

Climate Pollution Reduction through Lowering Barriers to Communitywide Climate Action and Leading by Example in Monroe County, NY

Monroe County has completed a Climate Action Plan for Government Operations and is currently developing its Phase II: Community-wide Climate Action Plan. Phase I was focused on emissions from County-owned facilities and fleet, over which the County has direct control for improvements in energy efficiency, alternative energy, and other actions to reduce its carbon footprint.

In Phase II, the proposed actions are voluntary and rely on the partnership and participation of a wide variety of community stakeholders. Based on outreach to and engagement with local stakeholders in the public, nonprofit, and private sectors, the major challenge to implementation is how to lower the barriers to participation.

Monroe County seeks to use Climate Pollution Reduction Grant funding to facilitate Phase II implementation through the following projects:

1. Sustainable Community Fund to support community stakeholders in reducing GHG emissions throughout Monroe County
2. Construction of the Northeast Quadrant (Gloria Drive) Renewable Energy Center, addressing fugitive emissions from an inactive landfill paired with a major expansion of solar power on county-owned property.
3. Converting an existing structure at the Monroe County Fleet Center into a Green Building Showcase, which will mitigate climate impacts of a County facility while providing a space for research and development to pilot new green technologies (such as sewer heat mining) that will accelerate community adoption by reducing upfront investment risks for our residents, businesses, and institutions.

The annual estimated greenhouse gas (GHG) mitigation is estimated to be 76,986.84 metric tons of carbon dioxide equivalent (MTCO_{2e}), with a Tier C grant request of \$99,996,083.

1. Sustainable Community Fund

- Project Description: The Sustainable Community Fund Program will offer grants to community organizations (municipalities and other governmental entities, non-profits, businesses, etc.) for innovative sustainability projects/programs to decarbonize local facilities and strengthen the green/regenerative economy. The program will be modeled on the existing *Bring Monroe Back* program developed for Monroe County's management of the American Rescue Plan Act (ARPA) funds.
- Monroe County's Climate Action Plan (CAP) and Climate Adaptation and Resiliency Plan (CARP) will serve as guidance for desired outcomes from the program. The program will highlight the intersectionality between sustainable planning and other areas of community concern, including social and environmental justice, public health, economic/workforce development, and infrastructure resilience. In addition, preference will be given to funding projects that encourage partnership and collaborative action and long-term reduction in operation and maintenance costs. Examples of topic areas that projects may cover include green jobs initiatives, supporting

regenerative business practices, renewable energy deployment, building energy efficiency and decarbonization, zero-emission vehicle adoption and infrastructure, growing alternative transportation options, and green infrastructure practices (including carbon sequestration and natural resource management).

- GHG Emissions Sectors Impacted: Transportation, Electricity, Commercial/Residential Buildings, Industrial, Waste and Materials Management, Agricultural, Decarbonization
- How GHG Emissions will be reduced: Lower barriers to implementation of green practices and projects for grant recipients to achieve CAP Phase II community-wide GHG emissions reduction goals.
- Project Contribution to Climate Justice: At least 40% of funding through the program will be provided to projects in disadvantaged communities to comply with federal Justice40 rules.
- Job Creation/Workforce Development Potential: Eligible projects include green jobs/workforce development projects.
- Alignment with Monroe County CAP: While Phase II community-wide goals and strategies are still under development at this time, it is anticipated that the plan will include actions to connect the community with funding resources to help address multiple areas of climate mitigation, adaptation, and resilience.

Strategic Importance

An important element of this project will be to bring a data-driven approach to allocating community funding. Applicants to the Sustainable Community Fund Program will be required to estimate, track, and report metrics to determine both success and replicability (as was a stipulation of the *Bring Monroe Back* program). This data can be used to evaluate levels at which to pitch incentive programs by providing evidence of participation rate. For example, many incentive funding programs do not account for consumer behavior and are set at an arbitrary percentage of overall project cost or require an arbitrary percentage recipient match. Understanding what level of funding most appropriately incentivizes the desired decision can accelerate such programs towards achieving ambitious goals. The Sustainable Community Fund program will collect data in a real-world scenario that EPA can then use to demonstrate and justify future funding initiatives. Finally, by establishing and administering a funding program at the local level, it allows for more nuanced funding decisions based upon the needs of the specific community than might otherwise be made at the federal level, reducing the grant administration burden on EPA staff.

