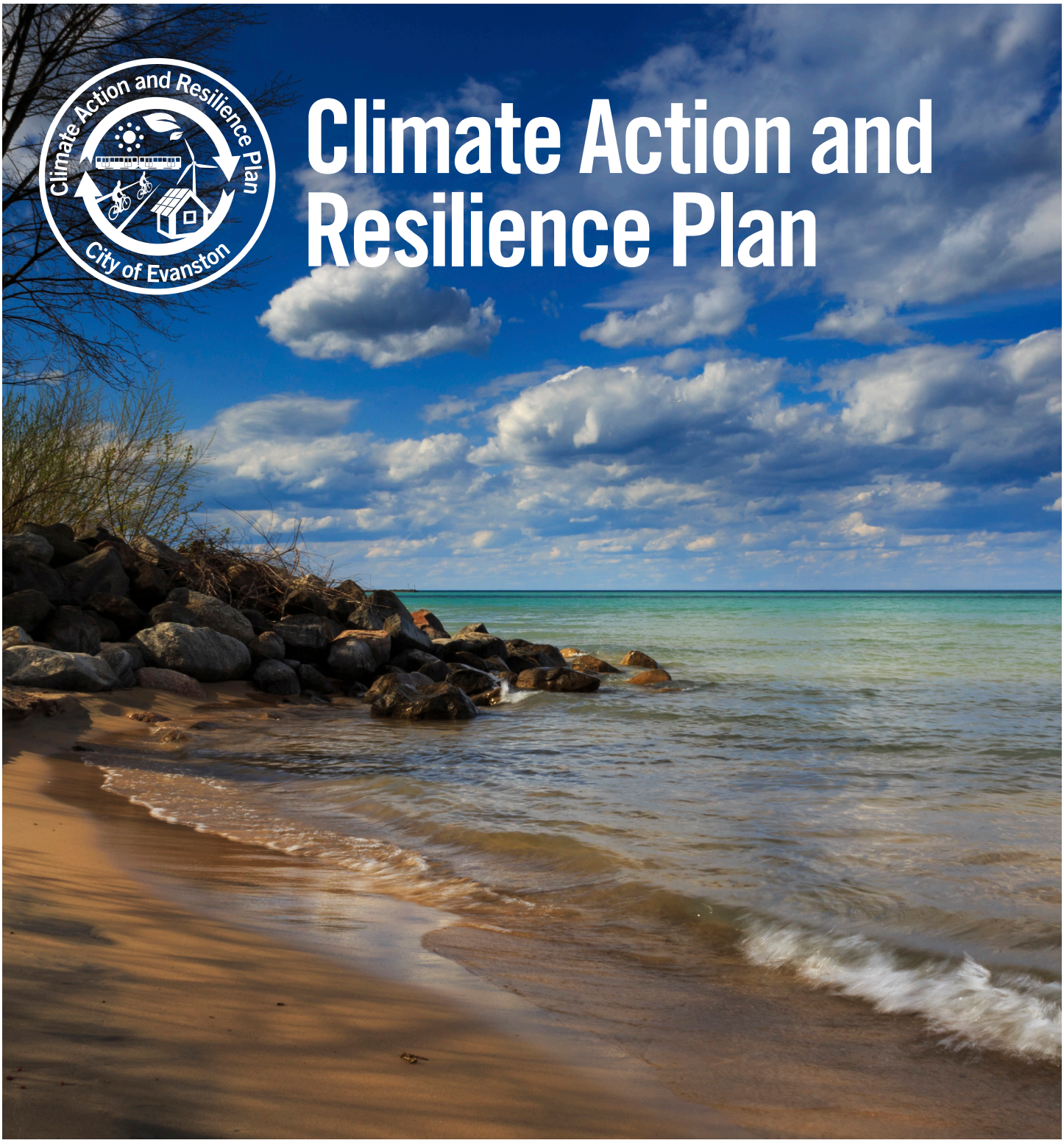


# Climate Action and Resilience Plan

## Carbon Neutral by 2050

City of Evanston™

cityofevanston.org/climate

November 2018

# Letter from the Mayor

Evanston has a long track record of success when it comes to climate action. Since the City Council's unanimous decision to support participation in the U.S. Conference of Mayors Climate Protection Agreement in 2006, our City has successfully implemented two climate action plans under the leadership of Mayor Lorraine H. Morton and Mayor Elizabeth Tisdahl, received certification and recertification as a 4-STAR sustainable community, been named the U.S. Earth Hour City Capital, and achieved a 24 percent reduction in greenhouse gas emissions relative to 2005 baseline levels. Still, there's more work to be done.

That's why, in 2017, I formed a resident-led working group to chart a path forward. The group, comprised of 17 community members with a wide array of backgrounds and expertise, has been hard at work over the last year developing a plan to not only continue reducing Evanston's impact on climate change, but to also prepare the city and its residents for its effects.

I am pleased to announce the culmination of their efforts with the release of **Evanston's Climate Action and Resilience Plan (CARP)**. Detailed on the following pages, the plan lays out a bold vision that "by 2050, Evanston will be a climate ready and resilient city that has successfully prioritized the needs of its most vulnerable while combating climate change."

To achieve that vision, the Climate Action and Resilience Plan sets a goal of achieving carbon neutrality by 2050, while reaching ambitious greenhouse gas reduction targets along the way. Other goals include securing 100 percent renewable energy for all Evanston properties by 2030, achieving zero waste by 2050, shifting to low- or non-polluting transportation methods, enhancing Evanston stormwater systems, and, for the first time, ensuring that all residents, including our most vulnerable, are prepared for the impacts of a changing climate.

Achieving these goals will require a community-wide effort, and the City can't do it alone. That's why our plan includes commitments from some of Evanston's largest institutions, including the Evanston Community Foundation, NorthShore University HealthSystem, Northwestern University, Presbyterian Homes, Presence Saint Francis Hospital, Rotary International, Evanston/Skokie School District 65, and Evanston Township High School.

From our residents, to our businesses, to our schools and hospitals, Evanston is united in its efforts to mitigate the far-reaching effects of climate change through bold action. While our city will likely undergo many changes on the way to 2050, this plan ensures that our commitment to climate action will remain.

Evanston Mayor
Stephen H. Hagerty

# Acknowledgements


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# Executive Summary

Dire warnings and new reports continue to fill news headlines that demand immediate and decisive action at all levels of government and throughout society, including local government. On October 8, 2018, the Intergovernmental Panel on Climate Change (IPCC), the leading scientific body responsible for climate research, issued a dire warning indicating that in order to limit global warming to 1.5 C, "net human-caused emissions from carbon dioxide (CO2) would need to fall by about 45 percent from 2010 levels by 2030, reaching 'net-zero' around 2050."* With nine of the 10 hottest years on record having occurred since 2005, precipitation continues to occur in more intense and less frequent storms, and wildfires and hurricanes have ravaged large swaths of the United States. This warning reflects the need for action.

In Evanston, the question is not whether or not climate change exits. The question remains, how do the City and community take actions that reflect the immediacy of the situation while centering the needs of those who will be most severely impacted locally? Although Evanston, as a Great Lakes city, is relatively insulated from threats such as hurricanes, sea level rise and wildfires, it is not insulated from increasingly intense storms, the influx of invasive species, hotter temperatures, drought-like conditions, human migration, threats to water quality and the relative instability of energy prices. Vulnerable communities and individuals will experience disproportionately negative impacts from climate change in the coming years and decades.

Evanston has a long-standing history of bold climate action and a track record of making consistent reductions in carbon emissions. This strong history, begun by Mayor Lorraine H. Morton and elevated by Mayor Elizabeth Tisdahl, is being taken to the next level under Mayor Stephen H. Hagerty. The Climate Action and Resilience Plan (CARP) calls for ambitious reductions in carbon emissions and, for the first time, establishes goals to ensure Evanston is prepared for the daunting impacts of climate change.

The Climate Action and Resilience Plan calls for carbon neutrality by 2050, 100% clean and renewable electricity by 2030, zero waste by 2050, and much more. These ambitious goals were developed by a community working group established by Mayor Hagerty in late 2017. The working group had 17 members and convened dozens of times in smaller task forces and as a whole from November 2017 to November 2018.

The plan is divided into five sections, with two major sections: Climate Mitigation and Climate Resilience. Climate Mitigation explores the far-reaching ways in which many daily routines are tied to larger systems that account for much of the City's emissions, namely buildings, which account for 80% of Evanston's emissions. Climate Resilience focuses on preparing social, ecosystem and built environments for the impacts of climate change. Many recommended actions improve climate resilience as well as reduce carbon emissions; the plan seeks to amplify those actions as especially critical.

Thirteen years after Mayor Morton signed the U.S. Mayors Climate Protection Agreement, Evanston has reduced its overall emissions by 24% and leads the region in climate-related planning and progress. The Climate Action and Resilience Plan builds on the foundation of community-driven planning and calls for another round of ambitious action.

* *Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.*

# Table of Contents


**Letter from the Mayor** ..... 2

**Acknowledgements** ..... 3

**Executive Summary** ..... 4

**Table of Contents** ..... 5

**Introduction** ..... 6-7

- Guiding Principles ..... 7

**Municipal Operations** ..... 8-9

**Climate Mitigation** ..... 10-22

- Greenhouse Gas Reduction Targets ..... 10-11
- Building Efficiency ..... 12-13
- Renewable Energy ..... 14
- Zero Waste ..... 15-16
- Transportation and Mobility ..... 17-19
- Urban Canopy and Green Space ..... 20-21
- Outreach, Education and Behavior Change ..... 22

**Climate Resilience** ..... 23-29

- Green Infrastructure ..... 24
- Health Impacts of Extreme Heat ..... 25
- Resilience Regulations ..... 26
- Community Networks and Education ..... 27
- Emergency Preparedness and Management ..... 28
- Vulnerable Populations ..... 29

**Implementation, Accountability and Partnerships** ..... 30-32

- Implementation and Accountability ..... 30
- Partnerships ..... 30
- Commitments from Large Employers ..... 31-32

**Appendix** ..... 33-43

- Appendix A: Community Greenhouse Gas Emissions Inventory ..... 33-40
- Appendix B: Glossary of Terms ..... 41-43

# Introduction

## Evanston 2050 Vision

The City of Evanston's Climate Action and Resilience Plan Working Group has a vision for the future and has set forth a path to reach that vision. This is what they foresee:

By the year 2050, Evanston has achieved carbon neutrality; all buildings are "high-performing" in terms of energy and water efficiency; all energy produced and consumed is from clean and renewable sources; a Zero Waste Strategy has been implemented and achieved; half of all trips made in Evanston are by transit, walking or bicycling; all vehicles and equipment rely on zero-emission technology; and the urban canopy is healthy and growing in size, adapted to the 2050 climate.

Green infrastructure is distributed equitably throughout the community, increased precipitation is captured by rain gardens and naturally filtered into the soil, the transition to zero emissions vehicles has improved air quality, the boom in renewable energy installations has solidified Evanston as a regional leader and expert in renewable energy and local food options are accessible and affordable to residents in every neighborhood. By 2050, Evanston will be a climate-ready and resilient City that has successfully prioritized the needs of its most vulnerable while combating climate change.

To realize this vision, the City of Evanston (City) is committed to taking immediate and decisive action to reduce the community's impact on climate change and to prepare the community to adapt and become more resilient to the changing climate and its effects. The City has set ambitious targets to combat the effects of climate change, achieve carbon neutrality by 2050 and make significant reductions in greenhouse gas (GHG) emissions in the short term. The Climate Action and Resilience Plan (CARP) will chart a path forward to meet those commitments and targets. The plan is divided into five sections with two supporting appendices.

### Sections

1. Municipal Operations
2. Climate Mitigation*
3. Climate Resilience**
4. Implementation, Accountability and Partnerships
5. Commitments

### Appendices

1. Appendix A: Community Greenhouse Gas Emissions Inventory
2. Appendix B: Glossary of Terms

* *Climate Mitigation describes actions that limit climate change through reducing the release of greenhouse gases (GHGs) such as carbon dioxide and methane.*

** *Climate Resilience or Adaptation is the task of evaluating the changing climate and its impacts and preparing the community to adapt and adjust to new climate conditions and the effects they will have on its assets, including people, ecosystems and infrastructure (social, health, natural and built).*

# Guiding Principles

The development and implementation of an ambitious climate action plan requires recognizing and understanding Evanston's historical, current and future context. To ensure that the goals developed within this plan meet Evanston's vision of becoming the "Most Livable City in America" and align with the comprehensive livability guidelines of the STAR Community Rating System, the plan relies on three core guiding principles: Equity-Centered, Outcome-Focused and Cost-Effective and Affordable.

