

3. GHG Emissions: Inventory Summary, Trends and Targets

This section summarizes the results of the 2024 Syracuse Municipal and Community GHG Emissions Inventory Report and make estimated projections of the level of effort required to meet the New York Climate Leadership and Community Protection Act (CLCPA) economy-wide GHG emissions reduction targets. The targets are 40% emissions reductions by 2030 and 85% by 2050, from the 1990 baseline, to put New York on a path towards carbon neutrality while ensuring equity, system reliability, and a just transition from a fossil fuel to a clean energy economy.¹⁶

This Climate Action Plan adopts these targets as benchmarks of success moving forward. Due to Syracuse note having a 1990 baseline, the Plan will use the 2002 emissions inventory for that purpose.

The City of Syracuse completed GHG inventories for the years 2002 and 2010 for both the community and for municipal operations, which enables the 2024 inventory to be compared against these benchmarks. Goals of a 40% reduction in municipal and 7% reduction in community emissions, against the 2002 baseline, were set in the 2012 Sustainability Plan.

These goals were both exceeded with a 67% reduction in municipal emissions, and 29% reduction in community emissions. A full description of the sources, data, and methods employed in the calculation of the 2024 GHGI can be found in the GHGI Emission Report.

Municipal Inventory

The Municipal Inventory included emissions from the following sources:

- Natural gas combustion for heating of City-owned buildings (Scope 1)
- Fuel consumption by City-owned fleet vehicles (Scope 1)
- Refrigerant losses from City-owned cooling systems (Scope 1)
- Energy related to treating the City's drinking water (Scope 1 + 2 – folded into the electricity and natural gas figures for municipal buildings)
- Electricity consumption for powering buildings and infrastructure such as streetlights (Scope 2)
- Carbon sequestration by the City's urban forestry program (Scope 3)
- Fertilizer use throughout the City (Scope 3)

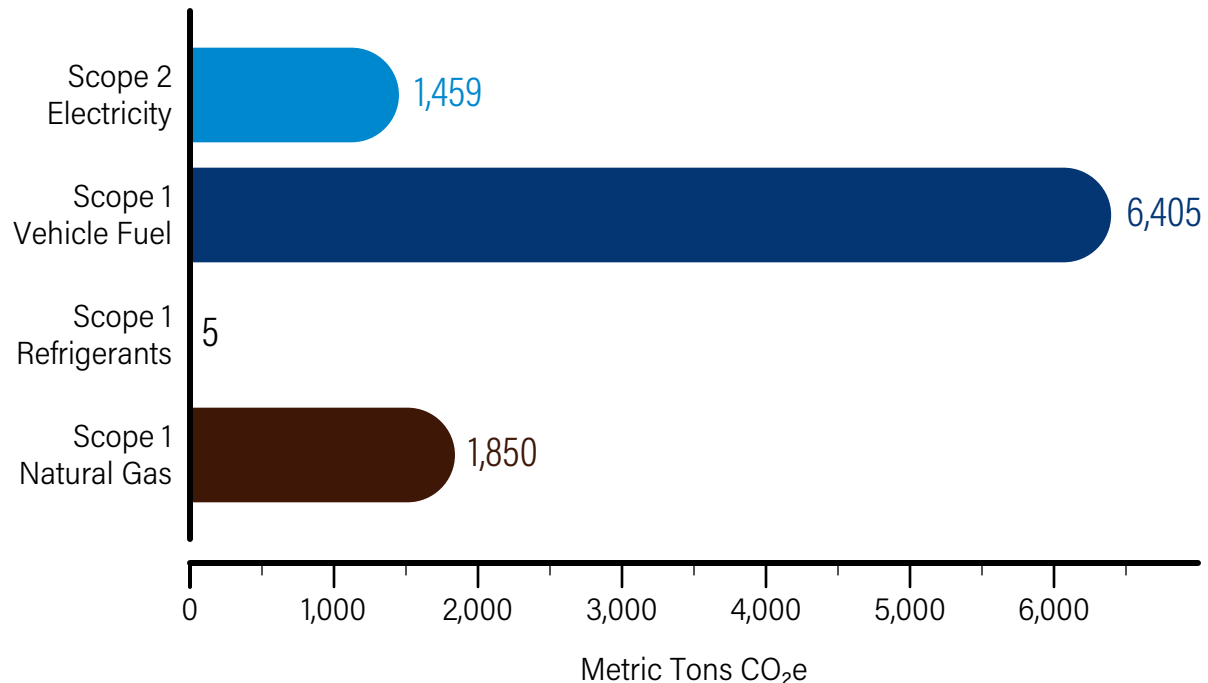
Total municipal emissions for 2024 were calculated to be 9,269 metric tons of carbon dioxide equivalent (MT CO₂e) of Scope 1 and Scope 2 emissions.

The key constituents and trends in GHG emissions for the municipal inventory are illustrated in the two figures below. The first graph shows the key components of the 2024 inventory. The second graph shows the trend in emission reductions by major source since 2002.