Examples of eligible programs and initiatives:

Municipal Planning Program

This project would enable municipalities to prepare and update planning and zoning documents and undertake planning and related studies focused on GHG emissions reduction. As a home rule state, municipalities in New York make local land use decisions. These determine the form and location of

housing and commerce, which in turn affects mobility in the community. Both land use and transportation patterns heavily influence individual and collective GHG emissions.

This project would reduce GHG emissions by aligning planning efforts with the Priority Climate Action Plan of the Genesee/Finger Lakes Region. Such plans may include:

- New or updated comprehensive plans.
- New or amended zoning ordinances.
- Area Plans, Corridor Plans, Feasibility studies, conceptual planning, zoning, or technical planning studies necessary to determine a course of action that would reduce GHGs.
- Transportation planning efforts that would reduce vehicle miles traveled (VMTs) and GHGs, such as Transportation Corridor, Municipal Complete Streets initiatives, alternative transportation (e.g. bicycle lanes, amenities and facilities), right-sizing parking, multi-use paths or off-road paths.
- Implementation of recommendations from municipally adopted planning documents.

Incentivizing density of development, infill, energy efficiency/ weatherization, and other green building practices, would make a substantive contribution to reducing GHG emissions through this program. An appropriate estimation might assume 5 municipalities (representing approximately 7% of Monroe County's population) reducing total emissions of 219,294 MTCO₂e with a reduction of approximately 20% from residential and commercial energy sectors in those municipalities.

Community Tree Planting & Maintenance Programs

The Monroe County Climate Action Plan presents a baseline assessment of tree cover of 31% of total land area (202 square miles) per the US Forest Service's i-Tree Canopy tool. This equates to 5.3 million tons of carbon storage capacity in the existing tree canopy. Annually, this tree cover sequesters 450,000 tons of carbon dioxide. An appropriate target for municipal tree planting projects within Monroe County would aim for an additional 8,650 trees, sequestering an additional 465 MTCO₂e. In addition, 1.4 tons of other air pollutants would be removed and 1 million gallons of stormwater runoff would be reduced per year.

On Street Parking Charging Stations

To meet New York's ambitious EV adoption targets, it will be necessary to facilitate EV usage for those living multifamily/low-income housing by providing on-street charging opportunities for those without access to off-street parking. The deployment of 100 on-street parking charging units could convert an estimated total of nearly 61,000 VMTs to zero-emissions technology, reducing GHG emissions by 257 MTCO₂e. This pilot program would be deployed in a high-density housing geographic area within a designated Disadvantaged Community.

EV Use Share Program

The EV Use Share program would expand accessibility of zero-emissions mobility for areas within a designated Disadvantaged Community. This program is specifically supported by analysis by the US Department of Energy, which found that establishing EV car shares reduces emissions and creates awareness of EV benefits... [by addressing a] common barrier to EV adoption... the lack of home

charging, particularly for people living in multifamily housing (MFH).¹ Assuming uptake numbers based on a previous program in Minnesota², an initial investment in 20 EVs could reduce gasoline-powered VMTs by up to 5,000 VMTs per day or 1.825 million VMTs per year. This would reduce automotive GHG emissions by 736 MTCO₂e per year.