## Equity-Centered

Climate change affects everyone. However, not all people are equally impacted. People of color, immigrants, refugees and lower-income populations experience increased exposure and sensitivity to environmental and climate hazards and a reduced capacity to adapt. To ensure that actions within this plan align with equity principles in Evanston, this plan will employ an equity-centered lens that is approved by City Council and implemented by the Office of Equity and Empowerment with advisory support from the Equity and Empowerment Commission. In the absence of a City definition of equity-centered, guidance will be sought from external leaders within the urban sustainability and equity fields throughout implementation of the plan. By following an equity-centered approach, the City seeks to achieve environmental justice for all its community members, which includes fair treatment and meaningful involvement with respect to environmental decisions and policies, regardless of race, color, national origin or income.

* *Language taken from the USDN Guide to Equitable Community-Driven Climate Preparedness Planning*

## Outcome-Focused

Meaningful progress toward reducing Evanston's contribution to climate change and increasing resilience to climate change impacts are most effectively demonstrated through measurable outcomes. Identified within the plan are measurable outcomes that reflect the goals of the plan. Example outcomes include reducing greenhouse gas emissions, increasing the use of renewable energy, increasing building efficiency, and reducing waste. Although there are actions within the plan that focus on behavior change, education and improving community awareness and understanding, those actions are anticipated to support the achievement of improved measureable outcomes.

## Cost-Effective and Affordable

There is a perception that being "green" or "sustainable" comes with a price or cost premium. Although this may be the case in some instances, many of the recommended policies and programs, if properly implemented, could lead to cost savings as well as economic growth and job creation. Sustainable actions and solutions are not inherently costlier than unsustainable ones. In evaluating the cost-effectiveness and affordability of actions, the City will work to incorporate the cost of inaction as well. The social and economic cost of climate and resilience inaction is considerable. All policies and programs implemented will consider the cost-effectiveness for the City to implement as well as the impact on affected parties and affordability in Evanston.

# Municipal Operations

The City of Evanston will continue to lead by example by setting ambitious goals for municipal operations. Although municipal operations account for less than one percent of Evanston's emissions, the City can play an outsized role in bringing together coalitions, partnerships and the wider community to meet the goals of the Climate Action and Resilience Plan.

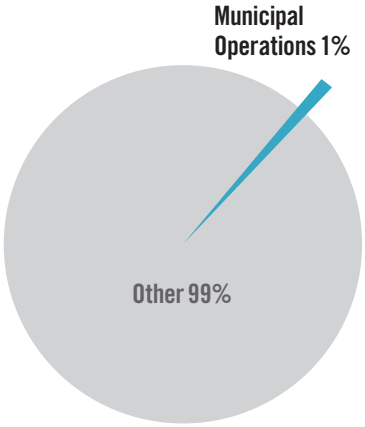
## Municipal Goals

2020 – 100% Renewable Electricity for Municipal Operations

2030 – Achieve Zero Waste for Municipal Operations

2035 – Carbon Neutrality for Municipal Operations

### 2017 Municipal GHG Emissions




## Purchasing and Planning

- Update the Environmental Sustainability and Best Practices document to align with CARP goals.
- Conduct a GPC-compliant emissions inventory for all municipal operations in 2019.
- Create a CARP checklist to provide to developers submitting projects to the Design and Project Review Committee (DAPR).

## Energy

- Develop a Net Zero greenhouse gas emissions policy for new municipal buildings in 2019.
- Host a shared solar project/serve as an anchor subscriber to a shared solar project and allow residents and businesses to subscribe to the project.
- Install LED lighting for all lighting on city properties, street lights, and traffic lights by 2025. Install 100% LED lighting on all City projects, facilities and infrastructure with lighting needs by 2025 (exceptions may be made if technology is not available to meet project requirements).
- Complete a feasibility study in 2020 to determine the best opportunities for installation of renewable energy installations on municipal properties.
- Retrofit all municipal facilities with water-efficient features to reduce potable water use.
- Develop a zero emissions vehicle purchasing strategy for the municipal vehicle fleet.

## Waste

- Require that capital projects divert construction and demolition debris from the landfill and incorporate a percentage of reclaimed material into projects where practicable.
- Ensure that recycling receptacles are located at all City properties including parking garages, parks and community centers.
- Expand compost collection service to public spaces and city facilities.
- Work with waste haulers to ensure that our city's garbage ends up in landfills that are managed responsibly and use methane gas capture technology to generate energy.
- Require waste haulers to complete regular waste characterization studies for each waste stream.

## Green Infrastructure

- Prioritize replacing trees on public property and focus on maintaining tree health to increase longevity. Policies that will improve the overall health of the urban tree canopy include:
  - o Maintain a cyclical pruning process for public trees
  - o Diversify tree planting selection to take into account anticipated future climate zone shifts due to a warming climate
- Maintain skilled forestry staff
- Develop a definition of natural and open spaces in Evanston.
- Increase natural landscaping on public property and expand no-mow areas in parks and other public spaces.
- Prioritize planting and preservation of native species of plants and trees on public property.
- Achieve and maintain the National Wildlife Federation Community Wildlife Habitat Certification
- Achieve all goals laid out in the Mayors Monarch Proclamation and maintain active support of the goals.
- Expand the geographic distribution of green infrastructure throughout the City.
- Efficiently utilize public land to increase stormwater infiltration and detention while enhancing the primary use of the property.

## Investments

- Align investment strategies and advocacy initiatives with CARP goals through a City Council-adopted resolution:
  - a. Define and implement an approach to sustainable investing that considers the risks associated with climate change and fully integrates environmental, social and corporate governance considerations into the City's investment decision-making process. This investment philosophy should be adopted with a clear, thoughtful approach to considering the long-term environmental and social sustainability of the entities in which the City invests.

## Advocacy

- Support local and national strategies for instituting limits on carbon, including market strategies such as a price on carbon
- Advocate at the state level for legislation and policies that support the goals of CARP; oppose legislation that overturns municipal home rule
- Encourage key institutions such as the school districts and large employers to serve as anchor subscribers to community solar projects.

# Climate Mitigation

Climate Mitigation describes actions that reduce the release of greenhouse gas emissions in order to limit climate change. Climate mitigating actions at the local level is imperative if Evanston is to play its part in holding average global temperature increases to below 2 degrees Celsius (3.6 degrees Fahrenheit) and preferably below 1.5 degrees Celsius (2.7 degrees Fahrenheit).

Research compiled by the Intergovernmental Panel on Climate Change (IPCC) indicates that if global temperatures are allowed to increase by 2 degrees Celsius, the consequences will be much more catastrophic than if we can limit warming to 1.5 degrees Celsius or below. The average global temperature has already increased by 1 degree Celsius (1.8 degree Fahrenheit) since pre-industrial levels. Warming greater than the global average is already occurring in many land regions, such as the Arctic, where it is occurring two to three times faster. Global warming is likely to reach 1.5 degrees Celsius by mid-century if trends continue at the current rate. Limiting the increase to 1.5 degrees Celsius as opposed to 2 degrees would mean the difference between a world with Arctic summer sea ice and coral reefs and one without them. More information on the IPCC and climate data can be found at **www.ipcc.ch**.

## Greenhouse Gas Reduction Targets

This plan calls for ambitious and immediate reductions in greenhouse gas emissions, building upon the success of the 2008 Evanston Climate Action Plan (ECAP) and the 2014 Livability Plan. The 2017 community greenhouse gas emissions inventory (Emissions Inventory) showed a 24% reduction in emissions from the 2005 baseline, which demonstrates significant progress towards carbon neutrality. To build off of this progress, the City has established the following community reduction targets:

- 2025 – 50% reduction
- 2035 – 80% reduction
- 2050 – Carbon Neutrality

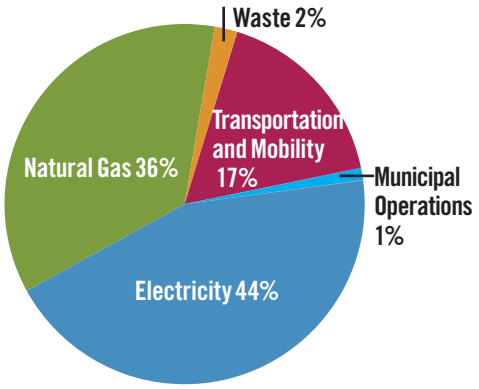
To evaluate and measure the community's progress towards these targets, the City has developed an Emissions Inventory that is compliant with the internationally accepted best practices put forth in the global protocol for community-scale greenhouse gas emissions (GPC). The Emission Inventory identifies emissions by sector and illustrates changes in emissions over time. An inventory makes it possible to evaluate the City's progress in reducing emissions and the impact of emission reduction policies.

The Emissions Inventory accounts for emissions attributed to activities taking place within the City's municipal boundaries. The Emissions Inventory is measured in metric tons of carbon dioxide equivalent ($MTCO_2e$), which is the standard measurement of greenhouse gas (GHG) emissions. The 2005 baseline of emissions attributed to the community totaled 1,056,169 $MTCO_2e$. The 2017 Emissions Inventory revealed total net emissions of 793,266 $MTCO_2e$ from the following sectors:

1. Electricity (44%)
2. Natural Gas (36%)
3. Waste (2%)
4. Transportation (17%)
5. Municipal Operations (1%)

A detailed Emission Inventory is available in *Appendix A: Emissions Inventory*.

**2017 GHG Emissions by Source**



# Target Years

Achieving the goals put forward in this plan requires immediate and ambitious action by the City and everyone who lives, works, and plays in Evanston. The target years of 2025, 2030, 2035 and 2050 provide specific milestones for action and achievements. The measure of success between now and 2050 may shift considerably as metrics evolve, and as new technologies and trends emerge. For this reason, the 2050 targets indicated in the plan are limited by current knowledge, but align with the vision for Evanston in that year.

Some of the goals outlined in this section are straight-forward outcomes of policies and programs that start at the City government level. Others require innovative partnerships, broad-reaching education programs, incentives, creative funding strategies and a culture shift in how we live, work, travel and consume today. Staying on track to meet our 2025, 2030, 2035 and 2050 targets will require adapting, adjusting and innovating future iterations of this plan and its metrics. Therefore, the plan will be regularly updated to ensure it is relevant and at the cutting-edge of technology, innovation and environmental and social justice.

## The Climate Mitigation section of the plan is split into six Focus Areas with corresponding Goals, Actions and Performance Metrics.

| Focus Areas | Goals |
|---|---|
| Building Efficiency | Reduce building energy consumption by 35% by 2035 (from 2005 levels). |
| Renewable Energy | Achieve 100% renewable electricity supply for all Evanston accounts by 2030. |
| Zero Waste | Increase the community waste diversion rate to 50% by 2025, 75% by 2035 and Zero Waste by 2050 (from 2017 levels). |
| Transportation and Mobility | Reduce vehicle miles traveled; increase trips made by walking, bicycling and transit. |
| | Increase use of electric vehicles; decrease carbon emissions from vehicles and equipment. |
| Urban Canopy and Green Space | Preserve and restore Evanston's urban canopy, natural areas, native vegetation and green space to maintain and increase carbon sequestration, improve stormwater runoff detention, improve air quality, energy efficiency and livability and reduce adverse urban impacts on humans and key species such as birds and pollinators. |
| Outreach, Education and Behavior Change | Educate, motivate and empower Evanston residents, institutions and businesses to take meaningful action to fight climate change and improve community resilience. |

***Electricity Aggregation:***

*Since 2012, the City has provided 100% renewable energy to participating residents in the City's electricity aggregation program. This program has resulted in a reduction of 445,154 $MTCO_2e$ of emissions, which is equivalent to 95,322 passenger vehicles driven for one year.*

# Building Efficiency



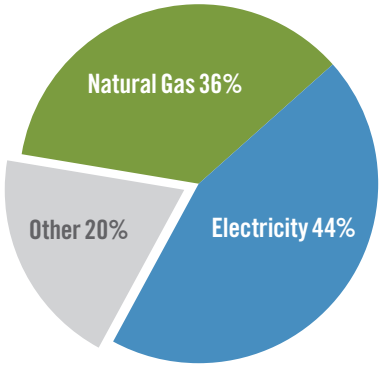
## Goal

**Reduce building energy consumption by 35% by 2035 (from 2005 levels).**

Building energy consumption is the largest source of greenhouse gas emissions in Evanston and accounts for roughly 80% of the community's emissions. Overall electricity emissions decreased significantly since 2005, however, this reduction is primarily the result of the purchase of renewable energy credits as part of Community Choice Electricity Aggregation (Aggregation) as well as the overall improvement in emission factors for the regional power grid (i.e. coal generation being replaced with less carbon-intensive generation such as natural gas and renewable energy sources). A detailed explanation of electricity consumption and corresponding emissions calculations is located in *Appendix A*.

Actions in this section will improve building efficiency and reduce energy consumption. Decreasing energy consumption can lead to cost-savings, reduced strain on systems and infrastructure and improved public health outcomes.