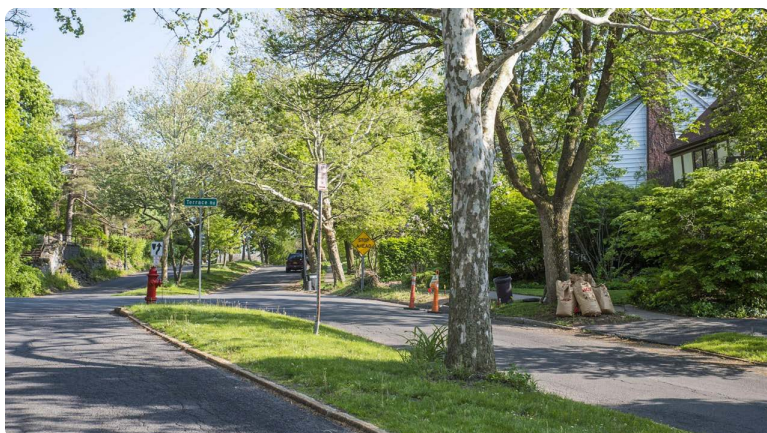


16. CLCPA Scoping Plan, page 3.

Figure 3-1
Municipal Inventory: Key Components of 2024,
Scope 1 and 2 Emissions



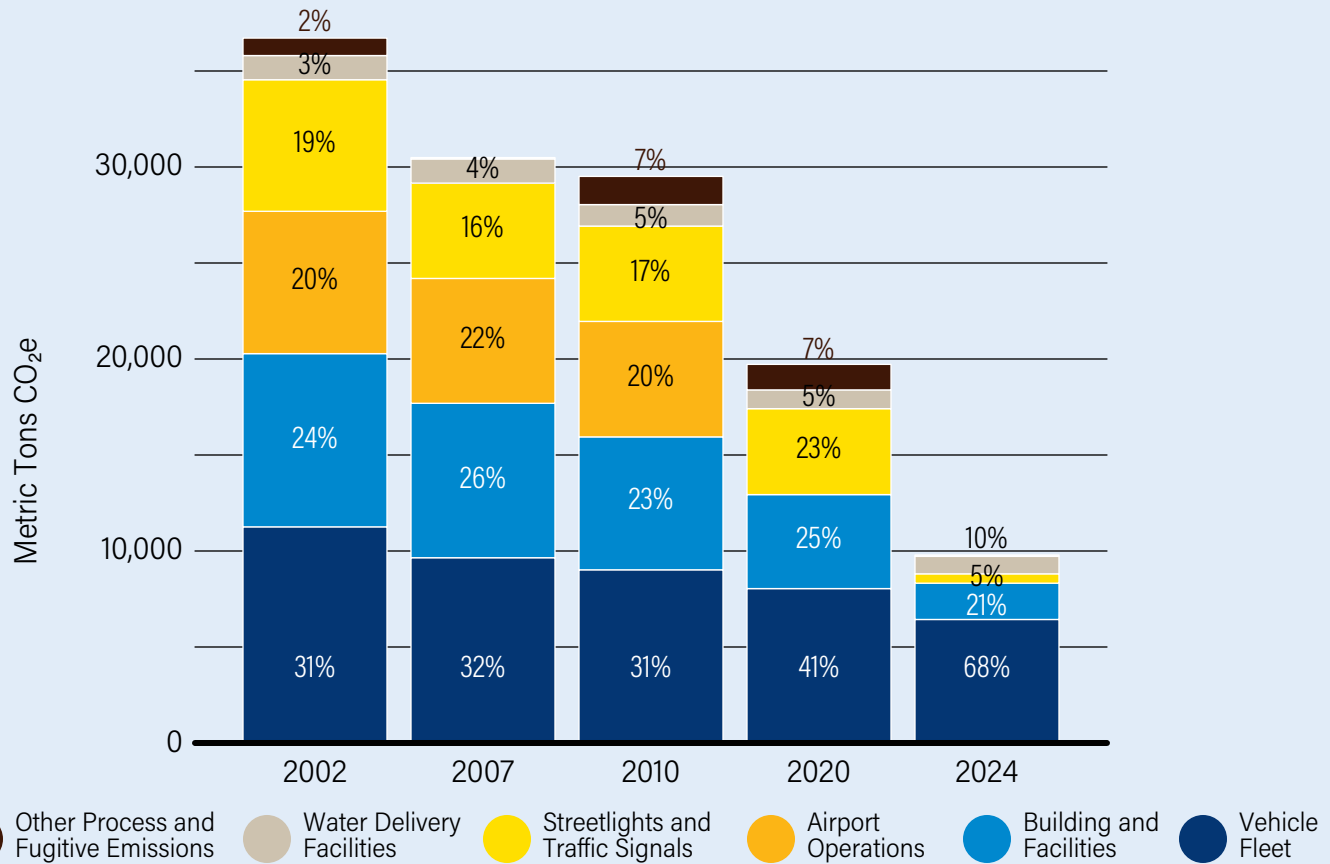
Municipal Inventory • Key Components of 2024, Scope 1 and 2 Emissions
Source: City of Syracuse, C&S Engineers, 2025.



Scope 3 Emissions

Scope 3 emissions were calculated for the CO₂ sequestered by trees located on City property, including parks and City rights-of-way. Scope 3 also includes the CO₂ produced when treating City areas with fertilizer, including parks, trees, and planters. **The annual amount of carbon sequestered by City-owned trees was estimated at 1,197 MT CO₂e/year.** Emissions from fertilizer use were calculated at 8.33 MT of CO₂e, combined for a net carbon removal of approximately 1,189 MT CO₂e/year. The net carbon sequestration in Scope 3 emissions is not being used to “cancel out” the Scope 1 and 2 emissions from an accounting perspective, but the number does show the value of the City’s trees as part of the fight against climate change.

