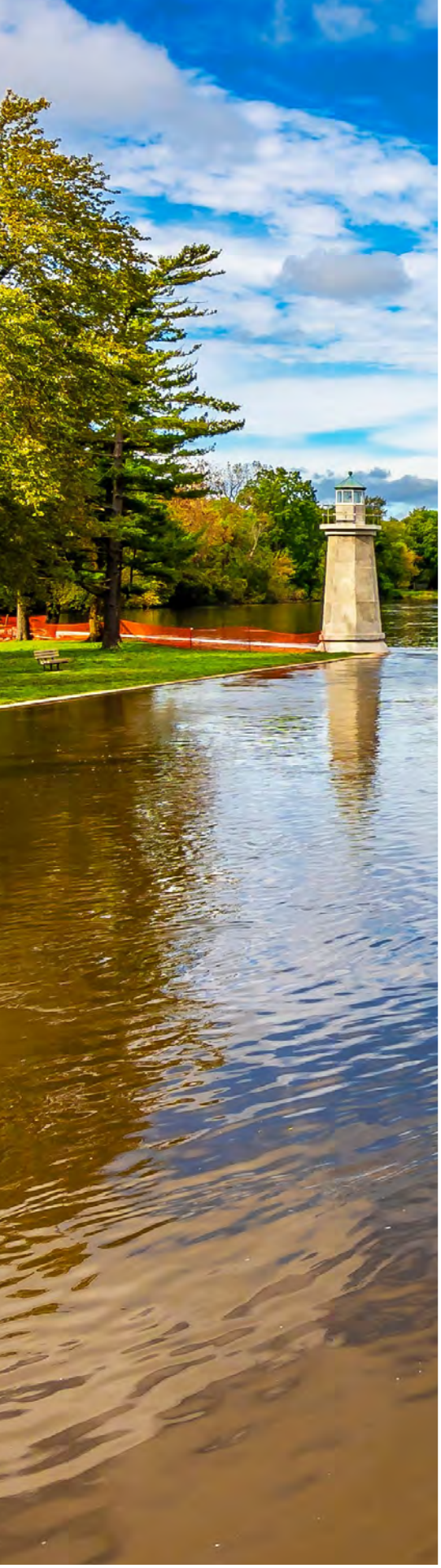
Strategy
W 4

Educate, engage, and empower the public on water quality and conservation.

Community education is a vital strategy for increasing water conservation and water quality protection. By raising awareness and providing knowledge and skills, community education can empower people to adopt sustainable water practices and behaviors. Community education can also foster collaboration and participation among different stakeholders, such as water utilities, local governments, schools, businesses, and citizens. Through community education, people can learn how to use water efficiently, reduce water pollution, protect water sources, and support water-related policies and programs. Community education can help create a culture of water stewardship that benefits both the environment and society.

⏭ Go to **Implementation and Actions** for supporting actions.





Water and Wastewater

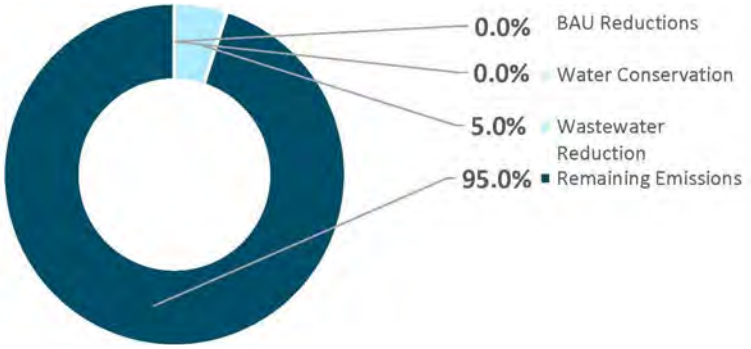
Planned Sector Emission Reductions Through 2030

The strategies and actions included in this section of the Climate Action Implementation Plan are projected to reduce countywide annual GHG emissions by 1,591 MT annually by 2030. The result is a total countywide Water and Wastewater sector reduction of 5% below 2019 levels.

When compared to 2019 emissions, this is equivalent to eliminating over 500 of the county's current vehicles from the road, or **28.5 million** cubic feet of human-made GHG atmosphere annually by 2030.

Sector Emissions Reduction below 2019 by 2030

The total change to sector emissions include CAIP reductions and business-as-usual emission changes as follows:





What You Can Do

You can support the goals of the Water and Wastewater section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:



Reduce Your Use Inside

- Be mindful of your water use and focus on changes in habits such as turning off water when brushing your teeth and taking shorter showers.
- Trade your shower heads and faucets for WaterSense labeled low-flow, water-efficient options.
- Install — or have a licensed plumber install — a WaterSense labeled, water-saving low-flow toilet.
- Install a leak detection system.
- Replace your clothes washer and dishwasher with a low water use unit, and avoid running small or partial loads.



Reduce Your Use Outside

- Replace your lawn with prairie grass, wildflowers, or landscape using Xeriscaping principles.
- Collect rainwater in rain barrels to water your lawn and/or plants.
- If you have a lawn and garden irrigation system, or use hoses and sprinklers, water thoroughly less often, and do so in the early morning or evening.
- Retrofit existing irrigation systems with smart irrigation controls that use soil moisture and weather data to determine irrigation needs.
- Avoid improper pruning, fertilization, mulching, and salting to reduce landscape water usage and contamination.

Local Food and Agriculture

Click here to return to TOC



CURRENTLY IN KANE COUNTY

2.4%
of community-wide GHG emissions in 2019 from Local Food and Agriculture

21
community gardens and farmer markets county-wide

136,000
acres of agricultural land county-wide

-700,000
change in total agricultural acreage state-wide since 2000

7.3%
of population estimated with food insecurity in county

Sector Goals

-33.4%
drop in GHG emissions (metric tons)*

Increasing
Access to local food for food insecure

-50%
Reduction in food insecurity

Preserve
agricultural land while increasing resilience

Climate change disrupts agriculture, causing erratic weather and crop yields, affecting food prices and availability, which affects the economic opportunities and viability of local agriculture. Our preference for animal products, which have high environmental costs, exacerbates global warming and influences food production. Food transport, needing fossil fuels and refrigeration, contributes to climate issues. Sustainable solutions like reduced transport via local farms and food production and processing.

73%
of survey respondents are moderately, very, or extremely concerned about potential impacts on food security.

In the Midwest, agricultural emissions from fertilizers, livestock, and machinery worsen climate issues, threatening crops and water management. Sustainable farming, including practices like cover cropping and reduced tillage, improves soil and reduces CO_2. Techniques like organic, regenerative agriculture, and agroforestry farming enhance soil health and biodiversity, lowering greenhouse gases, crucial for addressing Midwest climate challenges.

Economic Potential of Local Food Purchases

Purchasing food from local sources reduces the environmental impact of our diet by shortening the food supply chain and cutting greenhouse gas emissions from transportation. It also helps the local economy and small businesses. Studies show that local produce farms in a food market create about 32 jobs for every $1 million in revenue, compared to only 10.5 jobs in wholesale channels. Data from the Growing for Kane Program illustrate that local food production is in high demand and provides economic stability for many in our county.

Additionally, community gardens and neighborhood gardening promote outdoor and social activities, fostering social bonds, providing opportunities for different age groups to engage, supporting low-impact exercise, and creating habitats for plants, animals, and pollinators.

Potential Farmland Loss in Kane County

Illinois has lost over 700,000 acres of farmland since 2000. What's concerning is that 84% of the remaining agricultural land in the state is classified as nationally significant, meaning it's crucial for long-term food production. Unfortunately, farms near urban areas, similar to Kane County, have contributed to two-thirds of this farmland loss.

In Kane County, farms are under a significant threat to development or conversion to other uses like large-scale solar arrays. Despite occupying only 0.9% of the state's land area, it's estimated that nearly 8% of the total farmland loss in Illinois will happen in Kane County if we continue with business-as-usual. By using farmland protection strategies, we can reduce this loss from 27,900 acres to less than 20,000, which is a 30% reduction in farmland loss, according to the American Farmland Trust.

Since the early 2000s, Kane County has made significant progress in preserving its farmland under a Farmland Protection Ordinance. The County was the first in the state with this type of mechanism, allowing landowners to permanently protect their farmland. By the end of 2023, a total of 7,000 acres of farmland have been protected.



EATING OUR WAY TO CLIMATE RESILIENCE

6 Ways to Combat Climate Change with Food

Eat Climate-Friendly

The simplest way to increase climate-friendly purchasing is to buy more fruits, vegetables and other plant-based foods.

Eat Less & Better Meat

Meat has a high carbon footprint—eating less helps. You can also choose lower-footprint meats like chicken or fish.

Waste Less

1/3 of all food produced is wasted—and is responsible for 8% of worldwide GHG emissions. Eliminating food waste reduces this impact and address food insecurity.

Urban Agriculture

Urban farms, from community and home gardens to rooftop greenhouses, boost fresh food availability, fortify food system resilience, and promote sustainability.

Protect Soil

Safeguarding farmlands, promoting local, sustainable agriculture, and using climate-friendly practices boosts soil health, decreasing water use and increasing carbon sequestration.

Eat Local

Buying local food reduces "food miles", lowers fossil fuel usage and greenhouse gas emissions, preserves local lands, supports wildlife habitats, and encourages availability and capacity to grow fresh produce .



Local Food and Agriculture

Equity Considerations

"Food deserts" often prevail in low-income neighborhoods, where access to full-service supermarkets or grocery stores is limited, leaving residents with inadequate affordable, nutritious food options. This situation, compounded by the prevalence of fast-food restaurants, leads to "nutrition deserts." However, attempts to rectify this via local food programs can unintentionally perpetuate inequities. These programs, typically shaped by the dominant population, may overlook the disenfranchisement of marginalized individuals within the food system. As a result, those unable to afford "local" or organic may remain excluded, perpetuating food insecurity.

Equity Program Examples:

1. **Philadelphia Food Trust** - an initiative to combat food deserts by partnering with local supermarkets and community organizations to improve the availability of fresh food in underserved neighborhoods.
2. **Healthy Bodegas Initiative** – a program of the City of New York to transform local corner stores into sources of healthier food.
3. **Daily Table** is a nonprofit community grocery store chain dedicated to providing fresh, convenient and nutritious food at prices everyone can afford.

Climate Impacts

This sector impacts climate change through deforestation for farmland, methane emissions from livestock, release of nitrous oxide from fertilizer use, and other GHG emissions from fossil fuels used in farming practices and long-distance transportation of goods.

Climate Hazards

Fluctuating and volatile temperatures, affecting availability of local produce, feed, and meat. Flooding, droughts, wind, and unseasonal frosts affect land, infrastructure, and safety alike

Strategies

The strategies on the next pages show how we achieve our climate goals for Local Food and Agriculture. Each strategy has detailed actions explained in the Implementation section of this plan.

Click the double arrow symbol below each strategy description to view these detailed actions for each strategy.

STRATEGIES

Strategy FA 1

Increase share of farms using low emission or regernative agriculture practices. Achieve 50% carbon positive soil adoption rate by 2030.

(measured by share of total acres)

Farm crop practices can effect the greenhouse gas emissions associated with soil management. Soil emissions result from fertilizers, specific crops, and soil changes through irrigation.

Regenerative farming practices can both help to reduce GHG emissions as well as reverse soil degradation. These practices include rotational grazing, mixed crop rotation, cover cropping and no-till farming, which reintroduces carbon back into the soil as crop residues are pressed down when seeding.

Go to **Implementation and Actions** for supporting actions.

Strategy FA 2

Reduce GHG emissions from animal agriculture, achieve 10% manure management adoption rate and 20% high feed efficiency practices adoption rate by 2030.

Increasing cow feed efficiency reduces methane emissions, with benefits from adding legumes, using grass, and boosting feed oil content. Meanwhile, livestock manure contributes significantly to GHG emissions, with 12% in the US and 14.5% globally. Implementing specific manure management practices can lower methane emissions. Anaerobic digestion, a process where microorganisms break down organic matter without oxygen. Use of anaerobic digestion has three layers of emissions benefits as it can reduce emissions associated with manure storage and application while converting the methane into an energy source replacing fossil fuel use support farm operations or for sale to industrial consumers.

Go to **Implementation and Actions** for supporting actions.

Strategy FA 3

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

The US agriculture system faces regional climate challenges. The Pacific states are at risk due to limited water, warmer winters, and erratic spring weather. In the Great Plains and Midwest, grain production struggles with variable weather, heat waves, and flooding. Beef, pork, and poultry production in these regions and the Southeast are at risk from extreme weather, which can disrupt feed, water, and power supplies.

Climate change impacts on the food system affect everyone, but low-income and food-insecure individuals are particularly vulnerable. Enhancing local food systems can boost resilience, food security, job creation, and community wealth.

Go to **Implementation and Actions** for supporting actions.

Strategy FA 4

Reduce food waste and hunger, achieve a 50% reduction in food insecurity community-wide by 2030.

Nationally, 30-40% of the food supply is estimated to be wasted. There is an estimated 60,000 tons of food waste in Kane County's solid waste stream annually. In addition to the greenhouse gas emissions generated, this food waste represents an economic loss of over $75 million every year. Beyond reducing economic loss, food that is wasted could have benefited families in need. Climate change is likely to diminish food security through production disruptions that lead to local availability limitations and price increases, interrupted transport conduits, and reduced food safety among other causes. Reduction of food waste supports this plan's Waste Management sector goals, improves the overall sustainability of the community, and could reduce food insecurity within the community.

Go to **Implementation and Actions** for supporting actions.

Strategy FA 5

Protect and preserve agricultural land while increasing its resilience to climate shocks.

Kane County farms provide the opportunity for increased local food production and resilience, while agriculture and forestry land uses alone could provide as much as 20% to 30% of the mitigation needed globally to limit global warming to 1.5°C. Unfortunately, climate disruptions to agricultural production have increased over the past 40 years and are projected to rise further, with increasingly negative stressors on agricultural lands and the farmers managing them. These growing stressors are occurring at a time when the United States is losing over 80 acres of farmland to development every hour. Protecting and preserving the region's agricultural land is an important component of supporting the resilience of local food systems.

Go to **Implementation and Actions** for supporting actions.

Local Food and Agriculture

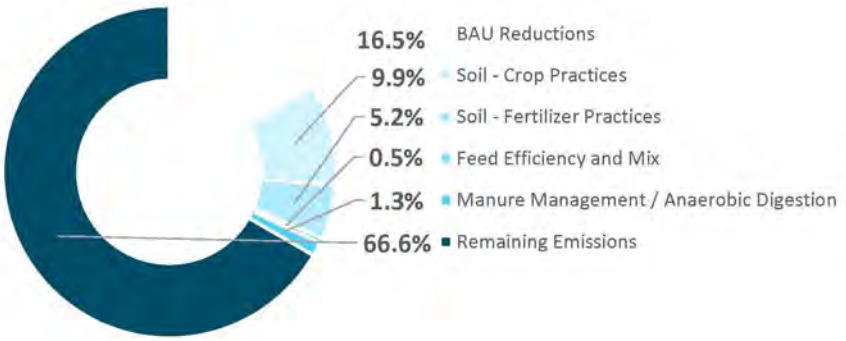
Planned Sector Emission Reductions Through 2030

The strategies and actions included in this section of the Climate Action Implementation Plan are projected to reduce countywide annual GHG emissions by 29,073 metric tons (MT) annually by 2030. In addition there is an anticipated reduction of 28,265 MT in "business-as-usual" agricultural sector emission changes. The result is a total countywide Local Food and Agriculture sector reduction of 33.4% below 2019 levels.

When compared to 2019 emissions, this is equivalent to eliminating over 17,000 of the county's current vehicles from the road, or **28.5 billion** cubic feet of human-made GHG atmosphere annually by 2030.

Sector Emissions Reduction below 2019 by 2030

The total change to sector emissions include CAIP reductions and business-as-usual (BAU) emission changes as follows:





What You Can Do

You can support the goals of the Local Food and Agriculture section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:

Grow your own

- Start a vegetable garden in your yard.
- See if there is a community garden near you, or work with others to start a community garden so you can grow your own.
- Explore back-yard poultry keeping. Ask your local government for specific local requirements.
- Plant fruit or nut bearing trees or shrubs that are well suited for our hardiness zone on your property. Examples include: Trees: Paw Paw, Cherry, Apple, Pear, Plum, Black walnut, Shrub: Serviceberry, Currant.

Eat climate-friendly

- Eat a plant-rich diet. Animal products are extremely GHG-intensive to produce compared to plants. Eating less meat and dairy will reduce emissions associated with food consumption. A great place to start is with "Meatless Mondays".
- Eat regionally-grown food that is suitable for the Illinois climate will make a difference through reduced transportation-related emissions.
- Plan meals to maximize nutrition and minimize climate impact.

Support local growers

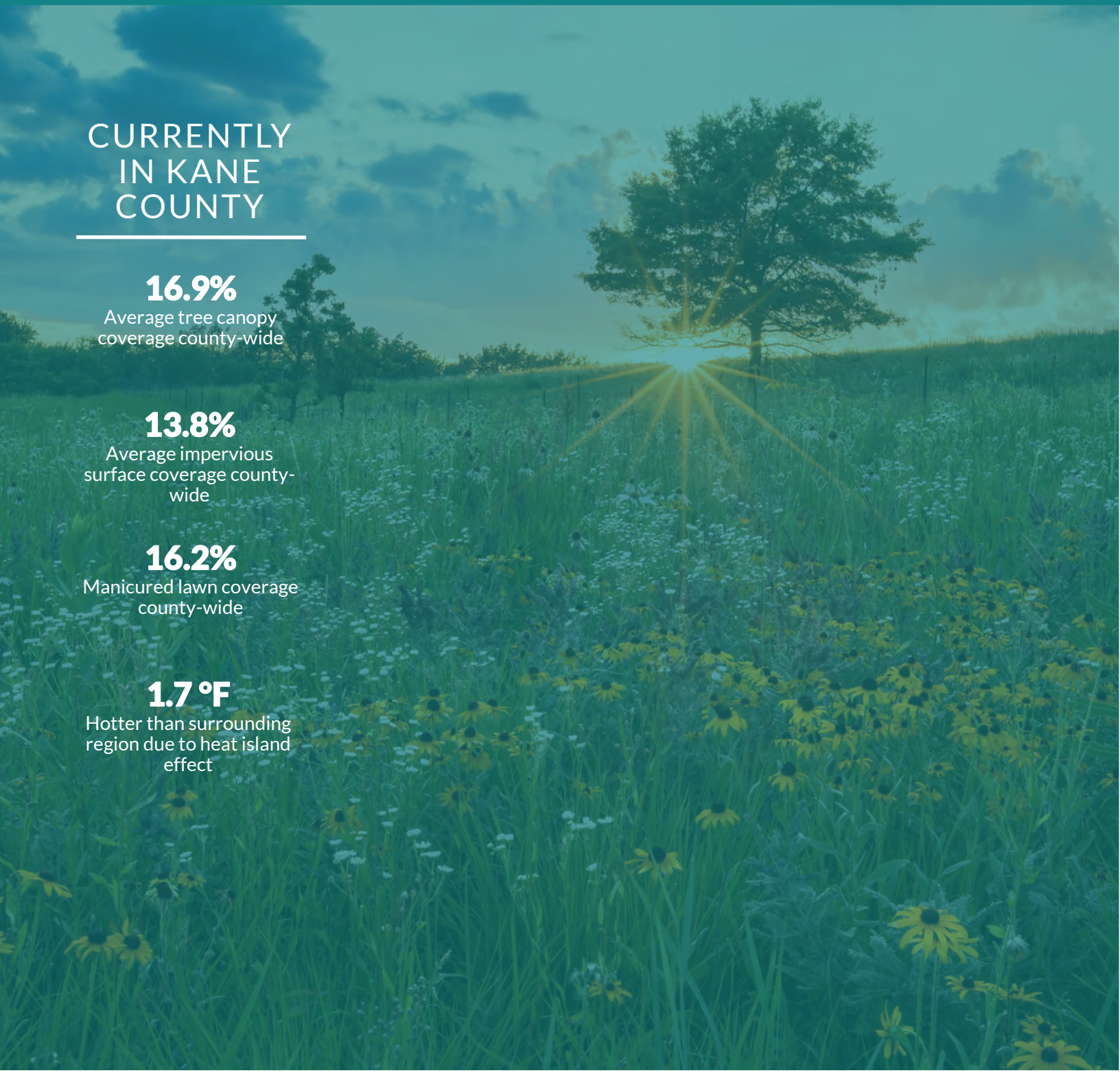
- Buy food directly from a local grower on an ongoing basis by joining a Community Sponsored Agriculture (CSA) group or frequenting a farmer's market.
- Support restaurants and grocery stores that use and sell locally-grown food.
- Buy food that is in season, minimizing the distance food must travel.
- Support your local farmers markets and farm stands..
- Buy ethically grown and harvested food, like fair-trade coffee and chocolate.