### 2017 Building GHG Emissions




## Actions

1. Develop a strategy to transition to net-zero greenhouse gas emissions (NZE) building standards in 2019. Implement strategy via building code update effective starting in 2020.
    a. Use best practices in each category of green building standards, including aspects of LEED Platinum, Passive House (PHIUS), Green Globes, Living Building Challenge, American Institute of Architects (AIA) 2030, and Enterprise Green Communities. Address all aspects of the building, including construction, energy use, water use, impacts on nature and wildlife (e.g. birds), and on the community (e.g. transportation).
    b. Require NZE building codes for residential and commercial new construction and retrofits by 2030.
    c. Include energy audits as part of the building permit approval process for residential, commercial and industrial modifications and additions.
2. Update the energy and water benchmarking ordinance to gather information on renewable energy purchases, renewable energy on-site generation, energy efficiency upgrades, waste management data (recycling, composting) and other relevant information.
3. Adopt policies that require retro-commissioning for larger buildings and building energy audits for smaller buildings.
4. Create a Property-Assessed Clean Energy (PACE) financing program to support residential and non-residential energy efficiency initiatives.
5. Increase water efficiency and reduce daily per capita water usage.
    a. Update and implement the Evanston Water Conservation and Efficiency Plan developed by CMAP in 2014.
    b. Facilitate reduction of water use by top 20 customers. Request large institutions and businesses to identify specific opportunities for employees or customers to conserve water and incorporate water efficiency into internal operations.
6. Institute a residential energy performance transparency program to help homebuyers understand the energy performance of homes they are considering for purchase.
7. Create an education and incentive program to empower and encourage residents, businesses and building-owners to reduce energy consumption.

***Northwestern University Reduction in building energy consumption by 20% by 2020:***

*Northwestern has been an active partner of the US Environmental Protection Agency's ENERGY STAR® program since 2015. Northwestern follows the program's Guidelines for Energy Management and uses its Portfolio Manager software to benchmark and track University energy, water and waste performance.*

***Rotary International to Pursue LEED Platinum by 2022:***

*Headquarters, located in Evanston, achieved LEED Gold certification in 2012 and 2017 and is EPA Energy Star-certified. Rotary has committed to having 100% of their facility electricity come from renewable sources, to pursue LEED Platinum certification, and reduce building energy costs by using less energy.*

## Focus Area Impact and Performance Metrics

Building energy consumption accounts for the largest single source of greenhouse gas emissions in Evanston. Completing actions to reduce energy consumption will take time, but ultimately could lead to the largest reduction in emissions.

| Target year | Metric Description |
|---|---|
| **2025** | Reduce building energy consumption by 25% from 2005 levels |
| **2035** | Reduce building energy consumption by 35% from 2005 levels |
| **2050** | Reduce building energy consumption by 50% from 2005 levels |
| **Annual** | Total energy consumed in applicable units |
| **Annual** | Average daily water consumption per capita |
| **Annual** | Number, type and energy-use intensity of buildings participating in implemented programs (i.e. benchmarking, retro-commissioning, etc.) |
| **Annual** | Number of high performance residential and commercial buildings |

## Outreach and Engagement

1. Identify strategies and funding to support residents and businesses in implementing energy efficiency improvements and energy usage reductions.
2. Educate the community about existing incentive programs through Nicor Gas and ComEd and other entities and prioritize connecting eligible properties with utility rebate and efficiency programs.
3. Pursue utility investments and benefits for Evanston residents, particularly those that benefit low-income residents.
4. Encourage buildings to pursue third-party sustainable building certifications such as Green Globes, Passive House (PHIUS), LEED, etc.

# Renewable Energy



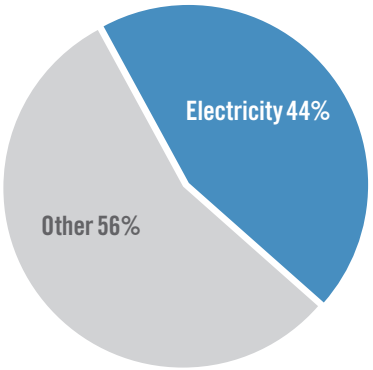
## Goal

**Achieve 100% renewable electricity supply for all properties in Evanston by 2030.**

In 2017, Mayor Hagerty joined the Sierra Club's Mayors for 100% Clean Energy. Although purchasing renewable energy credits (RECs) has played a large part in working toward this goal, the City also values onsite generation of renewable energy through sources such as wind, solar and geothermal installations within Evanston and the region. The included actions seek to provide competitive renewable energy options to all Evanston customers.

Shifting to renewable energy sources can result in cost-savings to residents and businesses. It will grow demand for renewable energy and stimulate job growth in related fields. As more renewable energy sources replace carbon-based sources, overall air quality will improve and there will be a reduction in carbon-based environmental contaminants in the air, water and soil nationally.

### 2017 Electricity GHG Emissions




## Actions

1. Continue Community Choice Electricity Aggregation (Aggregation). Explore expanding the reach of the Aggregation program and tighten sourcing requirements to encourage/require energy suppliers to directly invest in renewable energy.
2. Increase renewable energy supply options beyond Aggregation by supporting community solar and other renewable energy generation projects.
3. Create an educational program to inform commercial properties about renewable energy opportunities. Incentivize businesses to purchase renewable energy (such as through a sustainable business recognition program).
4. Evaluate the options available for the City to increase the supply of renewable energy to Evanston customers not eligible for Aggregation, such as Community Solar Subscriptions, development of a municipal alternative retail electric supplier (ARES), Power Purchase Agreements, etc.

### Focus Area Impact and Performance Metrics

Switching to renewable sources of electricity and purchasing renewable energy either directly or through Renewable Energy Credits (RECs) and offsets would eliminate greenhouse gas emissions from electricity consumption in Evanston.

| Target year | Metric Description |
|---|---|
| 2025 | 75% renewable electricity supply for all Evanston accounts |
| 2030 | 100% renewable electricity supply for all Evanston accounts |
| Annual | Number, size and output of onsite renewable energy installations in Evanston |
| Annual | Total megawatt hours (MWh) of renewable energy supplied to Evanston customers |

***Evanston Hospital:***

*NorthShore University HealthSystem has pledged to achieve 50% of their entire energy portfolio from renewable sources by 2025, reach a 30% recycling rate across NorthShore campuses by 2020, and obtain an Energy Star score above 75 for Evanston Hospital 2025.*

### Outreach and Engagement

1. Implement a sustainable business recognition program focused on increasing access to renewable energy supply options, reducing energy consumption and improving energy efficiency, waste reduction and diversion strategies, resource efficiency, sustainable purchasing and cost-savings.
2. The City, in partnership with local non-profits, will provide information and resources on the installation of onsite renewable energy systems.

# Zero Waste



## Goal

**Increase community waste diversion rate to:**

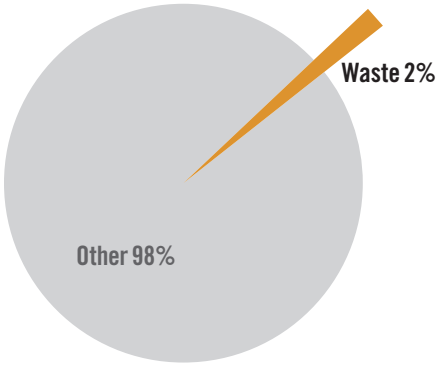
50% – by 2025
75% – by 2035
100% – Zero Waste

All diversion rates measured from a 2017 baseline (*see Appendix A for details*).

Disposal of waste only accounts for 2% of community emissions, yet material consumption and corresponding waste systems have significant environmental and climate impacts that are not included in calculations of community greenhouse gas emissions data. Given that measurements of these consumption and waste systems have yet to be refined and the significant impact of food waste, plastic pollution and demolition waste on the environment, developing a Zero Waste Strategy is considered a primary action within the plan. Furthermore, Evanston's 2017 community-wide waste diversion rate was 21% and has held steady at around 20% since 2012, which is far below its potential.

Actions in this category seek to meaningfully reduce the amount of waste generated, encourage more sustainable consumption behaviors, support the circular economy and develop and implement a Zero Waste Strategy. Additional benefits of actions in this section include reduced environmental and social impacts of waste disposal, improved air and water quality, improved public health, cost-savings, and potential job growth in related sectors.

**2017 Waste GHG Emissions**




## Actions

1. Create and Implement a Zero Waste Strategy
   a. Combat food waste by requiring 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.
   b. Eliminate petroleum-based, single-use products through phasing out the use of single-use plastics by 2025. Require food service retailers to use biodegradable, compostable or recyclable packaging (per City of Evanston recycling specifications). Explore the feasibility of establishing a reusable takeout container service.
   c. Implement a plastic straw and stirrer-free or opt-in policy for businesses that provide food and/or beverage services, with appropriate options for people with disabilities.
   d. Reduce construction and demolition waste by ensuring that strong recycling and reuse requirements are met for all building-related permits. Require that all real estate developments that receive financial assistance from the City or special zoning approval adhere to a higher standard of recycling and reuse.
2. Require recycling at all properties. Adopt policies that provide all properties equal access to waste diversion services such as recycling and composting. Require that all properties make recycling receptacles clearly accessible to tenants, patrons and visitors. Facilitate, encourage and incentivize all properties to engage in a composting program.
3. Update and revise the disposable plastic shopping bag ban to achieve its intended outcome.
4. Enforce the Cook County Demolition Debris Diversion Ordinance and strive to exceed minimum requirements in the revised building code.
5. Support the preservation, reuse, repurposing and retrofit of existing structures to reduce demolition waste, preserve the embodied energy and materials, while avoiding the energy usage related to demolition.

***Composting:***

*In 2017, the City launched the largest municipal compost collection program in Illinois. The program provides service options to all properties in Evanston in partnership with Collective Resource, an Evanston and woman-owned business. Diverting food from the landfill can reduce methane generation and allow waste food to be turned into a nutrient-rich soil amendment.*

## Focus Area Impact and Performance Metrics

Achieving the ambitious goal of Zero Waste will have numerous and significant positive impacts beyond the direct reduction in greenhouse gas emissions. Achieving Zero Waste has the potential to change local consumption habits, reduce costs associated with landfilling material, create jobs and energize circular economy practices throughout the community.

| Target year | Metric Description |
|---|---|
| **2025** | Community waste diversion rate of 50% from 2017 levels |
| **2035** | Community waste diversion rate of 75% from 2017 levels |
| **2050** | Community waste diversion rate of 100% from 2017 levels |
| **Annual** | Total weight of material disposed of within the community by month and type |
| **Annual** | Number of active accounts per waste service |
| **Annual** | Number of deconstruction projects in Evanston annually |
| **Annual** | Total weight of reclaimed material utilized in projects, renovations and new construction |

## Outreach and Engagement

1. Educate the community on waste management strategies starting with reducing consumption, followed by reusing, repurposing, recycling, and composting.
2. Participate in the "Love Food Hate Waste" campaign or a similar program to encourage food waste reduction on a community-wide scale.
3. Conduct a Zero Waste campaign.
4. Encourage schools to establish Zero Waste lunchrooms and classrooms.
5. Encourage grocery stores to offer bulk food sales to reduce packaging.
6. 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.
7. Promote the purchase of compost made in Illinois.
8. Provide a copy of the Cook County Demolition Debris Diversion ordinance with appropriate City permit materials.

# Transportation and Mobility



## Goal 1

**Reduce vehicle miles traveled; increase trips made by walking, bicycling and transit.**

## Goal 2

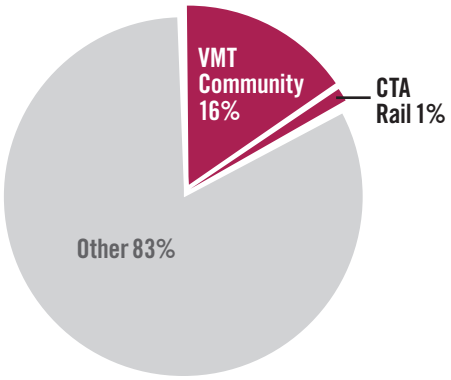
**Increase use of electric vehicles; decrease carbon emissions from vehicles and equipment.**

Transportation systems accounted for 17% of Evanston's emissions in 2017. Transportation-related emissions and transportation activity in Evanston are difficult to measure, thus the data included in the inventory is modeled data from the Chicago Metropolitan Agency for Planning (CMAP)'s regional transportation model scaled down for Evanston (*details in Appendix A*). Given the limited local data on all forms of transportation and mobility, it is recommended that the first step in taking meaningful action to reduce transportation and mobility emissions is to *develop and implement a comprehensive multimodal transportation data collection program that includes vehicle-miles-traveled (VMT)*. This program, once established, will be used to evaluate the impact and effect of policies on Evanston's transportation systems by mode.

Actions in this section focus on helping the community to shift to low- or non-polluting transportation modes such as walking, bicycling, and using public transit. Additionally, the actions support the expansion of the use of electric vehicles or other zero-emission vehicles (ZEVs) in the public and private sector and the infrastructure necessary to support this expansion. Shifting to low- and non-polluting modes of transportation while also increasing the use of zero-emission vehicles and equipment, and decreasing the use of combustion-engine vehicles and equipment, will have positive effects on public health through increased active lifestyle habits and improved air quality.