Figure 3-2
Municipal GHG Emissions, 2002 – 2024



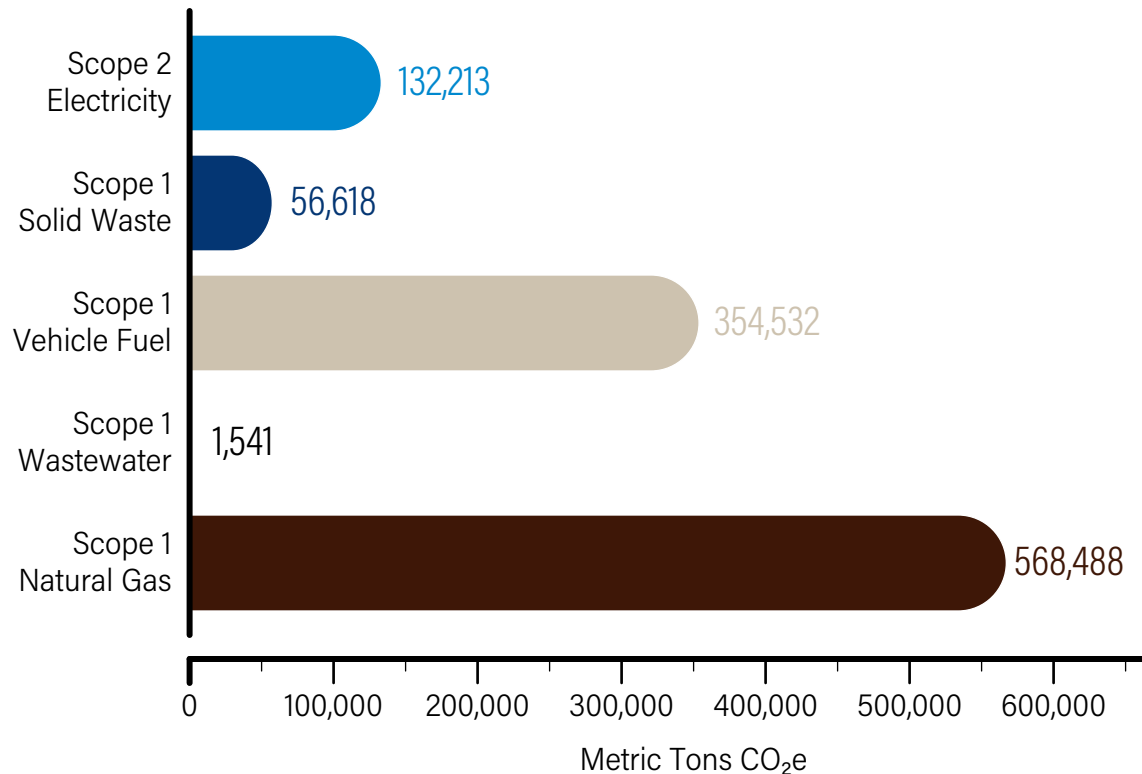
Municipal GHG Emissions, 2002 – 2024
Source: City of Syracuse, C&S Engineers, 2025.

Table 3-1
Municipal GHG Emissions, 2002 – 2024

MT CO ₂ E PER YEAR	2002	2007	2010	2020	2024
Other Process and Fugitive Emissions	901	69	1,466	1,320	5
Water Delivery Facilities	1,282	1,256	1,080	972	923
Streetlights and Traffic Signals	6,852	4,956	5,020	4,470	452
Airport Operations	7,439	6,564	5,961	0	0
Buildings and Facilities	8,996	7,989	6,928	4,928	1,934
Vehicle Fleet	11,251	9,674	9,039	8,039	6,405

Note: The airport was removed from City jurisdiction after the 2020 targets were set in the 2012 Sustainability Plan, and therefore the airport is not included in the 2020 targets in the graph above to ensure that reductions achieved in 2024 are not exaggerated.

Figure 3-3
**Community Inventory: Key Components of 2024,
 Scope 1 and 2 Emissions**



Community Inventory • Key Components of 2024, Scope 1 and 2 Emissions
 Source: City of Syracuse, C&S Engineers, 2025.

Community Inventory

The Community Inventory included emissions from the following sources:

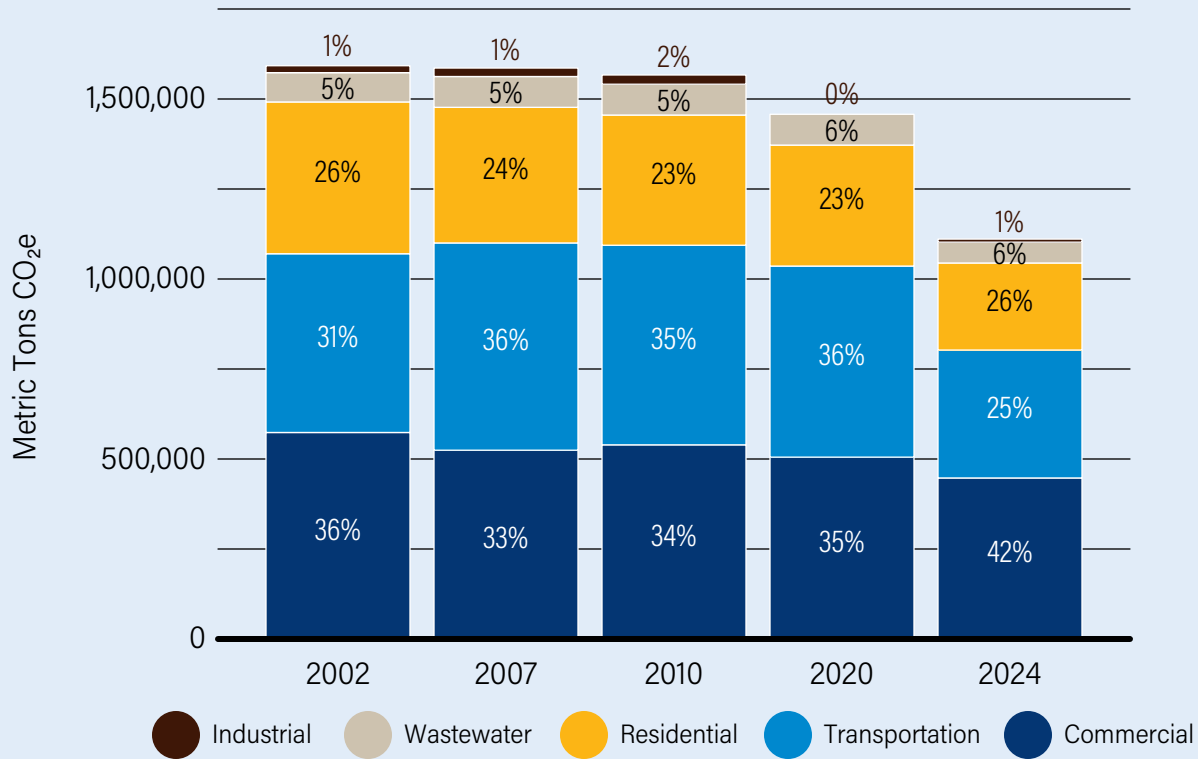
- Natural gas combustion for heating in project boundary (Scope 1)
- Fuel consumption from vehicle miles traveled within the project boundary (Scope 1)
- Wastewater treatment process emissions (Scope 1)
- Municipal solid waste (Scope 1)
- Electricity consumption for powering and conditioning buildings with the project boundary (Scope 2)
- Fertilizer use within project boundaries (Scope 3)

Community Inventory Scope 1 and 2 Emissions

Emissions from the Community Inventory resulted in 1,113,394 MT CO₂e of Scope 1 and 2 emissions.

The main constituents and the trends in GHG emissions for the municipal inventory are illustrated in the two figures below, which illustrate the magnitude of the decline in emissions since the first inventory was taken in 2002.

Figure 3-4
Community GHG Emissions, 2002 – 2024



Community GHG Emissions, 2002 – 2024
 Source: City of Syracuse, C&S Engineers, 2025.

Table 3-2
Community GHG Emissions, 2002 – 2024

MT CO ₂ E PER YEAR	2002	2007	2010	2020	2024
● Industrial	20,994.40	23,560.00	24,242.60	—	9,498.53
● Wastewater	81,428.10	85,698.60	86,005.10	85,996.00	58,159.20
● Residential	420,410.40	375,679.50	363,654.50	335,336.00	241,500.94
● Transportation	497,122.60	577,390.30	552,943.30	530,825.00	354,531.77
● Commercial	573,583.70	523,319.30	539,591.80	505,592.00	447,527.90

GHG Emissions, Targets, and Forecasts

CLCPA Alignment

Alignment with New York State's 2019 Climate Leadership and Community Protection Act (CLCPA) is a priority of the City of Syracuse's Climate Action Plan (CAP). The CLCPA set economy-wide emission targets to reduce GHG emissions to mitigate increasing risks and improve opportunity for climate equity. These targets are a 40% reduction of economy-wide emissions by 2030 and an 85% reduction by 2050, compared to 1990 baseline emission levels.

The emission reduction forecasts in [Figure 3-5](#) and [Figure 3-6](#) forecast effort for the municipality and the community to achieve the CLCPA targets by 2050. The three circles on each graphic show the 2002 baseline, then the 2030 and 2050 reduction targets. Both graphs show a dark blue line which illustrates what happens if nothing changes except the decarbonization of the grid: although clean electricity is important, its effects are minimal if natural gas heating and vehicles are not electrified. **The stacked columns show the impact each year of expected emission reductions (about 4% annually) following business-as-usual consumer choice shifts in the markets of vehicle electrification, natural gas electrification, energy efficiency, and refrigerant management.**