Rochester Community Thermal Energy Network using Sewer Heat Mining

The Rochester District Heating Cooperative (RDH) was awarded a grant from the New York State Energy and Research Development Authority (NYSERDA) to investigate divesting from a natural-gas-fired steam heating system and switching to a community thermal energy network (CTEN). While CTENs are being considered in other locations, this project, were it to be viable, would be ambitious in its scope of having to navigate the challenges of implementing a completely new utility system (and business model) in a downtown area with the energy primarily sourced from sewer heat/flow. The final study report estimated costs of the infrastructure project of approximately \$40 million and total HVAC system conversions costs for individual building owners to connect to the CTEN of \$28 million. Recognizing that building owners were a mixture of both public and private entities, the Sustainable Community Fund could be used to provide a grant to public and non-profit customers of RDH and a low-cost loan to for-profit customers of RDH to convert their HVAC systems. GHG emissions would be reduced by 5,930 MTCO₂e calculated from eliminating emissions from the natural gas-fired boiler plant for the steam system attributed to buildings in the proposed CTEN area. Replicability tests would be applied to the amount of incentive required for building owners to convert their system to connect to the CTEN (rather than invest in their own natural gas boilers when the steam system is shut down). Replicability would also apply to the model agreement that would need to be developed for the value of energy extracted from wastewater, which could then be extrapolated to model service agreements for other types of sewer heat mining systems at various scales.

Reuse/Repair Programs for Waste Diversion

The New York State Priority Climate Action Plan (PCAP) recognizes that waste prevention, reuse, and recycling can significantly reduce GHG emissions and prevent materials from being disposed and sent to landfills. Waste reduction focuses on the prevention or reduction of solid waste generation through changes in consumer and business behavior; changes in products, packaging, and purchasing; repair; and reuse. Reuse and recycling should be maximized when the generation of waste cannot be prevented. Another category for community grant funding would be community based programs to promote and facilitate repair, reuse, and upcycling of materials that would otherwise become waste sent to landfills.

This project would serve to test the threshold at which consumer preferences lean towards purchasing secondhand goods over new ones. Building capacity for repair and reuse could result in a corresponding decline in demand for new products, reducing overall consumption. By recirculating used items in their optimal state for higher/best use, rather than breaking them down for raw materials, waste is minimized and natural resources may be preserved. By extending the lives of tons of consumer goods, repair and reuse programs can reduce direct and indirect GHG emissions from the materials management,

¹ "Project Lessons: EV Car Share," US Dept. of Energy website. <https://cleancities.energy.gov/project-lessons-car-share/>

² "What Is Evie Carshare and Is It a Good Option for the Twin Cities?" StreetsMN. <https://streets.mn/2022/12/05/what-is-evie-carshare/>

industrial energy, and transportation sectors. Tonnage of waste diversion would be utilized as the conversion metric. This would also facilitate fulfillment of waste diversion goals in Monroe County's Climate Action Plan, and incorporate community engagement directed at distributing benefits to disadvantaged communities.

A program diverting about 2 million pounds of material from landfills each year could account for approximately 15 MTCO₂e in reduced hauling of materials and over 475 MTCO₂e annual savings in carbon emissions from repair and reuse of materials such as shoes, clothing, and housewares (compared to new items being produced and sold). This is an annual average total of nearly 500 MTCO₂e emissions reduction.³

Community Food Waste Organics Collection Incentive

Through Monroe County's Climate Action Plan community engagement process, the desire for organic recycling for food waste has been repeatedly voiced. Pilot projects have been established in the City of Rochester and the Town of Pittsford to investigate various models of food waste collection and centralized recycling (including community composting and anaerobic digestion). However, any municipal program may need to balance consumer desire to perform their own onsite organics recycling where allowed. This project would explore the extent to which incentives can be applied to encourage residents to participate in a community-based program to enable sufficient scale for an appropriate return on investment.

Based on the first 1000 users in the first year of a food waste in Rochester, NY, if the program had 5000 participating households, it is expected 580 tons of food waste organics per year could be diverted through this project, with an estimated that 350 MTCO₂e of methane that would otherwise be generated from landfills can be avoided.

Police Dept. EV Deployment

There has yet not been any electric vehicles added to police vehicle fleets in Monroe County. Police vehicles spend a lot of time idling so their actual fuel economy is much lower than the average vehicle, about 10 miles per gallon. A patrol car might put on up to 75,000 miles/year, so electrifying the fleet would greatly reduce GHG emissions. If funding is provided, there could be 30 EV police cars deployed in Monroe County, replacing 30 gas powered vehicles. This would avert the combustion of approximately 225,000 gallons of gasoline per year, resulting in a reduction of 2,000 MTCO₂e emissions per year⁴.