The transition from petroleum-powered vehicles to electric vehicles will require changes (upgrades) in fleets, personal vehicle purchases, and perhaps most importantly, electric vehicle infrastructure, namely charging stations for commercial and personal use. This section identifies the top priorities in each of these areas.

### 2017 Transportation GHG Emissions




### Preliminary Step

Develop and implement a comprehensive multimodal transportation data collection program that includes vehicle-miles-traveled (VMT), the mode-share for each (walking, bicycling, transit, driving alone and carpooling), and route selection through routine traffic counts for both roadways and key bicycle routes. The data collected should be able to assess the impacts of infrastructure improvements, increased development and other related policy changes on travel behavior. This data collection effort should include ride-share data provided by ride-share operators and commercial VMT attributed to trucks and delivery vehicles to better understand the impacts on overall community VMT. The process of developing a regular and comprehensive transportation data collection program may initially require external resources. The City will explore potential partnerships with local institutions and organizations to accomplish this preliminary step.

## Goal 1 Actions

1. Continue implementation of transportation-related City plans, including the Multimodal Transportation Plan, the 2014 Bike Plan Update, the Health Department's EPLAN, and the Complete Streets Policy.
    a. Expand safe, convenient and complete networks in Evanston for pedestrians, bicycles and transit; facilitate the expansion of strong bicycle and transit connections between Evanston and neighboring communities.
2. Foster active transportation habits in Evanston residents by:
    a. Providing bicycle and pedestrian safety and skills training to all school-aged children in Evanston with an accompanying program to educate parents and all interested adults. Conduct a "share-the-road" public education campaign to educate drivers about safe and respectful driving behavior mindful of pedestrians and bicyclists.
    b. Conduct Safe Routes to Schools audits for all Evanston elementary and middle schools to identify infrastructure improvements that would enhance pedestrian and bicycle safety and encourage trips to school on non-polluting modes of transportation.
3. Through revision of the building code, ensure that developers undertaking new development or redevelopment projects adopt practices and include infrastructure that encourages trips by walking, bicycling and on transit through:
    a. Reducing the amount of parking.
    b. Providing incentives such as density bonuses or expedited review for development projects that have mixed-used zoning (residential, retail and office uses) and commit to sustainable transportation practices. For example, prioritizing access by pedestrians and bicyclists, providing electric vehicle charging stations and discounted transit passes, as well as fee-appropriate parking.
4. Monitor impacts of ride-sharing services and work with ride-share operators to determine appropriate strategies to reduce unnecessary VMTs and incentivize the use of electric and hybrid vehicles. Assess fees relative to the impacts identified and earmark them for investments in transit, bicycle and pedestrian networks.

## Performance Metrics

| Target year | Metric Description |
|---|---|
| **2025** | Reduce community vehicle miles traveled by 20% from 2005 levels |
| **2035** | Reduce community vehicle miles traveled by 35% from 2005 levels |
| **2050** | Reduce community vehicle miles traveled by 50% from 2005 levels |
| **Annual** | Number of trips made by walking |
| **Annual** | Number of trips made by bicycling |
| **Annual** | Number of trips made by public transit |

## Goal 2 Actions

1. Incentivize electric vehicle infrastructure (charging stations).
   a. Work with neighboring communities to incentivize electric vehicle infrastructure by identifying appropriate locations that are convenient to residents of multiple communities.
   b. Establish an expedited process through the City's zoning and building code for electric vehicle charging infrastructure.
2. Partner with fleet operators and transit providers to work towards a goal that buses and fleets based and operating in Evanston, including school buses, be 100% electric by 2035 (50% electric by 2025). Work with transit agencies and bus companies to take advantage of federal transit grant opportunities to purchase new electric vehicles.
3. Educate fleet operators and residents about the no idling law and enforce it consistently, as well as create steeper fines for diesel vehicles, such as buses and construction vehicles and equipment.
4. Phase out the use of gas- and propane-powered leaf blowers, lawn mowers and construction equipment; provide a timeline by which they need to be replaced with electric or battery-powered options.

## Performance Metrics

| Target year | Metric Description |
|---|---|
| **2025** | Buses and fleets based and operating in Evanston are 50% electric |
| **2035** | Buses and fleets based and operating in Evanston are 100% electric |
| **Annual** | Number of electric vehicles registered in Evanston |
| **Annual** | Number of public charging stations located in Evanston |
| **Annual** | Percentage of city-owned fleet converted to electric vehicles |

## Focus Area Impact

Mode shifts, electrification of transit and private vehicles, as well as the impending proliferation of autonomous vehicles, will change the transportation and mobility landscape in Evanston. These changes will likely lead to an increase in electricity consumption, which can and will be purchased renewably, thus reducing emissions from transportation.

## Outreach and Engagement

1. Implement initiatives to educate residents about electric vehicles and related infrastructure.
2. Explore the use of a mobile app to educate Evanston residents about travel mode options and routes, and encourage, possibly through incentives, more trips using non- and low-polluting modes of transportation.
3. Advocate at the regional and state levels to maintain or expand the bus transit network in Evanston.
4. Partner with the Active Transportation Alliance and School District 65 to do safety audits of the walking and bicycling routes to all Evanston elementary and middle schools.
5. Explore funding opportunities through the Illinois Safe Routes to Schools grant program to make safety improvements on school walking and bicycling routes.
6. Develop a strategy to work with landscaping and construction industry contractors to eliminate the use of gas- and propane-powered equipment prior to the phase-out.

# Urban Canopy, Natural Areas and Green Space Preservation and Restoration for Mitigation and Resilience

## Goal

**Preserve, restore, and expand Evanston's urban canopy, natural areas, native vegetation and green space to maintain and increase carbon sequestration, improve stormwater runoff detention, improve air quality, energy efficiency and livability and reduce adverse urban impacts on humans and key species such as birds and pollinators.**

The presence of an urban canopy, natural areas, and green space provide a multitude of habitat, mitigation and resilience benefits to the community. A healthy urban canopy provides demonstrable carbon sequestration, improved air quality, stormwater absorption, and cooling and shading benefits to the community. Evanston's trees sequester approximately 24,985 $MTCO_2e$. Continuing to invest resources into maintaining and improving the health of the canopy will increase carbon sequestration, improve stormwater absorption and increase shading and cooling benefits. In addition, many forms of fauna rely on natural and green spaces in Evanston for food and shelter. Supporting these habitats and improving their resilience in the face of climate change is imperative to supporting local ecosystems.

The actions in this section seek to support and protect Evanston's urban canopy, green space, natural areas and overall ecosystems. The additional benefits related to the initiatives in this section include enhanced public health and livability through improved air and water quality, cost-savings related to the cooling and shading effects of trees, and healthier ecosystems.

## Actions

1. Prioritize replacing and planting additional trees on public property and assist residents with replacing trees on private property. Consult the Trees for 2050 publication developed by the Chicago Botanic Garden to guide tree selection for climate resilience.
2. Commit to protect, conserve, and expand natural areas throughout the city such as Isabella Woods, Clark Street Beach Bird Sanctuary, the North Shore Channel, Perkins Woods, existing habitat, etc.
3. Adopt a tree preservation ordinance that requires obtaining a permit for tree removal on private property; include exceptions for diseased and nuisance trees; develop a fee structure that does not overburden income-constrained property owners.
4. Prioritize planting and preservation of native species of plants and trees on public and private property through education, incentives and other promotional programs. Ensure that landscaping requirements articulated in the zoning code include the preservation of the maximum possible number of existing trees, the use of native plantings and the preservation of natural areas whenever possible.
5. Reduce pesticide (insecticides and herbicides) and chemical fertilizer use community-wide through City policy and community education.

***I Heart Evanston Trees and RePlant Express:***

*Since 2006, the invasive emerald ash borer, Dutch Elm disease, and intense weather events have claimed as many as 400 trees per year in Evanston! Trees clean the air, sequester carbon, absorb and filter stormwater, provide shade, help cool surrounding areas through evapotranspiration, and can increase property values. To combat these losses, the I Heart Evanston Trees and RePlant Express programs were created to raise funds to plant replacement trees.*

## Focus Area Impact

Quantifying emissions reduction and sequestration values is a challenging measurement process at the local level for urban canopy and green spaces. Maintaining green space, natural areas and the urban canopy in healthy and thriving condition improves Evanston's resilience to climate change and supports incremental reductions in greenhouse gas emissions.

## Performance Metrics

| Target year | Metric Description |
|---|---|
| **2025** | 500 net new trees planted |
| **2035** | 1,000 net new trees planted |
| **2050** | 2,000 net new trees planted |
| **Annual** | Number of properties with Natural Wildlife Federation Wildlife Habitat Certification |
| **Annual** | Number of pesticide-free public parks and other properties |

## Outreach and Engagement

1. Review and enhance the City's public health procedures, information and messaging to encourage local gardening, composting, leaving leaves, and reducing chemical fertilizers and pesticides.
2. Support community volunteers such as participants in Openlands TreeKeepers program.
3. Post information about the City pesticide policy at City properties, include the policy in the City's annual mailing to landscapers, and encourage voluntary steps to reduce pesticides.

# Outreach, Education and Behavior Change



## Goal

**Educate, motivate and empower Evanston community members, institutions and businesses to take meaningful action to fight climate change and improve community resilience.**

Collective and decisive action by all residents, institutions and businesses is needed for Evanston to meet its climate action and resilience goals. Educating all members of the community about climate change, its impacts and solutions is critical. Actions in this section aim to educate, motivate and empower all community members to play a part in the Climate Action and Resilience Plan.

Strategic action is needed at all levels, including the individual level. The average annual carbon footprint of a person living the U.S. is 16.2 $MTCO_2e$*. This is greater on average than any other nation in the world—twice as much as the average person in Europe or Japan and ten times as much as the average person in India. Every resident should aim to reduce their own carbon footprint and adopt behaviors that are more sustainable, reduce climate change, and increase resilience.

*World Development Indicators 11/13/2018 https://data.worldbank.org/indicator/EN.ATM.$CO_2$E.PC.

## Actions

1. Engage both school districts and private schools to explore the possibility of developing and implementing an environmental education-integrated curriculum
2. Expand environmental education locations and programming within Evanston specifically to raise awareness about climate change and its effects on the community and the world
3. Establish a carbon footprint data collection program through surveys to community members and businesses
4. Establish a "MyCARP" program for residents to build their own climate action and resilience plans to empower them to take meaningful actions to reduce their own carbon footprint and increase their resilience
5. Implement a "Green Me, Green E" publicity campaign to build awareness, create buy-in and possibly raise funds for climate mitigation and resilience efforts
6. Implement a sustainable business recognition program to publicly recognize businesses with a commitment to sustainable practices
7. Protect and expand community garden programs to encourage local food production, through dedicated space and increased education efforts.

### Focus Area Impact

Individual awareness about the impacts of climate change and what can be done to reduce Evanston's impact and prepare for changes are prerequisites for the success of all of the focus areas within this plan. Empowering community members to take meaningful action will lead to larger systems change.

### Performance Metrics

| Target year | Metric Description |
|---|---|
| **2025** | Each resident reduces their carbon footprint by at least 10% |
| **2035** | Each resident reduces their carbon footprint by at least 25% |
| **2050** | Each resident reduces their carbon footprint by at least 50% |
| **Annual** | Number of businesses recognized by the sustainable business recognition program |
| **Annual** | Number of residents participating in the "MyCARP" initiative |
| **Annual** | Number of public events held to educate, motivate and empower residents and businesses to learn about climate change and climate solutions |

# Climate Resilience

Climate resilience is the task of evaluating the changing climate and preparing the community for anticipated changes and the impact they will have on the community and its infrastructure.

The local impacts of climate change in Evanston were identified through the City's participation in the Urban Sustainability Directors Network (USDN) Socioeconomic Climate Mapping Tool Project. The resulting Climate and Socio-economic Vulnerability Assessment helped City staff understand local climate data. The primary local climate hazards and their impacts identified are:

## Evanston Climate Hazards

| Climate Hazard | By Mid-Century 2050 | By End-Century 2075 | Summary |
|---|---|---|---|
| Extreme Heat | ↑ | ↑↑ | Increase in extremely hot days, over 95°F and 100°F |
| Shorter Winters | ↓ | ↓↓ | Decrease in number of days below freezing |
| Storms | ↑ | ↑↑ | Increase in extreme precipitation events |
| Drought | ? | ↑ | Increase in drought conditions |

## Evanston Climate Impacts

| Climate Impact | By Mid-Century 2050 | By End-Century 2075 | Summary |
|---|---|---|---|
| Infrastructure Stress | ↑ | ↑↑ | With increased heat and sever storms physical infrastructure will be tested |
| Human Migration | ? | ? | The Chicago region may see an influx of climate refugees |
| Flooding | ↑ | ↑↑ | Higher risk of flooding and associated damage |
| Invasive Species/ Pests | ↑ | ↑ | Increase in invasive species and pests |
| Air Pollution | ↑ | ↑ | Poor air quality and increase in aeroallergens |

In order to respond to these threats six Focus Areas have been identified that demand policy and program solutions to ensure that Evanston remains a resilient community in the face of climate change.

| Climate Resilience Focus Areas |
|---|
| Green Infrastructure |
| Health Impacts of Extreme Heat |
| Resilience Regulations |
| Community Networks and Education |
| Emergency Preparedness and Management |
| Vulnerable Populations |

# Green Infrastructure



"Green infrastructure is a product, technology, or practice that uses natural systems or engineered systems that mimic natural processes to enhance overall environmental quality and provide utility services. Green infrastructure techniques apply to the use of soils and vegetation for infiltration, evapotranspiration, and/or recycling of stormwater runoff." —Federal Environmental Protection Agency (EPA).