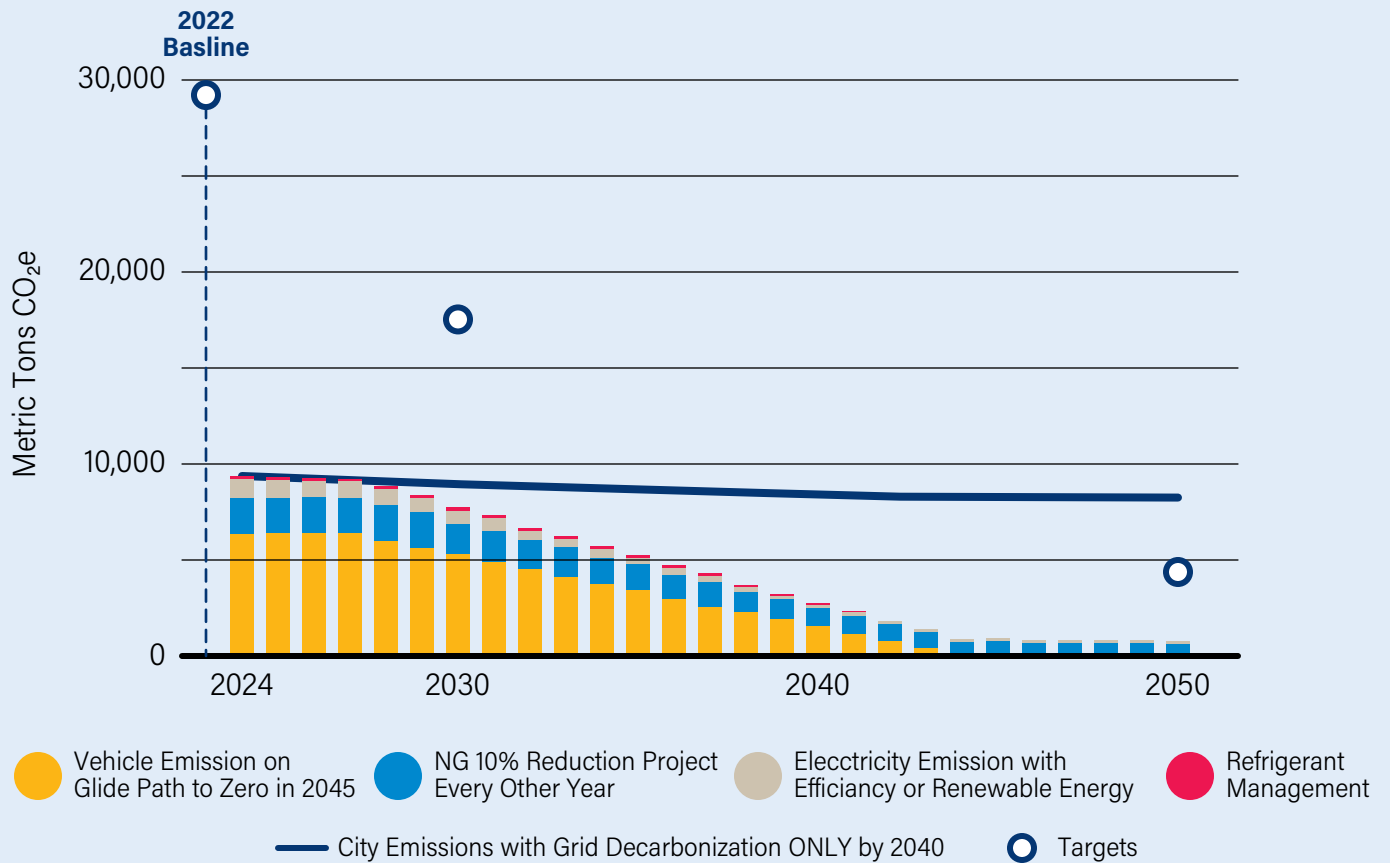
Even using 2002 as a baseline, the City has already achieved the 40% reduction target. The Community Inventory is close and could achieve the targets through collective effort. To close the gap and increase emission reductions past CLCPA targets, specific actions were prioritized, through stakeholder engagement, to guide the municipality and community. These specific actions to reduce emissions are outlined following the forecasting graphics. These actions are further contextualized and detailed in the Building a Climate Ready Syracuse chapter.



NEW YORK'S
CLIMATE LEADERSHIP and
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Figure 3-5
City of Syracuse Municipal Operations Forecast

