

PHASE I



GOVERNMENT OPERATIONS

**CLIMATE
ACTION
PLAN**

**MONROE
COUNTY**

New York

July 2022



ADAM J. BELLO
COUNTY EXECUTIVE

Acknowledgments

Many individuals contributed time and effort to help develop Phase I of the Monroe County Climate Action Plan. Their commitment and hard work are greatly appreciated.



CAP Advisory Committee

- » Matthew O'Connor, Co-Chair
- » Michael Yudelson, Co-Chair
- » Sue Hughes-Smith, Vice Chair
- » John Botelho
- » Sean Delehanty
- » Michael Garland, DES Director*
- » Richard Milne
- » Kathryn Walker
- » Tina Verno Stevens, Secretary
- » Fred Ancello, 2021 Member
- » Karla Boyce, 2021 Member
- » Lola D'Ascentiis, Student Member*
- » Helen Frank, Student Member*
- » Liam Smith, 2021 Student Member*
- » Leah Wirley, Student Member*

* Denotes non-voting member

County Internal Working Group

- » Clement Chung, DES Deputy Director
- » Joseph Vankerkhove, Engineer-in-Charge
- » Patrick Gooch, Planning Liason
- » Isabelle Haddad
- » Robert Franklin
- » Thomas Polech
- » Sean Murphy
- » Douglas French
- » William Johnston
- » Yasmin Guevara
- » Joseph Saurini, Sr.

Project Consultants



Bergmann has joined Colliers Engineering & Design.

This project has been funded in part by the Climate Smart Communities grant program, Title 15 of the Environmental Protection Fund through the New York State Department of Environmental Conservation.

Cover Image: Lucien Morin Park in Penfield, NY

Indigenous Land Acknowledgment

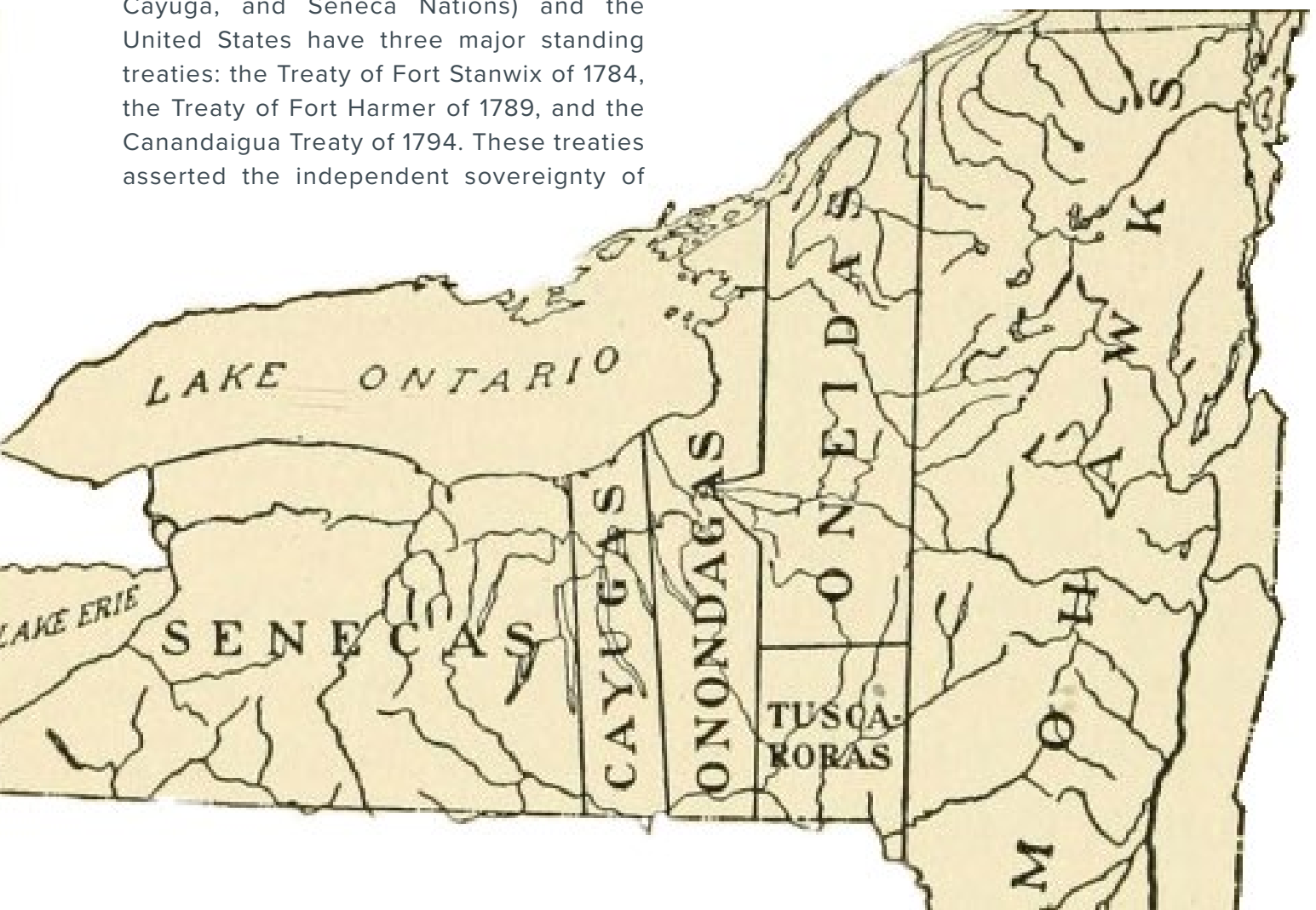
The overarching goal of this Climate Action Planning process is to develop a strategic vision and actions for improving the County's relationship with the land. As such, it is important to recognize the legacy of our land and those who first resided here. Our community is located on the homelands of Ho-de-no-sau-nee-ga (Haudenosaunee) and Onöndowa'ga (Seneca) people. We acknowledge that this land has been taken from the Haudenosaunee and Seneca people through a history of unjust land acquisition and unfair treatment during the time of colonization.

The Haudenosaunee Confederacy (which includes the Onondaga, Mohawk, Oneida, Cayuga, and Seneca Nations) and the United States have three major standing treaties: the Treaty of Fort Stanwix of 1784, the Treaty of Fort Harmer of 1789, and the Canandaigua Treaty of 1794. These treaties asserted the independent sovereignty of

the Haudenosaunee Nation and United States, established territorial boundaries and means of compensation, and called for a peaceful and friendly relationship between both entities.

The Haudenosaunee and Seneca people are an integral part of our community who continue to contribute to our community's history, culture, and growth. Through this acknowledgment, Monroe County recognizes, honors, and respects the Haudenosaunee Confederacy and Seneca Nation as the traditional stewards of the lands and waters on which we live - and strive to learn from these indigenous communities to foster a more integrated and sustainable relationship with their indigenous lands.

Image Source: Oneida Nation



This page is intentionally blank.

TABLE OF CONTENTS

Part 1

INTRODUCTION TO CLIMATE ACTION PLANNING 1

Plan Focus..... 2
 Phase I vs. Phase II Scoping..... 2
 What is a Government Operations Climate Action Plan?..... 3
 Plan Framework..... 4
 Planning Process..... 4
 What is a Government Operations GHG Inventory?..... 5
 Climate Mitigation vs. Adaptation..... 7

Part 2

EXISTING CLIMATE CONDITIONS & PROJECTIONS 9

The Science of Climate Change..... 10
 ClimAID Projections..... 11
 Climate Projections for Monroe County..... 14

Part 3

CURRENT CLIMATE INITIATIVES 17

New York State Climate Smart & Clean Energy Communities..... 18
 County Climate Initiatives..... 20
 Case Studies..... 25

Part 4

GREENHOUSE GAS (GHG) INVENTORY 29

Purpose..... 30
 Methodology..... 30
 Baseline Input Data Context..... 31
 Results..... 35
 GHG Emissions by Sector..... 36
 Business as Usual (BAU) Forecast..... 37

Part 5

CLIMATE ACTION GOALS & TARGETS 39

GHG Targets Overview..... 40
 Creating a Master Plan for Climate Action..... 42
 The Goal Framework..... 42
 Implementation Plan..... 46

Part 6

EXPANSION OF CLIMATE ACTION PLANNING 73

Administering & Monitoring the CAP..... 74
 Building on other Plans & Initiatives..... 77
 County Level Mitigation, Adaptation and Resilience..... 78
 Community-wide GHG Inventory & CAP (Phase II)..... 79

LIST OF FIGURES


Figure 1.	Climate Adaptation vs. Climate Mitigation	7
Figure 2.	Projected Temperature Changes in Region 1 (Western New York)	11
Figure 3.	Days over 90° F	12
Figure 4.	Number of Heat Waves	12
Figure 5.	Duration of Heat Waves	12
Figure 6.	Days under 32° F	12
Figure 7.	Days with over 1” of Rainfall	12
Figure 8.	Projected Shifts in Extreme Temperature Days	15
Figure 9.	Projected Average Precipitation (Inches)	15
Figure 10.	Ulster County Carbon Neutral Government Strategy (From 2019 CAP)	25
Figure 11.	City of Rochester Government Emissions	27
Figure 12.	Scope 1, 2, & 3 Emissions	31
Figure 13.	Baseline Emissions by Sector	35
Figure 14.	Buildings & Facilities Emissions	36
Figure 15.	Pure Waters Infrastructure Emissions	36
Figure 16.	Transportation Fleets Emissions	36
Figure 17.	Expressway Lights & Traffic Signals Emissions	36
Figure 18.	Business as Usual Forecast	37
Figure 19.	Emissions Reduction Targets	41
Figure 20.	Goal Framework	43
Figure 21.	Monitoring Process	74
Figure 22.	Intervention Logic Example	75
Figure 23.	County Plan Coordination	77
Figure 24.	Climate Planning Coordination	79

LIST OF TABLES

Table 1.	Projected Change in Average Temperature (°F)	14
Table 2.	Monroe/Orange County GHG Emissions Comparison	26
Table 3.	Buildings & Facilities Emission Data Sources	32
Table 4.	Pure Waters Infrastructure Emission Data Sources	33
Table 5.	Transportation Fleets Emission Data Sources	33
Table 6.	Expressway Lights and Traffic Signals Emission Data Sources	34
Table 7.	Monroe County Baseline GHG Emissions Inventory Summary	35
Table 8.	Business as Usual GHG Emissions Forecasts for Monroe County	37
Table 9.	GHG Reduction Targets	40
Table 10.	Buildings & Facilities Implementation Actions	47
Table 11.	Expressway Lighting & Signals Implementation Actions	55
Table 12.	Pure Waters Infrastructure Implementation Actions	59
Table 13.	Solid Waste & Materials Management Implementation Actions	63
Table 14.	Transportation Fleets Implementation Actions	69

LIST OF MAPS

Map 1.	Monroe County Municipalities Participating in the CSC Program as of 2022	19
--------	--	----



MONROE
COUNTY
CAP

GOVERNMENT OPERATIONS

Part 1

INTRODUCTION TO CLIMATE ACTION PLANNING

We've been given a warning by science and a wake-up call by nature; it is up to us now to heed them.

- **Bill McKibben**

American environmentalist, author, and journalist.

Plan Focus

Phase I of the Monroe County Climate Action Plan (CAP) focuses on reducing GHG emissions from County-run sites, facilities, and operations. This Phase identifies strategies and recommendations to:

- Improve sustainability, reduce greenhouse gas (GHG) emissions, and strengthen resiliency of Monroe County facilities;
- Create goals, actions, and policies that are innovative and achievable for addressing mitigation and adaptation from government operations standpoint;
- Advance County certification in NYSDEC's Climate Smart Communities (CSC) program alongside participating communities in Monroe County;
- Identify opportunities to satisfy the requirements of the New York State Energy Research and Development Authority (NYSERDA)'s Clean Energy Communities (CEC) program alongside CSC certification actions;
- Build on recent sustainability successes in County operations, from Clean Fleets to the County's Green Building Initiative;
- Create a plan that builds consensus and momentum to spur action and provides a clear path for transitioning to Phase II: Countywide Climate Action Plan; and
- Provide a long-term vision for Monroe County with actionable pathways.

Phase I vs. Phase II Scoping

By analyzing and understanding existing GHG emissions from County-owned facilities, infrastructure, and operations; as well as developing a strategic action plan for reducing emissions and adapting to climate change impacts within government operations, Monroe County is stepping into a leadership position and making firm commitments to a more resilient and sustainable future for our community.

Once this portion of the Climate Action Planning process has been completed (Phase I), the County will turn its eye to the emissions produced community-wide. This includes those outside of the direct control of the County government (Phase II). Phase II will provide a more robust understanding of the full scale of emissions-producing activities and infrastructure in the County, such as private industry operations and land use. Both phases are integral planning efforts to develop a deep understanding of where we are, where we'd like to go, and how we intend to foster a more sustainable future.



What is a Government Operations Climate Action Plan?

A climate action plan is a comprehensive, strategic effort to address and reduce greenhouse gas emissions in the atmosphere and the related environmental and climatic impacts associated with rising GHGs. GHG Inventories can happen at the state, regional, and community level (village, city, town or county scale). Communities are encouraged to prepare GHG inventories for governmental operations. GHG inventories can include direct emissions (i.e. emissions that occur physically within a boundary, such as burning natural gas in a building), indirect emissions (i.e. emissions from electricity power plants based on the amount of electricity consumed within the inventory boundary), and other indirect or “upstream” emissions that a community has no control over.

The goal of the Climate Action Plan for Government Operations is to examine GHG emissions from Monroe County-run sites, facilities, and operations, and develop strategies to mitigate future GHG emissions. The purpose of the Plan is to identify a strategy for Monroe County to decrease greenhouse gas emissions associated with its operations to reach a certain GHG reduction target over a defined timeframe. This Plan’s GHG emissions reduction target uses the County’s 2019 GHG inventory as a baseline.

Phase I Purpose Statement:

Identify a strategy for Monroe County to decrease GHG emissions attributed to Government Operations by 80% below the 2019 baseline by the year 2050.

This purpose statement aligns with the New York State Climate Leadership and Community Protect Act, which has a goal of

achieving 100% zero-emission electricity by 2040, and to reduce emissions at least 85% below the 1990 levels.



Monroe County Water Resource Recovery Facility



Iola Powerhouse & Cogeneration Facility

■ Planning Process

Phase I of the Climate Action Plan (CAP) was completed under the direction of an internal CAP working group and CAP Advisory Committee.

The project team facilitated weekly meetings with Monroe County’s internal CAP working group. This group consisted of members from the County Administration and representatives of various County Departments. The County’s Environmental Services, Planning and Development, Department of Transportation (DOT), Parks, Airport, Finance, and Human Resources Departments were consulted throughout the process to provide direct feedback on specific governmental sectors and operational activities.

These weekly meetings with the internal working group helped to refine the goals and vision of Phase I, including setting measurable GHG emissions goals, identifying and analyzing objectives and strategies, with the goal of identifying strategies and recommendations for the implementation of the CAP.

The project team and members of the internal working group also attended monthly CAP Advisory Committee meetings to provide updates on the development of the Plan and discuss key data, goal, and strategy elements. The CAP Advisory Committee consisted of citizens, local students, County staff members, and the County Legislature.

■ Plan Framework

The fundamental goal of the climate action planning process is to identify and prioritize goals, strategies and initiatives that will reduce GHG emissions from County sites, facilities, and operations.

The climate action planning process includes the following:

1. Develop GHG Inventory and Baseline: The Project Team reviewed emissions data collected from the County’s Environmental Services Department and statewide climate data to establish an appropriate baseline and create a GHG Emissions Inventory Report (see Part 4). The report contains emissions data from the following focus areas:

- » Buildings & Facilities;
- » County Vehicle Fleet;
- » Expressway Lights & Signals;
- » Pure Waters Infrastructure; and
- » Solid Waste & Materials Management.

The baseline data for this Plan was collected using the International Council for Local Environmental Initiative (ICLEI)’s ClearPath tool, a tool for local governments used by over 2,500 communities across the world. ClearPath created almost 400 GHG inventories in 2020. ICLEI allows communities to set baselines for operations, forecast future emissions, explore strategies for mitigating emissions, and monitor progress from actions taken to reduce emissions. More information regarding ICLEI and the methodology for the baseline inventory is presented in Part 4.

What is a Government Operations GHG Inventory?

GHG emissions inventories and targets help communities to establish quantifiable goals by a predetermined date. Setting GHG emissions goals and climate action planning in general often lead to economic opportunities, according to the Carbon Disclosure Project and the C40 Cities Climate Leadership Group, which looked at 110 global cities.

GHG emissions inventories are also the first step towards a community's certification in New York State's Climate Smart Communities (CSC) program. CSC requires communities to look at and inventory various GHGs including, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃) emissions. In New York State, these GHGs are attributed to the following activities:

- Fossil fuel combustion.
- Solid waste and sewage management, agriculture, and some industrial activities.
- Common refrigerants found in homes, businesses, vehicles, etc.
- Industrial gas used in the manufacturing of liquid crystal displays (LCD), semiconductors, solar panels, and chemical lasers.



Monroe County Water Resource Recovery Facility



Monroe County Water Resource Recovery Facility



Monroe County Solar Farm

2. Identify GHG Reduction Goals: A target and timeframe are most effective if it is aligned with the political, technical, and economic realities of County government and its equipment, processes, and facilities. The GHG reduction goal outlined in this plan was developed over the course of the planning process considering current GHG emission levels, feasible County actions, and estimated impacts of actions on the various focus areas.

3. Review Best Management Practices and Case Studies: The project team evaluated best practices from communities across the United States to identify how GHG emission reductions have been addressed across the spectrum of municipal operations. The case studies were summarized and presented to the County and CAP Advisory Committee to identify potential projects that may be desirable or applicable to Monroe County. The project team also reviewed the Ulster County CAP and the City of Rochester's Municipal Operations CAP as state and local references.

4. Identify and Analyze Strategies and Actions (Scenario Planning): Using the current climate activities identified in the baseline snapshot as a starting point, the Project Team worked with the internal climate working group, County administration, and CAP Advisory Committee to identify feasible climate action strategies, policies, programs, measures, projects, infrastructure, and community actions.

These strategies and implementation plans can leverage existing sustainability activities and assess capacity for applying new climate action strategies to address County operations. Actions in this Phase I Plan specifically address County facilities and activities. A range of potential actions are identified, including but not limited to:

- » Assistance with Climate Smart Community certification
- » Assessment of landfill and emissions management
- » Capital improvement projects (i.e. window replacement, etc.)
- » Identification of solar projects

The project team will educate County staff and government officials on the recommended strategies, policies and programs identified for the County to facilitate achievement of the targets established and accepted for County operations. We will work with the County to prioritize actions, identify metrics and timeframes, and will evaluate the feasibility of each actions. The implementation of the CAP will also provide a short-term list of priority projects that can be budgeted for in the County's annual capital improvement program. The long-term operation and maintenance impacts of proposed actions and recommendations will be considered.

5. Prioritize Strategies and Actions: Evaluating and scoring strategies and actions that were previously identified will help the County to prioritize potential strategies, actions, policies, initiatives, etc. Stakeholder input is an additional key aspect to identifying initiatives.