Practice regenerative farming

- Farmers can participate in the Illinois Nutrient Loss Reduction Strategy, a statewide effort to stabilize soil nutrients.
- Implement rotational grazing.
- Practice intercropping to improve soil health.
- Reduce fuel costs and improve soil health through no-till farming.

Greenspace and Ecosystems

Click here to return to TOC



CURRENTLY IN KANE COUNTY

16.9%
Average tree canopy coverage county-wide

13.8%
Average impervious surface coverage county-wide

16.2%
Manicured lawn coverage county-wide

1.7 °F
Hotter than surrounding region due to heat island effect

Sector Goals

	6.5% More tree canopy coverage	-5% Less turf / more prairie grass	-10% Less dark impervious surfaces
2019	56,171 acres	53,755 acres	32,605 acres
2030 Targets*	59,800 acres	50,755 acres	29,344 acres

* Includes impacts associated with population increases. See Appendix A for research compiled during plan development which supported planning team in goal finalization.

Trees and natural ground coverings are instrumental in bolstering regional health, enhancing air and water quality, cutting down energy usage in buildings, and contributing to climate mitigation. Recent research indicates that even simple interactions with nature, like visiting a park or observing a tree, can substantially boost a person's health and reduce stress levels. Consequently, our appreciation of trees has broadened to include their significant mental and physical health benefits. In terms of environmental advantages, trees play an indispensable role in purifying air by extracting harmful pollutants, such as carbon monoxide, particulate matter, and ground-level ozone. These contaminants can reach toxic levels and trigger asthma and other respiratory issues. The planting of tree species that are native to the Kane County area will increase the benefits to local ecosystems and at-risk species of insects, birds, and animals.

77%
of survey respondents are moderately, very, or extremely concerned about potential ecosystem loss impacts of climate change.

Prairie Grass and Climate Action

Replacing traditional turf lawns with prairie grass and wildflowers serves as an effective climate adaptation strategy. These native species require less water and maintenance, reducing irrigation needs and carbon emissions from lawn care equipment. Their deep root systems improve soil health, enhance water absorption, and increase carbon sequestration, mitigating flood risk and contributing to climate change mitigation. Additionally, they provide habitats for local wildlife, promoting biodiversity. This transformation supports the ecosystem, reduces environmental impact, and fosters resilience against changing climate conditions, making it a sustainable, multifaceted approach to climate adaptation.

The Link Between Impervious Surfaces and Extreme Heat

Impervious surfaces like pavements and buildings in a region contribute to higher "heat island" effects, resulting in increased atmospheric and surface temperatures in developed areas compared to rural ones. This rise in temperature, particularly during summer, heightens discomfort and health risks, especially during heat waves. A 2006 study by Minnesota State University and the University of Minnesota defined a ratio illustrating the correlation between a region's impervious surface percentage and the corresponding heat island temperature increase. Many residents of Chicago and the surrounding areas live in neighborhoods that experience extreme increases in heat due to this combination of impervious surface cover and lack of tree cover.



WHY TREES MATTER

The Benefits of Planting Trees

Community

Trees and green spaces enhance life quality and reduce stress levels.

Trees on your property can uplift the whole community.

Traffic moves more slowly and safely on tree-lined streets.

Environment

Trees reduce heat islands by cooling through evaporation and shading.

Trees enhance air quality by filtering dust and harmful pollutants like ozone.

Trees provide habitat, food, shelter, and protection for various wildlife. A focus on native species provides the best enhancements for wildlife.

Economy

Trees can regulate home temperature, reducing cooling and buffering winter winds.

Well-landscaped homes with mature trees can increase property value by up to 10%.

Through reducing energy demand, trees lower utility infrastructure costs, benefiting consumers.



Greenspace and Ecosystems

Equity Considerations

Areas with lower-income or other marginalized and vulnerable populations often have less tree canopy coverage, which results in missed benefits such as environmental enhancement, economic gains, and improved quality-of-life. These neighborhoods also suffer disproportionately from the urban heat island effect and pollution, characterized by higher temperatures due to fewer trees and more heat-absorbing surfaces like pavements and buildings. Consequently, residents experience increased heat, discomfort, and health risks, further compounding environmental inequalities.

Equity Program Examples:

1. **Targeted tree-planting** initiatives focused on native species in these neighborhoods.
2. **Community-led programs** for pavement-to-garden and turf-to-prairie conversions to promote local involvement.
3. **Policy-driven incentives** for green roof installations on buildings, aiming to reduce temperature disparities and enhance residents' well-being.

Climate Impacts

Impervious surfaces, such as pavements, amplify urban heat islands by absorbing and retaining heat, thereby exacerbating climate change impacts, boosting energy consumption, and heightening heat-induced health risks.

Climate Hazards

Climate change could lead to higher forest and urban tree mortality, decreased productivity, invasive species and disease proliferation, and green infrastructure's diminished carbon capture due to greenspace loss.

Strategies

The strategies on the next pages show how we achieve our climate goals for Greenspace and Ecosystems. Each strategy has detailed actions explained in the Implementation section of this plan.

Click the double arrow symbol below each Strategy description to view these detailed actions for each strategy.

STRATEGIES

Strategy GE 1

Increase tree cover and diversity, particularly in the priority neighborhoods, 6.5% by 2030 and 15% by 2040. (an increase of 3,660 acres and 7,000 acres respectively with growth coming from species that are native and climate adaptive)

Our tree canopy reduces storm water runoff, provides clean drinking water, reduces the effects of urban heat islands, decreases energy use in our buildings, sequesters atmospheric carbon dioxide while serving as a long-term carbon sink, and supports increasing economic growth. Increasing tree canopy coverage and health provides critical climate adaptation services. Increases should be prioritized to balance potential for tree canopy increases with the opportunity to improve equity, potential to impact as many households as possible, and heat island mitigation need. Agriculture land is excluded from potential canopy calculations.

Go to **Implementation and Actions** for supporting actions.

Strategy GE 2

Increase pollinator supportiveness of lawns and grassland in community and achieve a 30% turf replacement with native grasses and wildflowers on public lands and 5% replacement on private lands by 2030 with identified pollinator "corridors" given priority on private-to-public and public-to-private lands. (A decrease of 3,000 acres of turf county-wide)

Replacing lawns with native grasses and wildflowers creates a more authentic, natural American landscape that combats climate change and provides shelter and food for songbirds and other small mammals. Compared to the typical lawn, native grasses improve water quality, reduce air pollution, provide habitat restoration and protection, and increase carbon sequestration.

Go to **Implementation and Actions** for supporting actions.

Strategy GE 3

Reduce heat island effect through Community-wide "dark" impervious surface coverage particularly in neighborhoods identified with higher heat island impacts 10% by 2030 and 23% by 2040. (a decrease of 3,260 acres by 2030 and 7,500 acres by 2040)

Heat island effects intensify discomfort and health risks, particularly during heat waves which are projected to become more severe and more common for Kane County. The level of heat island temperature increase correlates with a community's impervious surface coverage, especially dark surfaces like asphalt and black roofs. A 2006 study by Minnesota State University and the University of Minnesota illustrates that reducing dark impervious surfaces will mitigate heat island and extreme weather impacts in the region. For every 1% reduction in impervious surfaces in a community, summertime heat island temperatures may be reduced by as much as 2˚F.

Go to **Implementation and Actions** for supporting actions.

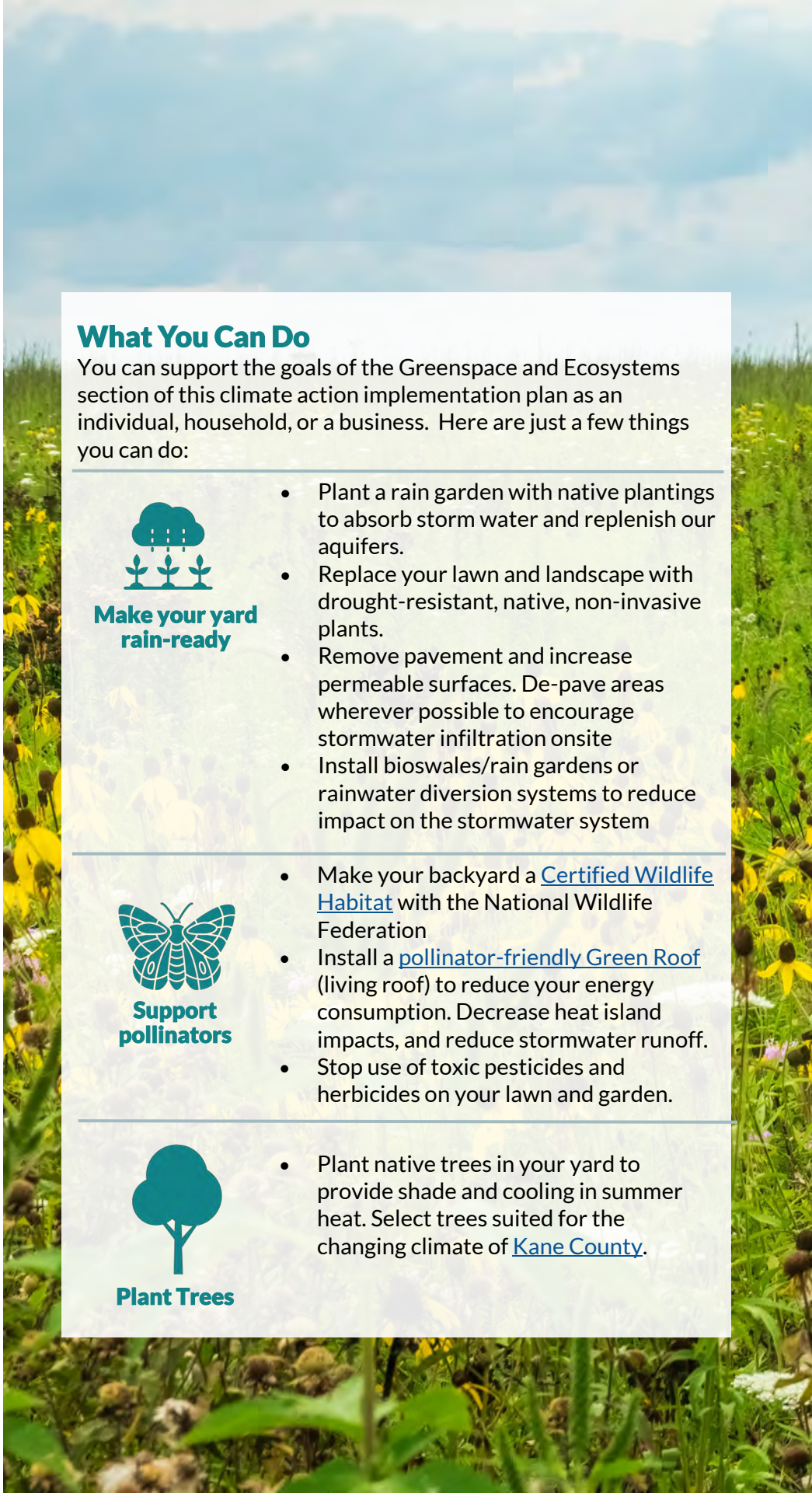
Strategy
GE 4

Reduce invasive species and increase climate resilience and biodiversity of community's tree canopy, parks and greenspaces.

(increased biodiversity focused on species that are native and climate adaptive)

Invasive species can outcompete native flora and disrupt ecosystem balance, making it harder for these systems to withstand the stresses of a changing climate. By managing invasives and fostering biodiversity, we enhance the resilience of ecosystems and greenspaces, allowing them to better absorb carbon dioxide, provide essential ecosystem services, and support a variety of plant and animal species. Biodiverse ecosystems are more adaptable to shifting climate conditions, making them essential for ensuring the long-term health and sustainability of our natural environments and green areas. For the success of such an effort, an exclusive focus on native species of plants is essential.

⏭ Go to **Implementation and Actions** for supporting actions.



What You Can Do

You can support the goals of the Greenspace and Ecosystems section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:

Make your yard rain-ready

- Plant a rain garden with native plantings to absorb storm water and replenish our aquifers.
- Replace your lawn and landscape with drought-resistant, native, non-invasive plants.
- Remove pavement and increase permeable surfaces. De-pave areas wherever possible to encourage stormwater infiltration onsite
- Install bioswales/rain gardens or rainwater diversion systems to reduce impact on the stormwater system

Support pollinators

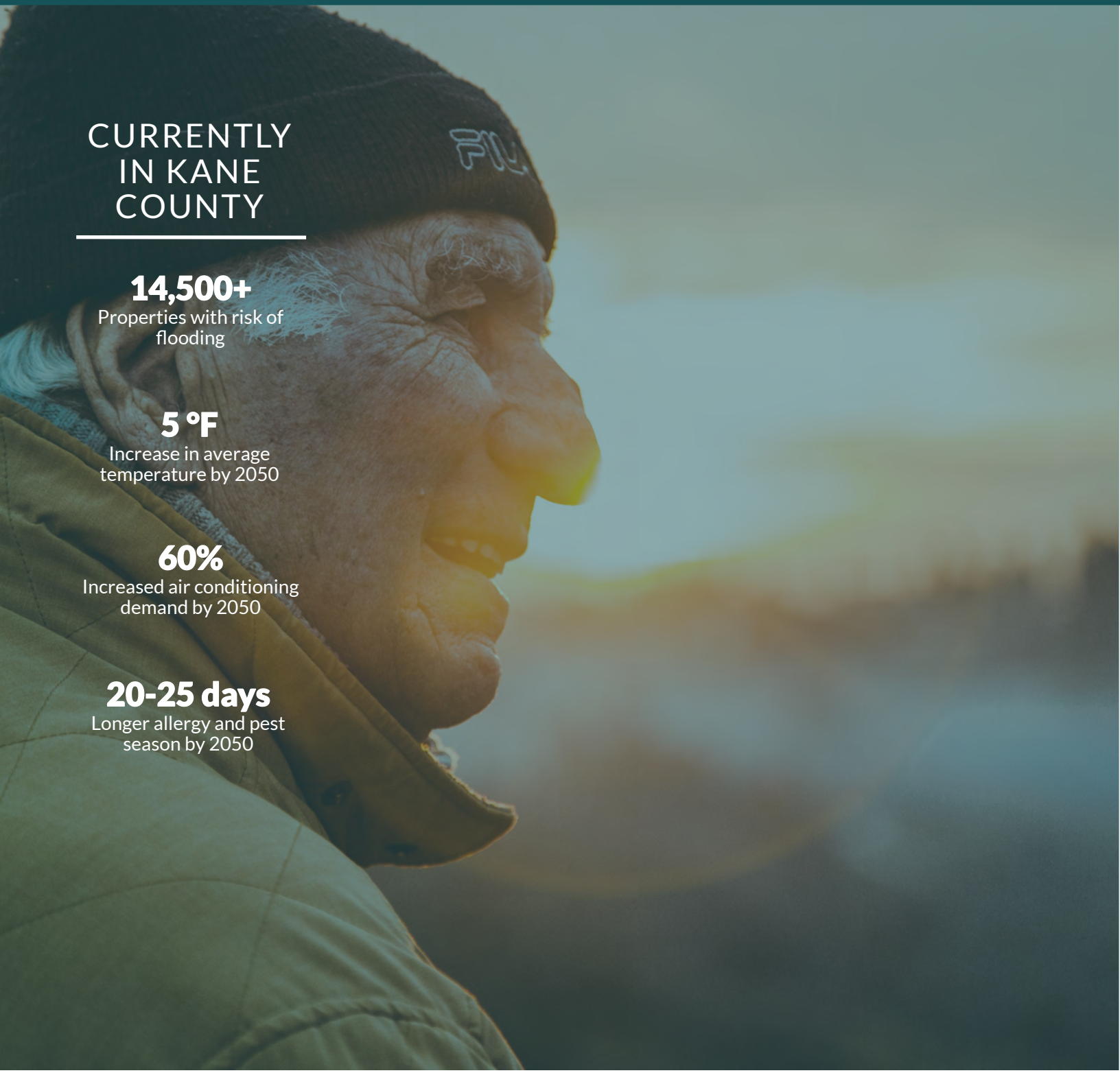
- Make your backyard a Certified Wildlife Habitat with the National Wildlife Federation
- Install a pollinator-friendly Green Roof (living roof) to reduce your energy consumption. Decrease heat island impacts, and reduce stormwater runoff.
- Stop use of toxic pesticides and herbicides on your lawn and garden.

Plant Trees

- Plant native trees in your yard to provide shade and cooling in summer heat. Select trees suited for the changing climate of Kane County.

Health and Safety

Click here to return to TOC



CURRENTLY IN KANE COUNTY

14,500+
Properties with risk of flooding

5 °F
Increase in average temperature by 2050

60%
Increased air conditioning demand by 2050

20-25 days
Longer allergy and pest season by 2050

Sector Goals



Reduce climate **Vulnerability**



Increase infrastructure **Resilience**



Increase adaptive **Capacity**



74%
of survey respondents have already been personally impacted by one or more effects of climate change.

The strong connection between human and environmental health is evident in the Midwest, where climate change is expected to worsen health issues. Rising temperatures contribute to more frequent heatwaves, especially affecting vulnerable groups like the elderly, infants, and those with pre-existing health conditions.

Changes in rainfall patterns may lead to increased floods and droughts, contaminating water and elevating the risk of waterborne diseases. Droughts also raise the chances of wildfires and dust storms, worsening air quality and respiratory conditions like asthma and allergies.

Warmer temperatures expand the duration of Illinois' hospitable seasons for disease-carrying vectors like mosquitoes and ticks. This expansion may result in more vector-borne diseases such as West Nile virus and Lyme disease.

Furthermore, climate change's social and economic impacts can contribute to mental health issues, including anxiety, stress, and trauma from climate-related disasters, potentially leading to an increase in mental health disorders.