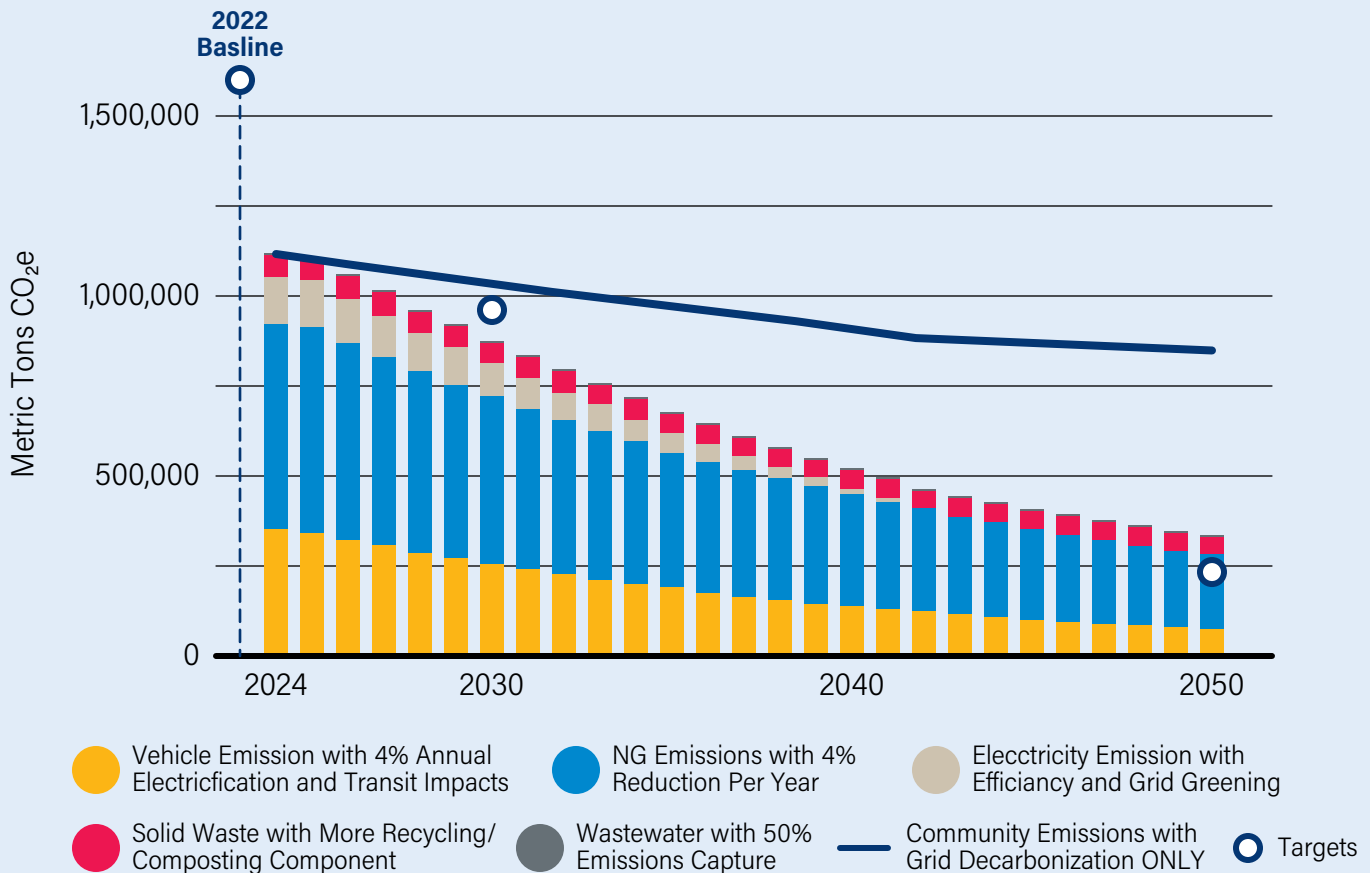


City of Syracuse Municipal Operations
Projected Emissions to 20250 with Comprehensive Building and Fleet Decarbonization vs. Business as Usual that Includes Grid Decarbonization.

Municipal Forecast

This figure shows future municipal operations emissions declining as a result of building energy efficiency and electrification, the transition of the municipal vehicle fleet to electric or low-carbon fuels over approximately 18 years, better refrigerant management, and the greening of the grid (over which the City has no control). The City may be able to achieve the 85% reduction with relative ease as it has a significant head start—it only has to cut its 2024 emissions in half. **The projections show the City far exceeding the CLCPA 85 percent target by 2050, largely depending on the transition of the municipal vehicle fleet, which logically is where the City should focus its efforts.**

Figure 3-6
City of Syracuse Community Emissions Forecast



City of Syracuse Community Emissions
Projected Emissions to 20250 with Comprehensive Building and Fleet Decarbonization vs. Business as Usual that Includes Grid Decarbonization.

Community Forecast

Since the City's emissions are less than one percent of the Community's emissions, it is important to focus on community-level reduction measures. The community may have a more challenging time reaching its 85% goal than the City. These projections took a conservative view of technological change and adoption, recognizing that buying cars and improving the efficiency of buildings are matters of individual choice that are affected by prices, incentives, and the performance of the technology itself. The business-as-usual consumer choice rate for electrification of natural gas and vehicles was therefore assumed at 4% four percent per year. At that rate, the Community could achieve the 2030 goal but not the 2050 goal: efforts would have to accelerate after 2030 to catch up.



Municipal Emission Reduction Actions

The City of Syracuse celebrated a 67% reduction of emissions in the GHGI Report compared to 2002 base-line emission levels. **To further this pattern and align with the 2030 and 2050 goals of the CLCPA, the City outlines several actions.**

Specifically, but not limited to, in the Energy and Green Building Strategy, the City outlines an action to perform ASHRAE building and facility audits (1.2.1) to inform energy efficiency upgrades (1.2.2) such as heat pumps which would greatly reduce municipal natural gas Consumption. Once accomplished, or simultaneously, the City can begin to pursue renewable energy sources (1.3.3). In the Transportation Strategy, the City outlines an action to transition Light Duty Vehicles (2.3.3) in the municipal fleet that lessens the carbon emissions of operational transportation. Lastly, in the Natural Environment Strategy, the City adheres to and promotes action to enforce its recently developed Municipal Tree Ordinance in pursuit of urban forestry expansion (4.2.2) that increases capacity in the City to sequester carbon emissions.

1.2.2 Municipal Building and Facilities Upgrades.

Perform building efficiency upgrades based on ASHRAE audit recommendations such as LED lights, metering installation, heat pumps, building envelope upgrades, etc.