Climate Mitigation vs. Adaptation

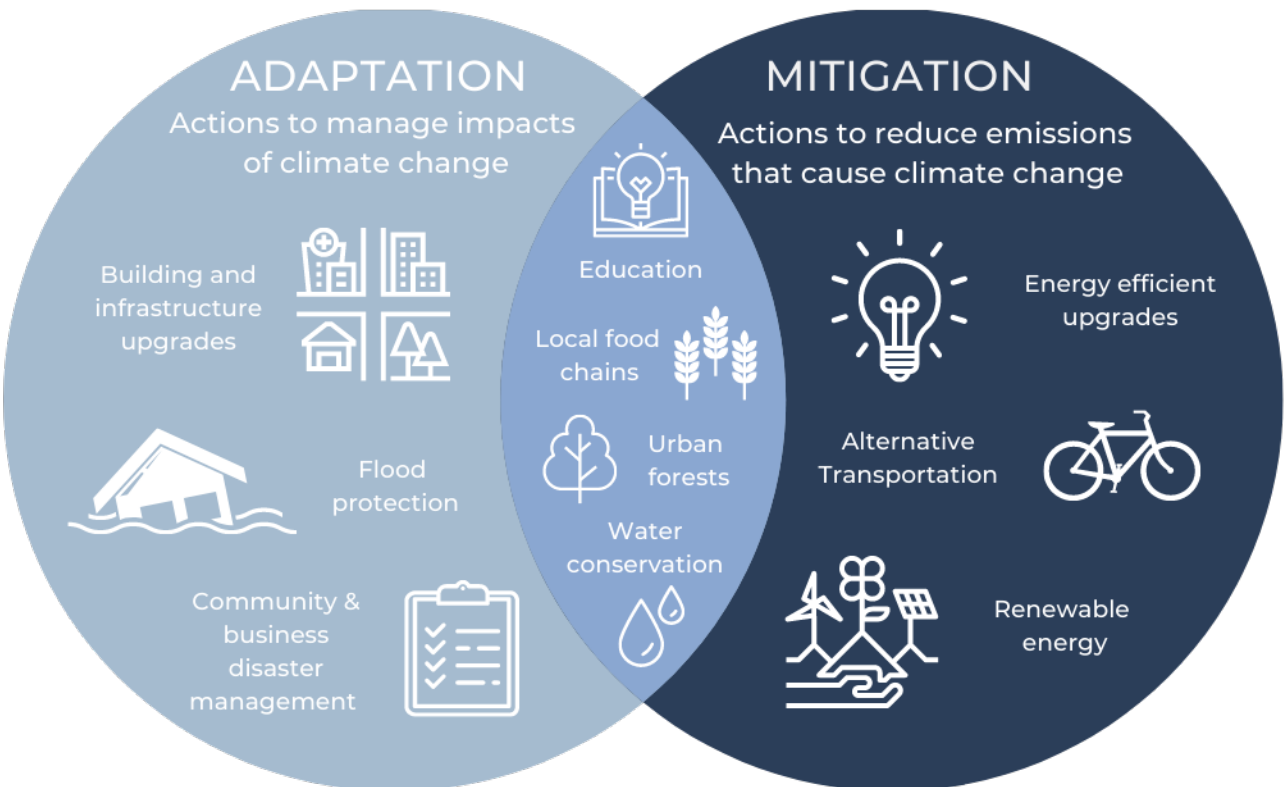
In order to navigate the challenges of Climate Change that face Monroe County, we must consider both how to tackle the contributing factors exacerbating climate change, while also minimizing the adverse impacts shifting temperature and weather patterns have on all aspects of our society. The following is an excerpt from the [2014 Climate Action Planning Guide](#) developed by NYSERDA:

“Both climate mitigation and climate adaptation initiatives deal with climate change. The difference is that climate mitigation initiatives aim to reduce or prevent GHG emissions, such as installing solar panels or riding a bicycle instead of driving a car. In contrast, climate adaptation


initiatives prepare a community for the unavoidable impacts of climate change, such as sea level rise or extreme weather events. Climate mitigation and climate adaptation initiatives are not always mutually exclusive and can have benefits in both areas as demonstrated in Figure 1. For example, installing a green roof on top of a building decreases energy consumption (climate mitigation) while absorbing stormwater runoff during extreme weather events (climate adaptation).”

While a CAP primarily addresses climate mitigation measures, this Plan will also examine opportunities for initiatives that provide adaptation benefits as well.

Figure 1. Climate Adaptation vs. Climate Mitigation



This page is intentionally blank.



MONROE
COUNTY
CAP

GOVERNMENT OPERATIONS

Part 2

EXISTING CLIMATE CONDITIONS & PROJECTIONS

The environment is where we all meet; where all of us have a mutual interest; it is the one thing all of us share.

-Lady Bird Johnson

Former First Lady of the United States (1963 - 1969)

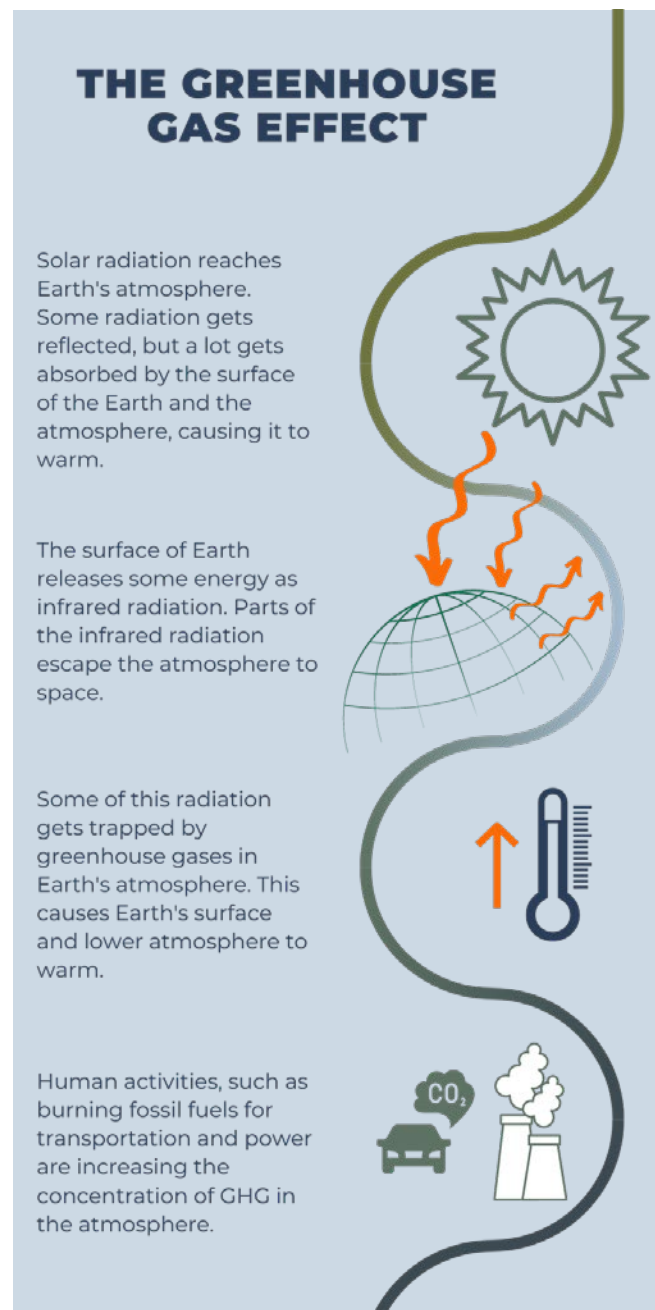
■ The Science of Climate Change

Climate change, a persistent and growing force on our planet, is one of the most pressing issues our society is facing, and will continue to face well into the future. The Intergovernmental Panel on Climate Change (IPCC) has stated that there is a greater than 95% chance that the rising global average temperatures are primarily due to human activities, driven by growing levels of greenhouse gases (GHGs) in the atmosphere¹. Fossil-fuel combusting, urban sprawl / rapid development of open space, and other human activities contribute to these ever-growing GHG levels. It's estimated that GHG levels are 40 percent higher than they were during the preindustrial era, and emissions continue to accelerate.

Some greenhouse gases can stay in the atmosphere for centuries or millennia². These GHGs trap heat, leading to a rise in temperatures; the impacts of which can already be seen on the environment across the globe. This includes rapidly melting icecaps leading to rising sea levels, increased flooding, stronger and more frequent extreme weather events, and so on². These impacts have devastating implications for all facets of our natural environment and society.

Monroe County, similar to other areas of New York State, is seeing effects such as increased precipitation, more frequent and intense storm events, and increased shoreline erosion³.

The average temperature in Rochester, NY has increased by 0.32° F between 1901 – 2012, and Rochester has experienced 2.32 fewer days below 32° F per decade. Based on the baseline average air temperature (1971-2000), the average temperature for Western New York is predicted to rise by 5.7-9.6° F in the 2080s based on 25th - 75th percentile projections from NYSERDA³.



Sources: (1) IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.
 (2) U.S. Environmental Protection Agency. 2016. Climate change indicators in the United States, 2016. Fourth edition. EPA 430-R-16-004. www.epa.gov/climate-indicators
 (3) Horton, R., D. Bader, C. Rosenzweig, A. DeGaetano, and W. Solecki. 2014. Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information. New York State Energy Research and Development Authority (NYSERDA), Albany, New York.

ClimAID Projections

Climate change risks include more frequent and intense incidents related, but not limited to: heat waves, heavy rainfall, flooding, interruption of the supply chain and food resources, sea level rise, and impacts on ecosystems and quality of life. Integrated Assessment for Effective Climate Change Adaptation in New York State (ClimAID) aims to provide information on New York’s climate vulnerability to help inform the development of climate action strategies and encourage further research. The ClimAID report was developed in 2008 by NYSERDA and updated in 2014.

Climate change is already having an impact on New York State. The ClimAID Report projects that Western New York will be impacted by increased flooding, heat, and precipitation. Higher temperatures and sea level rise are extremely likely for New York State communities³. Projected impacts from the ClimAID Report in regards to precipitation, temperature, and extreme weather events are described in further detail below.

Temperature

Average annual temperatures are projected to increase across New York State by 2.0–3.4° F by the 2020s, 4.1–6.8° F by the 2050s, and 5.3–10.1° F by the 2080s. Figure 2 presents the projected temperature changes by decade and percentile for the Western New York Region, which are similar to those of the State as a whole. Temperature increases

will have significant negative impacts such as increased flood damage, more intense urban heat island effect, and more prevalent disease-carrying insects. It is also estimated that the growing season in the State could lengthen by approximately a month with more intense summers and mild winters. The models suggest that each season will experience a similar amount of warming relative to the baseline period.

Precipitation

In Western New York, precipitation is predicted to increase by 2-7% through the 2020s; 4-10% by the 2050s; and 4-13% by the 2080s (based on a baseline of 1970-2000). It’s predicted that much of the additional precipitation will occur over the winter months, and there may be a slight decrease in precipitation during summer and fall months. Lake effect snow events may increase in the coming decades due to lack of ice cover on Lake Ontario, but by the end of the century as temperatures have warmed, lake effect snow instances may decrease. Extreme precipitation will create more flood risks as well -- as seen on Lake Ontario in the past several years.

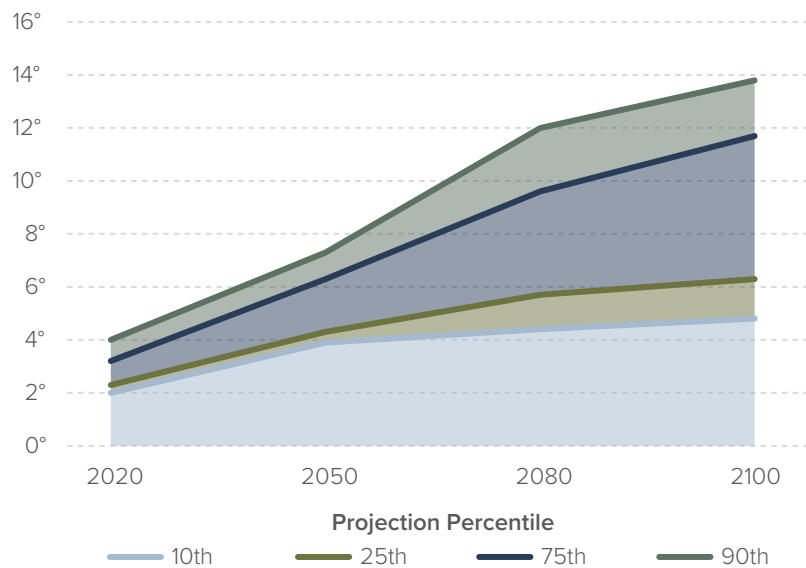


Figure 2. Projected Temperature Changes in Region 1 (Western New York) Source: ClimAID

Changes in Extreme Events

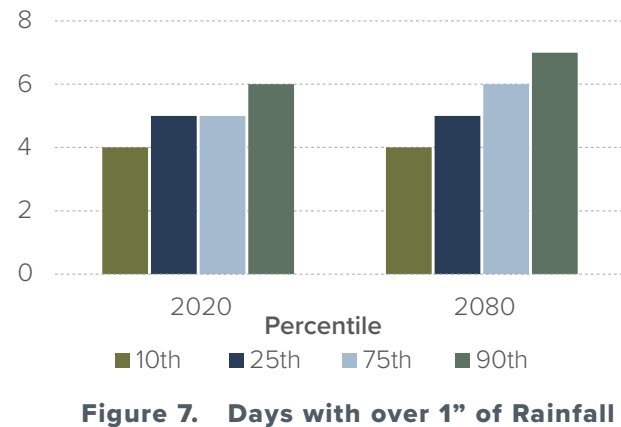
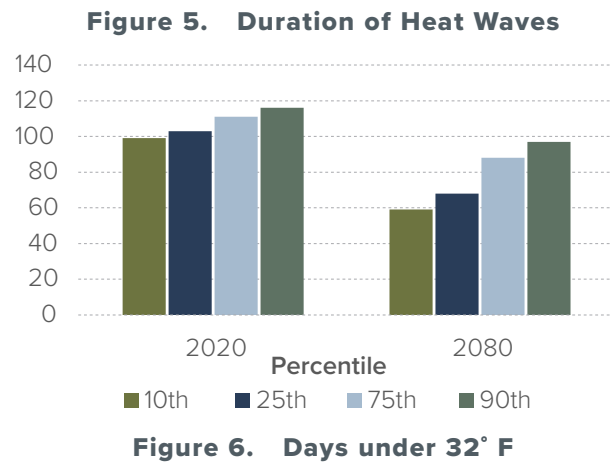
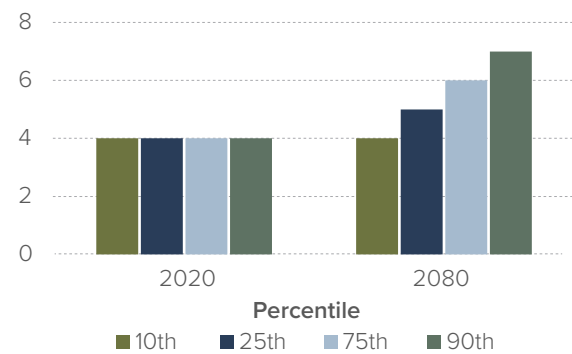
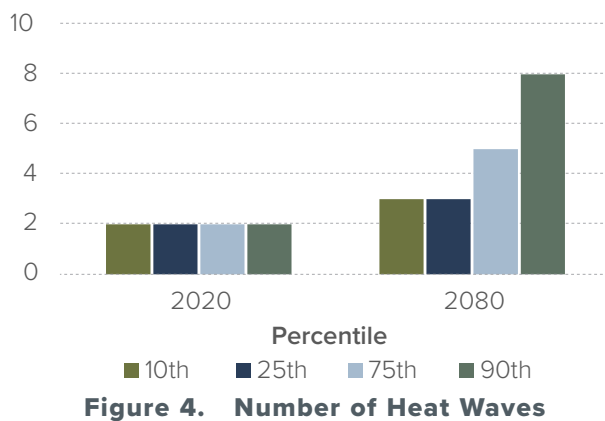
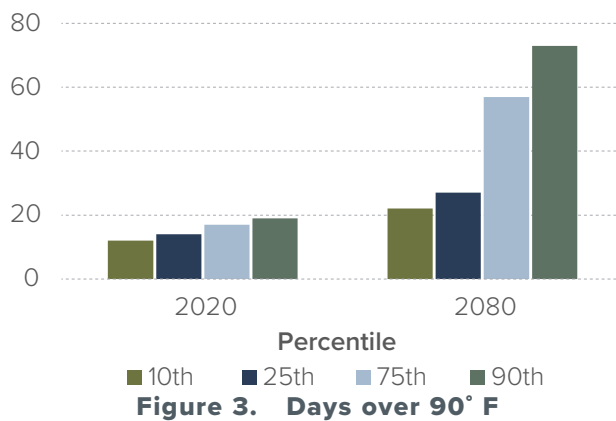
As a whole, the frequencies of cold events, heat waves, drought, flooding and other extreme weather events will increase for the entire state. Other severe events include more frequent large-scale storms, heat indices (temperature and humidity), and intense periods of precipitation. These events are likely to occur in higher frequencies due to higher temperatures and increased moisture in the air.

Conclusions

The 2008 ClimAID report and 2014 update observed already rising temperatures. The report concludes that climate change will have a noticeable impact on communities across New York State. Areas prone to flooding will likely experience more frequent flooding, temperatures will rise, and extreme weather events will occur more regularly.

There will be a notable economic impact as well, as more extreme weather events will impact the agricultural industry and tourism. The report suggests a number of policy recommendations to address climate change, which are summarized on the next page. Currently, NYSERDA is developing the New York State Climate Impacts Assessment, which will provide a comprehensive analysis of observed and projected impacts of climate change across the State. The completed assessment is anticipated to be available in early 2023.

Figures 3-7 Source: ClimAID



ClimAID Policy Recommendations

NYSERDA offered several policy, research and management recommendations for New York State to target climate adaptation and mitigation. Policy recommendations are targeted to decision makers. These recommendations include:

- Promote adaptation strategies that enable incremental & flexible adaptations across sectors and communities.
- Analyze environmental justice issues related to climate change & adaptation regularly.
- Evaluate design standards & policy regulations based on up-to-date climate projections.
- Improve public education and awareness about all aspects of climate change.
- Identify synergies between mitigation and adaptation.
- Develop standardized, statewide climate change mitigation and adaptation tools.

Management recommendations are meant for stakeholder organizations, and include:

- Integrate climate adaptation responses into the everyday practices.
- Consider climate change in future planning & development efforts.
- Identify opportunities for climate

adaptation partnerships across organizations.

There are ample opportunities to expand scientific research on climate change. NYSERDA recommendations include but are not limited to:

- Conduct research on understanding climate variability, including stakeholder-identified variables, such as ice storms, extreme precipitation events, wind patterns, etc.
- Implement and institutionalize an indicators and monitoring program focused on climate, impacts, and adaptation strategies.
- Improve spatial analysis and mapping to help present new data.
- Develop a better understanding of the economic costs of climate change and benefits of adaptations.
- Conduct targeted impacts research in conjunction with regional stakeholders.

As these recommendations suggest, there is a wide range of adaptation needs across sectors and regions. Some adaptations strategies can be undertaken in the short-term at low cost, but many recommendations will require additional funding, and communication coupled with cooperation between policymakers, scientists and communities. The overall objective is the advancement of equitable and efficient climate resilience throughout New York State.

Climate Projections for Monroe County

Projections specifically for Monroe County were developed by the New York Climate Change Science Clearinghouse (NYCCSC). While the ClimAID projections described previously focus on the statewide and regional picture, the NYCCSC data is presented at the County-level; providing more location-specific context. These projections tell a similar story: increased average temperatures, precipitation, and severe weather events. The data is based on a baseline period of 1950-2013, and projections cover through the year 2099.

If current day emissions trends are left unchecked, Monroe County could face a wide array of difficulties and challenges, including but not limited to degradation of air quality, heat-related health risks, increased costs of farming practices, and increased cooling and heating costs.

Average Temperature

The projected changes in annual and seasonal average temperature are presented in Table 1. Changes are relative to the 1980-2009 mean, calculated for four periods: 2020-2039, 2040-2059, 2060-2079, 2080-2099. The projections are derived from statistically downscaled (LOCA method) CMIP5 daily data⁴. The most significant temperature increases are anticipated in the summer months, and the lowest in the spring months. Figure 8 on the following page shows days under 32°F and over 90°F essentially becoming equal by 2090.

Average Precipitation

As shown in Figure 9, average precipitation is expected to increase by approximately 5.7 inches by the end of the 21st century, per the weighted mean of the projected values. The maximum projected increase for 2099 is almost 17 inches. These extreme increases will undoubtedly have impacts on our local water systems, particularly flooding along the Lake Ontario shoreline.