Relation to Regional and New York State PCAPs:

The Sustainable Community Fund would incorporate various strategies and measures from the Genesee/Finger Lakes Regional PCAP. This includes Transportation Strategy #1: Transition to Zero Emission Vehicles and Equipment for Municipal and Private Fleets with measure E; Strategy #2: Enhance Public Transportation Services with Measure B; Strategy #3: Expand the Availability of Low-Carbon

³"Quantifying the Economic Impact of Finger Lakes ReUse in Tompkins County, New York," Ithaca Reuse Impact Analysis, (August 2023). <https://ithacareuse.org/wp-content/uploads/2023/04/FLR-Economic-Impact-Analysis-2018-2022.pdf>

⁴ Calculated using US EPA's GHG Equivalencies Calculator, <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

Active Transportation Alternatives with measures C expanding communitywide bike infrastructure networks; and Strategy #4: Promote Smart Growth and Mobility Oriented Development to Reduce VMT with measures A, B, D, & E. Additionally, these projects would employ Buildings and Infrastructure Strategy #1: Advance the Decarbonization of Buildings and Infrastructure with Measure E; and Strategy #2: Adopt Zero Emission Codes and Standards Measures A, B, & C. Additionally, the fund would support implementing Economy Wide Strategy #3: Create Healthy and Sustainable Communities, with measures B, C, D, & E.

2. Northeast Quadrant (Gloria Drive) Renewable Energy Center

- **Project Description:** The former Northeast Quadrant Landfill at Gloria Drive in Penfield, NY, was active from 1975 to 1980. At the time of closure, there were no standards for mitigating fugitive GHG emissions derived from the ongoing decomposition of organic material deposited. Monroe County will apply modern standards for capping the landfill to capture and destroy future fugitive methane emissions. Capping of the landfill will further reduce emissions by eliminating the transportation of leachate from the site to the water resource recovery facility (WRRF) for treatment. During wet weather events, a much greater volume of leachate is produced and additional trucking is needed to move the much greater volume of leachate to the WRRF. The County proposes to use an innovative capping technology which will reduce both earthwork during construction and long term maintenance, as well as their associated emissions. The site will then be converted into a Renewable Energy Center, installing an innovative photovoltaic panel design on top of the capped landfill facility to provide electricity generation.
- **GHG Emissions Sectors impacted:** Electric Power Generation, Transportation, Waste and Materials Management
- **How GHG Emissions will be reduced:** This project would fully implement the Monroe County Climate Action Plan goal of 90% GHG emissions reduction in the Waste, Water and Sustainable Materials Management Sector by 2050. 98,000 MTCO₂e of landfill gas emissions are estimated between 2025 and 2030, with an additional 185,000 MTCO₂e being emitted by 2050. The installation of a geosynthetic cap would prevent direct landfill gas emissions to the atmosphere. A new passive gas conveyance and destruction system would be constructed under the cap, resulting in total emissions reductions up to 218,400 MTCO₂e, depending on system efficiency. Installation of a solar facility will further reduce GHG emissions by increasing renewable energy production. There is already a 4.8MW capacity solar facility on the Gloria Drive site that covers approximately 12 acres and generates approximately 4.9 million kWh per year, removing 2,100 MTCO₂e. Conversion of the 24 additional acres available on the capped landfill will allow installation of a 10.5MW capacity array, potentially doubling the environmental benefits and cost savings. A new leachate collection and conveyance system would also be installed, including a 12-well dewatering system in the waste mass and 18,000 linear foot (LF) conveyance pipeline from the landfill directly to the nearest point in the municipal sewer collection system. The pipeline would eliminate the need for daily leachate hauling, reducing the associated GHG emissions by approximately 31 MTCO₂e annually.

- Job Creation/Workforce Development Potential: The construction of the landfill cap and installation of renewable energy generation equipment will provide opportunities for green workforce development.
- Alignment with Monroe County CAP: This project directly addresses or supports the following Phase I Government Operations actions:
 - Cap Gloria Drive inactive landfill to prevent fugitive methane emissions and consider methane recovery options.
 - Install additional solar photovoltaic (PV) system(s).
 - Increase the proportion of renewable energy used in County government buildings.
 - Complete renewable energy feasibility studies.