In Evanston, there is a long history of investing in stormwater infrastructure primarily through the implementation of grey infrastructure such as: sewer pipes, pumps, detention ponds, and other human-made infrastructure. The implementation of green infrastructure in appropriate locations throughout Evanston can reduce potential flooding risks and potential capital expenses associated with grey infrastructure.

Based on available data, there is a high probability of an increase in the number and impact of damaging floods in Evanston in the future. Most impacts will be moderate (since riverine flooding is not a threat in Evanston), such as overland flooding of homes and sewer system backups. Additionally, depending on the severity of increased precipitation, flooding could negatively impact the water quality in Lake Michigan through the release of contaminants. Although this is a remote possibility, it would be very severe if it occurred, and climate change can lead to unpredictable outcomes (see, for example, the algae blooms that caused toxic drinking water contamination in Toledo, Ohio).

## Actions

1. Contribute to zero occurrences of combined sewer overflows (CSOs) which can result in the opening of the Wilmette locks to release untreated wastewater into Lake Michigan.
2. Enhance stormwater systems to handle an increase in severe weather events.
3. Prioritize managing stormwater before it enters the sewer system through a combination of overland flow, detention, and infiltration strategies (for example, permeable surfaces).
4. Target specific types of infrastructure to implement green infrastructure including: parking lots, alleys, parks, vacant lots, parkways, and grading near sidewalks. In addition, identify property owned by other public entities that have a high potential for improved ecological management to improve stormwater management functions (school districts, Metra, Chicago Transit Authority (CTA), and Metropolitan Water Reclamation District (MWRD)).
5. Promote native landscaping, restore and conserve habitat; encourage rain gardens on private property, avoid turf grass, and convert City-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" and other related assessments).
6. Prioritize tree planting and maintenance on public property.
7. During and immediately after major rainfall events, deploy an education and communication plan in coordination with the appropriate partners such as MWRD and Friends of the Chicago River to alert residents, businesses and institutions to delay activities that will contribute wastewater (such as doing laundry) until the treatment process can catch up with the overloaded combined sewer system.
8. Reduce water consumption.
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.
10. Prepare a comprehensive plan for stormwater management that goes beyond baseline regulatory requirements and includes green infrastructure with the goal of eliminating CSOs.

# Health Impacts of Extreme Heat



An increase in number of hot days annually and temperature increases overall can cause negative health impacts, particularly to community populations and ecosystems that are already susceptible to temperature increases. The elderly, children, workers who perform outdoor labor and individuals involved in outdoor recreational activities will be most impacted. Primary health impacts include increased risk of heat stroke and exhaustion and a decrease in overall air quality. These conditions can exacerbate existing health conditions such as cardiovascular disease, allergies, respiratory illness, etc.

Extreme heat, together with related air quality problems, poses an immediate and severe threat to human health, particularly for vulnerable populations. The following actions seek to reduce the adverse impacts of extreme heat.

## Actions

1. Establish cooling centers and provide information to the community to ensure vulnerable residents are aware of these services, including direct messaging at community facilities and through health providers.
2. Provide guidance through resource material to social service providers so they are aware of best practices in treating client needs during an extreme heat event.
3. Develop materials instructing residents how to reduce exposure to ground level ozone. (Promote improvements to indoor air quality for homes, schools, childhood learning centers, institutions, and businesses, such as requiring healthy Indoor Environment and Indoor airPLUS protocols for all new construction.)
4. Plant shade trees to limit the need for indoor cooling and reduce temperatures at parks, playgrounds, and other outdoor spaces.
5. Investigate programs to reduce cost barriers that limit access to cooling assets such as Evanston beaches and pools during extreme heat events.

# Resilience Regulations



New construction and modification to existing buildings are highly influenced by City zoning and building codes. Building codes, zoning ordinances, minimum parking requirements, landscaping regulations, and other requirements must support climate resilience strategies. Ensuring that new construction and renovations incorporate sustainable practices will improve climate resilience.

## Actions

1. Conduct a review of relevant City regulations, policies and practices and determine how climate resilience strategies can be incorporated.
2. Reduce vulnerability to flooding through provisions for locating mechanical and electrical equipment in above-ground building areas, and encourage alternative energy generation and energy storage systems.
3. Revise or implement building codes that reduce threats to vulnerable wildlife species, particularly birds (migratory and local).
4. Update plumbing codes to allow for non-potable water reuse for irrigation and other domestic uses.

# Community Networks and Education



Community awareness and preparedness for climate change and its impacts is fundamental, and an educated community is necessary for many of the City's actions to be effective. City programs to improve resilience will not be effective unless residents and businesses participate.

## Actions

1. Educate residents about the impacts of climate change and develop messages that inspire action. Identify areas (physical places or regular public service announcements) to communicate City efforts, call for volunteers, and raise general awareness.
2. Improve resilience through education at public events (street fairs, farmers' markets, and festivals). Increase awareness of climate change impacts and emphasize the need for household and neighborhood preparation. Create activities and messages that capture public interest.
3. Improve awareness among residents of the impacts of their actions on the environment, water quality, and waste generation. Educate residents and businesses on proper disposal methods for cosmetics, medications, and other products that contain potentially harmful chemicals.
4. Emphasize steps individuals can take to improve emergency preparedness. Increase awareness of City and other alert systems.
5. Provide education around vegetation management of trees and how proper management can reduce storm-related power outages.
6. Identify funding sources to facilitate a financial aid arrangement to assist property owners in conducting preventive vegetation management and assist with costs related to post-storm, tree clean-up.
7. Enhance community networks and connections for those who require special attention, such as the elderly, homebound, disabled, isolated, or those likely to be in need of financial assistance during or after extreme weather events (heat, cold and heavy precipitation).
8. Facilitate education about, and membership in, the existing North Shore Village organization.
9. Establish a "Neighbors Helping Neighbors" program.
10. 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.

***Presbyterian Homes:***

*This independent, not-for-profit organization will encourage carpooling among employees, upgrade lighting to LEDs, increase native plant species on their property, and purchase the most up-to-date HVAC systems. Future goals include developing a certified garden habitat at Westminster Place, one of their Evanston properties, and obtaining 100% of their energy from renewable sources by 2028.*

# Emergency Preparedness and Management



In addition to an educated and prepared community, the City also needs to use best practices in emergency preparedness, management and response. The City is a front-line responder to the extreme weather events associated with climate change, and must have effective systems and processes in place to manage and respond to emergencies as they occur.

## Actions

1. Update or develop a community resilience plan to prioritize and prepare for responses in the event of a disaster and extreme weather events. Identify the location of critical facilities including hospitals, medical service providers, senior homes, childcare facilities, shelters, major and alternate transportation routes, public transit facilities and locations where hazardous chemicals are used or stored.
2. Improve the resilience of emergency response and communications systems. The City Manager's Office will work with the Health and Human Services Department (HHS) Emergency Response Coordinator (ERC) and the City's Emergency Manager for employee and resident emergency communications. They will routinely test and utilize communications systems and build in notifications and alerts for extreme environmental situations.
3. Continue to involve key community partners, such as hospitals, in emergency preparedness and management. Include the impacts of climate change as emerging threats in future response planning.
4. Ensure that facilities that serve vulnerable populations are resilient to climate hazards. Develop model procedures for ensuring both City and non-City facilities employ best practices in the event of an emergency such as flooding, power outages, extreme heat, etc.
5. Update the City emergency plans with specific climate change-related emergency materials. These could include press release templates, information on cooling/heating centers, specific plans for populations requiring mobility assistance, and steps to identify and help populations affected by extended power outages, flooding, etc.
6. Develop a debris management plan to support response to severe storm events and flooding.

# Vulnerable Populations



The City has developed the following working definition for vulnerable populations relative to climate change hazards: community members who are placed at a disadvantage in preparing for and/or responding to climate hazards. These community members include, but may not be limited to: lower-income residents, people of color, immigrants, refugees, the elderly, children, people with disabilities, historically marginalized communities, renters, and those without access to cars. Different vulnerable populations will be affected depending on the climate hazard being experienced. It is expected that other populations will become vulnerable as a result of increasing climate hazards due to climate change.

Many climate hazards result in negative effects, which may include higher utility bills, increased probability of flooding, higher food costs, and other financial stresses. Vulnerable populations, by definition, are placed at a disadvantage when responding to and preparing for these effects. Addressing their needs is a matter of environmental and climate justice. A proactive approach to climate change is essential in protecting the community's most valuable assets, its residents.

## Actions

1. Identify current and future vulnerable populations.
2. Conduct targeted outreach with vulnerable populations to understand their needs and how the City can best assist them in preparing to meet those needs.
3. Assess City infrastructure and prioritize support for properties that provide services to vulnerable populations to ensure they are accessible.
4. Establish a protocol for providing assistance to populations that may face financial strain caused by climate hazards, such as higher utility bills, and identify funding sources to support those populations.
5. Investigate building improvement programs that would reduce energy consumption through added insulation, air sealing, passive energy systems, and higher efficiency equipment.
6. To buffer low-income residents from fuel price spikes, support alternative transportation modes such as transit, biking, and walking. Support renewable energy sources to provide resilience to energy price spikes.
7. Adopt an environmental justice ordinance, building on the work of Environmental Justice Evanston and the Equity and Empowerment Commission.

# Implementation, Accountability and Partnerships

The Climate Action and Resilience Plan Working Group recognizes that in order to achieve goals within the plan there must be robust implementation, external accountability and strong partnerships. The City will play a central role in coordinating partnerships, leading overall implementation and providing necessary information to allow accountability from external stakeholders such as relevant Boards, Committees, and Commissions and local stakeholder organizations.

## Implementation and Accountability

1. Increase City personnel dedicated to Sustainability to ensure that the City is able to implement the plan effectively.
2. Request that the CARP working group continue as an independent task force to assist with implementing plan actions, to identify projects or programs that could be carried out by interested volunteer residents, such as education campaigns, fundraising, etc.
3. The City should prepare an annual report on the status of implementing the plan. Ensure systems are in place to effectively implement, monitor and measure the plan and the outcomes of the actions.
4. Explore the feasibility of instituting a climate action tax/fee to be paid by the largest producers of GHGs to pay the costs of implementing the actions of the plan. Such funds could be used to create low-cost loans or small grants to encourage residential energy efficiency improvements, particularly for income-qualified residents.
5. Follow the Guiding Principles with a specific focus on centering equity in implementing and evaluating the plan.

## Partnerships

1. Partner with Citizens' Greener Evanston to implement CARP strategies and continue community engagement and education programs.
2. Partner with the Evanston Public Library system to develop community education and outreach efforts.
3. Partner with ComEd and Nicor Gas on CARP initiatives and maximize incentive programs for residents and businesses.
4. Partner with energy service providers on energy efficiency strategies for residents.
5. Partner with the Solid Waste Agency of North Cook County (SWANCC) and the Evanston Rebuilding Warehouse to achieve Zero Waste goals.
6. Partner with all major employers to collectively implement CARP actions.
7. Partner with relevant Boards, Committees and Commissions (Transportation and Parking, Environment Board, Utilities Commission, Equity and Empowerment, etc.) to draft and send appropriate policies to the City Council and its committees.
8. Partner with local religious, spiritual and faith communities to further develop resident education and outreach efforts.

# Commitments from Large Employers

Achieving ambitious goals such as Zero Waste, zero combined sewer overflows, 100% renewable energy and ensuring Evanston is a prepared and resilient community in the face of climate change, cannot happen without community leadership. Evanston is fortunate to have employers and organizations that are also civic leaders. Throughout the planning process the City worked with the following organizations to showcase their current and future contributions and commitments to sustainability and climate action."

## Evanston Community Foundation (ECF)

- Educating the nonprofit community on actions they can take to reduce their impact on climate change and support the plan.
- Review the guidelines of ECF's Climate Action Fund for opportunities to create long-term funding streams for this local carbon offset program.
- Explore opportunities to partner with the City of Evanston on joint grant ventures such as Partners for Places.

## NorthShore University HealthSystem

- Achieve 50% of entire energy portfolio from renewable sources (RECs) by 2025.
- Achieve 30% recycling rate across NorthShore campuses by 2020.
- Increase the percentage of meat/poultry raised without the use of routine non-therapeutic antibiotics to 20% by 2020.