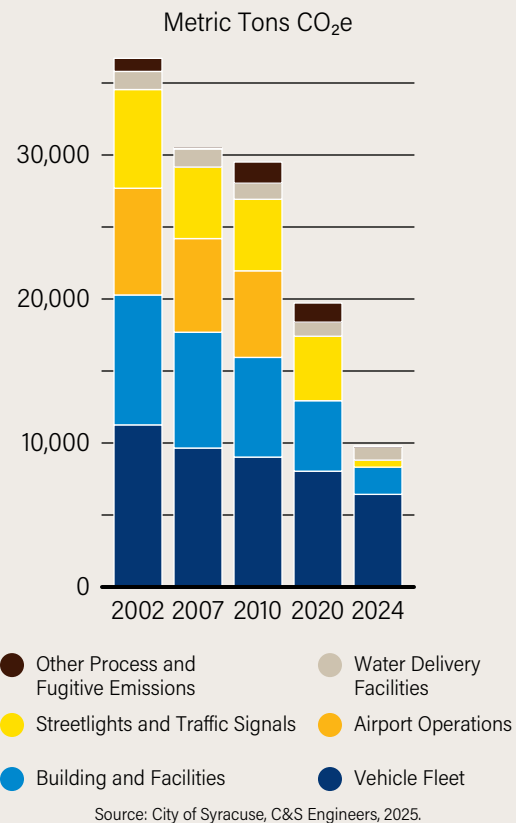
1.3.3 Municipal Renewable Generation and Storage.

Based on renewable energy generation and storage feasibility studies, implement renewable energy generators and associated storage facilities (batteries).

2.3.3 Light Duty Vehicle Fleet Transition.

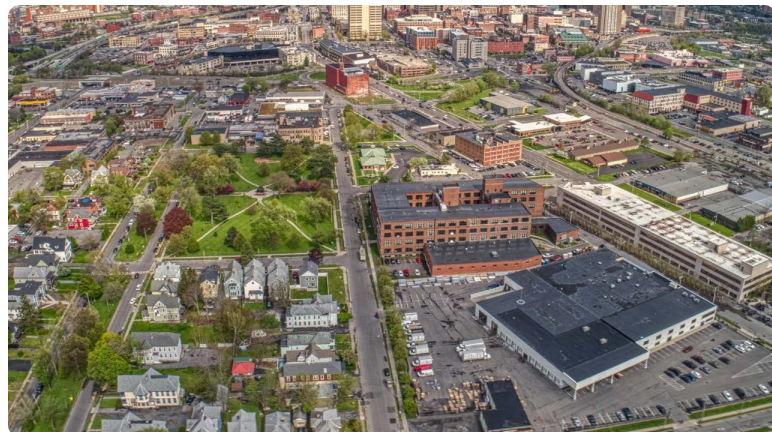
Transition 10% of the light-duty-vehicle fleet by 2035. Start with administrative vehicles, then cycle department vehicles upon end-of-life. Use lease agreements with dealerships for maintenance.

MUNICIPAL GHG EMISSIONS, 2002 – 2024



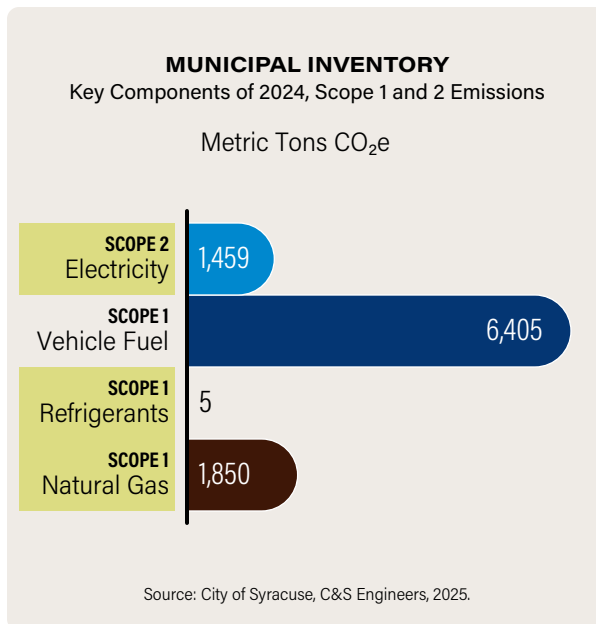
Estimated yearly emission reduction between a Gas-powered Chevy Equinox and All-electric Chevy Equinox is 2.13 metric tons of carbon with a projected lifetime savings (8 years) of 25.6 metric tons of carbon.

Source: A. Mazzone, Energy Program Manager at CNYRPDB & NYSEDA CEC Advisor, personal communication, June 11, 2025.



4.2.2 Maximize Tree Coverage on City Land.

Increase support for and continue implementation of the City's Urban Forestry Master Plan and Municipal Tree Ordinance including the initiative (in process) to modernize the tree ordinance.



Building and Facility envelope upgrades, to include roof and piping, could reduce hundreds of millions of CO₂ emissions over a 30-year period in commercial buildings.

Source: Independent Study Confirms Insulation Upgrades Save Energy and Emissions in Existing Buildings. (2023). Retrieved December 29, 2025, from <https://insulation.org/io/articles/independent-study-confirms-insulation-upgrades-save-energy-and-emissions-in-existing-buildings/>.