Season	Baseline (°F)	Scenario	2020-2039	2040-2059	2060-2079	2080-2099
Annual	48.7	High	+3.1	+5.4	+8.1	+10.7
		Low	+3	+4.3	+5.4	+6
Fall	51.5	High	+3.7	+5.8	+8.5	+10.9
		Low	+3.4	+4.8	+5.7	+6.3
Spring	46.2	High	+2.2	+4.6	+7.1	+9.7
		Low	+2.4	+3.7	+4.7	+5.5
Summer	69.2	High	+3.4	+5.7	+8.7	+11.4
		Low	+3.1	+4.5	+5.7	+6.1
Winter	27.4	High	+3.1	+5.4	+8.2	+10.7
		Low	+2.9	+4.3	+5.5	+6.2

Table 1. Projected Change in Average Temperature (°F) Source: NYCCSC

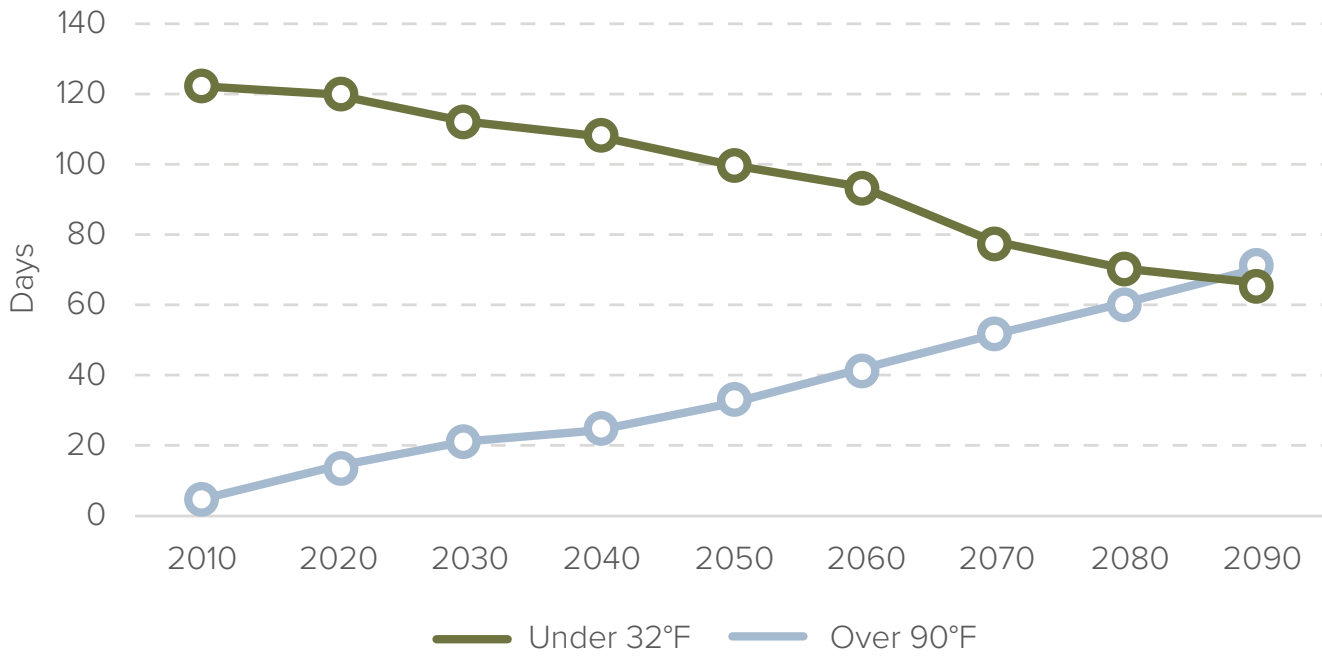


Figure 8. Projected Shifts in Extreme Temperature Days *Source: NYCCSC*

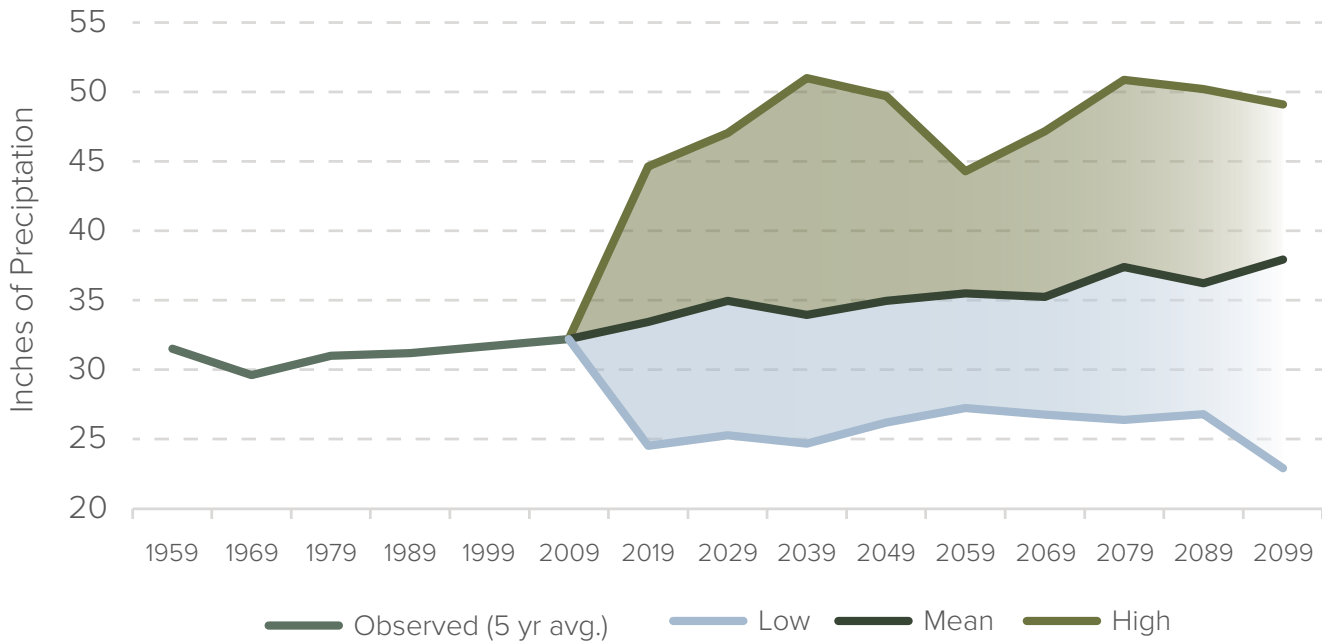



Figure 9. Projected Average Precipitation (Inches) *Source: NYCCSC*

Sources: (4) Maurer, E. P., L. Brekke, T. Pruitt, and P. B. Duffy (2007), 'Fine-resolution climate projections enhance regional climate change impact studies', *Eos Trans. AGU*, 88(47), 504.

This page is intentionally blank.



MONROE
COUNTY
CAP

GOVERNMENT OPERATIONS

Part 3

CURRENT CLIMATE INITIATIVES

We will be driven by our conviction that every person has the right to clean air, clean water, and a healthier life—no matter how much money they have in their pocket, the color of their skin, or what community they live in.

- Michael Regan

16th Administrator of the US Environmental Protection Agency

■ New York State Climate Smart & Clean Energy Communities

BACKGROUND

Climate Smart Communities (CSC) is a New York State program meant to assist governments with reducing greenhouse gas emissions, implementing climate change adaptation strategies, and providing technical assistance and grants to participating communities.

To participate, communities must pass the CSC pledge as a municipal resolution; register through the CSC online portal; review and select CSC actions (over 100), collect documentation, and submit an application. Upon review, the community will be evaluated and receive a bronze or silver certification based on points. As of 2022, there are 356 registered communities across NYS, covering a population of 9,430,145 in total. Of these registered communities, 82 are bronze certified and 8 are silver certified.

Benefits of participating in the CSC program include better scores on state funding grant applications (such as New York State Department of Environmental Conservation (NYSDEC)'s CSC grants), streamlined access to training, resources and tools, a strong framework to organize local climate actions and highlight priorities, and State-level recognition. There are additional quality-of-life benefits to implementing certification actions, such as cost savings due to greater efficiency, improved air quality, flood risk reduction, conservation of greenspace, more walkable communities, etc.

CSC IN MONROE COUNTY

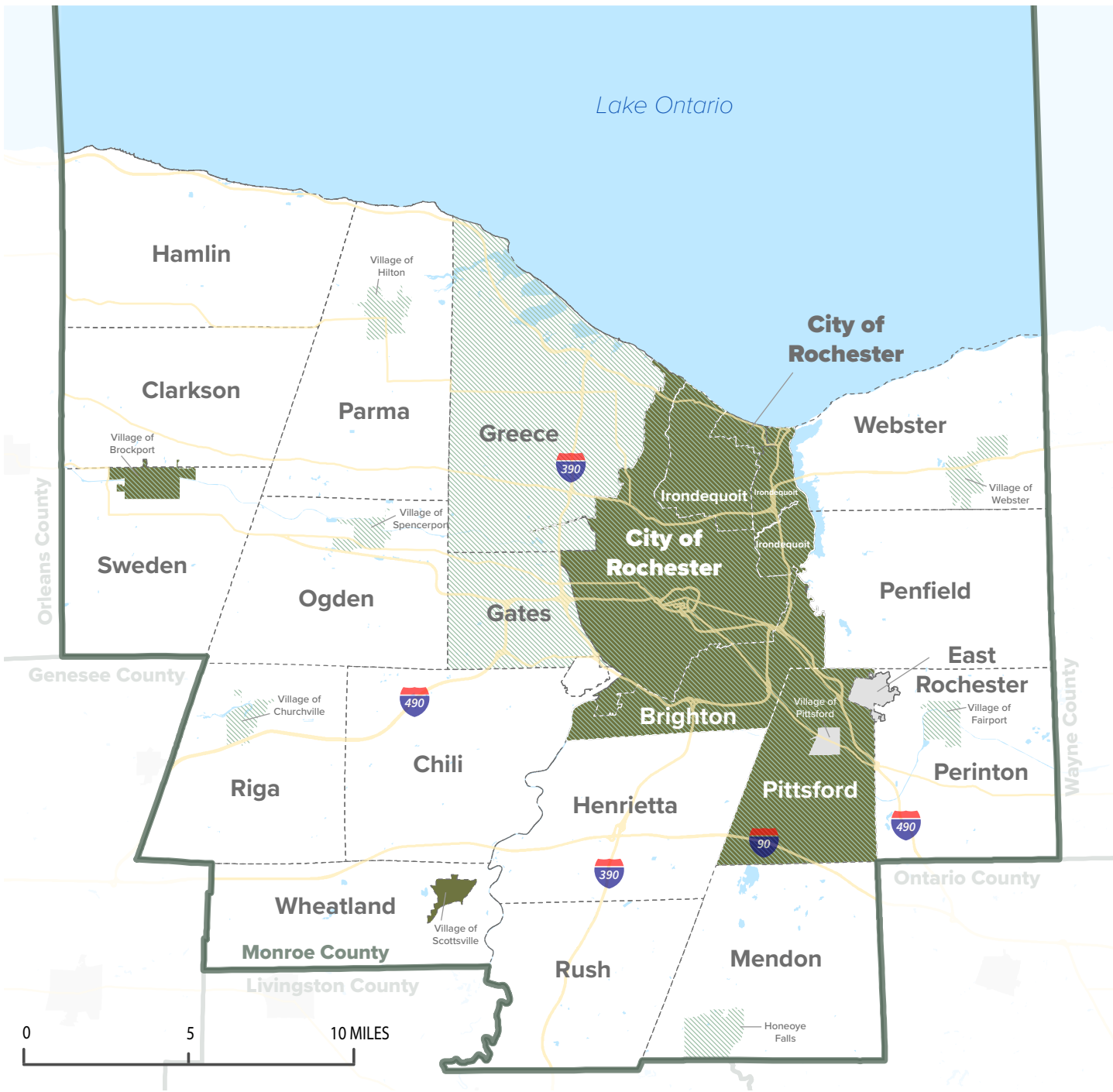
Monroe County passed a resolution to register as a Climate Smart Community in 2021. Given the County's commitment to the program, as well the participation of several local communities, the CSC can serve as a structure through which the County can plan, prioritize, and track resiliency and sustainability efforts. The County's efforts can also inform and encourage additional local municipalities to participate, and to leverage best practices and lessons learned from other areas of the County.

The County obtained funding through the CSC program to complete this Climate Action Planning process, and should continue to pursue funding through the program to support the actions and initiatives proposed in this Plan. The County has already taken a number of actions to work towards bronze certification, which are described in further detail on Page 20.

CLEAN ENERGY COMMUNITIES

In addition to CSC, the County as well as several local municipalities are also enrolled in Clean Energy Communities (CEC) through NYSERDA (as shown on Map 1). Similar to CSC, the program allows municipalities to undertake actions working towards clean energy to earn points and obtain increased recognition and access to grant funding.

Map 1. Monroe County Municipalities Participating in the CSC Program as of 2022



CSC CERTIFIED COMMUNITIES

- City of Rochester (Bronze)
- Town of Brighton (Bronze)
- Town of Irondequoit
- Town of Pittsford
- Village of Scottsville
- Village of Brockport

CERTIFIED CEC COMMUNITIES

- City of Rochester
- Town of Brighton
- Town of Irondequoit
- Town of Pittsford
- Town of Greece
- Town of Gates
- Village of Churchville
- Village of Spencerport
- Village of Brockport
- Village of Fairport
- Village of Honeoye Falls
- Village of Webster

County Climate Initiatives

NYSDEC Climate Smart Communities Certification Program: Monroe County

As of the writing of this Plan, Monroe County is a registered community under the CSC Certification Program. The County has undertaken a number of actions working towards a Bronze Certified status, including:

1. PE1: CSC Task Force

Creation of a team of local officials, professionals, and stakeholders to promote and support climate mitigation and adaptation initiatives.

2. PE1: CSC Coordinator

Appointment of an individual responsible for coordination of the CSC Task Force.

3. PE3: Green Building Standard for Government Buildings

Adoption of green building standards for new construction and/or existing government buildings and facilities.

4. PE3: Green Building Certification

Obtainment of a green building certification such as ENERGY STAR or LEED for a new government facility.

5. PE4: Solar Energy Installation

Installation of solar technology on new or existing public buildings or properties.

6. PE5: Recycling Bins in Government Buildings

Creation and implementation of a municipal policy that requires placement of recycling bins wherever there is a trash bin.

7. PE5: Reuse Program

Creation of a reuse program that provides opportunities for residents to donate and exchange material goods (such as a “take it or leave it” shed or station).

8. PE5: Waste Reduction Education Campaign

Creation of an education program about the benefits of climate-smart materials management.

9. PE7: Green Infrastructure

Planning for, training on, or implementation of design practices that use natural processes to capture stormwater.

10. PE8: PACE Financing

Development of a Property Assessed Clean Energy (PACE) financing program to allow property owners to repay the cost of clean energy upgrades to their commercial or non-profit property through a special assessment.

With the completion of this Phase I of the CAP the County will then be eligible for points under the following actions: PE2: Government Operations Greenhouse Gas Inventory and PE2 Action: Government Operations Climate Action Plan.

Solar and Alternative Power

Monroe County installed solar parks in 2017 and is home to Western New York's largest municipal solar installation: a 30-acre, 8.6 megawatt (MW) solar facility in Hilton, and a 4.8 MW solar facility in Penfield. The solar facilities are estimated to provide \$7.3 million in energy savings over the course of 20 years. Monroe County is also home to a 6.4 MW power plant which converts landfill gas to electricity.

Lighting

In 2020, Monroe County's Transportation Department began to upgrade the lighting infrastructure along sections of I-490, I-590, and Route 104. This \$24 million project will save \$150,000 annually in energy costs and decreases energy usage by 50%. Other County properties have made the transition to LED lighting at several locations, including Frontier Field, for energy cost savings of approximately \$400,000 annually.

Water Resource Recovery

Monroe County operates four Pure Waters districts, which provide wastewater collection and treatment services for 650,000 residents. The intent of the Pure Waters Division is to reduce the levels of pollution in Irondequoit Bay, the Genesee River, areas of Lake Ontario, and other local waters. The County's water resource recovery facilities process 40 billion gallons

FUN FACT:

20,000 cubic yards of yard waste and "zoo poo" are composted annually in Monroe County.

of water annually. The Frank E. VanLare facility has an average capacity of 135 million gallons per day, and the Northwest Quadrant facility has an average capacity of 22 million gallons per day. Annually, 100,000 tons of biosolids byproducts are recovered and codigested with municipal solid waste to produce landfill gas for renewable energy recovery.



Green Fleet

Monroe County's Fleet Division was ranked the 2nd best Government "Green Fleet" in North America by Government Fleet magazine in 2013, out of 38,000 public fleets. Monroe County's Fleet Division comprises approximately 873 vehicles in total, including 707 alternative fuel vehicles (34 propane; 395 biodiesel; 66 E-10; 2-1 E-85; 11 CNG), and 31 hybrid vehicles (including 1 plug-in).

Additionally, there are green fueling stations at the Rochester Operations Center, the Frank E. VanLare Water Resource Recovery & Monroe Community College (MCC) Applied Technology Center, and Electric Vehicle (EV) charging stations can be found at the Monroe County Fleet Center complex, MCC's Brighton Campus and the MCC Applied Tech Center. The County is currently installing additional public EV charging stations at approximately 20 other locations throughout the County.

Water Resource Recovery Energy Coaching (WEC) Pilot Program

STRATEGIC ENERGY MANAGEMENT

Monroe County has piloted a Strategic Energy Management (SEM) Program since March 2018, at the Frank E. VanLare Water Resource Recovery and Northwest Quadrant Water Resource Recovery Facilities (WRRFs). The SEM program is an all-inclusive approach to managing energy use, focusing on both behavioral and operational changes that result in continuously improving energy performance.

This is completed through training, coaching, on-site activities, and peer-to-peer knowledge sharing with County WRRF employees. The SEM Pilot for WRRFs is a structured series of NYSERDA-funded ‘learn-by-doing’ training sessions that enable WRRF management and staff to reduce energy intensity over time.

Participants learn to identify areas for improvement and develop the mechanisms to track and evaluate energy optimization efforts. The outcomes of the program allow for continuous improvement of core practices resulting in long-term energy, cost, and carbon savings.



Frank E VanLare WRRF Treasure Hunt Team

TREASURE HUNT FOR ENERGY SAVINGS

Monroe County participated in Two Energy Efficiency Treasure Hunts; one at the Frank E. VanLare Water Resource Recovery Facility and the other at the Northwest Quadrant Water Resource Recovery Facility. In attendance were NYSERDA’s WEC and SEM program team coaches along with County staff. The purpose of the Treasure Hunts were to identify low or no-cost “Quick Win” opportunities to immediately reduce facility energy use. The Treasure Hunt also identifies capital upgrade projects in need of further analysis, but with potential for an attractive return on investment. Additionally, the Treasure Hunt engages employees in the process of improving energy performance and informs upper management of the energy and cost savings opportunities within their operations, thus setting the stage for persistent energy management activity. For example, one of the identified potential future upgrades was a belt filter press. The installment of the press would pay for itself in 5 years through its energy savings.



Northwest Quadrant WRRF Treasure Hunt Team

Recycling and Composting

Monroe County began its curbside recycling program in 1992 along with the opening of the Monroe County Recycling Center. The Household Hazardous Waste collection program also came to fruition at this time. In 2008, the County started the first pharmaceutical collection program in New York State, leading to an environmental excellence award in 2009. Additionally, the County began a leaf composting program in 2008.

By 2011, the County opened the ecopark facility, creating the first of its kind one-stop drop off for items difficult to recycle, like electronics. The ecopark received an award from the American Public Works Association for technical innovation. In 2021, approximately 62,400 residents utilized the ecopark for recycling needs - up from 39,000 in 2019. Today, about 80,000 tons of recyclable materials are processed at County facilities annually.

Ecopark is the “one-stop drop” location for residential recycling and hard-to-recycle items. Centrally located near the Greater Rochester International Airport, the 60,000 sq ft facility offers drive-up self-serve recycling stations where residents can dispose of materials such as old appliances, electronic waste, documents to be destroyed, certain types of batteries, etc.; the majority of which for free (a few items require a small fee such as cathode-ray tube TVs or appliances with refrigerant). Ecopark also accepts household hazardous waste, but requires appointments for those items.

Between 2011 and 2021, ecopark collected over 5 million pounds of electronic waste, 9,000 tires 800 tons of scrap metal, and 2,500 tons of household hazardous waste. In total, the materials collected by ecopark have resulted an estimated reduction of over **15,000 metric tons of CO₂-equivalent (MTCO₂E)** (based on the Environmental Protection Agency (EPA) Waste Reduction Model (WARM)).