## Northwestern University

- Reduce energy use intensity (energy use per square foot of space) 20% below 2010 levels by 2020.
- Increase landfill diversion rates to 50% of total waste generated by 2020.
- Achieve net zero emissions by 2050 from 2012 baseline (Reduce Scope 1 and 2 emissions by 30% by 2030).

## Presbyterian Homes

- Westminster Place will commit to establishing a certified garden habitat and developing a pesticide management program by 2020.
- Pending resident support, Presbyterian Homes will develop a renewable energy program that will outline incremental increased commitments to renewable energy sources, resulting in a 100% utilization by 2028.

## Presence Saint Francis Hospital

- Reduce GHG emissions levels 50% by 2025.
- Expand use of ENERGY STAR Portfolio Manager to track and reduce water usage and adopt US EPA WaterSense Program.
- Reduce, divert and reuse 35% of construction and demolition material by 2025.

## Rotary International

- Pursue LEED Platinum status by 2022.
- Source 100% of electricity from renewable sources.
- Reduce building energy costs by continuously improving systems' efficiencies and reducing energy usage
  - Switch to LED lighting
  - Install hydronic economizer
  - Update boiler system controls
  - Replace variable frequency drives on chillers

## Evanston/Skokie School District 65

- Adopt the Next Generation Science Standards (NGSS), which introduce global climate change, to middle school students.
- Replace existing fluorescent lighting with LED lighting, which could cut electric consumption by 50% by 2028.
- Eliminate Styrofoam™ trays in school cafeterias and replace with compostable trays that will be picked up and composted by a third party. Implement recycling in all school cafeterias.

## Evanston Township High School District 202

- Continue conversion of standard lighting to LED lighting
- Expansion of urban agriculture class
- Continue to make own power, which allows ETHS to exit the ComEd power grid during peak demand periods

# Appendix A: Community Greenhouse Gas Emissions Inventory

A greenhouse gas emissions inventory is an assessment of all the greenhouse gases that can be attributed to a given organization or jurisdiction in a given time period. Evanston's greenhouse gas emissions inventory (Emission Inventory) is completed annually. The first year for which data is available is 2005.

## Purpose

The purpose of the inventory is to demonstrate the primary areas in which emissions are occurring in order to direct and prioritize actions to reduce those emissions over the long term. In addition, the Emissions Inventory allows the City to track compliance with external commitments such as the Paris Climate Agreement, the Chicago Climate Charter, We Are Still In, STAR Community Rating System and participation in consortiums such as Climate Mayors.

## Global Protocol

To ensure that Evanston's Emissions Inventory is accurate, comparable and rigorous, the City follows the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC). GPC has two levels of protocol: BASIC and BASIC +. Evanston's Emissions Inventory achieves the BASIC level. BASIC + includes emissions sources that are generally more difficult to track down. The City will evaluate achieving BASIC + in future years as more data is made available. In 2018, the City began disclosing its Emissions Inventory findings publicly through the CDP platform in accordance with The Global Covenant of Mayors for Climate and Energy (GCoM) requirements. The City will continue to disclose its Emissions Inventory data annually.

## Emission scopes

According to the GPC protocol, emissions can be broken down into three different scopes (1, 2, and 3). Each of these scopes indicates the nature in which those emissions are generated.

**Scope 1** accounts for emissions occurring within Evanston's municipal boundaries.

**Scope 2** is exclusively for electricity generated and supplied to accounts within Evanston's municipal boundaries.

**Scope 3** captures emissions caused by actions within Evanston's boundaries but occurring outside its boundaries, such sending waste to a landfill outside of Evanston.

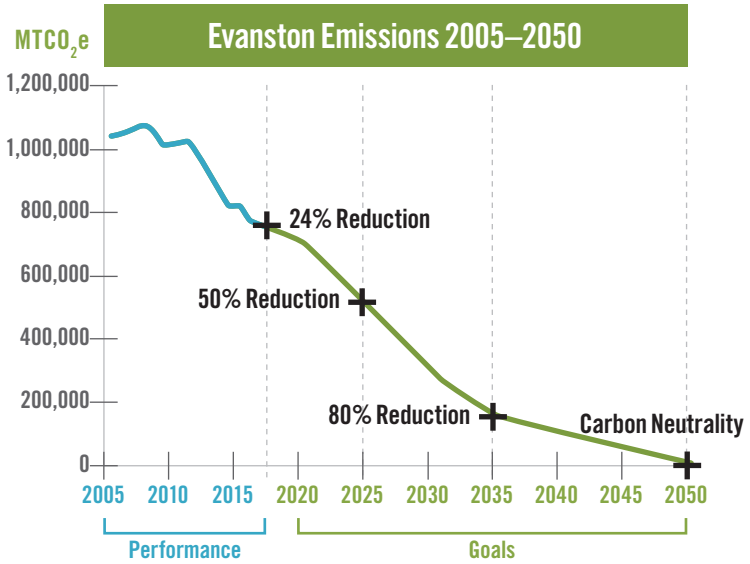
***Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC):***
*Created by the National League of Cities, this protocol provides a "robust framework for accounting and reporting city-wide greenhouse gas emissions" in a standardized comparable format.*

***BASIC and BASIC+:***
*The two levels of reporting through the GPC Protocol*

1. ***BASIC:*** *"BASIC level covers scope 1 and scope 2 emissions from stationary energy and transportation, as well as scope 1 and scope 3 emissions from waste"*
2. ***BASIC+:*** *"involves more challenging data collection and calculation processes"*

***CDP Platform:*** *Is a platform for reporting and disclosing publicly Evanston's climate data, risks and strategies to mitigate those risks. The Global Covenant of Mayors for Climate and Energy requires data to be reported through CDP for compliance.*

**Figure 1**



## Emission data

In order to provide detailed information on the data that impact emissions in Evanston, this Emissions Inventory includes three types of data for each emissions source: Source Data, Activity Metrics and Emissions Data.

**Source Data** is data used for calculating overall emissions, such as electricity consumption, tons of waste or vehicle miles traveled.

**Activity Metrics** are data within each emissions category that help contextualize the Source Data such as the number of registered vehicles in Evanston, number of electric accounts, or number of jobs.

**Emissions Data** are the emissions amounts in metric tons of carbon dioxide equivalent ($MTCO_2e$). The tracking and combination of these three sets of metrics allows for a contextualized and comprehensive understanding of the trends within the Emissions Inventory.

## Table 1: Community Greenhouse Gas Emissions Inventory

Table 1 is the Community Greenhouse Gas Emissions Inventory, which includes the major Source Data categories. City staff have also created emissions categories that are made up of groupings of Source Data in order to show trends more clearly. Emissions categories include: Building Energy Consumption, Mobility and Transportation, Waste and Offsets and Renewable Energy Credits (RECs). As the detail below will demonstrate, there are numerous other ways to group and categorize the available data, but the current configuration has been determined most appropriate. As new data or better resolution data are made available, the categories may change to provide deeper insight into emissions trends and possible solutions.

### Table 1: Community Greenhouse Gas Emissions Inventory

| Emissions Scope | Category | Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Units | $MTCO_2e$ | | | | | | | | | | | | |
| 2 | Building Energy Consumption | Residential Electricity (all classes) | 154,524 | 149,040 | 150,400 | 147,120 | 135,831 | 149,812 | 147,949 | 153,490 | 140,299 | 139,642 | 121,408 | 114,335 | 111,096 |
| 2 | Building Energy Consumption | Small Commercial Electricity | 366,025 | 380,907 | 385,988 | 374,123 | 364,908 | 377,846 | 368,431 | 372,696 | 358,954 | 350,347 | 325,850 | 137,478 | 138,849 |
| 2 | Building Energy Consumption | Large Commercial Electricity | | | | | | | | | | | | 151,289 | 149,842 |
| 2 | Building Energy Consumption | Government non-City-owned | 641 | 641 | 641 | 641 | 641 | 641 | 641 | 641 | 641 | 641 | 641 | 641 | 730 |
| 1 | Building Energy Consumption | Residential Gas Consumption | 114,674 | 116,791 | 119,144 | 127,295 | 118,762 | 114,717 | 120,070 | 120,070 | 122,458 | 114,322 | 118,433 | 106,071 | 109,489 |
| 1 | Building Energy Consumption | Industrial Gas Consumption | 224,266 | 221,954 | 234,950 | 245,586 | 218,672 | 198,521 | 4,284 | 4,284 | 4,402 | 4,108 | 3,895 | 3,412 | 3,482 |
| 1 | Building Energy Consumption | Commercial Gas Consumption | | | | | | | 207,016 | 207,016 | 217,132 | 181,887 | 217,779 | 209,169 | 209,463 |
| 1 | Building Energy Consumption | Fugitive Gas Emissions | 1,017 | 1,016 | 1,062 | 1,119 | 1,012 | 940 | 994 | 994 | 1,032 | 901 | 1,020 | 956 | 967 |
| 1 | Transportation and Mobility | VMT Community | 121,736 | 121,736 | 121,736 | 121,736 | 121,736 | 118,084 | 118,084 | 118,084 | 118,084 | 118,084 | 118,556 | 122,148 | 142,925 |
| 2 | Transportation and Mobility | CTA Rail | 18,785 | 17,659 | 18,698 | 19,321 | 14,916 | 19,366 | 21,536 | 19,979 | 22,085 | 21,416 | 13,396 | 11,263 | 11,708 |
| 3 | Waste | Waste | 17,000 | 17,000 | 17,000 | 17,000 | 17,000 | 17,709 | 17,709 | 17,709 | 17,709 | 17,709 | 16,226 | 18,216 | 18,475 |
| | | Total Pre-Renewable Energy Credits | 1,018,668 | 1,026,744 | 1,049,621 | 1,053,941 | 993,478 | 997,635 | 1,006,713 | 1,014,962 | 1,002,796 | 949,057 | 937,205 | 874,977 | 897,026 |
| 2 | Renewable Energy Credits | Renewable Energy Credits | - | | | | | - | - | -76,801 | -131,383 | -144,841 | -128,267 | -119,418 | -111,904 |
| | | **Total-Community** | **1,018,668** | **1,026,744** | **1,049,621** | **1,053,941** | **993,478** | **997,635** | **1,006,713** | **938,162** | **871,412** | **804,216** | **808,937** | **755,560** | **785,122** |
| | **Municipal Operations** | **Municipal Operations** | **24,559** | **24,559** | **24,559** | **24,559** | **24,559** | **19,251** | **19,251** | **19,251** | **19,251** | **19,251** | **10,689** | **8,144** | **8,145** |
| | | **Combined Total** | **1,043,227** | **1,051,303** | **1,074,180** | **1,078,500** | **1,018,037** | **1,016,886** | **1,025,964** | **957,413** | **890,664** | **823,467** | **819,626** | **763,703** | **793,266** |
| | | **% Reduction** | **0.0%** | **-0.8%** | **-3.0%** | **-3.4%** | **2.4%** | **2.5%** | **1.7%** | **8.2%** | **14.6%** | **21.1%** | **21.4%** | **26.8%** | **24.0%** |

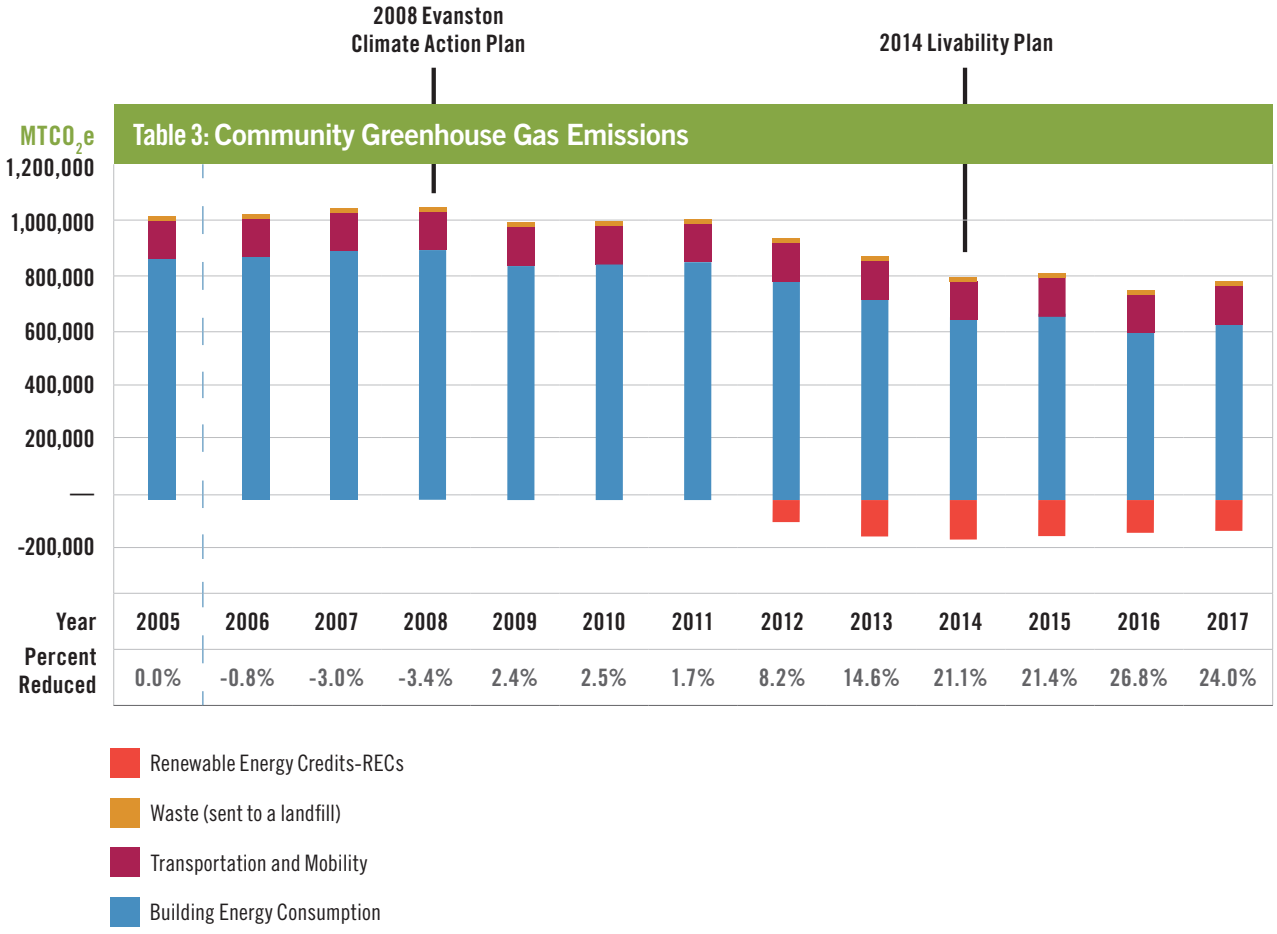
Since 2005, overall community-wide emissions have decreased by 24%. Over the same period, however, emissions proportion by category has not changed significantly, see Table 2.