The Role of Local Governments in Climate Health and Safety

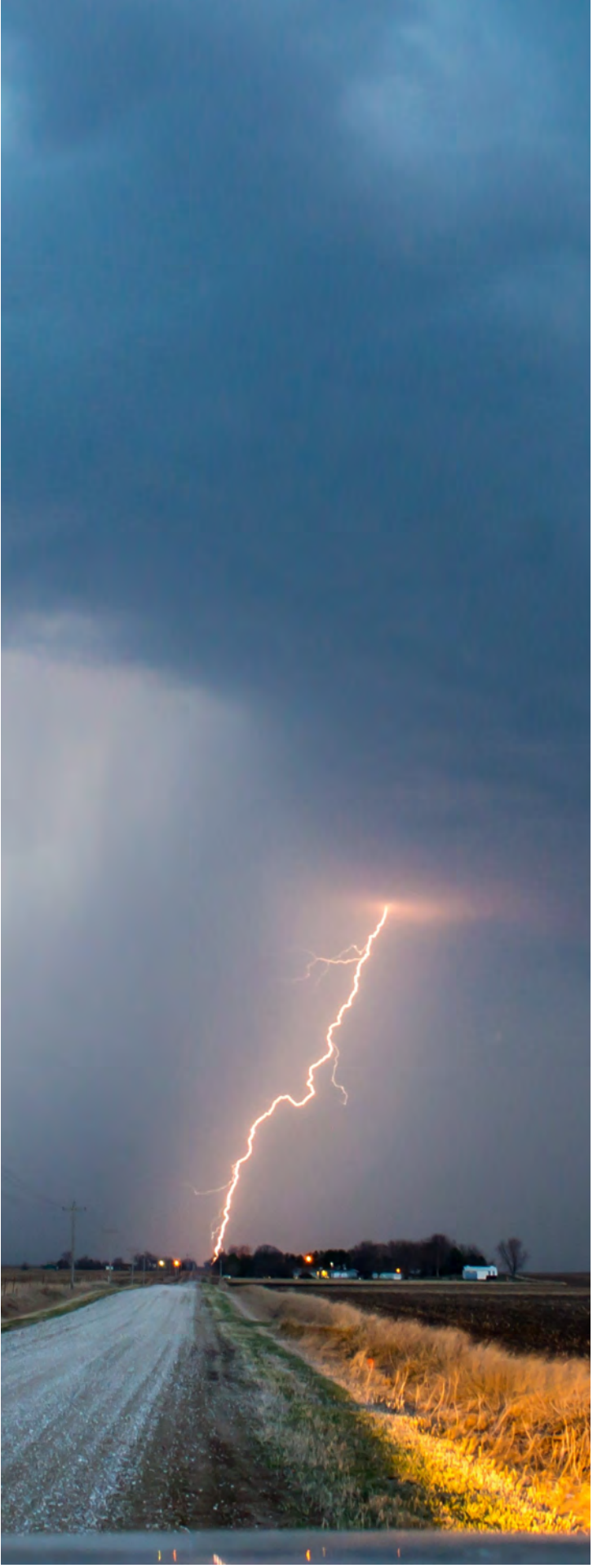
Climate change has substantial implications for public health and safety, affecting air quality, weather patterns, food and water sources, and our interaction with our surroundings. As detailed above, these impacts pose increasing health risks.

Just as local governments and the healthcare sector have promoted healthy behaviors like balanced diets and exercise, it is vital for them to acknowledge and address the link between climate impacts, adaptation efforts, resilience measures, and community well-being. The environment's condition significantly shapes public health outcomes, underscoring the importance of recognizing and acting on this connection.

THE TEMPEST

Climate Change Effects and Human Health Impacts





Health and Safety

Equity Considerations

Climate change impacts the health of all community members, however, people within our communities are differently exposed to hazards and some are disproportionately affected by the risks of climate change. According to the National Climate Assessment, greater health risks related to climate impacts can be experienced by some populations in our communities including children, older adults, low-income communities, and some communities of color. Within these populations, many are disproportionately affected by extreme heat and weather events, and may have increased health and social vulnerability which decreases their access to resources that can help them avoid the risks of climate change.

Equity Approach Examples:

Effectively managing climate impact and health inequities necessitates understanding climate change's varying effects and prioritizing vulnerable groups in adaptive policy implementation. The following are example approaches:

1. **Subsidized solutions** for home-cooling and accessible public cooling centers can protect vulnerable households during heatwaves.
2. **Green infrastructure investments**, like tree coverage and community gardens, boost public health by improving air quality and cooling neighborhoods.
3. **Enhanced stormwater management** and affordable insurance shield low-income communities from rising flood risk.

Climate Hazards

Climate stressors entail more frequent and severe poor air quality days, extreme heat, heavy rainfall, prolonged pollen seasons, and shifts in disease-carrying pest distribution.

Strategies

The strategies on the next pages show how we achieve our climate goals for Health and Safety. Each strategy has detailed actions explained in the Implementation section of this plan.

⏭

Click the double arrow symbol below each strategy description to view these detailed actions for each strategy.

STRATEGIES

Strategy HS 1

Assist climate vulnerable populations throughout the community in preparing for and mitigating climate change impacts.

Based on the Kane County Vulnerability Assessment, adaptive efforts may be most effective by prioritizing strategies which address the climate risks of extreme heat, air quality, flooding, food security, crop yield, and power/infrastructure failure. Particular attention should be paid to strategies which are most effective for people of color, individuals in economic stress, and seniors over 65.

Adaptation efforts that effectively address these key vulnerabilities will reduce the negative impacts of climate change as well as address underlying stressors and inequities that have long been an issue in the community.

Go to **Implementation and Actions** for supporting actions.

Strategy HS 2

Educate, engage, and empower the public on health and safety risks of climate change impacts.

Education plays a crucial role in driving climate action by improving understanding of the climate crisis and empowering individuals with the knowledge, skills, and awareness needed to instigate change. Research shows that climate education not only contributes to emissions reduction but also reduces vulnerability to environmental risks.

To effectively combat climate change as a public health threat, proactive measures like education and outreach are essential. These strategies can influence individual behaviors, helping to prevent and mitigate the impact of climate change, particularly in vulnerable communities within the county.

Go to **Implementation and Actions** for supporting actions.

Strategy HS 3

Ensure that mission critical, emergency services and health care facilities within the community are prepared for impacts of climate change.

Mission-critical services (those that would negatively impact the community if interrupted), emergency facilities, healthcare systems, and infrastructure are essential for community resilience. Their vulnerability during extreme weather events can result in significant consequences.

By preparing these critical assets for climate change impacts, local governments reduce risks, maintain essential services, protect vulnerable populations, and save lives. Climate-proofing these services demonstrates proactive governance, builds public trust, and encourages community involvement in climate change initiatives. In the face of growing climate challenges, such measures are imperative for sustainable development.

Go to **Implementation and Actions** for supporting actions.

Strategy
HS 4

Strengthen community response capacity and social support networks, especially around our most vulnerable populations.

Research indicates that social networks play a significant role during times of stress by facilitating collective action and communication. Communities with strong social connections are more likely to effectively implement climate risk management strategies, respond to severe weather events, and identify potential advantages in changing conditions.

In fact, some studies suggest that mutual support among individuals may be equally or even more crucial than emergency services. Given this, to communities of Kane County can enhance resilience to climate impacts by fostering improved social connectivity.

Go to **Implementation and Actions** for supporting actions.



What You Can Do

You can support the goals of the Health and Safety section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:

Make your home resilient

- Put together an emergency preparedness kit for your household.
- Prepare your home for the extremes. Understand the risk of extreme weather, extreme temperatures, flooding or wildfire to your home, and take action to safeguard your home.
- Keep yourself and your family current with physicals, vaccinations and prescribed medications and therapies.
- Plan and rehearse a fire evacuation plan with everyone who lives in your home or apartment.
- Have breathing-protection masks available for you and your family for when air quality alerts are declared.
- Take first-aid and CPR certification training.

Make your community resilient

- Get involved with your community's Emergency Response Team (CERT) and join your neighbors and receive training to prepare for potential disasters.
- Notice a person who lives alone. Offer to check on them periodically, especially during extreme weather or a natural disaster.
- Notice a person who sometimes lacks transportation to their doctor, shopping or other services. Offer to drive them.
- Notice a person or family who lacks air conditioning in their home or apartment. Offer to have them visit or stay with you during extreme heat events.
- Locate your local community resiliency hub.

Climate Economy

Click here to return to TOC



CURRENTLY IN KANE COUNTY

266,000
Jobs in Kane County

14,237
Unemployed workers in Kane County (2022)

3,000
New clean energy jobs created in Illinois (2022)

68%
Share of employed Kane County residents who work outside of County

60%
Share of workers in Kane County who live outside of County

Sector Goals



Develop economic
Potential



Climate economy
Job Training



Increase local business
Resilience

Climate change directly impacts our economy. Unaddressed, it will cost the U.S. billions by the century's end. A 2019 EPA study shows up to $224 billion difference in annual economic impact by 2090 between mid-range (RPC6) and high-range (RPC8.5) climate models (models that represent the projected impacts of different possible climate futures, RPC8.5 representing BAU and therefore the most dire environmental effects). To meet Paris Agreement goals, a carbon price of $40-$80 per ton is needed to internalize the social cost of carbon (2019 World Bank report), with some studies suggesting $200-$400 per ton. As per Kane County Climate Vulnerability Assessment, the estimated localized carbon cost is at least $58 per metric ton, calculated based on projected economic impacts divided by community-wide GHG emissions. This indicates the economic benefit of reducing GHG emissions county-wide is over $400 million annually.

Climate action today avoids the future costs associated with unmitigated climate change. Equally important, many of the efforts supported in climate action can generate local jobs and boost the economic well being of our communities. The positive relationship between reducing GHG emissions and our economy is shown through the trends of the last decade. In that time, Kane County GHG emissions dropped nearly 29% while county-wide GDP increased over 18%. Climate action has a positive impact upon our local, state and national economy.

Seizing Opportunities of Global Action for The County's Economy

The climate crisis has garnered global attention, with over 400 major companies committing to achieve net zero emissions by 2050. Ambitious targets have also been set by nations, as demonstrated in the recent *COP27 global climate meeting. China aims to achieve net zero emissions by 2060, while President Biden has pledged to reduce US emissions by 50-52% by 2030 and reach net zero by 2050, with support from the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA). Building local capacity for climate-forward businesses, jobs, and projects in Kane County is vital to capitalize on opportunities and actively participate in the transformative economic shift.

Climate action can actually support economic development. Transitioning away from fossil fuels, improving public transit systems, and fostering local food industries involve a shift toward local energy and labor sources. This presents communities with opportunities to create wealth by reducing reliance on imported resources and creating local jobs.

This plan outlines essential strategies and actions to boost investments in the local climate action economy and unlock further growth in related sectors. By embracing these measures, communities throughout Kane County can position itself as a leader in sustainable development and reap the economic benefits of proactive climate action.

*United Nations Climate Change Conference of the Parties, 2022

CLIMATE CHANGE MEANS BUSINESS



The Climate Economy: Impacts, Resilience, and Jobs



Physical Damage

Rising frequency of extreme weather events heightens the risk of property damage caused by flooding and storms.

Crop Loss

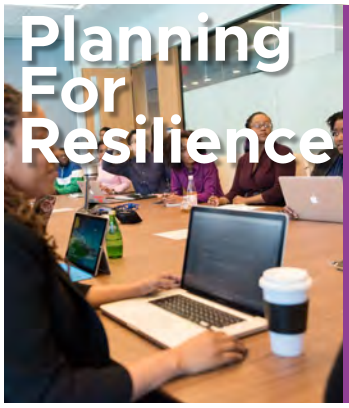
Increasing floods, droughts, and extreme cold/heat may reduce crop yields by 15% in Illinois by 2050.

Supply Chain

Extreme weather, floods, droughts, infrastructure damage, and blackouts can damage or halt supply chains.

Community Loss

Climate Change impacts are projected to cost local economies 1% to 4% of annual GDP by the end of the century



Learn

Understand the physical risks to the region, industries, individual businesses and the workforce.

Identify

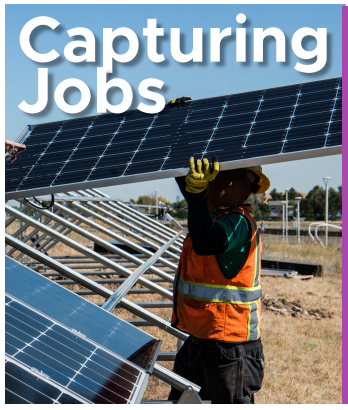
Identify the business and industry trends that will affect local employers, investment, and stability.

Include

Incorporate climate risks and opportunities into economic development strategic plans.

Partnership

Promote dialogue on climate change's economic impacts, foster partnerships, and inspire action.



Efficiency

Energy efficiency improvements in buildings stimulate job growth and enable new businesses.

Clean Energy

Investing in renewable energy creates more jobs and bolsters local economies .

Mobility

Every dollar spent on public transit generates four dollars and twice as many jobs as car investments.

Savings

Savings from energy efficiency, renewable energy, and climate actions are reinvested in the local economy.



Climate Economy

Equity Considerations

Climate action can create jobs and promote equity. Marginalized communities suffer most from climate impacts but gain the least economically. It's vital to ensure green jobs are inclusive and accessible.

Investing in renewables, energy efficiency, and public transit generates local jobs with fair wages. Savings from these actions reduce living costs, easing financial burdens. Strategic climate action fosters equitable economic growth.

Equity Approach Examples:

The following are example approaches to equitable climate economy strategies:

1. **Job Training and Education:** Equity in climate economy actions can be promoted through targeted job training and education programs, enabling historically disadvantaged communities to gain skills necessary for green jobs.
2. **Community-led Renewable Energy Projects**: Equity can also be achieved by engaging communities, especially disadvantaged ones, in planning and implementing renewable energy projects, providing local jobs and community-wide benefits.
3. **Affordable Green Housing Initiatives**: By improving energy efficiency and reducing emissions in housing affordably, these initiatives provide jobs, help residents save money, and promote access to all, regardless of income.

Climate Hazards

Climate change affects water and energy consumption and costs across various sectors, with extreme weather and temperature fluctuations impacting worker safety and transportation systems. Furthermore, these climate-related risks can jeopardize supply chains for materials and products.

Strategies

The strategies on the next pages show how we achieve our climate goals for Climate Economy. Each strategy has detailed actions explained in the Implementation section of this plan.

Click the double arrow symbol below each strategy description to view these detailed actions for each strategy.

STRATEGIES

Strategy CE 1

Capture economic value of each climate action goal in the Kane County CAIP.

Global climate action requires significant investment in the next 15 years to achieve goals and prevent long-term economic harm. However, these investments can stimulate growth.

Bold climate action can generate a $26 trillion economic gain in the US by 2030 compared to the status quo. On average, every $1 invested in climate action yields $4 in benefits. In the wake of the COVID-19 pandemic, research has shown that strong climate action and investments can be effective ways for communities to “build back better” from COVID while helping to secure long-term economic success. These dynamics offer economic development opportunities for communities, especially those strategically planning to harness the potential.

Go to **Implementation and Actions** for supporting actions.

Strategy CE 2

Support equitable workforce development and entrepreneur opportunities of climate action in the local economy.

Local climate actions, such as distributed solar energy and building weatherization, create quality 'green' jobs that stay in communities. According to the Brookings Institute, these jobs, vital for a carbon-free economy, offer higher, more equitable wages than the national average.

'Green' jobs have lower education requirements, providing better wages for workers with just a high school diploma compared to other sectors. However, these jobs do require scientific and technical skills, offering workers opportunities to acquire valuable skills for the local workforce. Preparing the local workforce for the climate economy can improve the economic potential for disadvantaged individuals while building community resilience.

Go to **Implementation and Actions** for supporting actions.

Strategy CE 3

Provide support to local businesses for building operational resilience in the face of climate change.

The COVID pandemic showed how disruptions impact businesses, workers, and communities, causing significant economic downturns. In 2020, the global economy shrank by 4.3%, or about $3.5 trillion (World Bank). According to Swiss Re, the economic impact of climate change could surpass COVID's. Even in the best-case scenario (meeting Paris Agreement targets), annual GDP impact by 2050 equals COVID. In the worst case (no emissions reduction), the annual impact could be four times worse.

Small local businesses, generating 44% of economic activity and most new jobs, are vulnerable. Boosting climate resilience benefits business owners, employees, households, and the broader community.

Go to **Implementation and Actions** for supporting actions.

Strategy CE 4

Establish suitable and sustainable financing for the implementation phase of the Climate Action Implementation Plan.

Existing state and federal subsidies, along with local taxation authority, may fall short of covering initial resilience and adaptation investments. This isn't because these investments lack value but because they don't align with traditional financing models. Many resilience projects involve short-term expenses but promise long-term benefits, while others mitigate future climate damage without providing immediate private capital returns.

To address this, communities are considering innovative financing tools such as climate bonds and public-private partnerships. Some have even started establishing Climate Funds and emissions trading programs to creatively address their climate resilience financing requirements.

Go to **Implementation and Actions** for supporting actions.

Strategy CE 5

Communicate climate action economic and development opportunities to stakeholder groups.

Climate change presents substantial challenges to the environment, health, and the economy. Addressing these issues requires collaboration between public and private sectors. Public-private economic communication can promote climate resilience and economic opportunities by encouraging innovation and investment. It enables sharing of information, aligning goals, leveraging strengths, and creating partnerships to hasten the shift to a low-carbon, resilient future.

Go to **Implementation and Actions** for supporting actions.

Strategy CE 6

Prepare for climate change migration.

Climate change will severely impact many US households, especially coastal communities facing chronic flooding. Over 170 US communities, with a significant share being socioeconomically vulnerable, will face chronic sea-level rise by the decade's end, according to the Union of Concerned Scientists.

Climate migration is a natural response, bringing accelerated changes and increased migration to inland areas. Around 86% of communities with over 10,000 residents are projected to experience climate migration this century, affecting labor markets, housing prices, and income distribution. However, climate migration can also have positive effects, such as increased productivity and a more skilled workforce. Preparing for climate migration can help Kane County communities seize opportunities.

Go to **Implementation and Actions** for supporting actions.

What You Can Do

You can support the goals of the Climate Economy section of this climate action implementation plan as an individual, household, or a business. Here are just a few things you can do:



Support sustainable businesses

- Shop at small, locally owned businesses.
- Support businesses that have transparent and sustainable practices.
- Talk to your children about sustainability and how we can all be more sustainable in our daily lives – including our purchases and businesses we support.



Support local workers

- Mentor a young person to support them in their studies and careers.
- Encourage the young people in your life to gain job experience and skills development in line with the climate economy such as in renewable energy.
- Advocate for factors critical to strengthening the climate action workforce, like a livable wage, unions, and safe workplace conditions.