Education and Outreach

Monroe County has developed robust and award-winning outreach campaigns to educate residents about the wide variety of sustainability and green initiatives, such as waste reduction and diversion, water resource recovery, and pollution prevention.

- » The ecopark website receives more than 100,000 visits annually.
- » Community and school presentations reach 65,000 annually.
- » Monroe County education and outreach materials were incorporated into the statewide Recycle Right NY campaign
- » Community stakeholder engagement, e.g. through the Monroe County Stormwater Coalition’s H₂O Hero Campaign and the Recycling Advisory Committee.

Regional Planning Initiatives

Sustainability planning also occurs at the regional level with the Finger Lakes Regional Sustainability Plan (covering Orleans, Genesee, Wyoming, Monroe, Livingston, Wayne, Yates, Seneca and Ontario Counties), which focuses on long-term sustainability efforts that will reduce greenhouse gas emissions and energy use. The plan highlights regional collaboration among stakeholders and is used to leverage investment in regionally significant sustainability projects. Additionally, many of the County’s past and current planning efforts have direct ties to the Climate Action Plan, such as:

- » **Plan Forward** - The County’s Comprehensive Planning process is currently underway as of 2022. One of the three key themes of the Plan

is “Environment,” which will address issues and opportunities pertaining to climate change, energy, natural resources, etc.

- » **Countywide Active Transportation Plan (CATP)** - The CATP will address reducing transportation-related emissions by promoting, enhancing, and supporting a non-motorized transportation network throughout the County.
- » **Bring Monroe Back** - The County’s COVID-19 Strategy has six key focus areas; one of which is sustainability.
- » **Farmland Protection Plan** - The County adopted the Plan in 1999, which discusses farmland preservation and the environmental and economic benefits of such.

Green Building Initiatives

In 2008, Monroe County adopted a Green Building Policy. The policy requires that all new County construction and any major renovation projects of 5,000 square feet or more must incorporate sustainable elements and evaluate for potential LEED certification. The County also has a Green Building Infrastructure Review team, made up of members from four County departments (Environmental Services, Planning and Development, Transportation, and Finance). Monroe County currently has 9 LEED Certified buildings: 1 platinum, 3 gold, 2 silver; and 1 certified.

Monroe County also has approximately 83 green infrastructure projects. These projects include 2 rainwater harvesting and recycling systems, 4 green roofs, 6 porous pavement projects, 49 bioretention / swales projects, 11 infiltration basins, 10 dry / wet ponds, and a wetland restoration project.

Case Studies

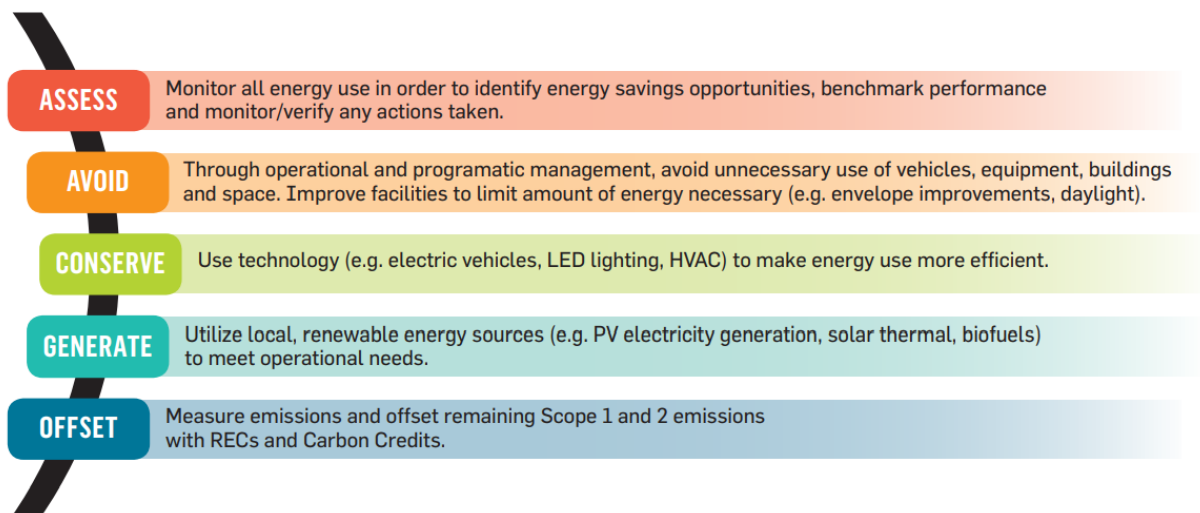
The following is a brief overview of comparable Climate Action Plans focused on Government Operations, which were reviewed and assessed to help guide the development of Monroe County’s CAP:

Ulster County, New York

Ulster County has reached Silver Certification status under the NYSDEC CSC Program. In 2019, Ulster County completed its Government Operations Climate Action Plan, which included four key elements:

- 1. Climate Action Leadership.** This component of the Plan provides a starting point for Ulster County as well as examples for other municipalities. It includes a County Sustainability Guide covering energy, green procurement, and materials management. The document serves as a handbook for other municipalities.
- 2. Carbon Neutral Strategy.** Ulster County’s Government Operations Strategy is centered around five main areas of action: Assess, Avoid, Conserve, Generate, and Offset. Reducing energy consumption is directed by Assess, Avoid, and Conserve efforts. Increasing renewable energy generation falls under the Generate strategy. Efforts to Offset emissions includes the purchase of Renewable Energy Credits (RECs) and Carbon Credits (See Figure 10).
- 3. Greenhouse Gas Inventory.** The GHG Inventory for Ulster County was first completed in 2012 and updated in 2018. This inventory covers all County building and fleet energy use under three sectors: Vehicle Fleet, Transit Fleet, and Buildings and Other Facilities. Water delivery facilities and streetlights and traffic signals make up a very small portion (0.3%) of their GHG inventory.
- 4. Implementation Roadmap.** The Climate Action Plan goal for Ulster County is to reduce GHG emissions by 25% from their 2012 baseline by 2025.

Figure 10. Ulster County Carbon Neutral Government Strategy (From 2019 CAP)



While the Ulster County 2012 baseline year pre-dates that of Monroe County's, there are several components still relevant and beneficial to consider in this Plan. For example, Ulster County's largest GHG emission section is also Buildings and Facilities. Understanding what actions have brought them success over the last decade provides great guidance to Monroe County in crafting an effective implementation strategy.

Orange County, North Carolina

Orange County's 2017 Climate Action Plan uses a baseline year of 2005. Through the Plan, the County has committed to a GHG emissions reduction goal of between 26% and 28% below 2015 levels by the year 2025. In 2017, the Board of Orange County Commissioners also added a commitment to transition to a 100% renewable energy based economy by 2050.

One unique aspect of the Orange County Plan is that it further breaks down GHG emission reduction goals by sector. Each sector has a conservative, moderate, and aggressive target. The low (conservative)

target is achievable through taking advantage of 'low hanging fruit,' or easy and quick methods of reducing energy consumption and emissions. The moderate scenario involves some ingenuity and longer term strategies. The high scenario involves aggressive emission reduction efforts and will involve significant ingenuity and initial investment. This approach is of particular interest in Monroe County, as the feasibility and impact of some actions may vary over time with changes in local capital, resources, and climate mitigation and adaptation technologies.

In terms of scale of Government Operations GHG emissions, Orange County is the most comparable to that of Monroe County (see Table 2). Additionally, Orange County has very similar sectors to that of Monroe County. In particular, Orange County was one of only a few case studies considered that had any significant emissions in the water and sewage sector. This offers a more direct point of comparison for developing Monroe County's GHG emission targets and reduction strategies and will help to identify potential effective actions for implementation under each sector.

Table 2. Monroe/Orange County GHG Emissions Comparison

FOCUS AREA OR SECTOR	ORANGE COUNTY		MONROE COUNTY	
	MTCO ₂ E	%	MTCO ₂ E	%
Buildings & Facilities	11,658	27%	26,073	57%
Water Resource Recovery Facilities	18,034	42%	9,225	20%
Solid Waste Facilities	2,112	5%	6,035	13%
Vehicle Fleet	7,530	18%	3,295	7%
Streetlights & Signals	3,046	7%	1,004	2%
Other	416	1%	-	-
TOTAL	42,840		45,632	

City of Rochester, New York

Rochester's Municipal Operations Climate Action Plan was adopted in 2013. The Plan is composed of the following major components:

- **GHG Emissions Inventory** This section outlines the methodology and results of the baseline GHG inventory, which relied on the Local Government Operations Protocol (LGOP) and ICLEI Analysis Software to calculate estimated 2008 emissions. The majority of the City's governmental operations emissions are generated from the Buildings and Facilities sector, followed by Highway Vehicles.
- **Energy Use Intensity and Greenhouse Gas Emissions Reductions Goals** The City committed to reducing energy use intensity (EUI) for its municipal buildings by 20% by 2020 (based on a 2008 baseline). This was based on the US Department of Energy's Better Building Challenge. Additionally, the City committed to a 20% reduction of total GHG emissions generated from City government operations during the same timeframe.
- **Existing Measures and Policies** This section briefly describes some of the projects and initiatives already taken or currently underway at the time the Plan was written. These include actions such as energy audits, LEED building certifications, lighting upgrade, fleet upgrades, and green infrastructure, many of which the County is also undertaking.

- **Proposed Measures and Policies** This section contains proposed projects and policies based on five sectors:
 - » Energy Efficiency & Renewable Energy
 - » Transportation & Fleet
 - » Materials & Waste Management
 - » Climate Change Adaptation & Green Infrastructure
 - » Employee Education & Engagement
- **Measures Implemented External to the City of Rochester** This section describes State and County initiatives and legislation that will influence City operations in the future. It is important that the County's CAP also take into consideration this broader context.
- **Guide for Future Steps** This section identifies components required for successful implementation including administration and staffing, financing and budgeting, development of a timeline, community-wide sustainability, re-inventory and monitoring progress, and CAP updates. The County's CAP is an opportunity to learn from and build upon City efforts with future implementation.

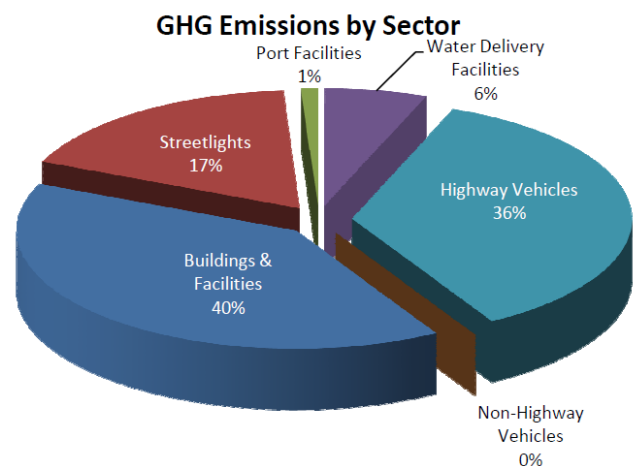


Figure 11. City of Rochester Government Emissions

This page is intentionally blank.



MONROE
COUNTY
CAP

GOVERNMENT OPERATIONS

Part 4

GREENHOUSE GAS (GHG) INVENTORY

Climate change is the single greatest threat to a sustainable future but, at the same time, addressing the climate challenge presents a golden opportunity to promote prosperity, security and a brighter future for all.

- **Ban Ki-Moon**

Former Secretary-General of the United Nations (2007 - 2016)

■ Purpose

As a first stage in the process to develop the Monroe County CAP, a baseline inventory of the County operations GHG emissions was developed. A baseline GHG emissions inventory is an essential first step in this planning process to understand the extent to which current County government operations are contributing to overall emissions. The calculation of emissions by sector also helps to identify which areas of government operations have the largest impact and where potential reduction strategies should be targeted. By developing this preliminary understanding of existing conditions, the County forms a solid foundation from which to develop recommendations and priority action items (Part 5 of this Plan).

In developing a separate emissions inventory for government operations, the County is strengthening its commitment to a sustainable and resilient future, and is taking a leadership position from which local municipalities and community members can draw inspiration and best practices upon which to build. It should be noted that this Phase I baseline inventory represents the GHG emissions under the direct control of Monroe County government. Phase II will involve a broader effort addressing community-wide GHG sources across both public and private realms.

The Solid Waste & Materials Management sector is of particular note. Of the landfills within Monroe County, only the Northeast Quadrant Landfill (NEQL) facility is under full government control; other landfills

are privately operated. The Gloria Drive Landfill is currently non-operational, but the County performs ongoing maintenance and environmental monitoring. All other landfills will be included in the Phase II inventory.

■ Methodology

ICLEI USA's online tool, ClearPath, was used to calculate the baseline County emissions inventory. ClearPath is built upon the Local Government Operations Protocol Version 1.1 (LGOP), which was developed through a partnership of the California Air Resources Board (ARB), the Climate Action Reserve (CAR), The Climate Registry (TCR), and ICLEI.

ClearPath is one of the leading online software platforms for completing GHG inventories, forecasts, climate action plans, and monitoring at both the government-operations and community-wide scales. ClearPath is a well-recognized and utilized tool in many states, as well as nationally. The methodologies behind the City of Rochester's CAP are the same as those encapsulated in Clearpath, helping to ensure compatibility between these local efforts. The ClearPath tool inventories all energy usage within the County's organizational boundaries (as defined by ICLEI), and converts it to metric tons of CO₂-equivalent (MTCO₂E) using EPA conversion factors. Due to the limited availability of GHG-related historical data for the County and the economically disruptive COVID-19 pandemic, it was determined that 2019 is the most appropriate year for Monroe County's baseline inventory.





Baseline Input Data Context

Following the categorization of GHG emissions by scope as detailed in the ICLEI protocols, all Scope 1 emissions (direct emissions with the exception of biogenic sources) and Scope 2 emissions (indirect emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling) were considered. This includes County-owned or County-purchased operations that produce GHG emissions. Scope 3 emissions (indirect emissions that occur because of government operations, but from sources not owned or controlled by the County) were not included (Figure 12).

In order to obtain the required baseline data, the project team worked with County staff to determine the relevant facilities and operations to document in the ClearPath tool. ClearPath defines emissions by sector and through engagement with County staff,

Biogenic sources are natural sources of emissions that result from biological activity, such as volatile organic compounds (VOCs). These emissions are a part of the natural carbon cycle, and therefore are not included in the inventory per ICLEI standards.

it was determined that Monroe County's emissions fell into the following sectors:

-  Buildings & Facilities
-  Pure Waters Infrastructure
-  Transportation Fleets
-  Expressway Lights & Traffic Signals
-  Solid Waste & Materials Management

To analyze each of these sectors, County-specific data points were necessary for ClearPath and accompanying calculation tools. Monroe County staff provided the specific data by sector, sourcing information from its various departments' records. The 2019 data is summarized on the following pages.

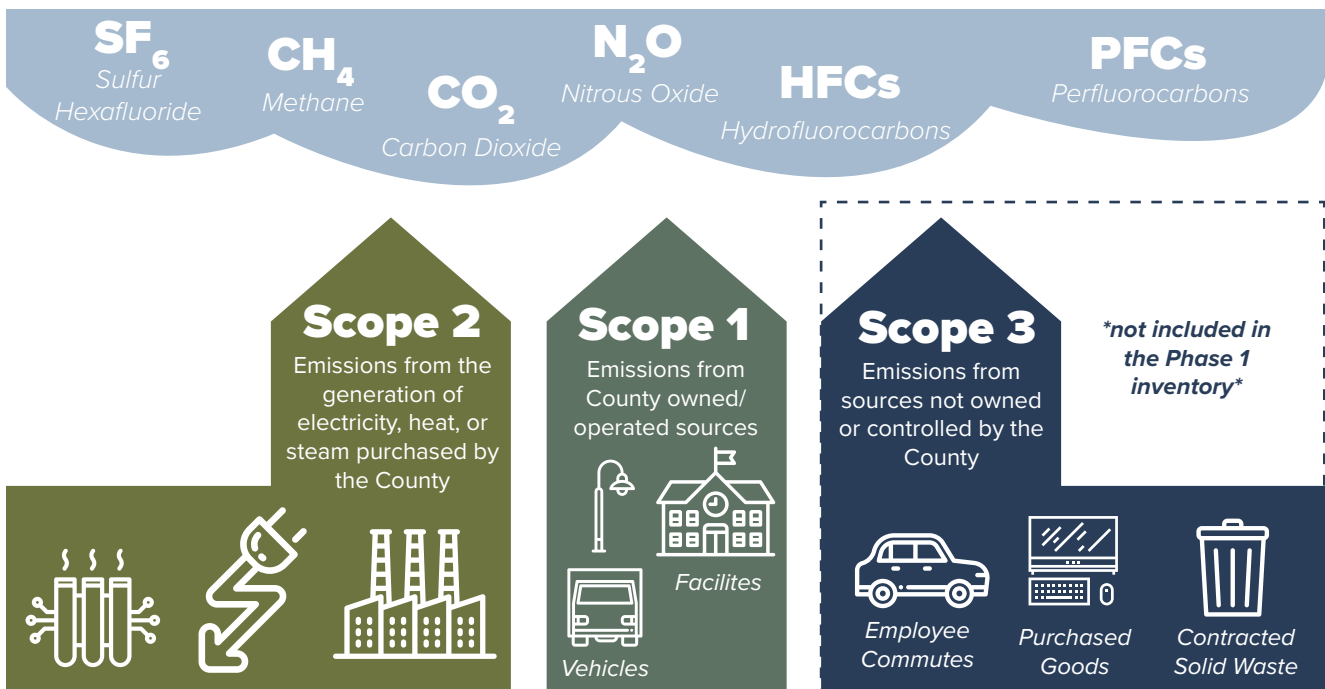


Figure 12. Scope 1, 2, & 3 Emissions



Buildings & Facilities

Buildings and facilities account for a significant share of emissions across the nation yet also present some of the greatest opportunities for mitigation strategies. To discern the extent to which County-owned buildings and facilities contribute to the overall carbon footprint of County operations, the following sources of heat and power were identified and quantified:

USEFUL SOURCE DEFINITIONS

Stationary Fuel Combustion¹:

Devices that combust solid, liquid, or gaseous fuel, generally for the purposes of producing electricity, generating steam, or providing useful heat or energy for industrial, commercial, or institutional use, or reducing the volume of waste by removing combustible matter.

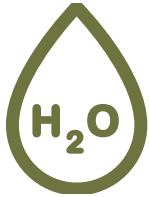
District Heating²: An underground infrastructure asset where thermal energy is provided to multiple buildings from a central energy plant or plants.

Combined Heat & Power³: On-site electricity generation that captures the heat that would otherwise be wasted to provide useful thermal energy such as steam or hot water than can be used for space heating, cooling, domestic hot water and industrial processes.

Sources: (1) EPA Carbon Footprint Calculator
 (2) International District Energy Association
 (3) EPA CHP Partnership

Emissions Source	Data	Relevant Facilities
Grid Electricity	Electricity Used	All County Buildings
Stationary Fuel Combustion	Fuel Use	All County Buildings
	Fuel Type	
Steam and District Heating Purchases	District Heat Fuel Type	Civic Center
	Quantity of Steam Purchased	
	Enthalpy of Delivered Steam	
	Boiler Efficiency	County Office Building
	Transport Losses	
Heat and Power Purchases from Combined Heat and Power (CHP)	Total Facility Fuel Consumption	Iola Facility
	Total Electricity Produced	
	Total Useful Heat Produced	
	Efficiency of Steam/Heat Production	Monroe County Community Hospital
	Efficiency of Electricity Production	
	Heat Purchased	

Table 3. Buildings & Facilities Emission Data Sources



Pure Waters Infrastructure

Pure Waters is a Division of Monroe County’s Department of Environmental Services, which operates four sewer districts. Depending on the district, domestic and industrial wastewater and/or stormwater is collected and conveyed for treatment. This sector of the emissions inventory quantifies the emissions produced from energy required to operate two WRRFs and several pump stations throughout the county. The sources identified are as follows:



It should be noted that the County’s WRRFs already utilizes energy-efficient processes for treatment processes. Aerobic digestion is undertaken using a blower, which generates biosolids, which is then sent to landfills. The emitted methane at the landfill is then captured and converted to electricity.