**Table 2: Emissions Proportion by Category Over Time**

| Category | Portion of Overall Emissions | |
|---|---|---|
| | 2005 | 2017 |
| Municipal Operations | 2% | 1% |
| Waste | 3% | 2% |
| Transportation and Mobility | 13% | 16% |
| Building Energy Consumption | 83% | 81% |

Factors such as a rapidly decarbonizing electric power grid and an increase in the use of electric vehicles will likely impact these proportions, although no local projections are available at this time.

*Overall community emissions in Evanston peaked in 2008, at which point emissions began a steady decline. The vast majority of reductions can be attributed to a cleaner power grid and significant purchases of renewable energy by Evanston residents, the City of Evanston, Northwestern University and NorthShore University HealthSystem. See Figure 1 for details.*



# Building Energy



Building Energy is made up of two data sources: electricity consumption and natural gas consumption. See Table 4 for historical detail on these Source Data.

**Table 4: Building Energy Source Data and Emissions Comparison**

| Year | Annual MWh* | $MTCO_2e$ | Therms | $MTCO_2e$* |
|---|---|---|---|---|
| **2005** | 781,430,715 | 521,189 | 64,691,231 | 339,957 |
| **2006** | 756,747,811 | 530,587 | 64,599,505 | 339,762 |
| **2007** | 798,961,428 | 537,029 | 64,498,321 | 355,157 |
| **2008** | 782,062,363 | 521,884 | 67,331,533 | 374,000 |
| **2009** | 747,226,840 | 501,379 | 70,906,768 | 338,447 |
| **2010** | 785,031,309 | 528,299 | 59,831,587 | 314,177 |
| **2011** | 773,258,343 | 517,020 | 62,479,154 | 332,364 |
| **2012** | 777,542,932 | 526,826 | 62,479,153 | 332,364 |
| **2013** | 762,912,199 | 499,894 | 64,858,783 | 345,023 |
| **2014** | 748,574,297 | 490,630 | 56,688,584 | 301,217 |
| **2015** | 721,176,990 | 447,899 | 63,392,116 | 341,128 |
| **2016** | 740,970,210 | 403,742 | 60,173,383 | 319,608 |
| **2017** | 735,999,431 | 400,517 | 60,887,490 | 323,401 |

*MWh=Megawatt hours
*$MTCO_2e$= metric tons of $CO_2$ equivalent

Citizens' Greener Evanston
Act Locally. Breathe Globally.

*Through generous support from Citizens' Greener Evanston (CGE), a local sustainability non-profit, the City was able to have the ICLEI—Local Governments for Sustainability, perform a quality control check on the inventory to correct any inconsistencies or errors.*

Since 2005, electricity consumption and natural gas consumption have decreased by 5.8% and 5.9% respectively. In contrast, metric tons of CO2 equivalent have dropped 23.3% and 5.9% respectively.

## Electricity

The precipitous drop in electricity emissions is due partially to changes in the makeup of Evanston's regional electric power grid. The U.S. is divided into different grid regions, each with their own operator and supply mix (sources of power generation such as coal generation, natural gas, nuclear, wind, hydro, solar, etc.). As the supply mix changes over time, the emissions intensity changes. For instance, as more renewable energy is brought in and older, dirtier forms of power generation are retired (coal and natural gas), emissions from electricity decrease. This change in power supply shows up in the City's calculations through a factor set provided by the Federal EPA called eGRID. This factor set has historically been updated every two years. The last update was for the 2016 calendar year. The City anticipates a release of a new set in 2019, which will be applied to the 2018 Emissions Inventory.

***(eGRID)***

*The Emissions and Generation Resource Integrated Database (eGRID) is a comprehensive source of data on the environmental characteristics of almost all electric power generated in the United States. eGRID values are developed by the U.S. Environmental Protection Agency and updated periodically.*

## Electricity Offsets

The other significant factor in the drop in electricity emissions is the result of the City, as well as a few community organizations, including Northwestern University and NorthShore University HealthSystem, purchasing Renewable Energy Credits (RECs) to offset electricity consumption. Electricity offsets have been purchased and tracked in the Emissions Inventory since 2011. RECs support investment in renewable energy. Since 2011, the largest single source of RECs has been secured through the City's Electricity Aggregation Program for residents and small businesses. In 2017, the combination of all RECs purchased in Evanston offset 15% of Evanston's community-wide emissions.

## Diminishing Impact of RECs

In order to calculate the offset amount for each REC that that is purchased, 1 REC is equivalent to 1 MWh of electricity. The City follows industry practice by using the same eGRID emissions factors to evaluate the impact on emissions. The same eGRID factor is used for electricity and for calculating REC impact. In this way, the reduction in eGRID values means that each new REC purchased becomes less impactful as the grid becomes cleaner. Although the cleaner grid is a good thing, it means that, depending on the future price of RECs, their cost to impact the ratio may increase. This does not mean that RECs should not continue to be a tool to reduce emissions, but indicates that RECs remain a short-term strategy to reduce emissions and that reliance on them should be evaluated regularly.

## Natural Gas

As stated above, the reduction in emissions associated with natural gas consumption are directly proportional to natural gas consumption. The City has not pursued policies to directly reduce natural gas consumption and, as prices have stayed low, it is unsurprising that consumption and emissions have not decreased significantly. This plan, as well as the existing Energy and Water Benchmarking Ordinance, are crucial next steps in setting the groundwork for future reductions in natural gas consumption and emissions.

Consumption of natural gas is split into four different categories as indicated in Table 1. Those categories are: Residential, Commercial, Industrial and Fugitive. Consumption breakdown is roughly 33% residential, 65% commercial, 1—2% Industrial and less than 1% fugitive. This breakdown has stayed the same since 2005.

Obtaining local transportation and mobility data has been a challenge for the City for numerous years and is an obstacle that many smaller jurisdictions face. As indicated in the Climate Mitigation section of the plan, data collection is listed as a "preliminary step" in order to make measurable improvements in mobility and transportation metrics.

The Mobility and Transportation section of the Emissions Inventory is made up of three parts: 1) Vehicle Miles Traveled (VMT) analysis, 2) Fuel Sales Factor, and 3) Chicago Transit Authority (CTA) Rail electricity consumption. Additional factors may be added in the near future, as the City evaluates how to capture emissions from alternative fuel vehicles, such as compressed natural gas and electric/hybrid electric.

## 1. Vehicle Miles Traveled (VMT)

The Chicago Metropolitan Agency for Planning (CMAP) conducts a regional VMT study every five years. They were able to perform an additional layer of analysis to extract Evanston's proportional contribution to the regional VMT. Thus, the included data does not reflect actual activity in Evanston, but rather serves as a placeholder for locally generated data. Given that the regional analysis is only completed every five years, there is only "actual" data for 2005, 2010 and 2015. Years 2016 and 2017 show different values, as will future years, because fuel sales are used as a factor to provide local "tempering" of the VMT data. See below for a complete explanation.

## 2. Fuel Sales Factor

In previous emissions inventories, the City relied exclusively on fuel sales to account for the transportation portion of emissions. The City still recognizes the value that fuel sales can provide in terms of providing a locally specific data point to evaluate changes in local behavior. As a result, the City has established a methodology where the annual percentage change in fuel sales is applied to the most recent year that VMT data is available, in this case 2015. This factoring or "tempering" allows for local activity to be expressed on an annual basis in the inventory.

## 3. CTA Rail

In 2005, CTA Rail accounted for 13.5% of transportation emissions and in 2017 that proportion had shrunk to 8%. Given that emissions and electrical consumption used by CTA Rail is outside of the City's direct control and oversight, there is not much attention paid to this emissions area. Efforts to influence this area of emissions would likely have to take the form of advocacy to the CTA to purchase renewable energy or install onsite generation for their usage.

## Zero Waste

Collecting comprehensive material recovery data for the community and calculating the associated emissions has proven to be quite difficult. Complicating factors include: lack of access to data, numerous data sources, incompatible data formats, insufficient information on waste characterization, variable contractor compliance, etc. Despite these challenges, the City has developed a comprehensive material recovery dataset that is divided into numerous material recovery types. The City does not have data prior to 2011, so emissions from 2005–2010 is estimated and some data beginning in 2011 is incomplete. Given those gaps in data, the City has selected 2017 as the official baseline year for measuring material recovery performance moving forward, including progress towards achieving Zero Waste by 2050.

Access to data is just one challenge in evaluating and calculating the emissions from material recovery. In the GPC BASIC protocol emissions, impact is not calculated for recycled items or material that is otherwise diverted from the landfill (except compost). Instead, the emissions for landfilled and composted material is calculated. Landfill management and methane capture are both factored into the calculations of emissions. Presently, material generated in Evanston is sent to landfills that are capturing, flaring or using for energy at least 95% of methane released. Additional factors that impact material recovery emissions include the characterization or make up of disposed of material. For example, the amount of paper vs. organics in Evanston's disposed of impacts the emissions profile. If greenhouse gas-intensive materials would be prioritized for diversion, such as food scraps and organics, that could have an impact on material recovery-related emissions.

**Progress will be measured against 2017 baseline data.**

**Table 5: 2017 Community Waste Breakdown.** All values shown in tons

| Service Category | Garbage | Recycling | Compostable Material | Miscellaneous Diversion | Total |
|---|---|---|---|---|---|
| Commercial | 30,342 | 3,111 | 54 | | **33,508** |
| Residential | 16,717 | 7,337 | 2,751 | | **26,805** |
| Northwestern | 3,197 | 1,432 | 681 | | **5,311** |
| City Collected | 3,153 | | | | **3,153** |
| Other | | | | 282 | **282** |
| **Total** | **53,410** | **11,881** | **3,487** | **282** | **69,062** |

## Material Types

Commercial includes all material collected through the City's Commercial Franchise, Food Waste Service by Collective Resource and collection that is exempt from the Commercial Franchise. Residential services combines both condominium buildings and residential buildings up to four units. Northwestern data is provided by SustainNU and includes all material collected at the Evanston campus. City Collected Garbage includes material collected through special pick-ups, special collections, bulk -pick-up, street sweeping, construction projects, etc.

### Table 6: 2017 Categorical Material Diversion Rates

| | Diversion Rate | |
|---|---|---|
| **Waste Category** | **Recycling** | **Overall** |
| **Commercial** | 8.9% | 9.0% |
| **Residential** | 25.6% | 36.2% |
| **Northwestern University** | 27.0% | 39.8% |
| **Community** | **17.2%** | **22.7%** |

## Trends

Commercial material collection accounts for just under 50% of the community's overall material generation. Any change within the commercial service category will have a significant impact on the overall community diversion rate. In order to achieve a community diversion rate of 50% by 2025 significant progress will need to be made in increasing commercial diversion. It is worth noting that residential diversion must increase from its current level of just under 40%. The impact of the Food and Yard Waste and Food Waste by Collective Resource services will begin to show up in data for 2018 and onward.