Explore opportunities

- Explore opportunities for a climate solutions career, a job in climate tech, sustainability, social impact, or learn more about sustainable career pathways or find training opportunities at a CEJA Workforce Hub.
- Access entrepreneurship resources through the State of Illinois' Small Business Assistance Office to learn how to start a small business.
- Explore opportunities for support through the



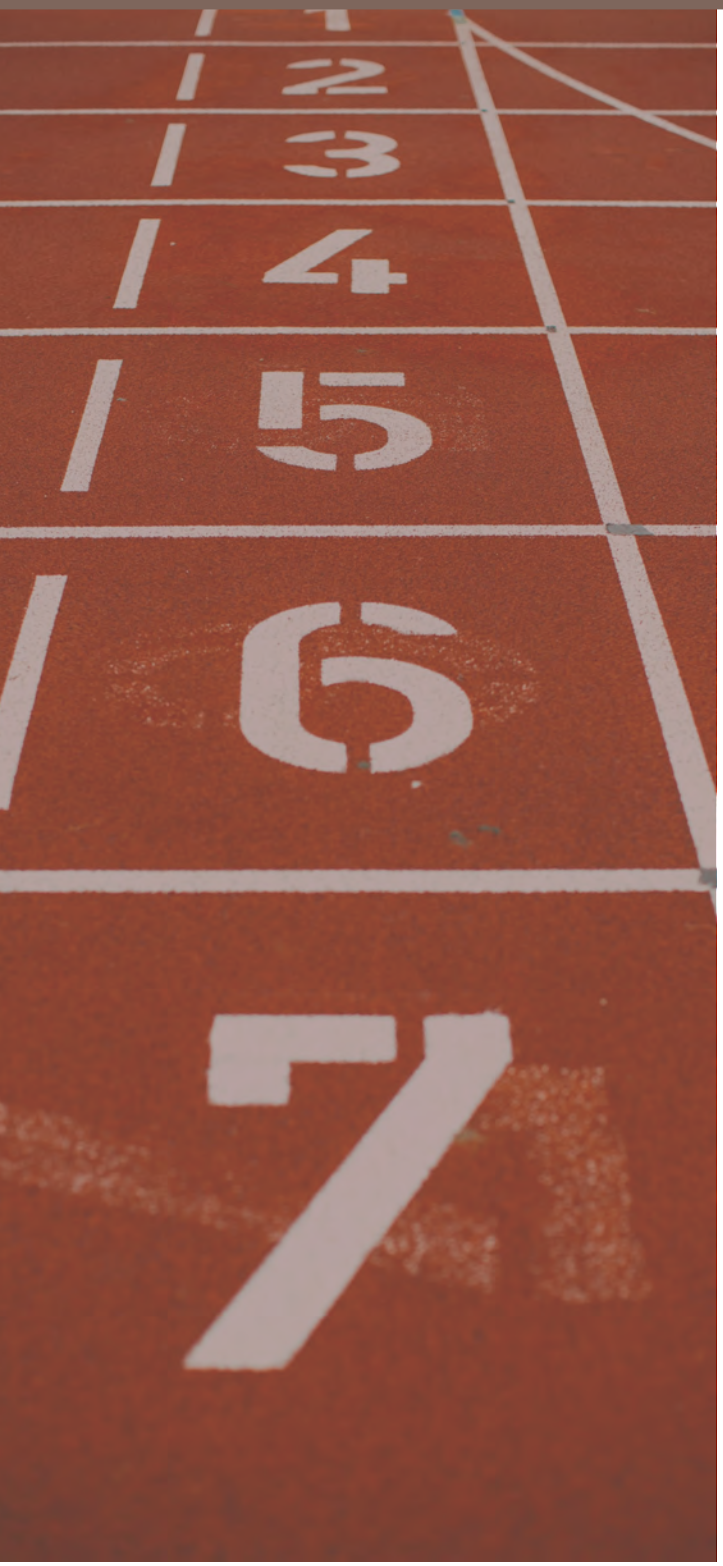
Make your business resilient

- Access information on sustainable business practices through the Illinois Green Business Association.
- Create a Disaster Preparedness Plan or Preparedness Toolkit for your business.



Implementation and Actions

Click here to return to TOC



The first few years after plan adoption are critical to its success. Establishing roles and identifying funding will help establish the implementation phase of the plan and ensure the community is on track to achieve its goals. This plan includes robust goals for significant greenhouse gas (GHG) emission reductions and addressing climate resilience. This vision requires commitment and integration of the CAIP into local government operations, functions, and services. Ultimately, however, successful implementation of this Climate Action Implementation Plan will require the support and commitment of Kane County public entities, residents, and businesses.

Implementation is For Everyone

The causes and impacts of climate change are broad. Solving it must be equally broad. Some actions will need to be led by local government elected officials or departments while others can only be supported by local government and will require engagement by the business community. In addition, there are steps that households and individuals can take to make an impact. Ultimately, achieving the visionary goals outlined in this plan will require engagement and a sense of responsibility not only by the leadership and staff of Kane County and municipal governments, but by the community as well.

Climate Action Implementation is a Journey

Starting a decade-long CAIP entails uncertainties, especially regarding future technologies, costs, and regulations, making a full initial cost-benefit analysis impracticable. This journey will require rolling adjustments to actions that guide Kane County towards its climate goals. Actions which may modify/create policy or ordinances or which may have expenses incurred should be anticipated to go through appropriate local government process for approval.

STRATEGIES

Strategy I 1

Organize for climate action implementation.

Integrating climate actions into day-to-day operations is central to successfully implementing the plan and achieving long-range climate goals. Establishing an implementation team with participation from all organizational departments, assigning staff to lead or participate in actions, and establishing a process for the review of implementation progress can all help climate action become integral to operations.

Go to **Actions** for supporting actions.

Strategy I 2

Facilitate and collaborate with external support needed for climate action implementation.

Climate Action Plans with community-wide goals require awareness by and participation of stakeholders throughout the community. Meanwhile, many communities throughout Kane County and the region have established climate action goals and are seeking to implement similar actions for their communities. This means that plan implementation needs to be, and can be, collaborative.

Establishing coordinated community communication campaigns, organizing a cross-jurisdictional collaboration team to facilitate action implementation with other local governments and public entities, and organizing volunteer efforts are all key opportunities to broaden implementation support.

Go to **Actions** for supporting actions.

ACTIONS

Detailed actions supporting the implementation of all strategies for each Sector included in this plan are on the following pages.

Click the double arrow symbol at the bottom of each action list page to return to the plan sector.

Implementation Support Tools

To support Implementation of this plan, the paleBLUEdot team has created the following tools:

Implementation and Monitoring Matrix
An excel-based tool for tracking action lead assignments, identification of potential community advocates and resources, and action implementation status and progress monitoring.

Example Climate Action Policies and Ordinances
Example policies and ordinances supporting some of the strategies and actions included in this plan: https://palebluedot.llc/kane-example-cap-policies

Example Policy Alignment Memo
For use in reviewing all public entity policy items against CAIP goals: https://cutt.ly/7wDCSQqZ

Example Internal Implementation Team Agendas
For support in establishing internal implementation teams in public entities: https://cutt.ly/5wDCDzvE

Strategy I 1

Organize for climate action implementation.

I 1-1	Local government manager will work with staff to develop an annual implementation plan that specifies a work sequence and timeline for implementation tasks for each fiscal year, estimates necessary funding and staffing resources, and outlines an accountability process, to be presented to relevant commission / council for comment and finalization within the local government annual budgeting process. Progress updates will be reported to relevant commission / council on a semi-annual basis.
I 1-2	Local government elected officials and/or manager to establish clear guidance and direction for the participation in and support of the CAIP implementation actions by all organizational departments. Encourage continuing education of municipal staff relevant to the Climate Action Implementation Plan. For example, encouraging engineering staff to earn continuing education credits related to bicycle infrastructure.
I 1-3	Local government manager to establish an internal "Climate Action Implementation Team" (CAIT) comprised of staff representatives from all key organizational departments. The task of the CAIT Team should be to meet regularly to support the initial and on-going prioritization and implementation of annual implementation actions and projects and to support reporting and progress updates. CAIT to request resources, guidance, or assistance from local government manager if needed to make planned progress.
I 1-4	Local government elected officials and/or manager to establish and implement a policy to review existing and future policy and ordinance changes as well as building and zoning variance requests against the goals, strategies, and actions of this Climate Action Implementation Plan to ensure alignment of changes with this plan. (see example policy memo: https://cutt.ly/7wDCSQqZ)
I 1-5	Fund and support sustainability / climate action staffing required to: •Facilitate discussion among large users to reduce emissions through business and industrial strategies. •Participate in technical resource programs as they are available through Regional, State, Federal, and non-profit provider partners. •Support department managers and staff as they implement CAIP actions within their service area or area of expertise. •Convene and support the internal Climate Action Implementation Team (CAIT). •Ensure the establishment and maintenance of a Climate Action webpage supporting CAIP resources for the community. •Coordinate and organize volunteer groups and events. •Engage local government's elected officials and representative boards and commissions to ensure the CAIP is integrated into their work plans.
I 1-6	Local government manager will work with staff to support review of plan implementation progress and impacts on a regular basis (1-2 year cycle). Review should include development of an updated community-wide and municipal operations GHG inventory. Strategies and actions should be reviewed for implementation progress and for continued appropriateness. Based on the review, adjust, add, and

Return to **Implementation** section.

Strategy I 2 Facilitate and collaborate with external support needed for climate action implementation.

I 2-1	Local government manager to establish / engage in a Kane County Climate Action Collaboration Team comprised of representatives from local governments and public entities engaged in climate action. The task of the Climate Action Collaboration Team should be to meet regularly to collaborate on implementation of plan actions, pursue joint action where appropriate, provide cross-jurisdictional support, share lessons learned from action implementation, and explore joint funding opportunities including collaborative grant pursuits.
I 2-2	Local government manager identify a commission or committee to act as a primary community member body to support the implementation of the CAIP. Commission or committee's annual work plans should include support of the implementation of the Plan; supporting local government staff in any relevant departments; receiving updates on CAIP projects and progress; being provided with opportunity to comment on identification of annual CAIP implementation priorities, projects, and budgets; and providing input on plan adjustments as needed.
I 2-3	Local government manager or staff to coordinate with partners like the Climate Reality Project Chicago Metro Chapter to establish a roster of Climate Action Speaker's Bureau or Climate Action Champion Volunteers within the community comprised of well regarded regional community members, leaders, experts, and/or relevant practitioners to support building community awareness of climate action, benefits, and the Plan's goals and actions.
I 2-4	Establish a coordinated communication and education campaign supporting the communication and educational needs of each of the CAIP sections. The campaign should also look to help community members: •Understand climate change in general, anticipated impacts, and the function and importance of implementing the Plan. •Understand why change at the individual, community, public entity, and business level needs to occur, •The role of individuals, households, and businesses in making change •How to make those changes correctly, and •What the benefit/incentive to them might be; for example, articulating that switching to solar energy and or an electric bus fleet might help reduce bills
I 2-5	Continue and expand sustained outreach and engagement efforts that seek to build and maintain direct relationship with under-resourced, traditionally marginalized, and climate vulnerable communities.

Return to **Implementation** section.

Strategy TL 1 Decrease community wide Vehicle Miles Traveled (VMT) by 5% by 2030.

TL 1-1	Continue sidewalk and bikeway construction and education projects that promote active transportation in alignment with the 2023 Kane County Bike and Pedestrian Plan.
TL 1-2	Conduct, or hire a consultant to conduct a neighborhood walk audits to ensure streets are free from any hazards and ADA accessible.
TL 1-3	Explore “market development” strategies, which would remove barriers for small-scale retail and essential services like daycare centers, especially those located within areas which would promote and support walk, bike, and alternative transportation access.
TL 1-4	Support businesses that make car sharing convenient and affordable by reducing sales tax on car sharing services.
TL 1-5	Support the efforts of special service districts to improve streetscapes and encourage walking and bicycling
TL 1-6	Support a new state multimodal transportation funding source for transit, bicycle and pedestrian services and facilities. Advocate for including provisions that prioritize transit and multimodal designs for facilities
TL 1-7	Continue to support the development of neighborhoods with walkable and bikeable access and connections to services, nature, transit and destinations, locally and across the community, by: a) Establish and implement a Healthy Connected City strategy to bring complete neighborhoods to 80% of the community's population by 2035. b) Completing a Comprehensive Plan with supportive maps, goals, policies and projects.
TL 1-8	Improve design and development standards for multifamily buildings and driveways to create more pedestrian-friendly environments. This could include landscaping and open space standards, building design and parking maximums and design standards.
TL 1-9	Support centrally located and regionally significant industrial areas that may provide for future intermodal facilities and also enable efficient local deliveries.
TL 1-10	Implement a large-scale public bike sharing program to support continued population and employment growth and mobility within community. Explore opportunities to support bike sharing of cargo bikes. Review programs adopted by other communities to support program design.
TL 1-11	Collaborate with school districts to help more students attend schools near their homes by expanding the Safe Routes to Schools Program for community schools. This involves working closely with schools to create and put into action plans that promote safe walking and biking to school.

Return to **Transportation and Land Use** section.

Strategy TL 2 Increase public transit commuter ridership from 2.24% to 6.5% by 2030.

TL 2-1	Use regulatory and voluntary tools to promote affordable and accessible housing development along existing and planned high capacity transit lines, frequent transit routes and in opportunity areas identified by planning department. Include identification of affordable housing areas within all future regional planning projects and evaluate needs for safe, direct bicycle and pedestrian access to transit in areas near affordable housing.
TL 2-2	Consider linking parking requirements to mode share targets.
TL 2-3	Collaborate to rapidly deploy public transit solutions such as bus rapid transit (BRT) or light rail to community hot spots, which could be areas with high congestion, populous areas with currently limited access to public transit, or areas with issues that increase single-occupancy vehicle (SOV) use within the community.
TL 2-4	Expand access to transit including implementation of a community-wide EcoPass (unlimited rides within community) and expansion of Bus Rapid Transit routes.
TL 2-5	Invest in infrastructure that supports bus operations and more comfortable and welcoming bus stop environments.
TL 2-6	Incorporate feedback of low-income and transit-dependent populations in planning and build-out of these lines to increase transit options and quality of life
TL 2-7	Collaborate with partners including IDOT, PACE, Metra, public entities, and local governments to implement and expand Intelligent Transportation Systems strategies to improve multi-modal travel times and user experience.
TL 2-8	Establish a Transportation System Plan which incorporates a) Transportation-related carbon reduction and vehicle-miles-traveled reduction targets in line with this plan. b) A policy that supports criteria on climate, equity, economic benefit, health, safety and cost effectiveness for project evaluation, development and funding decisions and for performance monitoring. c) Improved city and regional level of service standards to reflect bicycle, pedestrian and transit needs and urban congestion thresholds.

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Strategy TL 3 **Increase average population per developed acre by 4.5% by 2030** (from 6.07 to 6.35 ppl/acre).

TL 3-1	Encourage the establishment of development of accessory dwelling units ("ADU") to create additional legal ADUs compatible with residential neighborhoods. This will add additional housing options for the community's workforce, seniors, families with changing needs, and others for whom ADUs present an affordable housing option.
TL 3-2	Conduct a review of zoning code to highlight opportunities to update the code and promote appropriate increased density including changes to height, floor area ratio (FAR), incentives or specific design requirements that would promote energy efficiency, renewable energy, local food production and transportation options. Explore partnering with other jurisdictions to conduct simultaneous collaborative reviews of multiple jurisdictions within the county.
TL 3-3	Explore providing height or density bonuses for leasable ground floor commercial spaces within multi-family housing projects.
TL 3-4	Review, select, and use a Transportation Sustainability Rating System to ensure major infrastructure, transportation, land use, community development and project development plan and investment decisions align with the goals of this plan.
TL 3-5	Identify underutilized paved areas and incentivize conversion to sustainable green space or infill development. Conversion focus should take into consideration neighborhood's greenspace, heat island mitigation, affordable housing, and bike/walk mobility needs and prioritize site utilization based on addressing the greatest needs at each site as determined through appropriate engagement with the community, particularly people traditionally under represented.
TL 3-6	Incentivize the development of brownfields, vacant land, and abandoned buildings within medium and higher density areas. Identify unused industrial-zoned areas and explore rezoning to increase viability of development opportunities. Offer tax or other incentives to those located along transit and multi-modal corridors and those who agree to implement green technology such as green roofs, LEED certified buildings, solar arrays, geothermal heating, etc.

⏮ Return to **Transportation and Land Use** section.

Strategy TL 4

Increase battery electric vehicle (BEV) use to 15% of vehicles on the road by 2030 (from approximately 2,550 vehicles to 99,000 vehicles community-wide).

TL 4-1	Create an Public EV Charging Community Readiness Plans. Plan should create community-wide and public facility electric vehicle (EV) charging station study and masterplan to: 1) Map existing infrastructure, 2) determine the current and future demand for EV charging stations to meet goals of this plan 3) create increased public access to chargers, 4) identify locations for chargers in commercial areas, 5) identify DC Fast Charging locations 6) explore charging infrastructure technologies including streetlight integration and smart cable technologies, 7) address barriers to charging at homes and rental properties (such as households without garages), 8) identify strategies to increase use of EVs in car sharing programs, and 9) assess the potential to partner with third-party EV charging station providers to lower program and construction costs.
TL 4-2	Collaborate with local partners and electric utilities to study anticipated demands on the electric grid associated with increased electric vehicle utilization and create a grid enhancement plan to address demand need. Study should include innovative grid management approaches like vehicle-to-grid (V2G) systems where electric vehicles can be used as energy storage batteries, saving up energy to send back into the grid at peak times.
TL 4-3	Collaborate with partners to incentivize electric vehicle infrastructure by identifying appropriate locations that are convenient to residents, businesses, and visitors to community.
TL 4-4	Collaborate with partners such as businesses, school districts, fleet operators and transit providers including taxi fleets within community to work towards a goal that buses and fleets based and operating in the community be 50% electric by 2030 and 100% by 2035. Goals should include fuel economy target exceeding US Energy Information Agency projections for remaining internal combustion engine (ICE) portion of fleets. Work with transit agencies and bus companies to take advantage of federal transit grant opportunities to purchase new electric vehicles. Goal: 30 New organization commitments annually
TL 4-5	Organize and promote an electric vehicle (EV) Group Purchase campaign for public entity fleets, business fleets, and interested residents annually to partner with local dealerships to offer limited-time discounted pricing on EVs to help reduce the costs of EV purchase through volume purchasing power.
TL 4-6	Develop an incentive program to convert fuel-burning lawn equipment such as gas-powered lawn mowers and blowers to electric. Coordinate with utility rebate programs and state and federal incentives to promote electric yard equipment.

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Strategy TL 5

Establish viable renewable fuels in the economy and support infrastructure expansion and fuel adoption. Achieve 20% diesel consumption replacement by 2030. (Renewable fuels include hydrogen, renewable diesel, and bio diesel)

TL 5-1	Promote and support the conversion of all operations diesel fuel utilization to renewable and/or bio diesel fuel by 2030.
TL 5-2	Conduct, or hire a consultant to conduct a "Renewable Fuel Study" to identify viable no/low emission diesel vehicle fuel alternatives, sources, and outlets for increasing no/low emission fuel alternative availability and utilization. Study to include analysis of efficiency chain and impact on land use and other communities. Study may include exploration of existing supply chains as well as potential new sources such as through a locally operated biodiesel plant, renewable diesel produced through renewable energy and electrolysis plant, plasma gasification plant producing hydrogen or renewable diesel, as well as other hydrogen generation and supply chain opportunities.
TL 5-3	Develop a pilot project based on findings of the Renewable Fuel Study to assess opportunities for region wide adoption or production.
TL 5-4	Collaborate with the Midwest Alliance for Clean Hydrogen and other potential partners identified on the US Department of Energy's H2 Matchmaker to identify opportunities for expanding hydrogen supply chain availability and utilization within Kane County.
TL 5-5	Identify and engage partners to establish adequate bio and/or renewable diesel supply chain for community.
TL 5-6	Collaborate with the Midwest Alliance for Clean Hydrogen and other potential partners on continued research on hydrogen, and hydrogen plus natural gas blended fuel for industrial transportation such as long-haul trucking and freight train operations.