Emissions Source	Data	Relevant Facilities
Grid Electricity	Electricity Used	20 Facilities / Pump Stations
Stationary Fuel Combustion	Fuel Use	87 Facilities / Pump Stations
	Fuel Type	

Table 4. Pure Waters Infrastructure Emission Data Sources



Transportation Fleets

The transportation fleets sector is made up of the vehicles that support County operations, including the County’s Sheriff’s fleet, County DOT vehicles, and several other vehicle types generally used for administrative purposes.

Emissions Source	Data	Relevant Facilities
Administrative Vehicle Fleet	Fuel Type	Sheriff’s Fleet - Diesel
	Fuel Use	Sheriff’s Fleet - Total Gas
	Percent Biofuel in Blend	40 other vehicle types
Off-Road Vehicle Fleet	Equipment Type	Sheriff’s Fleet - Marine Unit
	Fuel Use	6 other vehicle types
	Fuel Type	
Transit Fleet Emissions	Fuel Type	Paratransit Fleet
	Fuel Use	
	Vehicle Type	
	Percent Biofuel in Blend	

Table 5. Transportation Fleets Emission Data Sources



Expressway Lights and Traffic Signals

The County operates a significant number of traffic signal devices and lighting on roadways under their jurisdiction. Although they account for a small portion of overall County emissions as shown in the next section “Results,” the data sources used for calculating such emissions are as follows:

Emissions Source	Data	Relevant Facilities
Emissions from Grid Electricity	Electricity Used	MCDOT Traffic Signals
		Buildings / Structures
		Expressway Lights
Emissions from Stationary Fuel Combustion	Annual Gas Use	None

Table 6. Expressway Lights and Traffic Signals Emission Data Sources



Solid Waste & Materials Management

As mentioned previously, only the landfill on Gloria Drive was analyzed due to the fact that this is the only landfill that the County both owns and operates. The landfill is currently inactive.

Emissions Source	Data	Relevant Facilities
Emissions from Solid Waste	Methane Emitted	Gloria Drive Landfill

GLORIA DRIVE LANDFILL



Monroe County owns and operates the now inactive Northeast Quadrant Landfill (NEQL, Gloria Drive Landfill). The Landfill was operated from 1975 to 1980 and provided solid waste disposal for towns in the northeastern region of Monroe County. An estimated 438,470 tons of municipal solid waste was landfilled during this timeframe. According to County records, the waste stream contained only household and commercial solid waste.

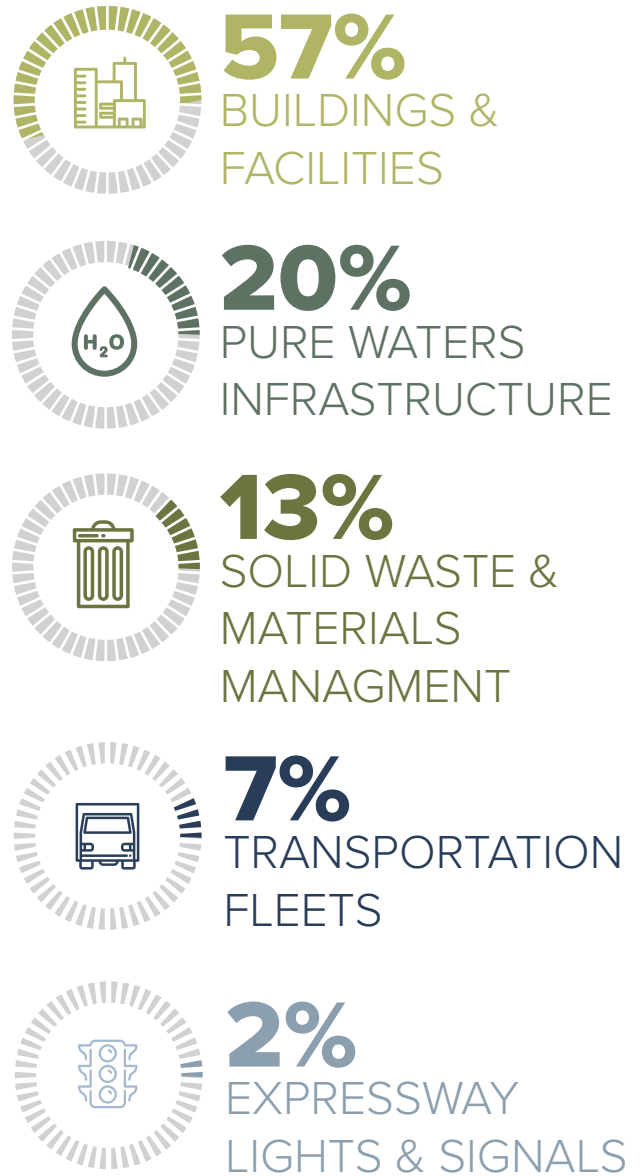
Landfilling operations ended around 1980 with the final closure completed in 1981. The closure system for the Landfill consisted of a low permeability soil cap and a gas venting system that was installed to allow for the landfill gas to be passively vented into the atmosphere, which was in accordance with the air quality regulations at the time. Monroe County is currently maintaining the site and performing environmental monitoring. Ongoing maintenance and monitoring work includes groundwater and surface water monitoring, final cover inspection and maintenance, and leachate (contaminated water percolated through a solid waste disposal site) collection and management.

Results

Using the data received from the County, records were created and populated in the ClearPath tool by sector. The total GHG emissions for each sector are shown in Table 7 below and Figure 13 at right. The next page also shows the data breakdown for each individual sector.

The calculations produced by this model were reviewed by ICLEI staff who reported that the results were in line with other studies and comparable counties. This baseline inventory was then used to develop the sector emission reduction targets and actions in Part 5 of this Plan.

Overall, the most dominant sector was Buildings & Facilities, which represented 57% of total County emissions. The next largest emission sectors were Pure Waters Infrastructure, followed by Transportation Fleets.



*the remaining 1% is divided among each sector.

Figure 13. Baseline Emissions by Sector

SECTOR	MTCO ₂ E
Buildings & Facilities	26,073
Pure Waters Infrastructure	9,225
Solid Waste & Materials Management	6,035
Transportation Fleets	3,295
Expressway Lights & Signals	1,004
Total	45,632

Table 7. Monroe County Baseline GHG Emissions Inventory Summary

GHG Emissions by Sector

Figure 14. Buildings & Facilities Emissions

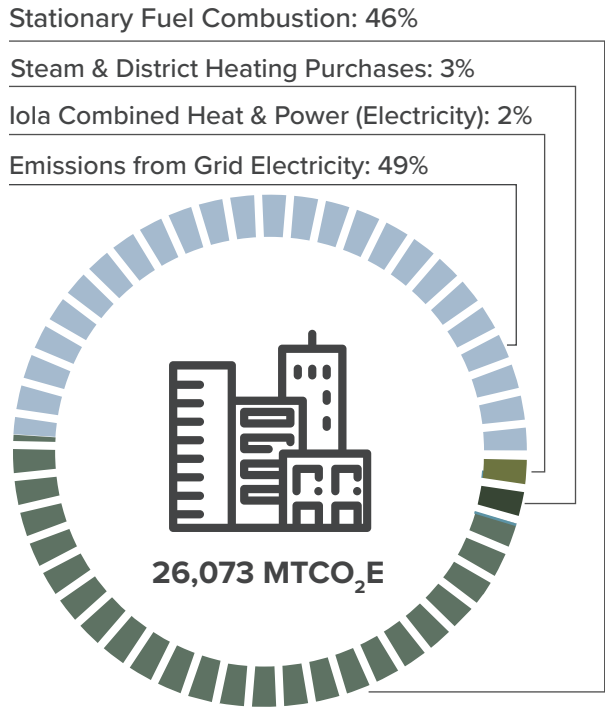


Figure 15. Pure Waters Infrastructure Emissions

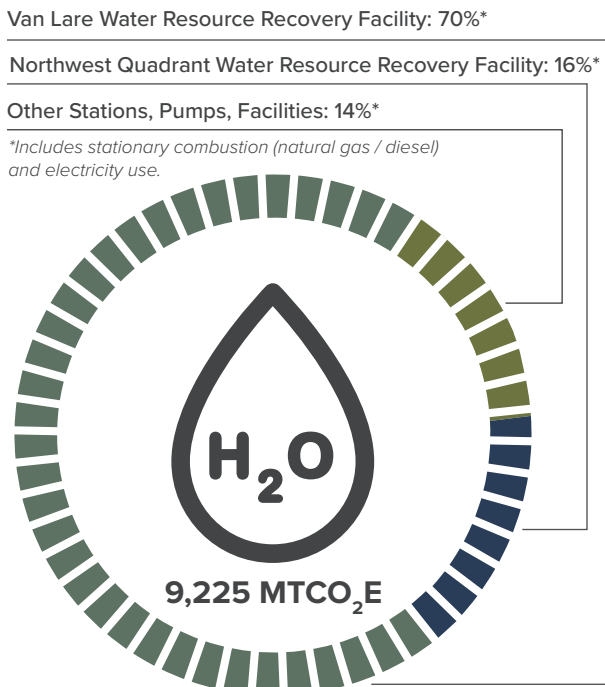


Figure 16. Transportation Fleets Emissions

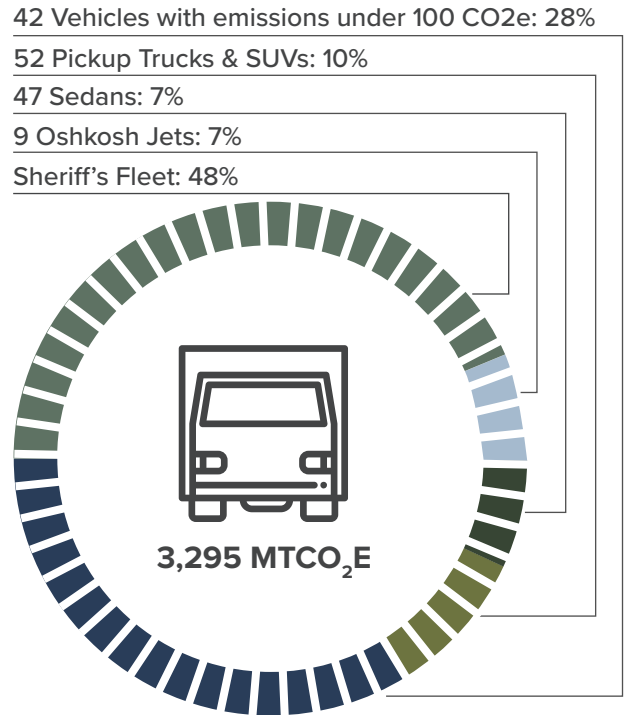
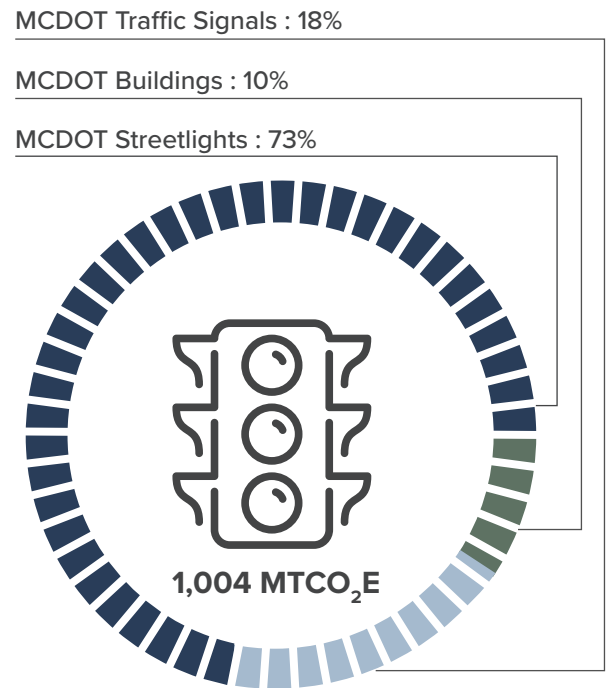


Figure 17. Expressway Lights & Traffic Signals Emissions



Solid Waste & Materials Management (Gloria Drive Landfill): 6,035 MTCO₂E

Business as Usual (BAU) Forecast

Following the Baseline Inventory, a Business as Usual (BAU) Forecast was developed in order to project future emissions should no mitigation actions be undertaken by the County. As a result, the BAU does not assume any reductions in consumption across any sector. However, it does factor in reduction strategies that are planned at other levels of government. These include federal vehicle emission standards and state clean power goals. Federal vehicle emissions standards are projected to increase by 1.8% every five years. New York State clean power goals assume 100% zero-emission grid electricity by the year 2040.

The results of this BAU forecast are shown in Figure 18 at right, as well as Table 8 below. Based on this analysis, the County can anticipate a 54% reduction in emissions levels by 2050. It should be emphasized that this scenario relies on achievement of the State’s ambitious reduction goals. If these are not met, the BAU forecast is very likely to yield a lesser reduction.

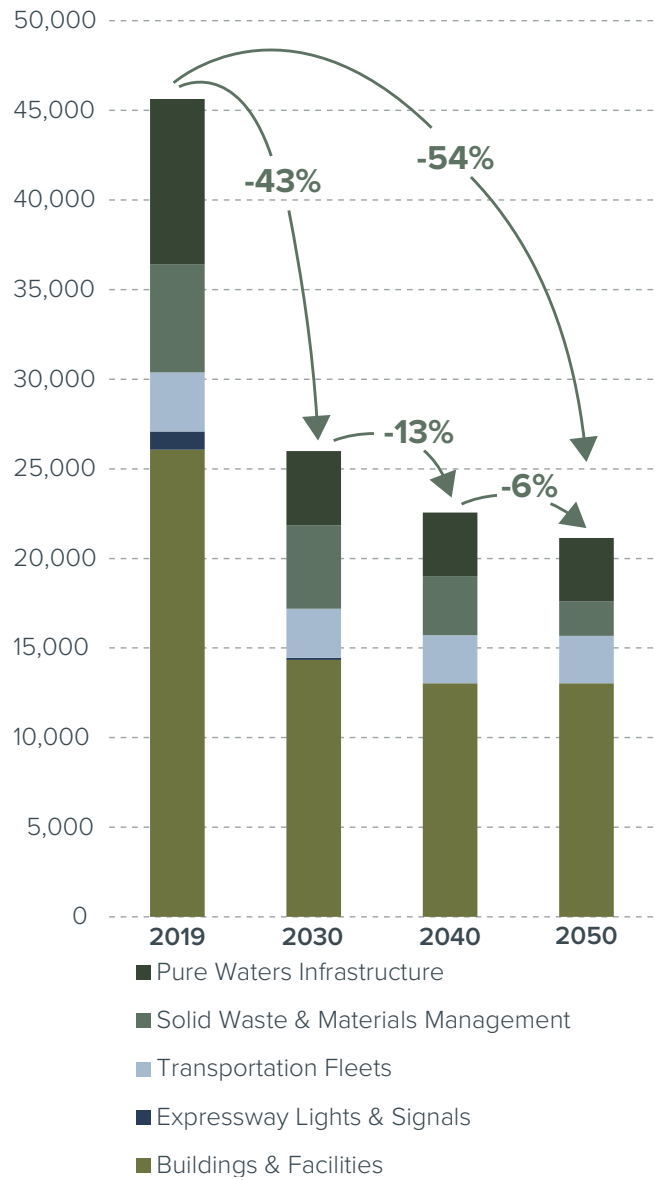


Figure 18. Business as Usual Forecast

Sector	MTCO ₂ E			
	2019	2030	2040	2050
Buildings & Facilities	26,073	14,342	13,037	13,037
Expressway Lights & Signals	1,004	121	0	0
Transportation Fleets	3,295	2,735	2,686	2,643
Solid Waste & Materials Management	6,035	4,661	3,288	1,914
Pure Waters Infrastructure	9,225	4,138	3,546	3,546
Total	45,632	25,997	22,557	21,140

Table 8. Business as Usual GHG Emissions Forecasts for Monroe County

■ New York Independent System Operator (NYISO) & State Clean Energy Goals

Monroe County currently purchases its electricity through NYISO, a not-for-profit business that operates the state's bulk electricity grid and administers the state's wholesale electricity markets. Monroe County was approved as a Direct Consumer by the NYS Public Service Commission, which allows the County to bypass RG&E, and purchase electricity and natural gas on the wholesale market.

NYISO has committed to working towards the goal of a zero-emissions grid by 2040 set by the NYS CLIMATE LEADERSHIP AND COMMUNITY PROTECTION ACT (CLCPA). NYISO has made its own goals to achieve this, including:



9,000 MW of Offshore Wind by 2035



6,000 MW of solar energy by 2025




185 trillion BTU reduction from energy efficient projects by 2025



3,000 MW of energy storage by 2030

NYISO is also proposing a carbon pricing scheme, which incorporates a “social cost” of CO₂ emissions into electricity markets. Currently, the total New York State Control Area Energy Production is 50% from zero-emission sources, and 91% of Upstate New York's energy production is zero-emission. CO₂, SO₂, and NO_x emissions from electric generation in New York have gone down by 52%, 99%, and 93%, respectively since 2000.



MONROE
COUNTY
CAP

GOVERNMENT OPERATIONS

Part 5

CLIMATE ACTION GOALS & TARGETS

Climate change isn't something in the future. That narrative is fundamentally flawed because there are millions impacted and so many displaced already. That is the new inconvenient truth that no one wants to hear.



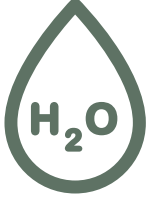


- Aneesa Khan

Climate Activist, Executive Coordinator - SustainUS

GHG Targets Overview

Based on the Clearpath analysis, the following targets were set for each sector; resulting in an **overall target for GHG emission reductions of 80% below 2019 levels by 2050**. These targets were established based on assumptions for several variables, which are described in further detail in the following pages.