Strategic Importance

Existing inactive solid waste landfills can be a cumbersome environmental issue. Many landfills were municipally owned, and at the time of closure, may not have been subject to the stringent GHG emissions requirements that are necessary today, even if the locations were known and closure protocols were followed. Additionally, the costs associated with these requirements may not have been factored into the closure plans, so retrofits of inactive landfills to address fugitive methane emissions may not have been budgeted. Instead, landfill owners could be incentivized to reduce these emissions by being provided with an option to generate revenue from the production of renewable electricity via innovative PV technology integrated with a geosynthetic cover used for capping. This project would serve as a demonstration of the proposed technology for scaling to higher and lower levels.

Relation to Regional and New York State PCAPs:

This project fulfills several items addressed in the state and regional PCAPs. The New York State PCAP includes measure 3.8, "reduce fugitive methane and co-pollutant emissions from landfills" and the Genesee/Finger Lakes Regional PCAP (for the Rochester Metropolitan Statistical Area) includes Strategy #4: Develop a resilient energy portfolio through diversified sources and local generation, including measure C, installing solar on landfills.

The Northeast Quadrant (Gloria Drive) Renewable Energy Center would employ Buildings and Infrastructure Strategy #1: Advance the Decarbonization of Buildings and Infrastructure, including Measure A. Transition to air-source and ground source heat pumps and heat pump water heaters in residents and business and use for new and renovative development; and Measure B. Implement air-source heat pumps and geothermal energy networks for municipal buildings, and pilot net-zero buildings. Additionally, Buildings and Infrastructure Strategy #4: Develop a Resilient Energy Portfolio through Diversified Sources and Local Generation, with Measure C: Generate renewable energy, install solar on landfills.

3. Green Building Showcase at Monroe County Fleet Center

- Project Description: The Green Building Showcase will provide Monroe County with a net-zero-carbon demonstration facility to test building decarbonization technologies and serve as an

educational resource for the community. Examples of potential technologies include clean heating and cooling (e.g. sewer heat mining), renewable energy generation (e.g. zero-profile wind turbines, embedded photovoltaic building materials, solar array parking canopies), and electric vehicle charging (e.g. Level 4 DC ultra-fast charging). As the home of Monroe County's Sustainability and Environmental Quality Office (SEQO), the technologies installed at the Green Building Showcase facility would have to prove immediate viability, limiting solution proposals to only those that hold the highest potential for success. Experience with operating and maintaining these systems in a controlled setting will then provide the County with a high degree of confidence about technologies that can be scaled across other facilities. As an education center, the County will provide the public with an opportunity to explore the technology installations for consideration for deployment in the community.

- GHG Emissions Sectors impacted: Transportation, Electric Power Generation, Commercial & Residential Buildings, Waste and Materials Management
- How GHG Emissions will be reduced: Direct emissions reduction will come from replacement of fossil-fuel-based heating systems, and indirect emissions reduction will come from renewable energy generation, with the goal of becoming net-zero emissions from the building. Additional emissions reduction will follow from adoption of technologies tested at the Green Building Showcase. With the current annual energy usage of 44,821 kWh electricity and 1,397 therms of natural gas, it is anticipated that the NG usage would be eliminated with electrification and a pilot sewer heat mining (SHM) project that would serve as a model for potential future SHM expansion in other areas proximal to interceptor sewers. The direct emissions reduction of removing natural gas usage at Monroe County Fleet Building 1 would be 7.40 MTCO₂e avoided.

Assuming uptake of 5 SHM projects of a similar size or larger, this has the capacity to reduce GHG emissions from participating facilities in the community by eliminating their use of natural gas and implementation of SHM to run a heat pump, 212.52 MTCO₂e. We would also explore emerging alternative energy technology including low-profile wind and solar energy projects. This would serve the dual purpose of generating additional clean energy for the Fleet Center, as well as assisting in the education of community stakeholders for potential implementation in their own facilities to offset electric usage and become net zero buildings (including current electricity and the added electricity to run a heat pump), offsetting 35.1 MTCO₂e per building with alternative energy technologies showcased in this project.