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Strategy TL 6

Achieve 100% conversion of gasoline passenger vehicles within local government and public fleets to EV's by 2030 (excludes law enforcement patrol). Achieve 100% conversion of all gasoline vehicles within local government and public fleets to EV by 2040 and all diesel vehicles by 2050.

TL 6-1	Encourage the phase out the use of gas- and propane-powered leaf blowers, lawn mowers, and construction equipment within local government and public entity equipment fleet.
TL 6-2	Conduct, or hire a consultant to conduct an Electric Vehicle Suitability Assessment (EVSA) for vehicle fleet. The EVSA should include fleet vehicle use case identification and operational monitoring resulting in determination of viable alternative fuel vehicle options for near, mid, and long term replacement. EVSA should include an overview of "EV Ready" strategies to support conversion of the vehicle fleet and equipment to EV, establish a charging station implementation plan for facilities, and identification of group purchase options, funding, and incentive.
TL 6-3	Encourage the establishment of a vehicle purchasing plan and budget process to default to no / low emission alternative fuel with traditional internal combustion engine (ICE) as optional requiring proof of need. Plan will take emissions/fuel reductions into account when purchasing vehicles/equipment. Focus on small vehicles as well as large vehicles for alternative fuels. EV replacement to be prioritized for high mileage vehicles.
TL 6-4	CA Diesel Free Transition Plan (DFTP) for diesel equipment in vehicle and equipment fleets. The DFTP should include fleet vehicle use case identification and operational monitoring resulting in determination of viable alternative fuel supply chain and vehicle options for near, mid, and long term replacement. Alternatives explored should include hydrogen, renewable diesel produced through renewable energy and electrolysis plant, plasma gasification plant producing hydrogen or renewable diesel, and biodiesel. The DFTP should include an overview of "Diesel Free Ready" strategies to support conversion of the diesel vehicle fleet and equipment to alternatives, establish an infrastructure implementation plan for facilities, and identification of group purchase options, funding, and incentives such as grants from the US EPA and other agencies in support of the Diesel Emissions Reductions Act (DERA).
TL 6-5	Assemble a team of content experts to present to and encourage local governments and public entities in the community to adopt strategies transitioning from internal combustion engine (ICE) vehicles to EV vehicles. Establish a process to support and promote a series of presentations and listening sessions with local government leaders. A position could be created and funded by a grant.

Strategy TL 7

Increase fuel efficiency of remaining combustion engine vehicles in local government and public fleets by 5% by 2030.

TL 7-1	Work with vehicle lease partners to identify fuel-efficient ICE vehicle lease options achieving a minimum 10% increase in fuel efficiency by 2030 where EVs are not available/practical.
TL 7-2	Ensure compliance with State of Illinois anti-idling law among local government staff and support improved fuel efficiency by compiling an "Eco Driving Guide" to distribute to all employees and include in new employee training.

⏮ Return to **Transportation and Land Use** section.

Strategy BE 1 — Improve total community wide residential, commercial, institutional, and industrial building energy efficiency by 12% for electricity and natural gas by 2030.

BE 1-1	Promote existing incentives for improving energy efficiency and renewable energy (e.g., insulation, energy-efficient windows, electric heat pumps, solar panels) in new construction and retrofit residential and commercial properties. Establish an Energy Efficiency (and Fuel Switching) Concierge service to assist building owners in identifying energy efficiency resources, rebates, tax credits, and programs appropriate for their home or business. Coordinate with Inflation Reduction Act, State programs CEJA, Utility incentives and PACE financing information. Goal: 3,500 households annually achieving a 15% efficiency increase per household. Goal: 200 commercial properties annually achieving a 15% efficiency increase per property.
BE 1-2	Collaborate with other communities, the Metropolitan Mayors Caucus, industry, and state agencies to support State and local government clean energy policies which support plan goals. Each legislative session, prioritize proactive clean energy policies, such as: State Renewable Portfolio Standard Increase (e.g., 25% by 2025), improved net-metering laws, legislation that allows Residential PACE Programs
BE 1-3	Modify the Kane County Affordable Housing Fund to prioritize and incentivize affordable housing projects which meet an energy efficiency standard, like Sustainable Buildings 2030 (SB2030), LEED Gold, Enterprise Green Communities, the 24 National Green Building Standard ICC/ASHRAE 700, or an equivalent certification. Include a requirement to include equipment selections which promote ease of long-term maintenance and economy of upkeep/replacement costs.
BE 1-4	Identify businesses in the community that have energy and/or climate goals and highlight them as leaders and examples. Hold stakeholder meetings with owners / managers of the largest buildings within the community to share the goals of this plan, advantages to property owners for meeting the goals, and available resources and funding available for energy efficiency, renewable energy, and building resilience upgrades.
BE 1-5	Encourage and support the development of a rental housing energy efficiency policy by recommending single family & multi-family rental housing report energy efficiency (and meet minimum energy efficiency) to qualify for rental licensing. Program to include an energy efficiency rating system (ENERGY STAR or HERS). Educate about the 45L Tax Credit (single family) & 179D (multi-family)
BE 1-6	Consider adopting an Energy Code establishing energy efficiency, renewable energy, and building resilience standards in line with this plan. Alternatively, strongly encourage use of the State of Illinois Stretch Code for projects within your community. Identify local government staff or partners to provide training for building officials, contractors, and designers.
BE 1-7	Explore establishing a Home Energy Scores program (performance tracking and reporting) and labeling program for homes listed for sale.
BE 1-8	Incentivize projects receiving public funding, PUD, CUP or other zoning action to meet an energy efficiency standard, like Sustainable Buildings 2030 (SB2030), LEED Gold, Enterprise Green Communities, the 24 National Green Building Standard ICC/ASHRAE 700, or an equivalent certification.

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BE 1-9	Establish a Kane County Energy Benchmarking and Disclosure Collaborative to support the energy benchmarking process of monitoring and reporting associated with the Building Performance Ordinance and Residential Energy Benchmarking program. The Collaborative should include "how-to" resources for energy benchmarking and provide opt-in program support for municipalities and opt-in building benchmarking support for individual building owners.
BE 1-10	Establish a Building Performance program that assists commercial and industrial buildings over 20,000 sf to track and report energy use – and eventually to implement specific energy efficiency actions.

Strategy BE 2

Increase adoption of high performance building construction technology, achieving 1% Net Zero households and commercial properties community wide by 2030. (Net Zero buildings are energy efficient buildings that produce as much energy on-site as they consume in a year)

BE 2-1	Establish a Net Zero / Green Building Resource Center to provide general and technical assistance about Net Zero strategies,, green materials, energy efficient appliances and equipment, lighting, renewable energy generation, and to provide information on available rebates to residents and others. Continue to provide resources to help residents and businesses make informed decisions about renewable energy options including on-site solar, green energy purchases, and community solar. Encourage businesses and residents to participate in utility offered renewable energy purchase programs. Assemble a list of all program offerings with links to utility resources.
BE 2-2	Establish a Net Zero Energy Building Guide providing building owners, renters, developers, designers, and contractors with detailed information on strategies to make new construction or significant renovation projects Net Zero Energy or Net Zero Energy ready. Include a project strategy checklist for building owners and teams to use and report sustainable strategies used.
BE 2-3	Establish a program to encourage and educate residents and businesses on the benefits of Net Zero Energy and on-site solar, share best practices, providing training, technical assistance, and promote the Net Zero Energy Building and Solar-Ready Guides. Include promotion of rebates and tax credits available for energy efficiency, high performance buildings, and on-site renewable energy, particularly those included in the Inflation Reduction Act. Partner with municipalities to provide and promote educational events.
BE 2-4	By 2027, analyze the need for a Net Zero Ready ordinance for new construction to be Net Zero Ready with no natural gas carbon emissions. Ordinance should be coordinated with the CEJA Stretch Code and extend beyond to focus on net zero construction and could be based off of Department of Energy ZER-H program.
BE 2-5	Develop competitive Request for Proposal for effective and innovative Net Zero pilot projects. Focus on "Net zero building in every neighborhood" to establish visibility of strategies throughout the community. RFP should encourage high quality mixed use redevelopment on infill properties and existing surface parking lots along transit oriented development corridors. RFP's should focus on equity, affordability, livability, and compliance/support of the plan goals.

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Strategy BE 3 Achieve 10% residential and commercial and industrial building "fuel switching" from on-site fossil fuel combustion to electrification by 2030.

BE 3-1	Implement a residential and small business "Electrification and Energy Efficiency/Weatherization" program (strategies include energy efficient zero fossil fuel combustion heating systems such as air source heat pumps, and ground source heat pumps). Program design to focus on improved equity (residential and commercial) in its implementation and explore strategies to support local small business contractors. Goal: 10% residential market conversion (2,500 households annually) and 5% commercial/industrial market conversion (an estimated 85 businesses annually) by 2030
BE 3-2	Identify, create, and promote incentives for low-income residents to electrify their homes.
BE 3-3	Work with utilities, including municipal utilities, to incentivize and promote replacement of inefficient building heating and cooling equipment before end-of-life, Goal: achieve 500 households replacing equipment annually.
BE 3-4	Collaborate with partners to educate contractors, installers, and homeowners about benefits of electrification and other on-site fossil fuel combustion reduction strategies, currently available technology such as heat pumps, and manufacturer resources for installation training and support.
BE 3-5	Explore existing and proposed Natural Gas bans and create an ordinance for adoption consideration.
BE 3-6	Create a heat pump grant to augment available federal tax credits to incentivize fuel switching. Incentive could be coordinated or combined with other energy efficiency / weatherization incentives.
BE 3-7	Create a volunteer think tank to Identify facilities in the community with excess waste heat and explore the potential of establishing a thermal energy grid or micro-grid. Consider creating a database to contain data from all studies from this plan.

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Strategy BE 4

Increase renewable energy to 25% (on-site and green source purchase) **of community-wide residential, commercial, institutional, and industrial building electric use by 2030.**

BE 4-1	Identify public entity owned sites suitable for hosting community solar arrays (including ground mounted and rooftop mounted options) and select site(s) to host a community solar array. Develop community solar array prioritizing low and middle income household subscribers. Once identified, organize, issue, and promote a Request for Proposals for community solar developments capable of serving residents and businesses interested in subscribing, particularly low income renters and home owners. Community solar developments may be within or outside of community boundary but those within community boundary should be prioritized. Provide communications and subscription procurement support to selected community solar developer. Goal: 12,500 MWh delivered through community solar subscriptions within County annually by 2030.
BE 4-2	Establish a Solar Ready Guide providing building owners, renters, developers, designers, and contractors with detailed information on strategies to make new construction or significant renovation projects fully Solar Ready enabling more cost efficient and easier installation of on-site solar arrays.
BE 4-3	Consider the adoption of a Solar Ready Ordinance to require all new residential, multifamily residential and commercial buildings to be solar ready based on a Solar Ready Guide, with flexibility for site suitability. Provide resources to help residents and businesses make informed decisions about renewable energy options including on-site solar, green energy purchases, and community solar.
BE 4-4	Identify, or hire a consultant to identify the "Solar Top 100" commercial/industrial properties within the community and produce detailed solar feasibility assessments for each site. Include a "Top 20 Community Solar" study to identify top potentials to support community solar benefits for low income residents. Include exploration of "carport" array options over large pavement expanses as well as large rooftop arrays on public facilities. Assessments to include potential solar generation and economic performance and return on investment estimates, information on financing and ownership models, and next step resources. Provide solar assessment reports to properties and provide an informational workshop to assist building owners and businesses in understanding the assessments, incentives, and next step potential. "Solar Top 100" assessment effort could be repeated annually.
BE 4-5	Create, or hire a consultant to create a Clean Energy Equity plan to support low-income residents and small organizations in purchasing renewable energy and reducing overall energy poverty (high energy burden) within the community.
BE 4-6	Build on current pilot study exploring best use of solar on farms and implement recommendations and findings of the pilot study to expand appropriate opportunities for solar on farms.
BE 4-7	Develop renewable energy program(s) which increase utilization of on-site / in-community renewable energy while creating benefit for low-income community members. Example programs include City of Dubuque Low Income Solar Renewable Energy Credit (SREC), Leech Lake Band of Ojibwe Community Solar for Community Action, and Texas Energy Poverty Research Institute Community Solar Program Model. Goal: 12,500 MWh clean energy delivered through programs annually by 2030.

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Strategy BE 5 — Increase resilience of community-wide buildings to potential impacts of climate change. (impacts include increased flooding risk, increased extreme weather events, and increased extreme temperature events)

BE 5-1	Create "safe haven" sites to act as hubs that provide community access to basic services during periods of power system failure, Provide solar-plus-storage energy generation at safe haven sites to power through renewable energy.
BE 5-2	Conduct, or hire a consultant to conduct a Facilities Resilience Assessment and Implementation Plan outlining appropriate facility resilience upgrade projects and establishing a timeline for implementation. Resilience considerations to include flooding, flash flooding, and urban heat island mitigation among other considerations. Resilience assessment should include considerations for how facilities can enhance or support resilience for surrounding community, particularly vulnerable populations (i.e. establishment of cooling center access, etc.).
BE 5-3	Map critical community infrastructure and operations and identify opportunities to upgrade energy systems that would enable these sites to sustain operations during periods of power grid disruption, prioritizing solar systems.
BE 5-4	Include educational and promotional material in zoning processes to increase greater awareness and adoption of climate resilience strategies, energy efficiency, clean energy, and water conservation improvements

Strategy BE 6 — Improve total government building energy efficiency by 15% by 2030. (electricity and natural gas, including water and wastewater infrastructure)

BE 6-1	Complete conversion of all streetlights to LED by 2028.
BE 6-2	Review all large capital expenditures against the GHG emission reduction and climate adaptation goals of the CAIP. Capital projects to be reviewed against their projected contributions in reduced GHG emissions, energy use, and vehicle-miles-traveled as well as the project's projected social cost of carbon savings, climate resilience and life-cycle costs. Explore development of project calculator tools to evaluate capital project proposals against plan goals and make tool available for private projects under development in the community (see City of Eau Claire WI land use calculators and Harvard Life Cycle calculator).
BE 6-3	Conduct, or hire a consultant to conduct a Facilities Energy Audit on all buildings and sites (including outdoor lighting conversion to Dark Sky approved LED lighting). Use results from Facilities Energy Audit to prioritize Capital Improvement Plans (CIPS) and maintenance improvements to achieve energy efficiency goals. Establish a timeline for improvements with implementation occurring within 5 years of completion of energy audits.
BE 6-4	Establish, or update Green Building Policy to encourage LEED Gold and to achieve 7 points within the LEED Optimize Energy Performance category as well as 8 additional points within the LEED Energy and Atmosphere category.

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Strategy BE 7 Achieve 25% government building thermal "fuel switching" from on-site fossil fuel combustion to electrification by 2030.

BE 7-1	Conduct, or hire a consultant to conduct an "Electrification Assessment and Action Plan" to outline actions and priorities for electrification of all local government owned facilities to move towards zero on-site fossil fuel combustion to meet or exceed 25% fuel switching by 2030. Work with regional energy partnerships to implement plan for all facilities. Include new and existing buildings, explore strategies to address electricity storage, and create a case study to highlight and share challenges, solutions, and lessons learned to share with the broader community.
BE 7-2	Support the establishment of a Green Buildings Policy to phase out on-site fossil fuel combustion and incentivize all new local government or publicly owned buildings to be 100% electric by 2027.

Strategy BE 8 Increase renewable energy to 100% (on-site and green source purchase) of government building electric use by 2030.

BE 8-1	Conduct, or hire a consultant to conduct a detailed solar assessment and "Renewable Energy Master Plan" for all primary publicly facilities. Master Plan should include exploration of on-site renewable options, community/shared renewable options, and Renewable Energy Credit (REC) options and provide an implementation plan for achieving 100% renewable energy for all facilities and operations. Incorporate strategies to address electricity storage, and focus on highlighting any hurdles or solutions that would be applicable to the broader community. Largest energy consuming properties should be prioritized for assessment. Provide an overview of funding strategies and incentives including those in the Inflation Reduction Act of 2022, and illustrate potential return on investment and operational savings.
BE 8-2	Install solar on all publicly owned buildings and sites, where feasible based on the findings and recommendations of the Facility Solar Feasibility and Master Plan study by 2027. Explore implementation of micro-grid, solar+storage and other options for improved facility resilience. Explore including facility solar purchases in community-wide commercial / institutional solar group purchase campaigns.
BE 8-3	Collaborate with partners to conduct, or hire a consultant to conduct a study to identify renewable energy generation potential, including on-site generation of Renewable Natural Gas (RNG) and/or plasma gasification, at all solid waste and wastewater treatment facilities within the community. Identify a pilot project for implementation by 2028.

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ACTIONS

Waste Management

Strategy WM 1 — Decrease total municipal solid waste handled 2.5% by 2030 (-17.5% estimated per household decrease).

WM 1-1	Create a comprehensive community-wide communication campaign to provide standardized information and communication on waste reduction, reuse, recycling and organics collection option and promote existing resources, services, incentives, and programs. Include identification of regional and local resources, as well as proper recycling, composting and source reduction methods. Partner with local government and public entity departments and other regional recycling and re-use organizations for promotional content sharing. Explore establishing a vintage or re-use festival.
WM 1-2	Collaborate with regional waste audit and diversion service providers to develop and fund a Waste Audit and Diversion Assistance Program for businesses. Program to support businesses in establishing tracking and reporting waste streams, identify reduction, diversion, beneficial use opportunities, identification of potential financing sources, and connect businesses with energy audit and other resources in support of full CAIP goals. Goal: 40 business waste audits completed annually with businesses engaged in measuring and diverting waste.
WM 1-3	Encourage and support creative solutions to consumption reduction: reuse, repair, and repurposing initiatives, including tool libraries, library of things, swap events, food-share opportunities, repair clinics, etc. Establish mini-grant programs to increase options and utilization.
WM 1-4	Collaborate with partners to explore options for expanding or establishing local facilities capable of accepting and processing organics composting / recycling to meet goals of this plan.
WM 1-5	Develop resources for a Universal Zero Waste Resolution, a non-binding document to encourage all waste handing contracts to provide recycling and compost collection services and supporting businesses to use these services.
WM 1-6	Support product stewardship and other legislative efforts at a state and federal levels to reduce the creation of waste
WM 1-7	Identify and promote reuse stores, "community shelves" and repair businesses and opportunities which can reduce the disposal of used goods.
WM 1-8	Conduct, or hire a consultant to conduct a comprehensive assessment of pricing incentives and penalties for residential waste and recycling services and identify strategies, such as volume-based variable-rate pricing, that could increase recycling and reduce waste. Develop resources for municipalities such as example bid specs, contract language, etc.
WM 1-9	Expand consumer education (e.g. host community forums and provide direct outreach) on sustainable consumption, materials management, available services, incentives, and facilities as well as proper recycling, composting, and source reduction methods.
WM 1-10	Research management practices of construction and demolition waste diverted from the landfill. Provide best practices education, training, and resources to contractors, designers, and building owners.