Table 9. GHG Reduction Targets

	Sector	2019 Baseline	2050 Reduction
	Buildings & Facilities		
	Percent	-	80%
	CO ₂ e (MT)	26,073	-20,858
	Expressway Lighting & Signals		
	Percent	-	100%
	CO ₂ e (MT)	1,004	-1,004
	Pure Waters Infrastructure		
	Percent	-	80%
	CO ₂ e (MT)	9,225	-7,380
	Solid Waste & Materials Management		
	Percent	-	90%
	CO ₂ e (MT)	6,035	-5,173
	Transportation Fleets		
	Percent	-	90%
	CO ₂ e (MT)	3,295	-2,965
OVERALL REDUCTION TARGET		-	80%

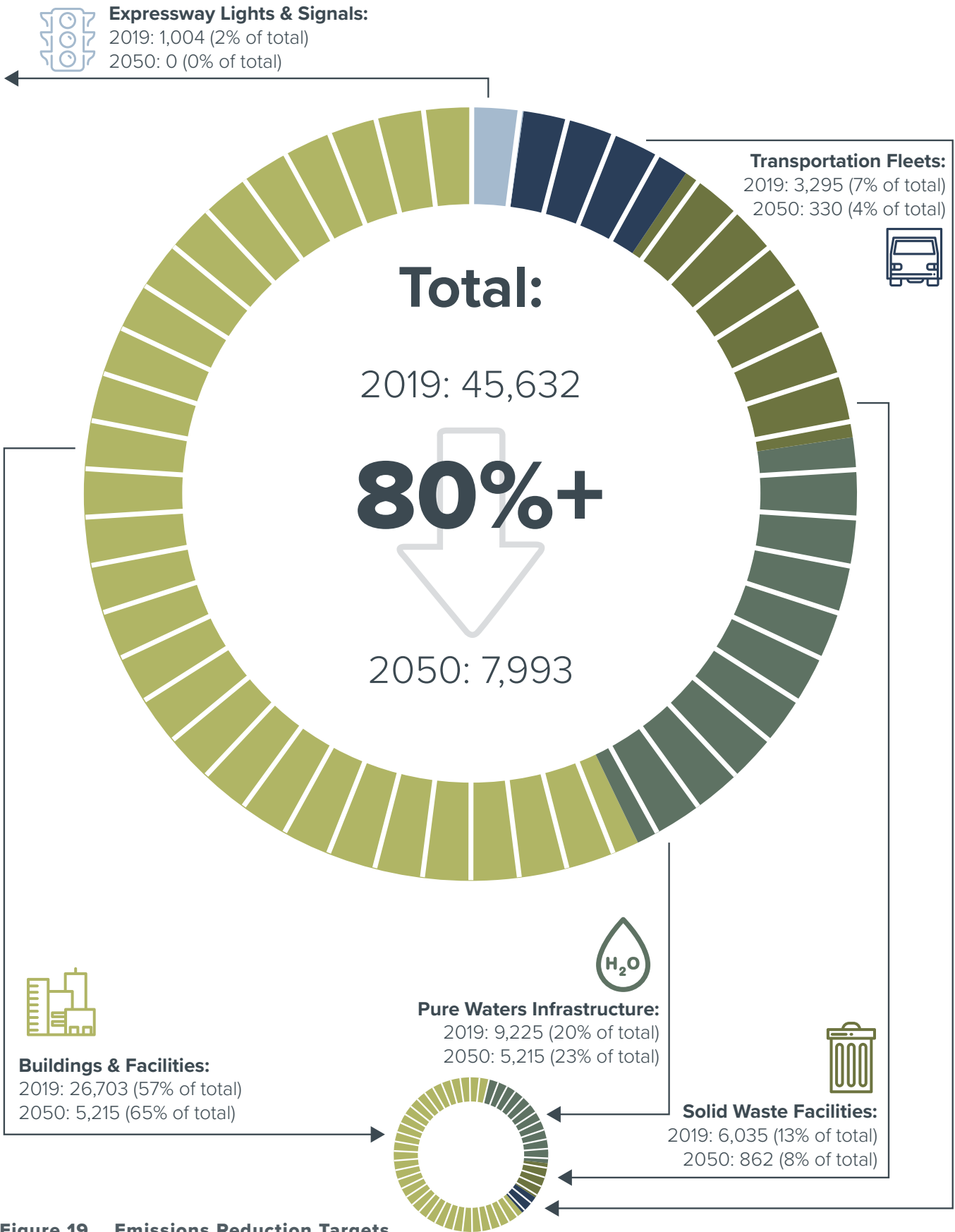


Figure 19. Emissions Reduction Targets

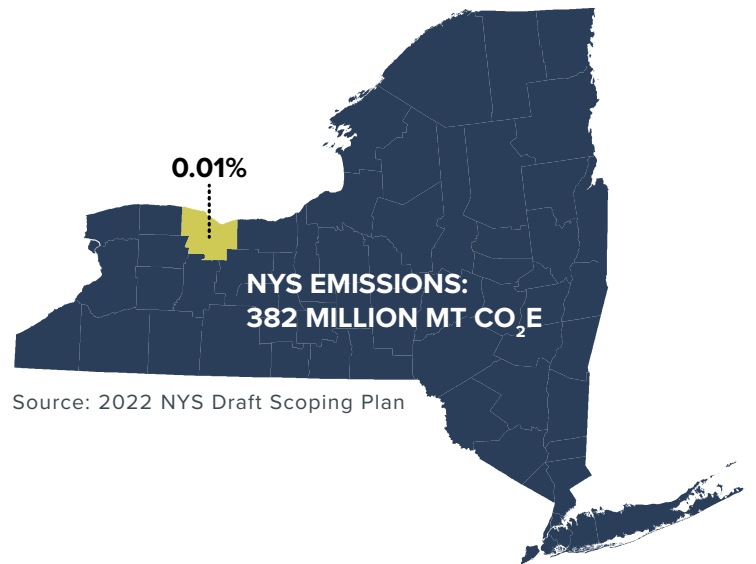
■ Creating a Master Plan for Climate Action

With the completion of the baseline inventory and BAU forecast, the County and Advisory Committee recognized that a more aggressive strategy could be implemented to achieve a greater level of GHG emissions reduction than relying on federal and state climate action measures alone.

Although Monroe County's government operations account for approximately 0.01% of the total share of GHG emissions in NYS, the County recognizes its obligation to lead by example and support other local climate action efforts.

The following emission reduction goal framework reflects Monroe County's commitment to undertake its own climate change mitigation and adaptation efforts, above and beyond that of the BAU forecast assumptions. The reduction targets in this Plan account for the implementation of both low and high impact/cost actions by the County to increase energy efficiency, reduce energy and natural gas consumption, transition to clean energy and fuel sources, and capture methane.

In developing its own action plan, the County is taking ownership of its local contribution to climate change and setting forth a path to a cleaner, greener future.



■ The Goal Framework

To guide the County's Phase I CAP efforts, a comprehensive Goal Framework was developed, which identifies goals, reduction targets, and supporting implementation plans by sector.

This framework is a compilation of both emissions reduction and adaptation strategies from current County initiatives, the NYS DEC Climate Smart Communities program, and other comparable municipal climate action plans. The resulting implementation plans were reviewed by key Monroe County Department Heads, who helped to ensure the actions listed herein are appropriate and achievable.

The structure and individual components of the County's Goal Framework are defined on the next two pages.

Framework Components

Goal

A general statement that describes the aspiration of the County to reduce Monroe County’s GHG emissions and local contribution to climate change.

Target

The quantification of a goal, specifying the potential reduction in emissions based on an aggressive implementation scenario modeled using the ICLEI ClearPath tool.

Action

A specific initiative which may be undertaken by the County to accomplish a goal. It can take the form of a plan, project, policy, or program. For the purposes of this Plan, actions are categorized into one of three tiers:

- **Tier 1:** A direct, measurable action
- **Tier 2:** A step to prepare for and/or support a Tier 1 action
- **Tier 3:** A broader policy or program providing guidance for a series of actions

Each action has three metrics: Impact, Timeframe, and Investment (next page).



Figure 20. Goal Framework

Impact

The estimation of effect an action is likely to have with respect to reducing GHG emissions.

- **Low:** Little to no impact
- **Moderate:** May have some impact
- **High:** Significant impact; has greatest potential for impact

Timeframe

The estimated period of time it will take to undertake and/or complete a specific action, policy, or measure.

- **Short:** 1-3 years
- **Medium:** 3-6 years
- **Long:** 6+ years or ongoing effort

Investment

The estimated level of County financial and human resources necessary to implement an action.

- **Low:** Achievable within existing budget; and/or normal staff capacity
- **Moderate:** May require additional capital or operational funding; and/or additional staff or contractual support
- **High:** Requires allocation of additional funding; and/or additional staff or contractual support

PRIORITY ACTIONS

To help prioritize actions, a qualitative analysis was conducted using the three action metrics: Impact, Timeframe, and Investment. Since there was not enough data to forecast the exact values for all metrics, the inputs were based on a reasonably estimated relative value. Each metric was assigned a score, which was then used to calculate the estimated ability of such action to achieve the best outcome relative to all other actions in that sector.

- 1:** Estimated to be **91-100% effective** in achieving best outcome
- 2:** Estimated to be **81-90% effective** in achieving best outcome
- 3:** Estimated to be **71-80% effective** in achieving best outcome
- 4:** Estimated to be **61-70% effective** in achieving best outcome
- 5:** Estimated to be **60% or less effective** in achieving best outcome

Because the primary goal of this CAP is to reduce County GHG emissions, the prioritization analysis gave the highest weight to Impact values, followed by Investment and then Timeframe. This allowed for consideration of high impact actions, while still balancing the financial, human, and time demands they may require.

While the implementation plan has been prioritized based on the three metrics described above, it is built upon assumptions. The County recognizes that in order for a full evaluation of the impact of these actions, additional data must be collected. More detailed data and quantitative analysis may cause shifts in County priorities and timeframe for implementation as more information is made available.

This page is intentionally blank.

Buildings & Facilities

GOAL: Reduce GHG emissions of County buildings and facilities by reducing energy use, transitioning to clean electricity, and reducing energy consumption in buildings powered by stationary fuel combustion.



Target: **80%**



	2019 Baseline	2050
Percent Reduction	-	80%
CO ₂ e (MT)	26,073	-20,858

The independent variables adjusted to model this reduction scenario for building and facility GHG emissions include:

- » Electricity Energy Equivalent (Quantity MMBtu)
- » Natural Gas – Energy Equivalent (Quantity MMBtu)
- » Natural Gas – District Heat Energy Consumption (Quantity MMBtu)
- » Electricity – Purchased Combined Heat and Power (Quantity MMBtu)
- » Heat – Purchased Combined Heat and Power Energy (Quantity MMBtu)
- » Carbon Intensity Factor

This target assumes a combination federal and state-wide energy efficiency and reduction strategies, County-led actions to transition to renewable energy sources, and fuel switching strategies that result in a shift away from reliance on natural gas. For modeling purposes, this scenario reflects a 1-2% increase in renewable energy adoption annually.



The table below presents the action items in the implementation plan that pertain to the County’s buildings and facilities. Certain actions are presented with more context and details on the following pages due to their high priority or need for additional context.

Table 10. Buildings & Facilities Implementation Actions

Priority	Type	Description	Impact	Timeframe	Investment	Page #
1	Tier 1	Institute procedures and/or training to encourage facility managers and municipal employees to improve heating, cooling and lighting use efficiency.	High	Short	Low	48
1	Tier 1	Install additional solar photovoltaic (PV) system(s).	High	Medium	Low	48
2	Tier 1	Install/update building energy management systems for lighting and HVAC equipment.	Moderate	Short	Low	49
2	Tier 1	Lower building temperature settings to adjust for localized floor heating systems. Heat the people spaces not the entire building volume.	Moderate	Short	Low	50
2	Tier 1	Optimize day light with window shades that allow light from the top section of windows near roofing level.	Moderate	Short	Low	51
2	Tier 1	Upgrade efficiency of outdoor lighting on County properties.	High	Medium	Moderate	-
2	Tier 1	Participate in district energy programs, i.e. district heating and cooling.	High	Medium	Moderate	51
3	Tier 1	Provide Radiant Electric heat in offices under the desk area. Control these localized heating systems with wireless smart thermostats.	Moderate	Short	Low	52
3	Tier 2	Update 2012 inventory of current building energy use to serve as benchmark and identify priority properties.	Low	Short	Low	-
3	Tier 3	Require new County buildings to be net zero carbon emissions.	High	Long	Moderate	52
3	Tier 1	Increase the proportion of renewable energy used in County government buildings.	High	Long	Moderate	-
4	Tier 2	Assess feasibility of small wind turbine system(s) for County-owned properties.	Moderate	Medium	Moderate	-
4	Tier 2	Complete renewable energy feasibility studies.	Moderate	Medium	Moderate	-
4	Tier 1	Complete interior lighting upgrades for 100% of County buildings.	Moderate	Short	High	-
4	Tier 1	Green the lifecycle of office equipment.	Low	Medium	Low	-
4	Tier 1	Install geothermal heating and cooling system(s).	High	Long	High	53
4	Tier 1	Retro-commission low-performing buildings.	High	Long	High	-
4	Tier 1	Install alternative energy technology (e.g. battery storage, hydrogen fuel cell emergency generation) on County property.	High	Long	High	-
5	Tier 1	Install water efficient fixtures.	Moderate	Long	Moderate	-
5	Tier 2	Create plan for upgrading HVAC equipment based on building inventory, maintenance schedule, and planned improvements.	Moderate	Long	High	-
5	Tier 3	Consider purchasing RECs to offset emissions from buildings and facilities.	Low	Long	High	-



Summary of Priority & Key Actions

- Priority: **1**
- Tier: **1**

Institute procedures and/or training programs to encourage facility managers and municipal employees to improve heating, cooling, and lighting use efficiency.

This action would help to expand the County’s potential impact on reducing GHG emissions in buildings and facilities by supporting energy efficient employee behavior and decision-making. An increased awareness of the importance of energy efficiency and reducing consumption could be achieved by implementing operational policies, educational campaigns, trainings, and incentive and/or participation based programs.

- **Impact: High** - Improves the behavior of employees to reduce energy consumption and foster a more sustainable work environment.
- **Timeframe: Short** - This type of program could be implemented within three years.
- **Investment: Low** - Administrative policy for behavior change could readily be implemented under existing staffing and County resources.

Next steps include reviewing the current energy policies and developing an educational / training plan and/or participation program for employees that demonstrates various practices they can adopt that will result in efficient energy usage.

- Priority: **1**
- Tier: **1**

Install additional solar photovoltaic (PV) system(s).

This Action aligns with CSC: PE4 Action: Solar Energy Installation.

The installation of additional solar PV systems has potential to reduce emissions associated with energy usage in addition to the financial resiliency that it can provide for the County, as the cost of fossil fuels are likely to increase over time.

- **Impact: High** - Provides clean energy from the generation of solar power.
- **Timeframe: Medium** - It can take several years to plan and construct solar PV systems, depending on size and interconnectivity.
- **Investment: Low** - There are many state and federal grants available, such as those by NYSERDA, which can help fund the installation of additional PV systems.



Next steps include conducting a solar assessment of the on-site potential as well as the remote potential for solar generation, including consideration of roof-mounted, ground-mounted, and canopy style solar system installations.

<ul style="list-style-type: none">• Priority: 2• Tier: 1	Install/update building energy management systems for lighting and HVAC equipment.
---	---

This Action aligns with CSC PE3 Action: Building Energy Management System.

The County can improve their building energy management systems for lighting and HVAC equipment by installing sensors and controls to optimize the usage of the systems. Occupational sensors combined with lighting controls can be used to turn lights off when they are not in use. Thermal sensors and controls can be used to automate the HVAC systems to provide comfort while the building is occupied and minimize the waste of thermal energy.

- **Impact: Moderate** - Due to the improved efficiency of the usage of lighting and HVAC equipment.
- **Timeframe: Short** - Installing sensors and controls can be done within a few years as part of standard maintenance.
- **Investment: Low** - Due to the relatively inexpensive cost of sensors and controls for low power applications such as lighting. Although HVAC sensors and controls can be more expensive, they can have a faster payback period because the energy savings potential is generally higher than for lighting, especially in large buildings with high temperature differences throughout the year.

Next steps include conducting an energy audit of the facilities and determining the potential for these technologies in County buildings as well as the vendor(s) who can provide them.



- Priority: **2**
- Tier: **1**

Lower building temperature settings to adjust for localized floor heating systems. Heat the people spaces not the entire building volume.

To minimize the usage of HVAC equipment, localized areas can be heated or cooled to reduce the energy used for ventilation. This can be done by providing heating mats or thermal bracelets to employees to reduce their personal need for thermal changes. Instead of heating/cooling the room, heat the person directly. This approach is generally effective in office spaces that are large and have a small number of people working in them as well as locations where a small amount of people occupy the space after standard working hours.

This allows for the building to reduce the demand on thermal regulation while maintaining a comfortable temperature for employees. This is especially effective at times where the temperature outside is only a few degrees off from the optimal internal temperature.

- **Impact: Moderate** - Due to the savings from additional heating/cooling that is reduced by providing personal thermal regulation devices.
- **Timeframe: Short** - The implementation of personal thermal regulation devices can be implemented in under a few years.
- **Investment: Low** - The cost of a personal thermal regulation device is often much lower than savings from HVAC regulation, especially when reducing need to heat large spaces with low occupancy.

Next steps would be to identify buildings/areas where this action would be the most feasible and effective, and get feedback from employees on their preferred method of personal thermal regulation.



- Priority: **2**
- Tier: **1**

Optimize day light with window shades that allow light from the top section of windows near roofing level.

Solar radiation can have a significant impact on the heat that is absorbed by a building. Providing proper shading can minimize the excess heat from sunlight entering the building. This can focus sunlight inside the building to increase passive solar heating during winter and reflect light during the summer to minimize the need for additional cooling from sunlight exposure.

- **Impact: Moderate** - Due to reduction of additional heating/cooling from optimal lighting coming into the building.
- **Timeframe: Short** - The installation of shading can be done relatively quickly and is easy to maintain.
- **Investment: Low** - The cost of shading is generally low and could be worked into operational budgets.

Next steps would be to identify the building areas that experience most sunlight and styles of shading that would be appropriate for the location of installation and in compliance with local building codes.

- Priority: **2**
- Tier: **1**

Participate in district energy programs, i.e. district heating and cooling.

The participation in district energy programs can provide emissions reductions, improved community image, and financial benefits when properly implemented. Demand-response programs, for example, could be an effective way to accomplish this in County facilities.

- **Impact: High** - Due to decrease in energy usage.
- **Timeframe: Medium** - Some implementations and retrofits to buildings may take a while to implement for the program(s).
- **Investment: Moderate** - The investment varies based on the energy program and initiative pursued as part of this action. Initiatives such as installing a battery system to support demand-response may be costly, whereas adaptation measures may be cheaper.

Next steps include reviewing the state and federal energy programs as well as utility-based programs that offer similar incentives and benefits from participation.



- Priority: **3**
- Tier: **1**

Provide Radiant Electric heat in offices under the desk area. Control these localized heating systems with wireless smart thermostats.

To reduce the demand for HVAC systems, radiant electric heaters could be provided for localized use in offices under desk areas. These heating systems could be controlled wirelessly to ensure optimal usage and comfort for the employee. This initiative would help to heat the local area instead of using the main system, thereby reducing the overall energy demand.

- **Impact: Moderate** - Due to the reduction of demand for heating from the main system.
- **Timeframe: Short** - The implementation of localized heating units could be accomplished in a few years.
- **Investment: Low** - Because the savings from reduced demand on the main system outweighs the investment and maintenance for the individual space heaters.

Next steps include identifying spaces where localized radiant heating would be effective and determining which units would be most appropriate for the application.

- Priority: **3**
- Tier: **3**

Require new County buildings to be net zero carbon emissions.

A net zero⁴ emissions policy will ensure that new buildings have maximum reduction of emissions. This policy action will provide a foundation for future buildings to meet Net-Zero emission design standards and reduce the overall emissions from buildings.

- **Impact: High** - Due to the aggressive carbon reduction standards.
- **Timeframe: Long** - Policy implementation may take a while to be fully developed and implemented. This also reflects the ongoing application of the net-zero policy.
- **Investment: Moderate** - The policy development may be a relatively low level investment; however, implementation and monitoring of the Net-Zero guidelines is likely to require additional funding and guidance.

Next steps include evaluating existing buildings and determining a path for a Net-Zero infrastructure as well as developing a plan for new building construction. Once the analysis is completed, the implementation process for the transition to Net-Zero can be initiated.

Source: (4) Science Based Targets initiative. 2021. SBTI Corporate Net-Zero Standard. Science Based Targets initiative. <https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf>



- Priority: **4**
- Tier: **1**

Install geothermal heating and cooling system(s).

This Action aligns with CSC: PE4 Action: Heat Pumps.

Geothermal heating and cooling systems can significantly reduce emissions associated with energy required for HVAC. These systems can be installed locally for individual buildings or expanded to one large system that services many buildings.

- **Impact: High** - Due to reduction on the energy demand from HVAC systems and stationary fuel combustion.
- **Timeframe: Long** - Installation of geothermal systems are likely to be spread out over several years, as they can be costly and effect short-term facility operations.
- **Investment: High** - The systems tend to have a large upfront cost; however, the energy savings overtime can help offset the initial expenditure.

Next steps include reviewing incentives provided on the federal level as well as through NYSERDA to determine the financial feasibility of installing geothermal systems.

OTHER CSC ACTIONS INCLUDE:

- Update 2012 inventory of current building energy use to serve as benchmark and identify priority properties. **PE3 Action: Benchmarking-Municipal Buildings**
- Upgrade efficiency of outdoor lighting on County properties. **PE3 Action: Outdoor Lighting Reduction; PE3 Action: Outdoor Lighting Upgrades**
- Complete interior lighting upgrades for 100% of County buildings. **PE3 Action: Interior Lighting Upgrades**
- Create plan for upgrading HVAC equipment based on building inventory, maintenance schedule, and planned improvements. **PE3 Action: HVAC Upgrades**
- Assess feasibility of small wind turbine system (s) for County-owned properties. **PE4 Action: Wind Energy Installation**
- Complete renewable energy feasibility studies. **PE4 Action: Renewable Energy Feasibility Studies**
- Increase the proportion of renewable energy used in County government buildings. **PE3 Action: Clean Energy Upgrades**
- Install water efficient fixtures. **PE3 Action: Water-efficient Fixtures**
- Consider purchasing RECs to offset emissions from buildings and facilities. **PE4: Renewable Energy Credits**

Expressway Lighting & Signals

GOAL: Eliminate GHG emissions of County expressway lighting fixtures and signal operations by transitioning to renewable energy sources and increasing efficiency of equipment.