- Job Creation/Workforce Development Potential: Partnerships with local colleges and research institutions will lead to opportunities for training in innovative technologies and/or processes. Once the technologies have been installed and commissioned, the Green Building Showcase can be used to train facility managers and maintenance personnel in how to operate such systems.
- Community Engagement: We would dedicate resources to public outreach and engagement which would include educating the public on the lessons learned from technologies showcased in this project, including sewer heat mining and various renewable energy technologies. There is potential to partner with existing educational campaigns, including the AMPED campaign which educates the public on building and fleet electrification technology.

- Alignment with Monroe County CAP: This project directly addresses or supports the following Phase I Government Operations actions:
 - Institute procedures and/or training to encourage facility managers and municipal employees to improve heating, cooling and lighting use efficiency.
 - Install additional solar photovoltaic (PV) system(s).
 - Install/update building energy management systems for lighting and HVAC equipment.
 - Require new County buildings to be net zero carbon emissions.
 - Increase the proportion of renewable energy used in County government buildings.
 - Assess feasibility of small wind turbine system(s) for County-owned properties.
 - Complete renewable energy feasibility studies.
 - Install geothermal heating and cooling system(s).
 - Install alternative energy technology (e.g. battery storage, hydrogen fuel cell emergency generation) on County property.
 - Create plan for upgrading HVAC equipment based on building inventory, maintenance schedule, and planned improvements.
 - Deploy solar Electric Vehicle Supply Equipment (EVSE).
 - Install additional Level 2 (AC) and Level 3 (DC) EV charging stations to support fleet operations.

Strategic Importance

During discussions with community members during the development of Monroe County's Climate Action Plan, a common obstacle to adopting solutions designed to reduce GHG emissions was reported as unfamiliarity with the technology and the costs associated with operating them. Government can play a leading role in identifying and addressing issues associated with early-stage innovations and then distributing that knowledge to community members, thus reducing or nullifying their risks associated with potential investment. Monroe County has performed this function effectively by early adoption of battery EV passenger vehicles in our fleet; our experience with procurement, operation, and maintenance has been used in public education campaigns targeting commercial and institutional fleet operators. The Green Building Showcase will expand our leadership capacity into the building energy conservation and generation space.

Relation to Regional PCAPs:

The Green Building Showcase would employ a variety of the Buildings and Infrastructure Strategies and Measures from the Genesee/Finger Lakes Regional PCAP. Strategy #1: Advance the decarbonization of buildings and infrastructure - including measures A. Transition to air-source and ground source heat pumps and heat pump water heaters in residents and business and use for new and renovative development; and B. Implement air-source heat pumps and geothermal energy networks for municipal buildings, and pilot net-zero buildings. The project would directly address these measures at the Monroe County Fleet Center, but also serve as a model for other county and non-county owned municipal buildings, as well as private sector buildings that may wish to replicate the work demonstrated at the Green Building Showcase. The project would also address Strategy 1, measure F. Expanding the purchase of renewable electricity and installing renewable energy at municipal facilities.

Overall Proposal Climate Justice Elements

Sustainable Community Fund would aim to allocate 35-40% of funding to areas identified by EPA Climate and Economic Justice Screening Tool (CEJST) and/or Disadvantaged Communities (DACs) as defined by the New York State Climate Justice Working Group in the New York State Climate Leadership and Community Protection Act.

Workforce Development aspects of the Sustainable Community Fund projects can offer opportunities to residents of DACs and organizations serving DACs. This would include low-income DACs in both rural and urban areas of Monroe County.

Lowering barriers to EV access through Sustainable Community Fund programs targeting low income/disadvantaged communities would improve the equity of the electrification of our transportation infrastructure.

The Northeast Quadrant (Gloria Drive) Renewable Energy Center project would also facilitate the expansion of workforce development through green jobs with both the implementation of the landfill cap and the installation of the 10.5MW solar landfill cap technology.

The Green Building Showcase would enable greater learning opportunities, with prioritization of engaging DAC residents in workforce development and job training programs specifically toward emerging green technology implementation.