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WM 1-11	Provide educational information and supporting resources for sustainable material management of construction and demolition (C&D) debris recovery.
WM 1-12	Support municipalities in establishing a Checkout Bag Charge and Recyclable or Compostable Pre-Checkout Bag Ordinance to reduce litter and waste and reduce contamination in recycling.
WM 1-13	Establish a phase out of single-use products by 2026 by implementing an opt-in fee for such products. This should apply to (but not limited to) bags (both paper and plastic), utensils, napkins, and take-out containers. Explore the feasibility of establishing a reusable takeout container service within the community. Applies to businesses of any size. Encourage restaurants to allow customers to bring their own take-out containers.
WM 1-14	Support state legislation to prohibit Styrofoam ; incentivize restaurants to choose alternatives ; education campaigns on single use items and consumer choice

Return to **Waste Management** section.

Strategy WM 2 — Achieve 35% organics landfill waste diversion by 2030 (from 6.7% to 15% of total MSW).

WM 2-1	Conduct, or hire a consultant to conduct legislative research to analyze compost facility permitting in states with robust commercial composting (e.g., California, Washington, Minnesota) vs. Illinois legislation and regulations and make a proposal for legislative change to enable robust food scrap composting in Illinois and Kane County communities.
WM 2-2	Combat food waste by partnering with municipalities to encourage retailers and restaurants to donate, reduce, reuse, or compost their unsold food, creating "zero-waste sections" where products are sold close to their expiration dates, and designating "zero-waste coaches" to raise awareness among staff and help manage products reaching the end of their marketable life. Edible unsold products shall be donated. When not edible, organic waste shall be composted through a City-approved vendor.
WM 2-3	Expand networks for food rescue efforts to connect to hunger services. Collaborate with partners to create, incentivize, promote and expand networks for food rescue efforts to connect to hunger services as well as sourcing, distributing and marketing cosmetically imperfect produce particularly those which provide affordable produce to low income and food insecure community members.
WM 2-4	Work with municipalities that do not currently include comingling of food scrap collection with yard waste in their waste programs to include it in their next bid for hauling services and to advertise it to residents.
WM 2-5	Establish a pilot organics diversion and composting program. Explore the potential for compost pickup as well as on-site composting programs.
WM 2-6	Close the loop on organics recycling; use compost as a soil amendment for all Kane County projects, prioritizing locally developed compost where possible. Encourage private construction projects to do the same.
WM 2-7	Highlight the benefits of compost being used as a soil amendment and integrate the usage during routine landscape maintenance on local government or public properties.
WM 2-8	Increase support for back-yard composting for communities without curbside compost pickup including compost education and improved access to materials like compost bags and composters.

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Strategy WM 3 Increase recycling from 31% to 37% of total MSW handled by 2030.

WM 3-1	Collaborate with partners such as Chamber of Commerce, downtown business associations, community businesses, and colleges and universities to create a recycling and reusable products marketing campaign and branding and provide reduce/recycle marketing and signage at storefronts, in parking lots, at point-of-sale, on websites, in local papers, on TV, etc. Campaign to standardize information and communication on solid waste, recycling, and organics options.
WM 3-2	Consider developing ordinances requiring commercial customers to recycle material streams like cardboard, paper, beverage containers, etc. Collaborate with other local governments for joint enforcement of county and municipal ordinances.
WM 3-3	Work with state agencies to support the enforcement of the Illinois Solid Waste Management Act (415 ILCS 20). Increase support for enforcement of the Kane County Recycling and Hauler Licensing Ordinance 95-157. Liaison with any city that is exempted to work towards cooperative agreements implementing the same.

Strategy WM 4 Decrease municipal solid waste from government operations 15% by 2030.

WM 4-1	Ensure recycling is provided and utilized at all local government or public facilities. Coordinate with public partners to ensure recycling is provided and promoted in all schools, municipal buildings, public housing, and public spaces. Include coordination on recycling education and communications to improve reduction of contamination.
WM 4-2	Educate local government or public entities on making zero and reduced waste events standard for large community events (in-door and out-door). Hosts of events on local government or public entity properties to provide a comprehensive waste management plan meeting requirements of local waste policies.

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ACTIONS Water and Wastewater

Strategy W 1 Promote increased water conservation and wastewater generation community-wide with a targeted reduction of 5% by 2030.

W 1-1	Facilitate reduction of water use by top customers annually through an opt-in water reduction program targeting water reduction goals of 20% or more per site. Offer free technical resources to large institutions and businesses to identify specific opportunities for employees or customers to conserve water and incorporate water efficiency into internal operations. Goal: 40 business water use audits completed annually with customers engaged in measuring and reducing water consumption. Note, could be implemented in combination with the Waste Audit and Diversion Assistance Program (see the Waste Management section)
W 1-2	Advocate for updated building codes to require water conservation measures (e.g, rain water collection, water-efficient irrigation systems, native and drought-resistant landscaping) in new construction and renovations. Collaborate with municipalities to establish ordinance prohibiting Home Owner Associations from requiring lawn watering.
W 1-3	Establish and promote a program supporting the installation of low-flow water fixtures in residential homes and commercial businesses as well as opportunities for real-time water and energy metering that may help customers better understand and reduce their water and energy consumption. Program may be integrated or coordinated with Energy Audit/Energy Efficiency Program(s) in the Buildings and Energy section of this plan. Goal: achieve 500 households and 40 businesses upgraded annually
W 1-4	Encourage rainwater collection systems and Water Sense water efficient fixtures and appliances at all local government and public facility projects and all projects receiving public funding.

Strategy W 2 Update design standards and implement plans to meet projected climate change storm water and flood mitigation requirements.

W 2-1	Coordinate with municipalities to create and implement watershed based plans that are actively used in development and design.
W 2-2	Update the Stormwater Master Plans to incorporate projected increases in precipitation and extreme weather events and address the development/redevelopment of properties currently exempted from stormwater management requirements. Use future precipitation data from climate models for evaluation of designs. Plan should address individual wells and water quality issues developing as a result of increased chlorides.
W 2-3	Develop green infrastructure implementation goals in-line with the Kane County Hazard Mitigation Plan and integrate with community's plans. Seek funding opportunities through Federal Emergency Management Agency (FEMA)'s Building Resilient Infrastructure and Communities (BRIC) Grant Program. Include a focus on equity in implementation.
W 2-4	Explore adjustments to allowable floor to area ratios in zoning ordinances to increase community stormwater resilience and improve water quality.

⏮ Return to **Water and Wastewater** section.

Strategy W 3 Increase groundwater, stream, river and wetland water quality protection and restoration.

W 3-1	Conduct, or hire a consultant to conduct a stormwater management study exploring full range of methods of stormwater management including permeable pavements, bioswales, rain gardens, biochar amendments in soils with high clay content, and flood-tolerant plantings. Establish a recommended percentage goal of stormwater from local government controlled impervious surfaces with sustainable stormwater strategies by 2030. Findings of study to be integrated into updated appropriate local government plans with recommended implementation projects.
W 3-2	Educate and incentivize reduced home, business, and local government fertilizer usage, increased use of locally-sourced compost, improved agricultural soil health, and upgrades to wastewater treatment facilities to reduce and eliminate water runoff capable of causing water quality impacts on the community's surface water (such as algae blooms and hypoxia, low oxygen levels, which harm fish)
W 3-3	Prioritize managing stormwater before it enters the sewer system through a combination of overland flow, detention, and infiltration strategies (for example, permeable surfaces)
W 3-4	Install rain gardens at local government facilities and encourage them at other public agency sites, including parks and school districts. Identify and support programs promoting increased on-site storm water management such as rain gardens and impervious surfaces as well as commercial, institutional, and residential sites.
W 3-5	Support collaboration in watersheds that cross public entity jurisdictional lines. Work with partners to create accessible and useful environmental impact statements (EIS) for residents and businesses. EISs to include a climate change impact, and the options for development available within them need to be widely accessible and easy to adopt.
W 3-6	Conduct, or hire a consultant to conduct a comprehensive study to determine the value of existing arable and open lands for water reclamation, deep, and shallow aquifer replenishment so as to better understand and preserve optimal sites against careless development.
W 3-7	Involve land managers to develop management approaches to conserve and restore riparian zones along tributaries that lead to the Fox River
W 3-8	Promote native landscaping, restore and conserve habitat; encourage rain gardens on private property, avoid turf grass, and convert publicly-owned space to include stormwater absorption features. Tree selection should consider those on the “Adaptive Planting List” which will thrive in our future local climate (refer to Chicago Botanic Garden’s “Trees for 2050”)
W 3-9	Develop a program to provide incentives to property owners for improved stormwater management to be paid for in part by a stormwater utility fee assessed based on the amount of stormwater generated by a property. Include an evaluation of a stormwater utility fee on lower- and moderate-income residents and property owners
W 3-10	Identify areas for restoration to increase and improve stream and wetland protection, identify preferred restoration strategies appropriate for target areas, and establish an implementation plan and a funding strategy.
W 3-11	Establish a Sustainable Development Incentive to encourage developers to implement sustainable practices including increased greenspace, wetlands, riparian and wildlife corridors, natural drainage-ways, and low-impact stormwater management like installing permanent infiltration or collection features (e.g., swale, culvert outfall, rainwater cistern) that can retain 100 % of the runoff.
W 3-12	Assess the need for a Stormwater Utility Fee based on impervious surface and stormwater runoff calculations, including a Stormwater Credit for properties which implement strategies to meet or exceed stormwater retention and runoff reduction.

Return to **Water and Wastewater** section.

Strategy W 4 Educate, engage, and empower the public on water quality and conservation.

W 4-1	Protect natural waterways and lakes through addressing invasive species, pollution, recreation, fishing, etc. Support education and awareness that "explains the why" and supports understanding and "buy in."
W 4-2	Promote, share and create "Actions you can take" fact sheets for businesses, homeowners, rental property owners, and renters to increase water conservation, protect water quality, and increase resilience to water related climate impacts. Establish an accessible outreach and engagement plan to reach at-risk properties during infrastructure projects. Incorporate other resources such as "landscaping for absorption" practices (like native plantings, rain gardens, and bioswales) and MyRain Ready.
W 4-3	Develop educational materials to support the goals of the Water and Wastewater section. Materials should create greater awareness and adoption of water conservation; expand public awareness of the value of watersheds, rain gardens and low-impact development to address stormawater run-off; and covering the link between water resources and climate change and the risks to community residents and businesses.

Return to **Water and Wastewater** section.

Strategy FA 1: Increase share of farms using low emission or regernative agriculture practices. Achieve 50% carbon positive soil adoption rate by 2030. (measured by share of total acres)

FA 1-1	Collaborate with partners to improve data on existing regenerative practices within the community. Identify existing agricultural practices using a combination of currently available data from state and federal agencies and strategic surveys to local farmers. This action should focus on establishing a baseline as well as identify farmers who can serve as Champion Farmers supporting farmer-to-farmer network mentorship.
FA 1-2	Collaborate with partners and consultants to support farmers in soil health assessment for implementation of best management practices that optimize the efficiency of fertilizer use.
FA 1-3	Collaborate with partners and advocate for the development of a carbon credit program to compensate farmers for demonstrating increases in carbon sequestration. Funding mechanisms could include establishing an tax on auto gasoline and diesel and home heating fuel.
FA 1-4	Collaborate with partners including US DOE Hydrogen Hubs (Midwest Alliance for Clean Hydrogen and Heartland Hydrogen Hub) to identify opportunities to increase availability and use of Green Fertilizers throughout Kane County. Green Fertilizers are produced with renewable electricity, green hydrogen (hydrogen produced through renewable electricity), or green ammonia (ammonia produced through renewable electricity)
FA 1-5	Promote the adoption of low-emissions, carbon positive, sequestration, and ecosystem-service beneficial practices through education and/or incentives, with incentives focused on equity. Collaborate with partners to develop or expand on informational materials outlining low-emissions, carbon positive, sequestration, and ecosystem-service beneficial practices that can be used in the community and the area's range of cropping contexts (e.g., for corn, soybean, vegetables, etc.).
FA 1-6	Collaborate with partners to work with local farmers to promote the use of regenerative agriculture systems (e.g., no-till practices, perennial groundcover, alley cropping, silvopasture, succession planting, rotational grazing practices, etc) through incentives, workshops, and demonstration projects in order to increase carbon sequestration on farmland while also improving soil health and increasing resilience to climate impacts such as drought and flooding.
FA 1-7	Work with local farmers, ranchers, and land managers to promote and increase carbon-smart practices to increase carbon sequestration on agricultural lands. Develop a program by 2024 that, through targeted outreach, provides carbon sequestration education and resources to relevant stakeholders (e.g., farmers, ranchers, and land managers). The program will focus on educating stakeholders about the co-benefits of implementing carbon sequestration practices and the variety of financial and technical resources that are or may become available to assist farmers and ranchers in implementation. This program may be coordinated with industry groups and non-profits.
FA 1-8	Continue and expand work with agricultural organizations to create an outreach program with educational resources to inform and encourage community farmers and other stakeholders to adopt practices to reduce nitrogen fertilizer, increase crop diversity, and improve soil health and soil organic matter while ensuring fair incomes for farmers (such as perennial groundcover, rotational grazing systems, and other natural approaches).

Return to **Local Food and Agriculture** section.

Strategy FA 2 Reduce GHG emissions from animal agriculture, achieve 10% manure management adoption rate and 20% high feed efficiency and practices adoption rate by 2030.

FA 2-1	Collaborate with partners to commission a feasibility study of the potential costs, benefits, barriers, and opportunities associated with a biomass "upcycling" facility to convert marginal biomass streams into value-added biomass products. The upcycling facility could include a regional manure composting operation, a mixed substrate composting operation, and a processing operation for biomass harvested from nutrient catch strips and agricultural buffer strips.
FA 2-2	Collaborate to establish an educational campaign and advocate for and seek new or additional financial incentives and technical assistance, to improve management of manure to reduce methane and nitrous oxide losses including: i. Cover manure stockpiles and storage facilities, ii. Optimize timing and direct incorporation of manure application to soil, iii. Increase use of fertilizer and manure stabilization products (N-serve, MTM, etc.) to reduce gaseous losses
FA 2-3	Promote and encourage the development of value-added agricultural biomass waste opportunities such as composting, energy, biochar, and wood products.
FA 2-4	Establish a educational and communications campaign to advance low emission entric fermentation feed management practices including: increased feed quality/digestability; increased high-quality grazing; feed amendments such as seaweed; and agricultural waste treatment amendments.
FA 2-5	Collaborate to advocate for and seek additional financial incentives and technical assistance to livestock farmers to implement new or expanded high feed efficiency practices Climate Feed Management (CFM) programs, including both feed amendments (e.g. seaweed, biochar) and improved feed quality (e.g. forage quality). Seek partnerships and to direct additional funding through existing regional farm assistance programs.

Strategy FA 3 Increase production of and access to local food, particularly serving low income and food insecure individuals.

FA 3-1	Increase education around and access to local healthy food in Public Schools. Partner with schools and other organizations to create "edible school yards" and sustainable gardening programs at public and private schools. Include summer programming.
FA 3-2	Encourage and support a joint local food purchasing program for all local government, public entity, school district, and state facilities, operations, and events within the community.
FA 3-3	Work regionally to support and facilitate food donation programs. Food donation programs reduce the amount of healthy, safe food that goes to waste and redirects it to those in need.
FA 3-4	Improve the availability of culturally appropriate food accessible to the community's populations of color, religiously diverse, and limited English speakers. Explore opportunities to expand local development of these goods through engagement with local food producers and promote information on locations and price ranges of uncommon culturally important produce and food products.

⏮ Return to **Local Food and Agriculture** section.

FA 3-5	Equitability provide programmatic resources to: a) Increase the production and consumption of home-grown and locally sourced food by supporting farmers markets and community supported agriculture. b) Create policies and practices to encourage the purchase of healthy, climate-friendly and minimally processed foods for public meetings, events and facilities. c) Expand opportunities for food production and neighborhood-scale distribution including community gardens, especially for low-income populations and communities of color. d) Increase the use of public and private land and roof-tops for growing food. e) Increase the planting of fruit and nut trees in appropriate locations. f) Leverage the purchasing power of public and private institutions to source low-carbon and local foods including schools.
FA 3-6	Encourage multi-family properties developers to establish land for community gardens.
FA 3-7	Provide resources and information regarding community gardening and composting to educate the general public on how to grow edible plants with low inputs or organically.
FA 3-8	Increase capacity for community gleaning, defined as "the act of collecting excess fresh foods from farms, gardens, farmers markets, grocers, restaurants, state/county fairs, or any other sources in

Strategy FA 4 — Reduce food waste and hunger, achieve a 50% reduction in food insecurity community-wide by 2030.

FA 4-1	Collaborate with partners to strengthen and expand food rescue networks across the community, with the goal of boosting the retrieval of high-quality, nutritious food. This can be achieved by increasing the capabilities of food relief organizations, identifying and resolving distribution obstacles, enhancing communication, and expanding the availability of rescued food.
FA 4-2	Establish community gardens at local government and other publicly-owned spaces, especially those which can serve food insecure or low income community members.
FA 4-3	Create collaborative partnerships with community-based organizations and affinity groups (including low-income populations and communities of color) focused on promoting healthier, low-carbon diets, encouraging local food production, increasing the affordability of and access to healthy food (e.g., through neighborhood food-buying clubs and coops), and reducing food waste
FA 4-4	Create a community-wide mobile fresh food market to bring locally-produced fresh produce and perishable items to community members without farmer's markets or without a grocery store year-round, particularly during winter months.

Return to **Local Food and Agriculture** section.

Strategy FA 5 Protect and preserve agricultural land while increasing its resilience to climate shocks.

FA 5-1	Conduct, or hire a consultant to conduct a survey of the community's agricultural land with special care to note its potential for water reclamation, watershed protection, habitat preservation, and capacity to neutralize careless suburban sprawl so as to establish a benchmark of regional agricultural resilience practices, establish a benchmark, and practice adoption goals especially as it relates to rezoning and permitting of alternative land use.
FA 5-2	Collaborate with partners to develop a comprehensive farmland conservation plan that prioritizes food production while taking into consideration other greenspace and climate adaptation priorities. The plan could also include specific maps or areas prioritized for farmland conservation or identify those areas most at risk from development or climate change impacts. Program should focus on exploring increased local food-to-table, local food utilization, and local development of cultural food products in support of underserved communities.
FA 5-3	Establish and promote incentives to plant native prairie grass and wildflowers and other edge of field practices for treating tile water to mitigate nitrate runoff and reduce N2O.
FA 5-4	Support, identify, and promote compatible programs to strengthen revenue streams and protect vitality of the community's agricultural land, such as through combining agricultural tourism (agritourism) with agricultural production land.
FA 5-5	Continue to promote farmland conservation to increase agriculture operations' economic resilience to potential decreases in revenue and costs increases associated with climate change.
FA 5-6	Collaborate with partners to provide educational resources such as featuring films, "fact sheets" and educational content. Use these partnerships to create field trips for students and others to visit farms and urban agriculture sites to see food production, meet farmers and animals and promote consideration of farming and local food production as a career. Communications, events, and field trips to prioritize racial/cultural diversity among participants.
FA 5-7	Collaborate with partners to provide information and support to farmers on implementing or expanding tile drainage to mitigate climate change driven impacts on precipitation and support earlier crop planting.
FA 5-8	Collaborate with partners to provide information and education to farmers on the advantages of earlier crop planting for reduced fertilizer use.

Return to **Local Food and Agriculture** section.