Target: **100%**



	2019 Baseline	2050
Percent Reduction	-	100%
CO ₂ e (MT)	1,004	-1,004

The independent variables adjusted to model this reduction scenario include:

- » Electricity Energy Equivalent (Quantity MMBTu)
- » Carbon Intensity Factor

The reduction scenario in this sector assumes that the NYS Clean Power Goals are followed, achieving 100% renewable grid electricity. Because County expressway lights and signals are 100% electric in their consumption, implementing the combination of recommended actions of this Plan and goals of NYS is forecasted to result in total elimination of GHG emissions in this sector.



The table below presents the action items in the implementation plan that pertain to the County’s expressway lighting and signals. Certain actions are presented with more context and details on the following pages due to their high priority or need for additional context.

Table 11. Expressway Lighting & Signals Implementation Actions

Priority	Type	Description	Impact	Timeframe	Investment	Page #
1	Tier 1	Convert any remaining traffic signals and blackout signs from incandescent to LED bulbs.	High	Medium	Moderate	56
2	Tier 2	Identify areas where light pollution may be a concern. Align with LED replacement program, where appropriate.	Low	Short	Low	57
2	Tier 2	Develop transition plan for lighting and signal facilities based on inventory of existing energy use, maintenance schedule, and planned infrastructure improvements.	High	Long	Moderate	-
4	Tier 1	Upgrade to more energy efficient LED bulbs on the off-expressway lighting system.	Moderate	Medium	High	-
5	Tier 1	Reduce energy use through reducing hours of operation and/or number of lights.	Moderate	Long	High	-
5	Tier 2	Assess feasibility of transitioning to Solar Photovoltaic (PV) powered street and emergency lighting as technology advances.	Moderate	Medium	Moderate	57



Summary of Priority & Key Actions

- Priority: **1**
- Tier: **1**

Convert any remaining traffic signals and blackout signs from incandescent to LED bulbs.

This Action aligns with CSC: PE3 Action: LED Traffic Signals (completed)

The County has already converted much of its expressway and street lighting to LED lights. LED lighting is particularly effective in applications where high luminosity lights are on for extended periods such as expressway and street lighting because they are better at heat management and have a longer lifespan than alternatives. Any remaining incandescent streetlights under County operation should be replaced with LED in accordance with this action and County policy.

- **Impact: High** - Due to reduced energy usage from converting to more efficient lighting technology.
- **Timeframe: Medium** - The conversion process is relatively simple, but may take several years to retrofit all of the remaining lighting in the county.
- **Investment: Moderate** - LED technology may be more expensive than alternatives, but it ends up saving the most energy and money in the long run. Incentives from the utility and the state can reduce the upfront cost of LED lighting.



- Priority: **2**
- Tier: **2**

Identify areas where light pollution may be a concern. Align with LED replacement program, where appropriate.

Lighting pollution can be addressed by identifying areas where it may be a concern and adding features to LED lighting fixtures to reduce the amount of ambient light that is being cast off. Lighting controls can be included as well to further reduce light pollution by turning off the light when it is not being used.

- **Impact: Low** - Due to the minimal direct carbon reduction that results from addressing lighting pollution.
- **Timeframe: Short** - The assessment of building and facility lighting and review of maintenance programs could be completed in under a couple years.
- **Investment: Low** - Implementation is relatively inexpensive and can be achieved with current resources, especially for passive systems that do not have sensors or controls.

- Priority: **5**
- Tier: **1**

Assess feasibility of transitioning to Solar Photovoltaic (PV) powered street and emergency lighting as technology advances.

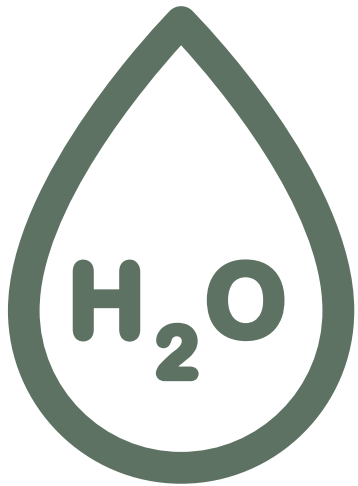
The addition of solar photovoltaic (PV) systems to outdoor lighting can provide emergency services in case instances where the grid goes down and are useful for on-demand lighting applications. The combination of PV, energy storage, sensors, and controls create microgrid systems that can be effective in providing lighting in critical areas.

- **Impact: Moderate** - Due to the emissions reduced by powering the light(s) with solar energy that is installed on-site.
- **Timeframe: Medium** - It may take several years to evaluate where the best locations are and properly site the solar PV for direct lighting applications.
- **Investment: Moderate** - There may be some additional resources required to complete the purchase and installation of these PV systems, depending upon grant availability.

Next steps include identifying areas where solar powered lights would be best to implement such as in critical areas that require lighting when the grid goes down or in remote areas.

Pure Waters Infrastructure

GOAL: Reduce GHG emissions of County water resource recovery facilities by transitioning to renewable energy sources and reducing use of stationary fuel combustion.



Target: **80%**



	2019 Baseline	2050
Percent Reduction	-	80%
CO ₂ e (MT)	9,225	-7,380

The independent variables adjusted to model this reduction scenario for County pure waters infrastructure GHG emissions include:

- » Electricity Energy Equivalent (Quantity MMBtu)
- » Natural Gas Energy Equivalent (Quantity MMBtu)
- » Carbon Intensity Factor

This reduction target assumes the County will take action to increase electric energy efficiency of facilities, reduce energy consumption, transition to renewable energy sources, and achieve a 1-2% reduction in natural gas consumption annually. Also reflected in this target scenario is the implementation of fuel switching actions that reduce reliance on natural gas as well as opportunities for methane recovery in operations.



The table below presents the action items in the implementation plan that pertain to the County’s pure waters infrastructure. Certain actions are presented with more context and details on the following pages due to their high priority or need for additional context.

Table 12. Pure Waters Infrastructure Implementation Actions

Priority	Type	Description	Impact	Timeframe	Investment	Page #
1	Tier 3	Incorporate energy efficiency as a key component of equipment specifications for improvement of wastewater systems.	High	Short	Moderate	60
2	Tier 2	Continue to look for changes to process operations to improve energy efficiency in wastewater conveyance and treatment.	Moderate	Short	Moderate	60
2	Tier 2	Evaluate/model potential methane, nitrous oxide, and carbon dioxide emissions from specific WRRF processes, especially if onsite biosolids stabilization or nitrification/denitrification requirements are added to future SPDES permits.	Low	Short	Low	61
3	Tier 2	Evaluate feasibility of emergency power generation alternatives that rely upon renewable energy sources, such as hydrogen for emergency generators.	Low	Medium	Low	-
4	Tier 2	Evaluate existing biosolids disposal methods and identify potential alternatives/improvements for biosolids management, dewatering, stabilization, and methane recovery.	High	Medium	Moderate	61
4	Tier 1	Continue an energy efficient retrofit of facilities, especially pumping and aeration processes.	High	Long	High	-
4	Tier 1	Improve energy efficiency of existing equipment.	High	Long	High	-



Summary of Priority & Key Actions

- Priority: **1**
- Tier: **3**

Incorporate energy efficiency as a key component of equipment specifications for improvement of wastewater systems.

Energy efficiency is important for systems that are on for extended periods of time such as wastewater treatment systems because they reduce the overall energy demand of the system.

- **Impact: High** - Due to the resulting large-scale decrease in energy demand of pure waters infrastructure facilities compliant with new specifications.
- **Timeframe: Short** - The energy efficiency policy itself could be developed in the near term; however, the implementation and impacts are likely to exceed 6 years.
- **Investment: Moderate** - While current staff may be able to develop the policy, additional resources may be needed to fund the procurement and installation of the equipment.

Next steps include conducting an energy audit of the current wastewater equipment and identifying equipment that could be retrofitted or replaced with more efficient solutions. An additional analysis of sensors and controls that could further improve efficient use of the equipment should also be evaluated as part of implementing this policy.

- Priority: **2**
- Tier: **2**

Continue to look for changes to process operations to improve energy efficiency in wastewater conveyance and treatment.

Identify areas where the process of wastewater conveyance and treatment could be improved towards energy reduction and nature-based solutions.

- **Impact: Moderate** - Improvement in efficiencies would have a significant impact to the reduction of carbon emissions associated with energy usage.
- **Timeframe: Short** - Analysis of operations may be conducted over a few years.
- **Investment: Moderate** - Some additional resources may be required to complete the analyses and purchase more energy efficient equipment or equipment modifiers.

Next steps include conducting a process audit to identify areas for improvement and determining the equipment required to implement energy reduction strategies.



- Priority: **4**
- Tier: **2**

Evaluate/model potential methane, nitrous oxide, and carbon dioxide emissions from specific WRRF processes, especially if onsite biosolids stabilization or nitrification/denitrification requirements are added to future SPDES permits.

While most GHG emissions from wastewater treatment are indirect and associated with the energy used to power and heat processes, direct sources will become proportionately more important as equipment efficiency improves. Assessing the specific impact of both current and anticipated processes needed to meet new permit requirements is the first step towards quantifying future investments.

- **Impact: Low** - Monroe County’s WRRFs do not currently include processes known for high direct emissions.
- **Timeframe: Short** - An evaluation study could be performed with a year’s worth of data; however, some analysis techniques are still being developed.
- **Investment: Low** - The study could be performed by internal staff or consultants; however, some long-term monitoring equipment may need to be purchased to develop emissions trends.

Next steps include soliciting expertise in methane, nitrous oxide, and carbon dioxide monitoring and modeling, as well as reviewing monitoring technologies that would be appropriate to install at the WRRFs.

- Priority: **4**
- Tier: **2**

Evaluate existing biosolids disposal methods and identify potential alternatives/improvements for biosolids management, dewatering, stabilization, and methane recovery.

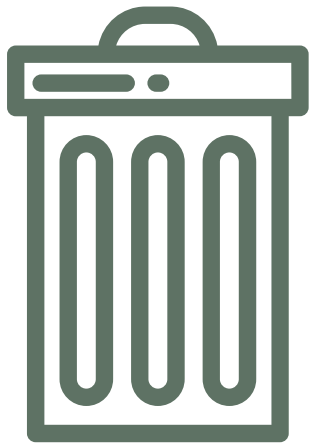
Biosolids management can be energy intensive and contribute to direct emissions, so this action likely has the greatest overall potential to impact GHG emissions from this sector.

- **Impact: High** - Emissions associated with processing and disposing of biosolids is substantial, so even minor improvements in this process are anticipated to have a significant effect on emissions reduction.
- **Timeframe: Medium** - Analysis and implementation of solutions is likely to take several years.
- **Investment: Moderate** - Additional resources will be required to complete the evaluation and begin implementation.



Solid Waste & Materials Management

GOAL: Reduce GHG emissions of County owned and operated solid waste and materials management facilities and reduce County waste generation contributing to methane production.



Target: **90%**



	2019 Baseline	2050
Percent Reduction	-	90%
CO ₂ e (MT)	6,035	-5,173

The independent variables adjusted to model this reduction scenario for Gloria Drive Landfill GHG emissions include:

- » Methane
- » Waste in Place
- » Carbon Intensity Factor

This reduction target reflects the natural deterioration of inactive landfill GHG emissions over time and assumes the County will undertake an effort to cap Gloria Drive. For modeling purposes, 2044 is identified as the year the landfill is capped, resulting in the capture of 90% of methane emissions.



The table below presents the action items in the implementation plan that pertain to the County’s solid waste and materials management. Certain actions are presented with more context and details on the following pages due to their high priority or need for additional context.

Table 13. Solid Waste & Materials Management Implementation Actions

Priority	Type	Description	Impact	Timeframe	Investment	Page #
1	Tier 3	Update the County’s Existing Green Procurement Policy.	High	Short	Low	64
1	Tier 2	Evaluate processing capacity for composting of food waste organics.	Moderate	Short	Low	65
1	Tier 1	Participate in EPA WasteWise program.	Moderate	Short	Low	65
2	Tier 1	Maximize the diversion of organic waste from County facilities to disposal and the beneficial reuse of the organic material.	High	Medium	Moderate	66
2	Tier 3	Incorporate reuse and deconstruction policies in Solid Waste Management Plan.	Moderate	Short	Low	66
3	Tier 2	Perform a solid waste audit of County facilities operations.	Low	Short	Low	-
3	Tier 1	Establish a Green Office Challenge that includes a reduction in office waste.	Low	Short	Low	-
3	Tier 1	Cap Gloria Drive inactive landfill to prevent fugitive methane emissions and consider methane recovery options.	High	Short	High	67
4	Tier 3	Develop and implement a paper use reduction policy and procedures – Under broader sustainability measures (sustainability committee); e.g. efforts to go paperless.	Low	Medium	Low	-
4	Tier 1	Purchase biodegradable cleaning supplies in accordance with Green Procurement Policy.	Low	Short	Moderate	-
4	Tier 3	Consider adopting a zero waste policy for County facilities and parks, including recycling, repurposing, and composting components. Expand current recycling/trash policy and procedures. Investigate feasibility of an organic waste program for County buildings/facilities.	High	Long	High	-
4	Tier 1	Reduce waste generation and increase recycling at County facilities.	Moderate	Long	Moderate	-
4	Tier 1	Reduce and/or eliminate single-use plastics within County facilities.	Moderate	Long	Moderate	-

NOTE: Since the Solid Waste and Materials Management Sector emissions are based on the Gloria Drive landfill alone, the majority of actions listed above do not necessarily contribute to the target reduction. However, they do serve to reduce County generated waste contributing to community-wide GHG emissions. Although the impacts of these actions are not measured under this model, they have been included in Phase I as they are County led/driven actions associated with governmental operations.



Summary of Priority & Key Actions

- Priority: **1**
- Tier: **3**

Update the County's Existing Green Procurement Policy.

The first step to developing solid waste and material management improvements include evaluating the source of waste and limiting materials that cannot be recycled. This can be done by updating the county's green procurement policy.

- **Impact: High** - A green procurement policy establishes the type of materials that are going to be consumed and can limit the embodied energy and emissions from consumption.
- **Timeframe: Short** - The revisions to the policy may be made over a year or two.
- **Investment: Low** - Substituting products for alternatives that are recyclable or more environmentally friendly may have a marginal cost increase, but is likely to be manageable under current budget.

Next steps include evaluating the procurement practices and limiting the amount of non-recyclable and non-compostable materials being purchased for the County.



- Priority: **1**
- Tier: **2**

Evaluate processing capacity for composting of food waste organics.

Food waste organics processing could be expanded to residential and commercial partners in the County and the byproducts of the process can be used for fertilizer on County grounds or donated to local landscaping needs.

- **Impact: High** - Resource recovery contributes to the capture and processing of greenhouse gases from waste streams.
- **Timeframe: Short** - Evaluation could be conducted in a few years, while implementation of the system(s) is likely to be prolonged.
- **Investment: Moderate** - Additional funding and expertise is expected to be needed in order to evaluate and administrate organics waste processing.

Next steps include evaluating the amount of organic waste in the county and determine the capacity to process the contents at one or more locations.

- Priority: **1**
- Tier: **2**

Participate in EPA WasteWise program.

This Action aligns with CSC: PE5 Action: WasteWise Program

The EPA WasteWise program (www.wastewise.com) focuses on minimizing certain waste streams into the landfill and encourages a more sustainable approach to waste management.

- **Impact: Moderate** - Due the significant emissions reductions that can be achieved from reducing the amount of waste sent to the landfill.
- **Timeframe: Short** - This is an annual program; however, participation will be ongoing.
- **Investment: Low** - There is a significant amount of federal funding and guidance associated with participation in this program, so existing resources may be augmented.

Next steps include reviewing the WasteWise program details and preparing to participate. Reviewing GHG Reduction tools such as WARM (<https://www.epa.gov/warm>) may also be effective in determining ways to reduce emissions associated with waste.



- Priority: **2**
- Tier: **1**

Maximize the diversion of organic waste from County facilities to disposal and the beneficial reuse of the organic material.

This Action aligns with CSC: PE5 Action: Organics Management Plan

The diversion of waste from the landfill is an effective way to lower emissions associated with the transportation of waste as well as preventing additional methane producing products from entering the landfill. This can be utilized as on-site residential food waste recycling programs.

- **Impact: High** - Due to the potential to reduce the emissions associated with organic food waste as well as provide the byproducts from the process for local usage such as county landscaping purposes.
- **Timeframe: Medium** - It may take a few years to develop the strategy prior to installing the facilities for the County to process the organic food waste.
- **Investment: Moderate** - Some additional financial support may be required to build and run the organics composting/recycling facility(s).

Next steps include an analysis of potential sites and ability to process the organic contents as well as determine the partners involved in installing and running the facility(s).

- Priority: **2**
- Tier: **3**

Incorporate reuse and deconstruction policies in Solid Waste Management Plan.

This Action aligns with CSC: PE5 Action: Construction & Demolition Waste Policy

Updating the Solid Waste Management Plan to incorporate reuse and deconstruction policies can have a significant impact on emissions reductions by keeping certain waste streams from entering the landfill, thereby preventing additional emissions from building activities.

- **Impact: Moderate** - Due the potential to decrease emissions pertaining to construction and demolition waste being hauled and deposited into the landfill instead of being reused or recycled.
- **Timeframe: Short** - Updating the plan can be completed in the near term, and implementation can be quickly administered on selected projects.
- **Investment: Low** - This initiative will build off of existing policy which is already being administered under current operations.



- Priority: **3**
- Tier: **1**

Cap Gloria Drive inactive landfill to prevent fugitive methane emissions and consider methane recovery options.

Effectively capping the Gloria Drive inactive landfill will prevent emissions from escaping and provides the foundation for capturing the methane and converting it to Renewable Natural Gas (RNG), combusting it into electricity, or installing solar panels on the landfill for renewable energy generation.

- Impact: High - Due to the passive capture of emissions from the decay of material in the landfill, as well as a means to generate renewable energy once the landfill is capped.
- Timeframe: Short - The capping process does not take more than three years to implement once the area has been evaluated.
- Investment: High - The cost to cap the landfill is estimated to be between \$80,000 and \$500,000 per acre, not including any equipment or systems necessary to convert the emissions.

Next steps include evaluating the status of the landfill and preparing the capping process. This involves conducting a thorough analysis and commissioning the right partners to implement it.

OTHER CSC ACTIONS INCLUDE:

- Consider adopting a zero waste policy for County facilities and parks, including recycling, repurposing, and composting components. Expand current recycling/trash policy and procedures. Investigate feasibility of an organic waste program for County buildings/facilities. **PE5 Action: Organic Waste Program for Government Buildings**
- Perform a solid waste audit of County facilities operations. **PE5 Action: Government Solid Waste Audit**

Transportation Fleets

GOAL: Reduce GHG emissions of County transportation fleets by eliminating reliance on fossil fuels and pursuing net-zero transportation operations.



Target: **80%**



	2019 Baseline	2050
Percent Reduction	-	90%
CO ₂ e (MT)	3,295	-2,965

This scenario is based on the County provided inventory of 254 gas vehicles and 56 diesel vehicles in the 2019 baseline analysis. The independent variables adjusted to model the reduction scenario for Transportation Fleets GHG emissions include:

- » Gasoline (Quantity)
- » Diesel (Quantity)
- » LPG Quantity
- » Energy Equivalent (Quantity MMBtu)
- » Carbon Intensity Factor

This target reduction scenario reflects a change of roughly 222 gas vehicles to EV by 2050, or 7.4 per year on average, and changing 47 diesel vehicles to EV by 2050, or 1.6 per year on average.



The table below presents the action items in the implementation plan that pertain to the County’s transportation fleets. Certain actions are presented with more context and details on the following pages due to their high priority or need for additional context.