Community Emission Reduction Actions

The Syracuse Community celebrated a 29% reduction of emissions in the GHGI Report compared to 2002 baseline emission levels. **To further this pattern and align with the 2030 and 2050 goals of the CLCPA, the Syracuse Community is encouraged by the CAP to engage in several actions.**

Specifically, but not limited to the Energy and Green Building Strategy, the Community has the opportunity to engage with municipal partners to educate themselves on the benefits of and funding opportunities for building envelope upgrades **(1.2.3)** such as heat pumps which reduce natural gas consumption and pursue renewable energy generation **(1.3.1)**, sequentially or simultaneously. In the Transportation Strategy, the Community is encouraged to engage in alternative and public transportation **(2.1.1 & 2.1.2)** to reduce single-use vehicle use and, therefore, decrease community VMT emissions.

Lastly, in the Natural Environment Strategy, the Community, and Agencies within the Community, are encouraged to pursue the expansion of food waste reduction **(4.3.1)** and composting access expansion **(4.3.2)** as to reduce methane levels in waste processing facilities. In addition to reducing emissions, these actions, amongst several others, will reflect and magnify beneficial changes taking place in Syracuse such as widespread improvements in transportation infrastructure, increased vehicle efficiency and cheaper electric vehicles, more use of renewable energy, and more electrified energy-efficient buildings. It is key to ensure that the benefits are broadly accessible to all who live in the City of Syracuse.

The next section will identify the climate actions that the Syracuse Municipal Government and the Community will undertake to reduce GHG emissions, increase climate resilience, and prepare for a climate-impacted future.

1.2.3 Community Building and

Facilities Upgrades. Promote opportunities for residents, businesses, and organizations to upgrade their buildings and facilities to be more energy efficient such as heat pumps, LED lights, building envelopes, etc.

1.3.1 Community Renewable Generation.

Promote opportunities for residents, businesses, and organizations to utilizing existing renewable energy sources (Community Solar subscriptions) or implement their own generation and storage systems.

- 2.1.2 Centro-Bus Rapid Transit System.** Promote the use of BRT system through education and map distribution.

Communities with strong public transportation networks can reduce the United States emissions by 37 million metric tons of carbon yearly.

Source: Reducing Your Transportation Footprint. Retrieved on December 29, 2025 from <https://www.c2es.org/content/reducing-your-transportation-footprint/>.

- 4.3.1 Gleaning and Food Waste.** Utilize the NYS Food Donations and Food Scrap Recycling Law, and local organizations such as the Onondaga Food Rescue Network to divert food waste that lowers emissions and addresses community hunger.

- 4.3.2 Composting and Organic Waste Management.** Educate community members on composting and organic waste management practices to divert waste from the landfill. The composting material can additionally be used for urban agriculture systems and fertilizer needs.

Methane has a warming impact 86 times stronger than CO₂. Waste from food and other organic materials account for 20% of methane emissions.

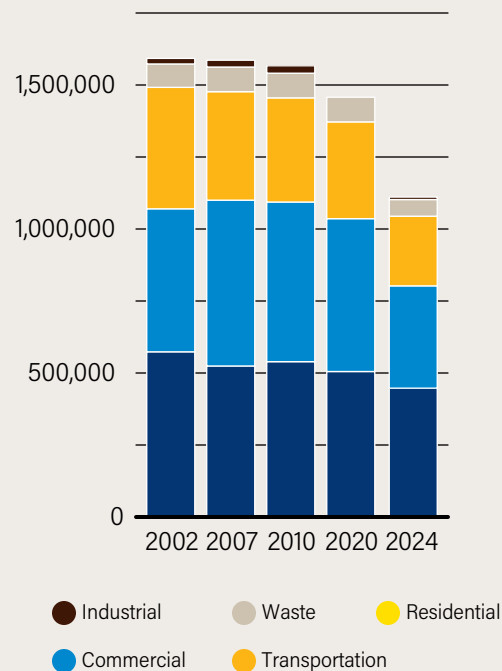
Source: Climate and Clean Air Coalition, Methane. (2021). Retrieved December 29, 2025, from <https://www.ccacoalition.org/short-lived-climate-pollutants/methane>.

Emission Reductions and Strategic Action to Improve Climate Resiliency and Quality of Life for All

Actions to reduce greenhouse gas emissions can, and often do, improve quality of life. This chapter specifically acknowledged core GHG emission reduction actions for the municipality and community to take to achieve targets set by New York State in the Climate Leadership and Community Protect Action. The sequential chapter will highlight these actions, and others, that aim to improve climate resiliency and quality of life, for all.

COMMUNITY GHG EMISSIONS, 2002 – 2024

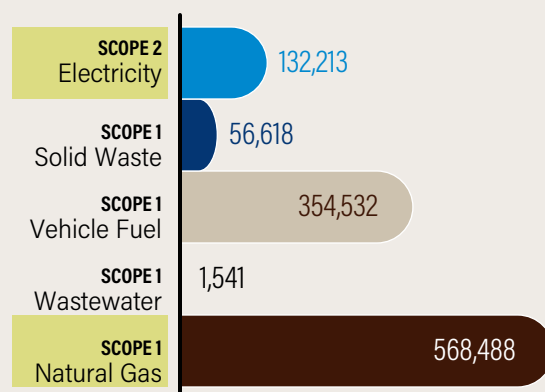
Metric Tons CO₂e



Source: City of Syracuse, C&S Engineers, 2025.

COMMUNITY INVENTORY Key Components of 2024, Scope 1 and 2 Emissions

Metric Tons CO₂e



Source: City of Syracuse, C&S Engineers, 2025.