Strategy GE 1

Increase tree cover and diversity, particularly in the priority neighborhoods, 6.5% by 2030 and 15% by 2040 (an increase of 3,660 acres and 7,000 acres respectively with growth coming from species that are native and climate adaptive).

GE 1-1	Consider establishing an effective tree ordinance for protection of trees within the community, with a particular focus on large and mature trees.
GE 1-2	Identify "heritage trees" over 100 years old on both public and private land. Establish guidelines and regulations for protecting this heritage similar to regulations governing heritage structures in the City's historic districts
GE 1-3	Consider revising zoning codes to increase diversity of native tree cover, including the preservation of the maximum possible number of existing trees and establishing minimum tree coverage for developments and planting islands in parking lots with a mix of canopy trees, shrubs, and groundcovers appropriate to the lot and its surroundings. Consider revising zoning codes to also encourage the use of native plantings and the preservation of natural areas whenever possible.
GE 1-4	Plant trees in county highway rights-of-way, especially in priority areas as identified by the Kane County 2023 ground cover study.
GE 1-5	Establish a tree planting plan to meet the goals of the CAIP. Prioritize tree replacement programming in neighborhoods based on factors outlined in the County's Ground Cover study including those with low-income households, vulnerable populations, street and boulevards with less than 30% sidewalk/ curb length shade coverage. Include a focus on increasing shade trees areas where people congregate (picnic areas, bus shelters, etc.) as well as a focus on species of trees that are native to the Kane County area. See County's 2023 Ground Cover, Tree Canopy, and Carbon Sequestration Study.
GE 1-6	Establish incentives and other promotional programs to support increased tree canopy on private property, with a focus on priority neighborhoods as identified in the Kane County Ground Cover Study. Include a focus on species of trees that are native to the Kane County area.
GE 1-7	Develop a comprehensive list of species of trees and plants that meet the following criteria: adaptability to climate change, especially heat extremes, drought, flooding, and high winds; hardiness and longevity; provision of food and hosts for wildlife, including bees, butterflies, birds, and other creatures; species native to the area (200-mile radius) Include instructions or links to resources for planting and maintenance. Use list for all local government and public projects and encourage use by the public. Make publicizing the resource part of an overarching long-term communications plan for the climate actions.
GE 1-8	Establish a program to give away trees on an annual basis for residents to plant on their property. Potential program concept: grow seedlings and give to homeowners once per year, or sell at a discount. Limit the trees that are given away to species that are native to the Kane County area. Goal: 1000+ trees per year
GE 1-9	Support and incentivize developers to plant shade and water-absorbing trees that are species native to the Kane County, and replace turf landscaping with native prairie, wild flower, and savanna plantings.

Return to **Greenspace and Ecosystems** section.

Strategy GE 2

Increase pollinator supportiveness of lawns and grassland in community and achieve a 30% turf replacement with native grasses and wildflowers on public lands and 5% replacement on private lands by 2030 with identified pollinator "corridors" given priority on private-to-public and public-to-private lands. (A decrease of 3,000 acres of turf county-wide).

GE 2-1	Conduct, or hire a consultant to conduct a Turf Conversion Master Plan supporting the ground cover goals included in this CAIP. Analyze public and private property for unused turf and impervious areas, and create a Ground Cover Conversion Implementation plan to convert to native plant and pollinator restoration areas, permaculture areas, wetlands, shrub, tree coverage or urban agriculture uses with goals by census tract. Include goals and an implementation plan to meet or exceed the CAIP goals for tree, native pollinator area, and lawn conversion for local government or publicly owned properties. Goals should be weighted by heat island, water runoff, and equity needs. Identify incentive opportunities and establish an outreach campaign.
GE 2-2	Support the use of native plants in landscaping at local government and publicly owned properties..
GE 2-3	Explore and develop partnerships with the largest land owners in the community to engage in turf replacement projects and establish demonstration / pilot projects illustrating strategies
GE 2-4	Establish and effectively manage native-habitat corridors along trails and utility easement areas to restore and maintain landscape connectivity
GE 2-5	Put in place an effective campaign to discourage and minimize use of toxic pesticides and herbicides, with a particular focus on those which are most toxic to Kane County ecosystems. Such a campaign might have several aspects, including a long-term communications focus, direct education work with landscapers and businesses that sell and use such products, direct education with homeowners and businesses, direct work with community organizations that promote gardening, etc.
GE 2-6	Develop guidelines and recommendations for types of native, climate adaptive plantings as turf alternatives for particular areas, such as parks, other open areas, and household backyards. Make publicizing the resource part of an overarching long-term communications plan for the climate actions and hold educational workshops.

Return to **Greenspace and Ecosystems** section.

Strategy GE 3

Reduce heat island effect through community-wide "dark" impervious surface coverage particularly in neighborhoods identified with higher heat island impacts 10% by 2030 and 23% by 2040. (a decrease of 3,260 acres by 2030 and 7,500 acres by 2040).

GE 3-1	Provide resource materials for all commercial development projects receiving public funding, PUD approval, and/or Conditional Use Permitting to implement heat island mitigation strategies including cool surfaces, solar-friendly landscape shading strategies, impervious surface reduction, and breeze capture.
GE 3-2	Review and refine park and natural space plans to minimize damage from the impacts of increased use, warmer conditions, and potential extreme weather events.
GE 3-3	Expand and connect green spaces so they are welcoming, within walking distance of all residents, especially in underserved communities where there is a high level of impervious surfaces, and accessible via trails and bike/pedestrian ways.
GE 3-4	Conduct, or hire a consultant to conduct an Impervious and Parking Surface Conversion study. Study to provide particular focus on reduction of impervious surface coverage within neighborhoods with the highest existing coverages and identify priority reduction opportunity sites (see 2023 Kane County Tree Survey and Carbon Sequestration Study).
GE 3-5	Establish / review and revise parking lot shading guidelines and encourage increased tree canopy cover to achieve increased impervious surface coverage of tree canopy.
GE 3-6	Develop a "Cool Roof", "Cool pavement", green roof, and/or vertical garden pilot project to educate on and exhibit heat island mitigation strategies and measure potential for effectiveness. Identify local government or publicly owned building with low solar PV prioritization/feasibility for inclusion as pilot project location.

Strategy GE 4

Reduce invasive species and increase climate resilience and biodiversity of community's tree canopy, parks and greenspaces (increased biodiversity focused on species that are native and climate adaptive).

GE 4-1	Explore feasibility of adopting the federal government's 30x30 goal - 30 percent of land and water maintained in a natural state by 2030, and if infeasible make recommendation for appropriate similar goal for the community.
GE 4-2	Partner with local sustainability organizations to foster public volunteer efforts to maintain and grow park systems and green infrastructure, through tree plantings and integrated invasive species control. These programs could help contain costs and foster public involvement. Potentially hold partnered events on environmentally focused holidays such as May Day, Arbor Day, Earth Day, solstices, Mother's Day, Father's Day, etc
GE 4-3	Consider updating current development regulations to incorporate the use of appropriate native, climate adaptive trees and plants for new and re-development.
GE 4-4	Explore establishing a lighting control ordinance to protect native plants, species, biodiversity, and improve night sky quality.

⏮ Return to **Greenspace and Ecosystems** section.

Strategy HS 1 Assist climate vulnerable populations throughout the community in preparing for and mitigating climate change impacts.

HS 1-1	Incorporate climate change and CAIP goals into the Community Health Assessment (CHA) and Community Health Improvement Plan (CHIP).
HS 1-2	Create and distribute climate vulnerability related emergency communications/outreach materials available in multiple languages and platforms.
HS 1-3	Add climate awareness and preparedness elements to public health programs already aimed at vulnerable populations and low-income households.
HS 1-4	Collaborate with partners and municipalities to organize a transportation-assistance program for individuals without access to vehicles.
HS 1-5	Develop a toolkit for Emergency Response using the EOM resources available on the Kane County Emergency Management website and state and federal training to publicize the tool kit to ensure residents are aware and have access to the resources.
HS 1-6	Conduct, or hire a consultant to conduct a needs assessment of accessible community centers for extreme weather or other emergency situations. Create a development improvement plan, if needed.
HS 1-7	Identify a sustainable funding source for increased utility assistance for low-income residents, including support for energy efficiency projects, such as weatherization.
HS 1-8	Increase availability to cooling mechanisms in low-income housing and rental units (e.g., air conditioning units, fans, window screens).
HS 1-9	Consider establishing or updating Nuisances And Property Maintenance code to manage and mitigate mold or fungus. Include references to requirements in rental license..
HS 1-10	Establish a Resilient Home inspection referral list to provide voluntary on-site home reviews to identify possible resilience improvements such as flood mitigation strategies, improved weatherization, vegetative shading, etc. Explore a partnership with other agencies including local governments, public entities, ComEd, and local schools. Note, this action may be implemented in collaboration with energy efficiency, fuel switching, and solarization actions in the Buildings and Energy section of this plan.
HS 1-11	Collaborate with partners to ensure public safety staff is properly trained to recognize and respond to physical and behavioral signs of heat related illness. Conduct, or hire a consultant to conduct climate change impacts and adaptation training for law enforcement, fire, first responders, and utilities. Promote equity in hazard mitigation, and emergency response and recovery activities, and consider populations most vulnerable to weather-related emergencies in all plans and exercises, including evacuation routes, transportation for vulnerable population groups, shelter in place locations, back-up power operations, extended access to fuel/power sources and drinking water, etc.
HS 1-12	Prepare public health agencies and health care providers to address health impacts of climate change including heat and vector related illnesses and wildfire smoke.

Return to **Health and Safety** section.

Strategy HS 2

Educate, engage, and empower the public on health and safety risks of climate change impacts.

HS 2-1	Develop and distribute educational content (brochures, k-12 curricula content, infographics, media announcements, etc) which outlines and actively promotes the clean air and health benefits of strategies included in this CAIP. Strategies to be actively promoted include use of renewable energy, conservation of energy, use of electric vehicles, public transit, ride share, and walking and biking for transportation. Engagement may include collaborating with public schools on curricula content, visiting local schools to talk about environmental conservation, sponsoring science fairs and asthma awareness days, disseminating information about the Air Quality Index and the UV index, supporting smart growth and green community programs, and working with municipal government leaders to establish clean air policies and initiatives.
HS 2-2	Create an interactive GIS tool and an app that maps areas of vulnerabilities (i.e. areas at risk of flooding, vulnerable populations, etc) and to identify where nature-based solutions can alleviate challenges related to climate change. Include additional information layers for flooding, air quality, health data, etc.
HS 2-3	Develop and implement a plan to monitor climate change related illnesses. Utilize results in resource and policy planning, with particular focus on neighborhoods. Communicate results to the public on a periodic basis.
HS 2-4	Collaborate with partners to increase outreach to diverse populations about climate change and health, natural hazards, and emergency preparedness via broadcast, print, bus ads, social media, and other forms of communication in multiple languages and accessible to individuals with disabilities to ensure that emergency preparedness planning reaches all residents.
HS 2-5	Increase the participation in bike-to-work and bike-to-school weeks as well as other health and wellness, exercise and nutrition programs through promotion, support, and sponsorship.
HS 2-6	Educate and encourage community members to take steps to related to increasing their safety in the face of climate change such as improving emergency, extreme weather and temperature preparedness, preventing exposure to vector-borne and water borne diseases, and an awareness of relevant existing state, county, municipal, and other alert systems to stay informed.
HS 2-7	Conduct education and outreach on the effects of nutrient loads and contaminants in stormwater on local water quality.
HS 2-8	Conduct targeted outreach to ensure that vulnerable populations are signed up for alert systems that notify them of dangerous conditions and where/how to seek shelter or other resources.

Return to **Health and Safety** section.

Strategy HS 3 Ensure that mission critical, emergency services and health care facilities within the community are prepared for impacts of climate change.

HS 3-1	Work with local electric utilities to conduct a grid capacity, conditions, and resilience assessment. Assessment recommendations should also identify strategies for improved energy resilience including solar+storage back-up.
HS 3-2	Develop a transparent and inclusive decision-making framework designed to achieve climate, equity, safety, health and prosperity goals. Support and encourage local governments to use it when making major infrastructure, transportation, land use, community development and project development plan and investment decisions. Consider existing systems, like STARS and MOSAIC, as models.
HS 3-3	Prepare for public buildings to be used in different ways, both in lower-impact ways, such as community members and vulnerable populations using the buildings as cooling centers during hot days, and as safe-havens during acute emergencies. Integrate these concepts in all local government and publicly owned facility design and renovation design processes and considerations.
HS 3-4	Ensure that facilities that serve vulnerable populations (e.g., senior centers, libraries, hospitals and clinics) are resilient to climate hazards and have established best practices for responding to emergencies such as flooding, power outages, and extreme heat.
HS 3-5	Plan and establish alternative or on-site power supply at key facilities within higher vulnerable areas with capacity to operate during grid failure. Explore use of re-deployable mobile solar arrays.

Strategy HS 4 Strengthen community response capacity and social support networks, especially around our most vulnerable populations.

HS 4-1	Support capacity of neighborhood and community groups to implement climate mitigation and adaptation initiatives. Explore establishing resilience grants to support community-based climate action efforts.
HS 4-2	Collaborate with partners like health care providers, colleges and universities, non-profit entities, schools, municipalities, and state agencies and to form and maintain a public health and climate change working group, with a focus on networks for community support, adaptation, and education.
HS 4-3	Enhance the coordination between local natural resource agencies and vector control programs to ensure populations of mosquitos, ticks, rodents, and other potential disease vectors are managed in a way that protects human health and ensures ecological integrity and vitality.
HS 4-4	Implement or expand climate change science and adaptation curricula in the public and private grade schools.
HS 4-5	Support the creation of call trees and block networks to check on neighbors during/after extreme weather events, particularly when they involve grid disruption.

⏮ Return to **Health and Safety** section.

Strategy CE 1 Capture economic value of each climate action goal in the Kane County CAIP.

CE 1-1	Leverage Community Development Block Grants from the Department of Housing and Urban Development, or HUD, to invest in resilient and equitable communities
CE 1-2	Conduct, or hire a consultant to conduct a Community-Wide Renewable Energy Potentials Study. Study should identify economic development opportunities as well as economic savings/impacts of expansion of renewable energy infrastructure within the community.
CE 1-3	Conduct, or hire a consultant to conduct a study to Identify economic opportunities possible through the successful implementation of the CAIP and achievement of its goals, especially those which can provide opportunity for the community's vulnerable populations and advancement of entrepreneurship.
CE 1-4	Conduct, or hire a consultant to conduct a Climate Economy Economic Development Assessment to identify economic development potential of climate adaptation, climate mitigation, and energy action planning. Assessment to include an evaluation of the potentials associated with green hydrogen (hydrogen produced through renewable electricity), including generation, supply chain and distribution, retail, and use.
CE 1-5	Collaborate with partners to create a market for Certified Compost. Work with organics collection sites to expand infrastructure to accept more food residuals and working with municipalities to expand residual food scrap collection.
CE 1-6	Collaborate with partners to establish a regional business incubator to support the establishment of innovative energy efficiency and renewable energy and sustainability business models within the community. Structure incubator to increase participation of under-resourced communities and increase opportunities for equity. Explore partnerships and collaboration with schools, colleges, and universities.
CE 1-7	Focus business development efforts on “green” businesses that are non-polluting, offer or support environmentally sustainable goods or services, and/or actively promote telecommuting, alternative work schedules, and alternative transportation modes.

⏮ Return to **Climate Economy** section.

Strategy CE 2 Support equitable workforce development and entrepreneur opportunities of climate action in the local economy.

CE 2-1	Coordinate with partners, including local unions, to develop and promote job training programs to equip individuals with valuable, future-oriented skills that contribute to climate resilience, while also providing pathways to employment, particularly for those in disadvantaged communities. Programs to include: 1. Renewable Energy and Energy Efficiency: Developing programs that teach skills related to solar energy system construction and the weatherization of buildings to improve energy efficiency. 2. Alternative Building Demolition Techniques: Promoting methods such as building relocation, deconstruction, and salvage instead of traditional demolition. Establishing a job training program specifically for building deconstruction skills, modeled after initiatives like the Better Futures Program 3. Heat Pump Technology Training: Exploring training opportunities in retail and with contractors/ installers, focusing on the availability and functionality of heat pump technology for applications like water heaters and clothes dryers.
CE 2-2	Collaborate to establish and promote a Climate and Equitable Jobs Act (CEJA) workforce training program.
CE 2-3	Collaborate with the Midwest Alliance for Clean Hydrogen and other potential partners identified on the US Department of Energy's H2Matchmaker to identify opportunities for establishing and supporting new green hydrogen startup businesses within Kane County.
CE 2-4	Collaborate with the Midwest Alliance for Clean Hydrogen to establish and promote a Kane County Green Hydrogen workforce education and training program.
CE 2-5	Collaborate with school districts to promote youth development through support of programs like the Future Cities competition which challenge students to design projects for sustainability in their community.
CE 2-6	Promote workforce development in partnership with local schools, colleges, and universities create and implement a curriculum for green skills—the knowledge, abilities, values, and attitudes needed to live in, develop, and support a sustainable and resource-efficient society. Goal: 1,000 "green careers" by 2030.
CE 2-7	Explore training opportunities within retail stores, contractors, and installers, surrounding availability and functionality of heat pump water heaters/clothes dryers.
CE 2-8	Engage with local green jobs training providers to coordinate strategic planning and encourage programs to develop local workforce capacity and assess, train, and place local residents to perform energy retrofits, solar pv installations, and other green improvements.
CE 2-9	Collaborate with partners such as school districts, colleges, unions, local non-profit/community organizations, and employers to establish a paid Green Jobs apprenticeship and internship program for youth. Program to facilitate the hiring of program graduates through the promotion and subsidized internship placement with employers within the community. Explore establishing a cost sharing / resource sharing component with the businesses benefiting from internships. Program to prioritize internship candidates from households with low income and people from under represented populations.

Return to **Climate Economy** section.

Strategy CE 3 Provide support to local businesses for building operational resilience in the face of climate change.

CE 3-1	Explore use of geographic information systems (GIS) to link with municipal business licenses, tax information, and other business establishment data bases to track local and regional "churn" and available development sites as well as integrated hazard information to make rapid post-incident impact assessments.
CE 3-2	Support climate resilience of local economy by preparing water, road, utilities, and other public infrastructure for increased demands from climate change based on the Kane County Climate Risk and Vulnerability Assessment, Emergency Management Plan, and State climate change data and projections. Strategies to implement include ensuring redundancy in telecommunications and broadband networks to protect commerce and public safety in the event of natural or manmade disasters.
CE 3-3	Establish a business coalition focusing on disaster and emergency preparedness as well as other impacts businesses need to prepare for things like rising electric bills or impacts to employees. Facilitate discussions with the coalition to identify the businesses and infrastructure that are most vulnerable to disaster and identify potential ways to enhance resilience.

Strategy CE 4 Establish suitable and sustainable financing for the implementation phase of the Climate Action Implementation Plan.