### Table 7: 2017 Community Diversion Rate Comparison

| City | Overall Diversion Rate |
|---|---|
| Columbia, MO | 18% |
| **Evanston, IL** | **22%** |
| Ann Arbor, MI | 50% |
| Louisville, KY | 58% |
| Santa Monica, CA | 78% |
| Palo Alto, CA | 82% |

## Zero Waste

In order to achieve the Zero Waste by 2050 goal and 50% diversion by 2025, Evanston must make strides in decreasing the amount of overall material generated as well as continue to implement programs that target high potential and low performing service areas such as commercial entities. In addition, the City needs improved data in order to better track trends impacting material recovering within each service type. Improved data will allow for stronger contracts and policies to be implemented that make meaningful progress towards decreasing overall material generation.

***Compostable Material Recovery***

*In late 2017, the City implemented new residential and condo waste hauling contracts and was able to do three things that should lead to a reduction in waste-related emissions: waste characterization studies, reporting quarterly transportation related emissions, and implementing food waste composting services.*

# Appendix B. Glossary of Terms

### Carbon Emissions
The release of carbon dioxide into the atmosphere. Primary human sources of the release of carbon dioxide occur from burning oil, coal, and gas for energy use.

### Carbon Disclosure Project (CDP)
An international organization that administers a platform for organizations and cities to publicly disclose their environmental impacts, such as climate risk. CDP is one of the approved disclosure platforms utilized by GCoM. Evanston began disclosing climate risk in compliance with GCoM requirements with CDP in 2017 and plans to continue disclosing annually.

### Carbon Neutrality
For the purposes of the Climate Action and Resilience Plan, Carbon Neutrality refers to the point at which Evanston's net greenhouse gas emissions reach 0. This will likely be achieved through a combination of reducing emission sources and offsetting and sequestering any remaining emissions.

### Carbon Sinks
A forest, ocean, or other natural environment viewed in terms of its ability to absorb carbon dioxide from the atmosphere.

### Chicago Metropolitan Agency for Planning (CMAP)
A regional planning organization created in 2005 for the northeastern Illinois counties of Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will. The agency develops and guides implementation of comprehensive regional planning and is based in Chicago, Illinois. Evanston's Vehicle Miles Traveled (VMT) data is derived from a regional transportation study developed by CMAP.

### Circular Economy
An alternative to a traditional linear economy (make, use, dispose) in which an economy is a regenerative system where resource input and waste are minimized. This is achieved through long-lasting product design, repair, reuse, remanufacturing, and recycling. Circular economy strategies are often cited as systems level approaches to reducing waste generation through product and system design.

### Clean and Renewable Energy Sources
Refers to the definition of "renewable energy resources" provided by the Illinois Power Agency Act and utilized by the Illinois Sierra Club. The definition includes energy and its associated renewable energy credits or renewable energy credits from wind, solar thermal energy, photovoltaic cells and panels, biodiesel, anaerobic digestion, crops and untreated and unadulterated organic waste biomass, tree waste, and hydropower that does not involve new construction or significant expansion of hydropower dams. For purposes of this Act, landfill gas produced in the State is considered a renewable energy resource. "Renewable energy resources" does not include the incineration or burning of tires, garbage, general household, institutional, and commercial waste, industrial lunchroom, or office waste, landscape waste other than tree waste, railroad crossties, utility poles, or construction or demolition debris, other than untreated and unadulterated waste wood.

### Climate Change
Any significant change in the measures of climate lasting for an extended period of time. Major changes include changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer. For this plan, the term specifically references anthropogenic climate change initiated and exacerbated by the burning of fossil fuels.

### Climate Hazard
An extreme climate event or condition that can harm human health, livelihoods, or natural resources. It can include abrupt changes to the climate system such as extreme precipitation, storms, droughts, and heat waves.

### Climate Mitigation
The efforts to reduce or prevent the consequences of climate change. It generally involves reducing emissions of heat-trapping gases or removing them from the atmosphere.

### Climate Resilience or Adaptation
The capacity of a natural environment to prevent, withstand, respond to, and recover from a disruption. The process of adjusting to new climate conditions in order to reduce risks to valued assets.

### Climate Vulnerability Assessment
A report used to identify and define the risks posed by climate change and inform adaptation measures needed to combat climate change. Reports can be about a wide range of fields including food security, poverty analysis, and sea-level rise.

### ComEd
The largest electric utility in Illinois (based in Chicago). ComEd delivers electricity to homes and businesses and manages four million customers across Northern Illinois, including Evanston.

### Community Choice Electricity Aggregation (Aggregation)
Allows local governments the option to bundle together residential and small commercial retail electric accounts and seek proposals for potentially cleaner, cheaper sources of power. The City of Evanston provides 100% renewable energy to residents enrolled in its Aggregation program. This program has been in place since 2012; more information can be found at www.cityofevanston.org/cca.

### Community Solar
Solar facilities shared by multiple community subscribers who receive credit on their electricity bills for their share of the power produced. Community solar allows members of a community to share the benefits of solar power on their property without installing it on their own property. Electricity generated by the community solar farm typically costs less than the price from utility companies. In 2016, the State of Illinois passed robust tax incentives and accompanying legislation to incentive community solar programs throughout the state.

### Combined Sewer Overflow (CSO)
Combined sewers are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. During periods of heavy rainfall or snowmelt, wastewater volume can exceed the capacity of the sewer system and overflow into nearby streams, rivers, or other bodies of water, thereby creating a Combined Sewer Overflow. Unfortunately, the overflow can also contain untreated human and industrial waste, toxic materials, and debris. Evanston works with the regional stormwater utility, the Metropolitan Water Reclamation District (MWRD) to manage stormwater and prevent CSOs.

### Deconstruction
The process of systematically dismantling a structure in an environmentally, economically, and socially responsible manner to maximize recovery of materials for reuse and recycling.

### Emission Scopes
The GPC breaks down greenhouse gas emission sources into different categories; one of these categories is Emission Scopes. Emission Scopes are primarily useful when combining emissions inventories from multiple cities or jurisdictions to ensure no double-counting is taking place. The three standard Emissions Scopes are:

**Scope 1:** direct emissions from owned or controlled sources
**Scope 2:** indirect emissions from generation of purchased energy
**Scope 3:** indirect emissions that occur in the supply chain, both upstream and downstream

### Environmental Justice
The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

### U.S. Environmental Protection Agency (EPA)
A federal agency, with state and local affiliates, established in 1970 to consolidate research, monitoring, standard-setting and enforcement activities a mission to protect human health and the environment.

### Global Covenant of Mayors for Climate and Energy (GCoM)
An international coalition of cities and local governments with a shared long-term vision of promoting and supporting voluntary action to combat climate change and foster a resilient society.

### Global Protocol for Community-scale Greenhouse Gas Emissions (GPC)
Created by the National League of Cities, this program promotes a "robust framework for accounting and reporting city-wide greenhouse gas emissions" to help cities lessen their greenhouse gas emissions. Evanston's GPC-compliant Emissions Inventory allows Evanston to effectively track emissions changes overtime and compare progress to comparable communities.

### Greenhouse Gas
Any gas that absorbs infrared radiation and traps heat in the atmosphere. Common greenhouse gases include carbon dioxide, methane, nitrous oxide, and fluorinated gases. Carbon dioxide and methane are commonly referenced as having the largest impact on anthropogenic climate change.

### Greenhouse Gas Emissions
The release of greenhouse gases into the atmosphere. Sources of greenhouse gas emissions include electricity, transportation, industry, commercial and residential properties, agriculture, and land use.

### Greenhouse Gas Emissions Inventory
A report that provides a comprehensive accounting of total greenhouse gas emissions for all human-made sources and removed from the atmosphere by carbon sinks. Evanston's greenhouse gas emissions inventory can be found in Appendix A: Emissions Inventory.

### Green Infrastructure
An approach to managing precipitation by reducing and treating stormwater at its source while delivering environmental, social, and economic benefits. Stormwater runoff can carry trash, bacteria, and other pollutants and is a major cause of water pollution in urban areas.

### Indoor Environment and Indoor airPLUS
A voluntary EPA program for new home builders aimed at improving the quality of indoor air. The program requires certain construction practices and products to minimize exposure to airborne pollutants and contaminants.

### International Panel on Climate Change (IPCC)
The leading international body for the assessment of climate change. The IPCC was established in 1988 to provide the world with a clear scientific view on climate change and its potential environmental and socio-economic impacts.

### Kilowatt Hours (kWh)
The most common unit of measurement for quantifying electricity generation and consumption. Evanston's uses kWh and MWh in its tracking and calculations of electricity consumption and generation. Individual homeowner electric bills, such as those from ComEd, are typically measured in kWh.

### Megawatt hours (MWh)
The second most common unit of measurement for quantifying electricity generation and consumption. Evanston uses kWh and MWh in its tracking and calculations of electricity consumption and generation. A megawatt hour is equal to 1,000 kilowatts of electricity used continuously for one hour.

### Metric Tons of $CO_2$ Equivalent
A measure used in comparing emissions from different greenhouse gases on the basis of their global warming potential (how long a gas remains potent and active in the atmosphere), used by converting amounts of various gases to the equivalent amount of carbon dioxide's global warming potential.

### Metropolitan Water Reclamation District (MWRD)
Is the storm- and waste-water utility serving Evanston and most of Cook County. The MWRD is governed by an elected Board of Commissioners created by the state government tasked with reclamation and treatment of wastewater and flood water abatement. The District must protect the health and safety of the public and protect and manage water as a vital resource.

### Mode Share
The percentage of travelers using a particular type of transportation. Modal share is an important component in developing sustainable transport within a city or region because it reveals the level of utilization of various transportation methods. The percentage reflects how well infrastructure, policies, investments, and land-use patterns support different types of travel.

### Municipal Alternative Retail Electric Supplier (mARES)
An Alternative Retail Electric Supplier (ARES) is an energy services company that supplies electric power to customers. ARES typically have more control over their electric power source, such as purchasing renewable energy, and can lock-in longer term prices for customers. A municipal ARES would allow the City to act as an alternative electric supplier to Evanston customers.

### Net-zero Emissions (NZE)
Building A building or property that generates or offsets all energy consumed. If the City develops a NZE building code, this definition will have to be refined to provide additional guidance on calculating emissions and offsets to achieve net-zero emissions.

### Nicor Gas
An energy company that delivers natural gas to 650 communities throughout Northern Illinois, including Evanston.

### North Shore Village
A non-profit organization in Evanston that offers older adults support and connections to each other as they age. It is a member-driven organization that helps older adults stay in their homes for as long as they can while being active, vital, and contributing members to the community.

### Pre-industrial
The multi-century period prior to the onset of large-scale industrial activity around 1750, typically associated with the beginning of intensive fossil fuel extraction and burning and the subsequent release of greenhouse gases into the atmosphere.

### Power Purchase Agreement (PPA)
A power purchase agreement (PPA), or electricity power agreement, is a contract between two parties; one party generates electricity (the seller) and the other party looks to purchase electricity (the buyer). Individual customers and organizations may enter into PPAs with individual developers or may join together to seek better prices as a group. PPAs can allow longer term commitments to renewable energy as well as a form of "direct" investing in new renewable energy generation.

### Property-Assessed Clean Energy (PACE)
A program created for financing energy efficiency and renewable improvements on private property. Private property can include residential, commercial or industrial properties. Improvements can include energy efficiency, renewable energy and water conservation upgrades to a building. The State of Illinois has passed legislation allowing PACE programs at the municipal and county-level throughout the state.

### Renewable Energy
Energy resources that are naturally replenishing such as solar, wind, hydro and geothermal energy.

### Renewable Energy Credits (RECs)
A market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation. RECs are issued when one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a renewable energy resource. The single largest category of reductions in Evanston's emissions has been through the purchase of RECs.

### Retro-commissioning
The systematic process to improve an existing building's performance ensuring the building controls are running efficiently and balancing the designed use and the actual use of the building.

### Ride-share
The practice of sharing transportation in the form of carpooling or vanpooling. It is typically an arrangement made through a ride-matching service that connects drivers with riders.

### Urban Tree Canopy
Describes the makeup and characteristics of trees within the urban environment. Evanston has a "robust" urban tree canopy that is made up of trees on public property and trees on private property.

### Vehicle Miles Traveled (VMT)
A measurement used to estimate the total annual miles of vehicle travel. It is typically calculated by measuring the total non-freight vehicle miles traveled divided by the total population. Evanston does not conduct its own local VMT study; it relies on modeled data provided by CMAP. VMT is standard method of transportation-related emissions.

### Zero Emission Vehicles (ZEV)
A vehicle that does not emit harmful emissions during operation. Harmful emissions can have a negative impact on human health and the environment. Electric (battery-powered) cars, electric trains, hydrogen-fueled vehicles, bicycles, and carriages are considered to produce zero emissions.

### Zero Waste
A cyclical system in which products are designed for reuse, which creates no waste. A zero waste system eliminates the volume and toxicity of waste and materials and conserves current resources through reuse. Evanston's goal of Zero Waste is calculated based on the percentage of material diverted from a landfill; when that percent reaches 100%, then Evanston will have achieved Zero Waste.