Table 14. Transportation Fleets Implementation Actions

Priority	Type	Description	Impact	Timeframe	Investment	Page #
1	Tier 2	Eliminate unnecessary vehicle idling through policy action, reduction technologies, and zero emission vehicle use.	Moderate	Short	Low	70
2	Tier 3	Certify County fleet mechanics to maintain and repair EVs.	Low	Short	Low	-
2	Tier 2	Require fuel use reports from County contractors and incorporate emission reduction standards into County contracts.	Low	Short	Low	-
2	Tier 1	Increase alternative fuel use for County-owned vehicles (hydrogen, etc.).	Moderate	Long	Moderate	70
2	Tier 1	Reduce trips taken by County vehicles.	Moderate	Long	Low	-
2	Tier 2	Improve fleet deployment and monitoring.	Moderate	Long	Low	-
3	Tier 1	Deploy solar Electric Vehicle Supply Equipment (EVSE).	Moderate	Medium	Moderate	-
3	Tier 2	Identify opportunities for cross-department use of County fleet through a Fleet Efficiency Policy including fleet right-sizing.	Moderate	Medium	Moderate	-
3	Tier 1	Purchase EVs for Sheriff’s Department (passenger vans, patrol fleet, etc.).	High	Long	High	-
3	Tier 1	Purchase electric grounds maintenance equipment.	High	Long	High	-
3	Tier 1	Offset emissions from vehicle fleet and transit operations (Renewable Energy Credits, carbon credits, etc.).	High	Long	High	-
4	Tier 1	Install additional Level 2 (AC) and Level 3 (DC) EV charging stations to support fleet operations.	Moderate	Long	Moderate	-
4	Tier 3	Continue preventative fleet maintenance program for County-owned vehicles.	Low	Long	Low	-
4	Tier 2	Quantify and track vehicle miles traveled for County fleet.	Low	Long	Low	-

NOTE: Although not included in the target scenario, actions undertaken by the County to reduce fuel consumption and unnecessary gas/diesel vehicle use will also contribute to meeting the transportation fleet GHG emission reduction targets.



Summary of Priority & Key Actions

- Priority: **1**
- Tier: **3**

Eliminate unnecessary vehicle idling through policy action, reduction technologies, and zero emission vehicle use.

County vehicle users should be directed to minimize idling at all times to reduce waste of fuel and excessive emissions. This can be achieved from policy enforcement as well as through reduction technologies and the use of zero emissions vehicles.

- Impact: Moderate - Due to the potential to reduce emissions across all county vehicles from unnecessary idling vehicles.
- Timeframe: Short - Policy implementation is attainable in the short-term; however, idling reduction technologies may take several years to assess, acquire, and install.
- Investment: Low - Due to the behavioral change aspect of the implementation of this policy and potential funding/rebates for zero emission vehicles.

Next steps include reviewing the current policies and identifying the best way to implement an no-idling strategy for the County vehicles.



- Priority: **2**
- Tier: **1**

Increase alternative fuel use for County-owned vehicles (hydrogen, etc.).

This Action aligns with CSC: PE3 Action: Advanced Vehicles

Switching to alternative fuels for vehicle use is an effective way to reduce the emissions associated with the combustion of fossil fuels. For example, hydrogen fuels can provide the energy demanded, but with a lower carbon footprint.


- Impact: Moderate - There is significant potential for emissions reduction by switching to alternative fuels, particularly for a larger share of the vehicle fleet.
- Timeframe: Long - It may take several years to source the fuels as well as convert the vehicles to be able to be compatible with the alternative fuels.
- Investment: Moderate - Additional resources may be required to source the fuel and convert the vehicles to be able to consume it.

Next steps include identifying where alternative fuels can be sourced as well as evaluating the current status of vehicles to determine the need for conversion technology.

OTHER CSC ACTIONS INCLUDE:

- Install additional Level 2 (AC) and Level 3 (DC) EV charging stations to support fleet operations. **PE3 Action: Alternative-fuel Infrastructure**
- Identify opportunities for cross-department use of County fleet through a Fleet Efficiency Policy including fleet right-sizing. **PE3 Action: Fleet Efficiency Policy; PE3 Action: Fleet Rightsizing**

This page is intentionally blank.



MONROE
COUNTY
CAP

GOVERNMENT OPERATIONS

Part 6

EXPANSION OF CLIMATE ACTION PLANNING

It's time to protect those who are most vulnerable to the climate impacts that are no longer avoidable.

- Vanessa Nakate

Climate Activist

■ Administering & Monitoring the CAP

The Phase I CAP for governmental operations serves as a framework that future policies, programs, and capital spending should rely on in order to maximize sustainable and resilient decision-making in the County moving forward.

The Department of Environmental Services (DES) will be the primary administrator of this Plan given its role in managing the County’s assets, including facilities, fleets, and water resource recovery facilities. The County should consider the development of a Climate Action/Sustainability Coordinator position to ensure dedicated staff hours for the successful implementation of the CAP. The success of this Plan will also require coordination with all County departments, and employee education and training will help assist in this wholesale effort. To facilitate this cross-department coordination, the County’s Sustainability Committee should be involved in initiatives tied to the CAP.

Crucial to the successful implementation of this Phase I CAP is the development of an effective monitoring and evaluation system. This will allow for the County to track progress towards its climate action goals and enhance transparency and accountability. Furthermore, continual monitoring will allow the County to shift operations as necessary based on evaluation of outcomes over time.

A well-considered monitoring process should be developed based on the following steps, adapted from the C40 Cities Climate Action Planning Resources:

1. **Defining Indicators**
2. **Collecting & Monitoring Data**
3. **Evaluating Outcomes**
4. **Reporting & Readjusting**



Figure 21. Monitoring Process Source: C40 City Monitoring, Evaluation and Reporting Guidance

Defining Indicators

An effective monitoring and evaluation program will rely on clearly defined indicators. These may include qualitative and quantitative indicators, although quantitative indicators are more easily defined and understood.

Indicators should be developed for each sector identified in the Plan, as well as overarching impacts, such as total emissions reductions. In addition to monitoring emission reductions, it may be useful for the County to monitor positive outcomes such as health outcomes or economic benefits. Indicators addressing equity and environmental justice outcomes should also be incorporated.

Collecting & Monitoring Data

To effectively monitor the identified indicators, the County must have a robust and up-to-date baseline dataset against which to measure progress. This Plan includes a baseline inventory, but a more detailed dataset pertaining to assets and facilities will allow the County to more closely monitor progress and understand potential benefits of future actions.

The County should begin by assessing the current inventory and identifying gaps in the data. The gaps should then be prioritized by importance for monitoring purposes. The more data the County has in its possession, the more refined the monitoring and evaluation process can be.

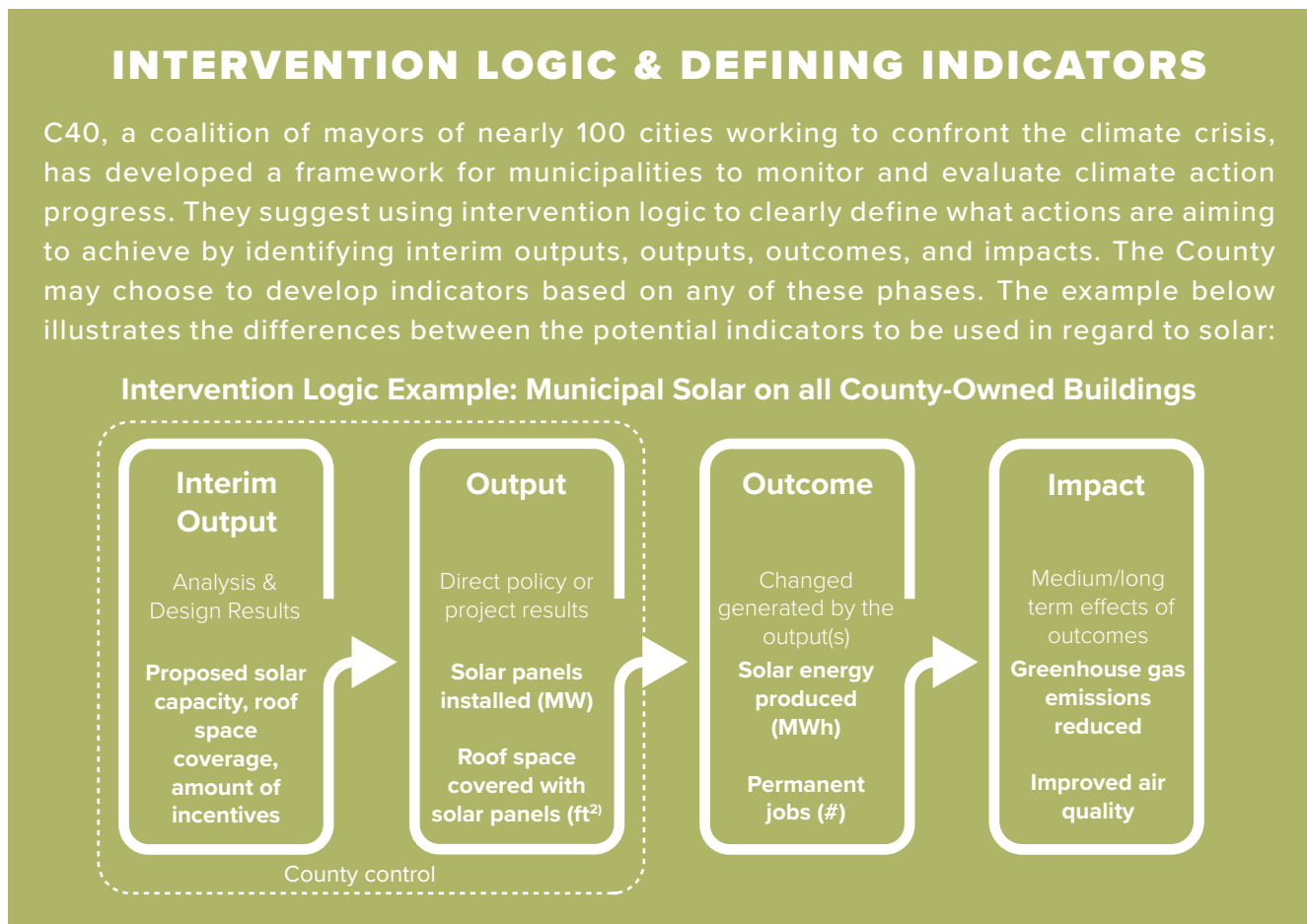


Figure 22. Intervention Logic Example Source: C40 City Monitoring, Evaluation and Reporting Guidance

Once an enhanced inventory can be established, the data collection process should be continual to be able to monitor progress and trends. Quality controls should also be established to ensure the accuracy and completeness of the data.

It should be noted that the ClearPath Model used for this CAP accommodates a wide range of inputs, which could be expanded upon by the County with future efforts.

Evaluating Outcomes

While data collection and monitoring should be an ongoing process, evaluation should occur periodically. Evaluation of the data will provide a more critical view of the process of climate actions, and create a better understanding of the successes and setbacks of each action in order to further refine the implementation process.

Causal relationships and unanticipated consequences can be identified during this process. This will allow the County to identify factors outside of its initial assumptions that may be impacting the overall progress of certain actions or initiatives, and whether they are within the control of the County or not.

Furthermore, an equity analysis can be performed during evaluation periods, such as the impacts of climate actions on underrepresented or marginalized populations.

These evaluations will set the stage for the County to report on its progress, and to adjust its strategy for achieving emissions reduction and more sustainable and resilient operations.

Reporting & Readjusting

Presenting the results of the evaluation process will help increase transparency and accountability of the County's efforts in mitigating and adapting to climate change. The County should identify strategies for conveying these results to multiple stakeholders, including elected officials, County staff, residents, and businesses / institutions.

The manner in which the results are reported for each of these groups may vary based on their particular interest and needs. The reporting of the findings of the evaluation can help foster institutional learning, which in turn will help County staff to adjust actions and identify new strategies to optimize the outcomes of their climate actions and efforts.

Staff resources and funding are known challenges in implementing this effort, but are essential for the success of this Plan. The administration and monitoring of progress will require a significant amount of collaboration and County-wide buy-in. However, by continually engaging in the monitoring process, the County can help bolster their climate-related goals, and gain trust and political support for the priority actions of this Plan.

Active monitoring will also ensure that this Plan "remains off the shelf," and is a dynamic tool that the County can refer to and adjust as time goes on. This should include annual reporting on action item progress, a continual five-year update process for the GHG inventory, and a reassessment of the implementation plan which may include reprioritization and addition of new action items.

Figure 23. County Plan Coordination

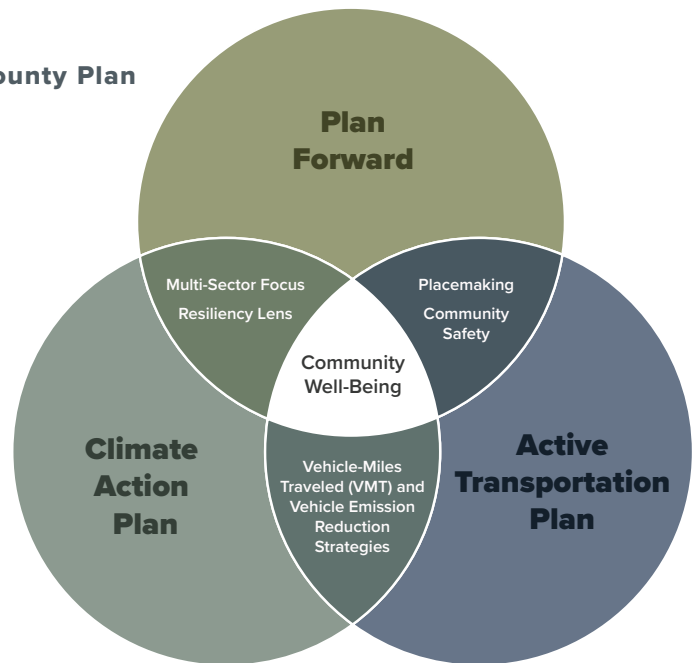
■ Building on other Plans & Initiatives

Monroe County is currently undertaking several important planning initiatives that have direct influence on this CAP, and vice versa. In order to develop a clear roadmap for future actions, policies, and capital spending in the County, each of these Plans must speak to and support the others. Three of the most significant and relevant efforts include Plan Forward - the County's Comprehensive Plan, the Countywide Active Transportation Plan, and Bring Monroe Back - Monroe County Recovery Plan.

Plan Forward

The Monroe County Comprehensive Plan, known as Plan Forward, will establish goals for Monroe County, and provide targeted, specific strategies to meet those goals. The Monroe County Comprehensive plan addresses large-scale issues and opportunities in regards to sustainability, social equity, energy supply and conservation, and climate change while still boosting economic development, recreation, and other essential aspects that contribute to community quality of life.

One important pillar of the Comprehensive Plan is addressing environmental topics such as like climate change, energy supply and conservation, environmental stewardship and sustainability, open spaces (parks, trails, etc.) and water quality. The Comprehensive Plan will set an overarching vision for the future of Monroe County.



All identified implementation strategies in this Plan should be considered in the light of these community-wide goals and aspirations. Given the County's emphasis on the environment, these Plans should support each others broader visions, and should share recommended actions and policies where relevant.

Countywide Active Transportation Plan (CATP)

The CATP will provide the County with an equity-focused, data-driven framework for achieving desired changes to the County's non-motorized transportation network. The Plan will analyze existing conditions, issues, and opportunities in the County as they pertain to walking, biking, and other modes of active transportation. These findings will inform a set of context-sensitive recommendations that seek to create a cohesive, safe, and accessible non-motorized transportation network throughout the County that users of all ages and abilities can benefit from.

As one of the major contributors of GHG, there are many opportunities within the transportation sector for emissions reduction. One of these strategies is to

encourage mode-shift, or switching from vehicle trips to non-motorized trips such as walking or biking; particularly for short distance trips. The CATP supports this emissions reduction strategy by identifying needed network build-out, upgrades, and improvements to ensure seamless non-motorized travel to and from key destinations in the County. Furthermore, the CATP will outline policy recommendations and education and outreach strategies to encourage more walking and biking in the County.

Bring Monroe Back

Bring Monroe Back is the County's Recovery Agenda for the American Rescue Plan Act of 2021 (ARPA). The County received over \$144 million dollars in ARPA funding, and this planning effort is intended to carefully consider and prioritize how the funding should be used for the improved health, safety, and wellbeing of all Monroe County Residents.

Bring Monroe Back, is based on dozens of public and private reports and assessments that contain thematic and actionable recommendations. The combination of research, expert testimony, and community feedback builds a foundation for a recovery strategy to build on current resources in the Monroe County and asks the public to identify critical areas of investment.

Sustainability is one of the critical areas in Bring Monroe Back, with a focus on investing in renewable energies like solar, clean water, improving transportation options such as bike infrastructure and urban green space. The significant dedicated funding associated with this planning

effort presents a great opportunity for the County to move forward with some of the actions within this Phase I CAP by aligning the strategies and recommendations of Bring Back Monroe with the CAP's recommendations.

County Level Mitigation, Adaptation and Resilience

As was stated elsewhere in this CAP, both mitigation and adaptation strategies are needed to manage and fight climate change. Due to the focus of this Plan on reducing GHG emissions, the majority of actions are focused on mitigation efforts. Although important for the long-term goal of reducing the County's impact, mitigation measures do not necessarily address the immediate challenges of climate change that we face today.

To compliment this Plan, the County should consider undertaking various climate adaptation and resiliency planning efforts to better understand how to respond to, manage, and protect itself from the current and near term effects of climate change on our community.

These efforts would focus on identifying crucial assets and determining their vulnerabilities to the impacts of climate change such as flooding, extreme heat, or major weather events. They would also outline strategies that the County could take to increase the resiliency of its facilities and other assets to preserve the integrity of County operations to the greatest extent possible.

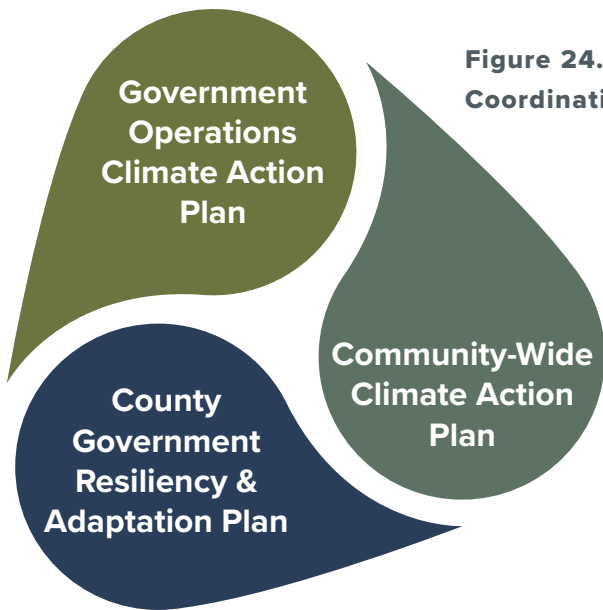


Figure 24. Climate Planning Coordination

Climate adaptation and resiliency planning efforts that may be undertaken and implemented directly by Monroe County include:

- » Conducting a Climate Vulnerability Analysis for County facilities (including ability to meet future regulations related to wastewater and stormwater infrastructure).
- » Developing a Climate Adaptation & Resiliency Plan for County properties
- » Coordinating climate drivers in the County Hazard Mitigation Plan (including Heat Emergency Plan and Flood Mitigation Plan).
- » Facilitating NFIP Community Rating System participation through Monroe County Stormwater Coalition.
- » Developing a shade structures policy for County facilities in conjunction with a Natural Resources Inventory
- » Incorporating sustainability and resiliency efforts in the County Parks Master Plan, including nature-based carbon capture opportunities.
- » Creating a Forest Management Plan and identifying strategies to utilize and improve protection and management of trees.

■ **Community-wide GHG Inventory & CAP (Phase II)**

The County’s efforts to develop the Phase I Governmental Operations CAP is an important first step in planning for a more sustainable and resilient Monroe County. It identifies essential actions that are directly within the County’s control, and sets up the County as a role model and champion of sustainable practices.

To expand on this work, the County is undertaking a community-wide GHG inventory and CAP to better understand emissions from the County and all its stakeholders -- including residential, commercial, industrial, municipal, and all other energy dependent activities that occur within Monroe County.

This effort, called the Phase II CAP, will have a much larger scope of emissions sources inventoried and the potential actions for climate change mitigation and adaptation. It will also require a significant amount of community buy-in and public support in order to successfully implement the Plan’s recommendations.

Together, the Phase I and Phase II CAPs will create a comprehensive roadmap for the Monroe County government and its community partners to reduce our region’s overall contribution to climate change and provide for a more healthy sustainable future.

END OF DOCUMENT



ADAM J. BELLO
COUNTY EXECUTIVE