CE 4-1	Establish and maintain a database of federal funding, incentives, and grants available to support regional and local government climate action implementation resulting from the Inflation Reduction Act (IRA), Infrastructure Investment and Jobs Act (IIJA) and others. Explore opportunities for grant submissions, including collaboration with other communities or entities.
CE 4-2	Establish a Green Bank, or promote the State of Illinois Green Bank, to support funding of climate action and resilience strategies including Energy Efficiency, Renewable Energy installations, and climate resilience upgrades with a prioritization for local businesses and those serving low income to moderate income community members. Funding available through the Inflation Reduction Act and State of Illinois CEJA.
CE 4-3	Establish a policy that accounts for all energy efficiency and renewable energy and other operational cost savings of owned buildings and fleets arising from CAIP actions. All savings to be invested into a CAIP Fund as one source of financing for continued energy efficiency, renewable energy, and other CAIP implementation related efforts.
CE 4-4	Identify a sustainable funding source for increased utility assistance for low-income residents, including support for energy efficiency projects, such as weatherization
CE 4-5	Establish Forest Carbon Offset credits for local government and publicly managed urban forests and tree stock. Use funds to support climate action in the community.
CE 4-6	Consider establishing a policy that requires infrastructure projects and capital budgets incorporate climate risk and vulnerability analysis and adaptation plans to ensure that future spending contributes to resilience and achieving the Plan goals.

⏮ Return to **Climate Economy** section.

Strategy CE 5 Communicate climate action economic and development opportunities to stakeholder groups.

CE 5-1	Create an online Climate Economy Hub to provide information on the CAIP and identify resources available for business owners. - Include a Funding Resources page to include information on incentives, grants, and other funding opportunities available for businesses to support climate action and resilience. - Working with local partners, develop a community Green Jobs Bulletin Board promoting local green job opportunities and connecting local businesses with local job seekers. - Collaborate with the regional partners to include an online tool on the Climate Economy Hub to support the assessment of business' vulnerability/resiliency (refer to examples on row CE 221)
CE 5-2	Strengthen communications in support of business and economic climate resilience, the economic opportunities associated with climate action, and the goals of this plan. Effort should focus particularly on communications with disadvantaged group businesses (minority-owned, veteran-owned, economically-disadvantaged, etc.) and small businesses.

Strategy CE 6 Prepare for climate change migration.

CE 6-1	Collaborate with the school district to study potential service needs which may be required under a range of climate immigration/migration scenarios. Collaborate to create a "Climate immigration and migration response plan" identifying actions.
CE 6-2	Create, or hire a consultant to create an Affordable Housing Master Plan to identify current and potential future need for affordable housing including scenarios anticipating climate immigration and migration potentials. Plan should identify policies and actions to implement to avoid "climate gentrification," and include a climate immigration / migration community development assessment to identify potential sustainable economic development and community development opportunities for the community. Master plan should identify priority affordable housing locations which meet the goals of this CAIP.

Return to **Climate Economy** section.

Appendix A
Supporting Research

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Climate Action Baseline Study

To support the Kane County CAIP planning team members, the paleBLUEdot team assembled the Climate Action Baseline Study. This document provided a review of a wide range of community-wide metrics, data, and comparisons against Countyal peer communities for each of the CAIP sectors included in this report. The document also included preliminary sector specific draft strategic goal recommendations for the CAIP planning team to consider, discuss, and revise at the beginning of the planning team effort.

Click on the link below to access the document:
https://view.publitas.com/palebluedot/kane-county-climate-action-baseline-assessment/

Climate Vulnerability Assessment

At the beginning of the planning effort, the paleBLUEdot team developed a Climate Vulnerability Assessment for Kane County. The assessment included the identification of vulnerable populations within the community and possible impacts and risks associated with projected climate change for the County. paleBLUEdot mapped the vulnerable populations within the County as well as existing infrastructure and resources which may be capable of supporting climate adaptation strategies. These assessments provided a basis for understanding vulnerabilities and resources which supported the decision making process needed for identifying and prioritizing climate adaptation measures to be included in the final CAIP. The Assessment focused on County-Wide vulnerabilities with a particular focus on climate vulnerable populations to ensure all populations benefit from proposed implementation measures.

Click on the link below to access the document:
https://view.publitas.com/palebluedot/kane-county-climate-vulnerability-assessment/

Community-Wide GHG Inventory

The paleBLUEdot team compiled a County-wide Greenhouse Gas Inventory. The assessment included collection of raw data and calculation of greenhouse gas emissions for each of the primary emissions sectors included in this CAIP. The inventory included both community-wide emissions as well as municipal operations. The report included community-wide emissions comparisons against communities within the State and County.

Click on the link below to access the document:
https://view.publitas.com/palebluedot/kane-county-ghg-inventory-report/

County-Wide Ground Cover, Tree Canopy and Carbon Sequestration Study

paleBLUEdot conducted a baseline assessment of County-Wide ground cover and tree canopy extent. The study identified ground cover conditions (grass, water, wetland, tree canopy) County-wide as well as by census tract. Based on the ground cover data, calculations were made for annual carbon sequestration rates, carbon stock, tree canopy/green space economic value, and pollution absorption rates (CO, O_3, NO_2, SO_2, particulate pollution).

Included in this assessment was an assessment of County-Wide heat island characteristics and conditions. The study identified impervious surface conditions and coverage (sidewalks, roadway, parking, and building) and compiled data in subcategories of light reflective and light absorbent conditions. Baseline calculations were made for overall heat island contribution coefficient by neighborhood (expressed as summer night time degrees F above natural conditions, calculations based on research and formulas compiled by the University of Minnesota and Minnesota State University).

Click on the link below to access the document:
https://view.publitas.com/palebluedot/kane-county-ground-cover-heat-island-and-carbon-sequestration-study/

Climate Community-Wide Renewable Energy Potentials Study

In support of development of effective renewable energy goalsetting and to establish strategies addressing renewable energy development, paleBLUEdot conducted a County-Wide solar pv potentials study including economic and environmental benefits. This effort included:

1) Collect community-wide satellite data (NREL, NOAA, and NASA data).
2) Determine building roof stock characteristics and solar suitable buildings, calculate total suitable areas by roof configuration/orientation.
3) Calculate total rooftop solar capacity and annual energy generation by roof configuration/ orientation.
4) Identify cost efficient annual energy generation potential.
5) Research solar market at national, State and Countyal levels. Identify low, medium, and high solar market absorption rates and community-wide solar pv goals.
6) Identify environmental and economic benefit of solar including economic development and job creation potential. (NREL JEDI model)
7) Develop community-wide Renewable Solar Energy Potentials report.

Click on the link below to access the document:
https://view.publitas.com/palebluedot/kane-county-renewable-energy-potentials-study-vpj6oadkmj96/

Appendix **B**
Abbreviations and Glossary of Terms

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Abbreviations

BAU	Business as usual
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
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
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt-hour
LEV	Low emission vehicle
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
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxides
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
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

A

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. (IPCC)

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. (IPCC2)

Afforestation
The process of establishing forests on lands that weren't previously forested. (IPCC2)

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. (CARB)

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. (USEPA2)

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. (IPCC2)

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.

BAU
Refer to “Typical Future Projection”

Beneficial Electrification
See "Transition of Energy Sources"

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. (NASA)

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. (IPCC1)

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. (EIA)

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. (IPCC2)

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
The Intergovernmental Panel on Climate Change (IPCC) describes this as the predicted emission levels if upcoming trends emulate historical ones and no policy amendments are enacted. This projection presumes no further emission-curbing actions will be adopted beyond existing or committed measures.

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. (NASA)

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. (IPCC2)

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. (EIA)

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 interchangeable with "Net Zero"

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. (IPCC3)

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.

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. (IPCC2)

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. (IPCC2)

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 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. (IPCC)

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. (IPCC)

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. (CARB)

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. (IPCC)

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. (IPCC)

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

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. (CARB)

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. (UNFCC)

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.

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. (EIA)

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.

Emissions
The act of discharging certain substances, often gases in the context of climate change, into the environment. (USEPA1)

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. (IPCC)

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. (CARB)

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

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%. (ACEEE)

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

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". (IPCC)

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. (IPCC)

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. (USEPA4)

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. (Planetary Health Alliance)

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. (USEPA1)

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. (IPCC2)

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. (UNFCC)

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. (UNFCC)

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

Green Infrastructure
A strategy focused on managing rainwater and stormwater using natural processes, which offers environmental, societal, and economic advantages. 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. (IPCC3)

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. (IPCC2)

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”.

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. (IPCC)

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. (USEPA1)

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.

Intergovernmental Panel on Climate Change
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 facets of climate change. Harnessing expertise from hundreds of world-renowned scientists, the IPCC conducts periodic assessments, offering insights into global climate change and its repercussions. Governments worldwide view the IPCC as the primary scientific body providing information on the state of climate change science. The IPCC has also spearheaded the creation of internationally recognized methods for national greenhouse gas emission evaluations. (USEPA1)

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. (IPCC2)

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. (IPCC2)

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. (CARB)

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. (IPCC)

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. (USEPA1)

N

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

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 balances its greenhouse gas emissions by producing or compensating with carbon-neutral energy, resulting in a zero net emission over a year.

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. (UNFCC)

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. (NASA)

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).

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. (IPCC2)

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. (IPCC)

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. (IPCC2)

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. (CARB)

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. (IPCC)

R

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. (UNFCC)

Reforestation
The act of reintroducing forests on lands that once held forests but were later repurposed. (IPCC2)

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. (CSU)

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.

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. (UNFCC)

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

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. (IPCC)

Respiration
A biological process where living entities transform organic substances into carbon dioxide, using up oxygen and releasing energy in the process. (IPCC2)

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. (USEPA1)

Sink
Any activity, process, or mechanism responsible for removing a greenhouse gas, aerosol, or their precursor from the atmosphere. (IPCC2)

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. (IPCC2)

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. (NREL)

Source
Any process or activity that introduces greenhouse gases, aerosols, or their precursors into the atmosphere. (IPCC2)

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

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. (UNFCC)

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. (USEPA3)

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. (CARB)

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. (IPCC)

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. (IPCC)

U

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

VMT Vehicle Miles Traveled:
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 aiming to eradicate all severe injuries and fatalities from traffic accidents, ensuring safe and equal mobility for everyone. [Referenced from https://visionzeronetwork.org/]

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. (UNFCC)

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 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.

Appendix C

Potential Cumulative Community Cost and Savings from Plan Implementation

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The following document the calculations and source references used for estimating the potential cumulative community-wide cost savings of the actions included in the Climate Action Implementation Plan.

Summary of Estimated Cumulative Savings of Modeled Reductions

Kane County

Notes

Transportation

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

Formula:

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

	VMT saved (goal year)	211,497,942
	Cumulative vehicle miles saved (through goal year):	845,991,767
1	Average vehicle operating cost per mile:	$0.810
	Gross VMT savings	**$845,991,767**

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/ https://www.thesimpledollar.com/save-money/is-it-really-cheaper-to-ride-the-bus/

Increased Public Transit Use

Formula:

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

	Increased public transit miles (goal year)	94,751,078
	Cumulative increased public transit miles (through goal year):	379,004,312
2	Annual increased public transit pass costs (goal year):	-$10,311,846
	Cumulative increased public transit pass costs (through goal year):	-$41,247,385
	Increased spending on public transit	**-$41,247,385**

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.transitchicago.com/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

	VMT converted to EV/Alt fuel (goal year)	634,493,825
	Cumulative VMT converted to EV/alt fuel (through goal year)	2,537,975,301
3	Average fuel savings per mile:	$0.129
4	Average vehicle maintenance savings per mile:	$0.040
	Cumulative Gross EV VMT savings (through goal year)	$429,915,860
5	Spending difference per vehicle on EV purchase vs ICE purchase	-$277
	New electric vehicle purchases	96,450
	Gross EV purchase spending difference (through goal year)	-$26,716,650
	Net EV VMT savings	**$403,199,210**

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/PowerSearch.do?action=noform&path=1&year1=2017&year2=2019&vtype=Electric)

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.kbb.com/car-advice/electric-car-faqs/) with an average of $3,750 in tax credits appied (tax credits are available up to $7,500 for qualifying vehicles) 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 = Potentail Total Cumulative Transportation Cost Savigns

Transportation Sector Savings	
Gross VMT savings	$845,991,767
Gross EV VMT savings	$429,915,860
Total Gross Transportation Savings	$1,275,907,627
Transportation Sector Cost Increases	
Increased spending on public transit	-$41,247,385
Gross EV purchase spending difference	-$26,716,650
Total Gross Transportation Cost Increases	-$67,964,035
Potentail Total Cumulative Transportation Cost Savings	**$1,207,943,592**

Summary of Estimated Cumulative Savings of Modeled Reductions

Kane County

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

	Residential kWh converted (goal year)	80,942,493
	Cumulative residential kWh converted (through goal year)	323,769,973
	Average net solar cost savings per solar kWh	$0.062
6	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)	62,892
	Estimated total solar installation costs	$196,004,103
8	Est average lifespan kWh produced per solar pv KW installed	38,429
8	Estimated cumulative lifespan kWh produced	2,416,892,259
9	Estimated value of cumulative lifespan kWh produced	$346,386,165
	Average solar cost savings per kWh produced	$0.062
	Residential solar savings	**$20,145,373**

6 Recent average cost per KW is 1000x the per watt cost reported by Solar Reviews https://www.solarreviews.com Value includes assumed financing costs bsaed 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 (https://www.nrel.gov/analysis/tech-footprint.html) with an average degradation rate of 0.5% (https://www.nrel.gov/state-local-tribal/blog/posts/stat-faqs-part2-lifetime-of-pv-panels.html)

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

	Residential kWh converted (goal year)	323,769,973
	Cumulative residential kWh converted (through goal year)	1,295,079,892
10	Average community solar cost savings per kWh	$0.010
	Residential solar savings	**$13,520,634**

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

	Residential kWh converted (goal year)	0
	Cumulative residential kWh converted (through goal year)	0
11	Average utility purchased cost/savings per kWh	-$0.013
	Residential utility purchased cost/savings	**$0**

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)	194,261,984
	Cumulative residential kWh saved (through goal year)	777,047,935
12a	Average cost per kWh	$0.104
	Gross Residential electrical energy efficiency savings	**$81,123,804**
13	Residential Electrical Efficiency Upgrade Costs	-$71,388,948
	Net Residential Electrical Energy Efficiency Savings	**$9,734,857**

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 spending

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)	26,046,721
14	Cumulative residential therms saved (through goal year)	104,186,885
15	Average cost per therm	$1.402
	Gross Residential natural gas energy efficiency savings	**$146,070,012**
14,16	Residential Natural Gas Efficiency Upgrade Costs	-$128,541,611
	Net Residential Electrical Natrual Gas Efficiency Savings	**$17,528,401**

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	$20,145,373
Residential community solar savings	$13,520,634
Residential utility purchased renewable cost/savings	$0
Residential electrical efficiency savings (net)	$9,734,857
Residential natural gas energy efficiency savings (net)	$17,528,401
Potentail Total Cumulative Residential Energy Savings	**$60,929,265**

Summary of Estimated Cumulative Savings of Modeled Reductions

Kane County

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)	193,416,562
	Cumulative Non-Residential kWh converted (through goal year)	773,666,247
	Average solar cost savings per kWh	-$0.008
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)	150,285
	Estimated total solar installation costs	$297,263,372
8	Estimated average lifespan kWh produced per solar pv KW installed	38,429
8	Estimated cumulative lifespan kWh produced	5,775,297,650
9	Estimated value of cumulative lifespan kWh produced	$250,796,850
	Average solar cost savings per kWh produced	-$0.008
	Non-Residential solar savings	**-$6,224,715**

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 bsaed 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 (https://www.nrel.gov/analysis/tech-footprint.html) with an average degradation rate of 0.5% (https://www.nrel.gov/state-local-tribal/blog/posts/stat-faqs-part2-lifetime-of-pv-panels.html)

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

	Non-Residential kWh converted (goal year)	773,666,247
	Cumulative Non-Residential kWh converted (through goal year)	3,094,664,989
10	Average solar cost savings per solar kWh	$0.00
	Commercial solar savings	**$12,533,393**

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

	Non-Residential kWh converted (goal year)	0
	Cumulative Non-Residential kWh converted (through goal year)	0
11	Average utility purchased cost/savings per kWh	-$0.013
	Non-Residential utility purchased cost/savings	**$0**

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)	464,199,748
	Cumulative commercial kWh saved (through goal year)	1,856,798,993
12b	Average cost per kWh	$0.032
	Gross Commercial electrical energy efficiency savings	**$58,736,741**
13	Commercial Electrical Efficiency Upgrade Costs	-$51,688,333
	Net Commercial Electrical Energy Efficiency Savings	**$7,048,409**

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 paterns: 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)	18,910,855
14	Cumulative Non-Residential therms saved	75,643,421
15	Average cost per therm	$0.688
	Gross Non-Residential natrual gas energy efficiency savings	**$52,042,674**
14,16	Non-Residential Natural Gas Efficiency Upgrade Costs	-$45,797,553
	Net Non-Residential Natural Gas Energy Efficiency Savings	**$6,245,121**

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	-$6,224,715
Non-Residential community solar savings	$12,533,393
Non-Residential utility purchased renewable cost/savings	$0
Non-Residential electrical efficiency savings	$7,048,409
Non-Residential natural gas energy efficiency savings	$6,245,121
Potentail Total Cumulative Non-Residential Energy Savings	**$19,602,208**

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

Formula:

Energy sector savings - Energy sector cost increases = Potentail Total Cumulative Energy Cost Savigns

Energy Sector Savings	
Total solar energy savings	$13,920,659
Total community solar energy savings	$26,054,027
Total energy efficiency savings - electricity	$139,860,546
Total energy efficiency savings - natrual gas	$198,112,686
Total Gross Energy Savings	$377,947,918

Energy Sector Cost Increases	
Total solar PV installation costs	(included in estimated Total Solar Energy Savings)
Total utility purchased renewable cost/savings	$0
Total energy efficiency upgrade costs - electricity	-$123,077,280
Total energy efficiency upgrade costs - natrual gas	-$174,339,164
Total Gross Energy Cost Increases	-$297,416,444

Potentail Total Cumulative Energy Cost Savings	**$80,531,474**

Summary of Estimated Cumulative Savings of Modeled Reductions

Kane County

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	
Residential food waste reduced (goal year)	28,545
Cumulative residential food waste reduced (through goal year)	114,182
17 Average cost savings per ton reduced	$2,469
Residential food waste savings	**$281,914,200**

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	**$281,914,200**

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	
Participating businesses (goal year)	30
Cumulative participant/years (through goal year)	210
18 Average cost savings per participant/year	$475
Commercial solid waste savings	**$399,000**

18 Savings per business engaged in waste reduction programs are based on MN WasteWise reported average business savings ($431) escallated to 5 year (mid point) Cumulative savings assume businesss reduction strategies remain in force. See 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	
Commercial food waste reduced (goal year)	18,117
Cumulative non-residential food waste reduced (through goal year)	72,467
19 Average cost savings per ton reduced	$494
Commercial food waste savings	**$35,784,181**

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. See 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 = Potentail Total Cumulative Solid Waste Savings

Residential Food Waste Savings	$281,914,200
Non-Residential Solid Waste Savings	$399,000
Non-Residential Food Waste Savings	$35,784,181
Potentail Total Cumulative Solid Waste Savings	**$318,097,382**

Appendix D
Acknowledgements

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We are deeply grateful for the community collaboration and input that went into this plan. Below are some of the main contributors that made Kane County's first Climate Action Implementation Plan possible:

CAIP Planning Team

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Lucas King	Blackberry Township, pastor, TCF, FREP, KCPC
Ivy Klee	(Former) Kane County Staff - Resource Management Coordinator
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