Ulster County 2021 Climate Smart Communities Recertification Documentation

PE2 Action: Government Operations GHG Inventory

Background:

Ulster County completed its first GHG inventory in 2012. In 2018, it updated the inventory for inclusion in the County's 2019 Government Operations Climate Action plan.

Documentation:

- 2018 GHG Inventory, Ulster County Government Operations Climate Action Plan:
  - Section III, pages 33-38
  - Appendix A, pages 78-86

GOVERNMENT OPERATIONS
Climate Action Plan

ULSTER COUNTY, NEW YORK

EXECUTIVE ORDER NO. 1-2019

GOVERNMENT OPERATIONS

Climate Action Plan

ULSTER COUNTY, NEW YORK

EXECUTIVE ORDER NO. 1-2019

The lesson which life constantly repeats
is to 'look under your feet.'

You are always nearer to the divine and
the true sources of your power than you think.

The lure of the distant and the difficult
is deceptive.

The great opportunity is where you are.

Do not despise your own place and hour.
Every place is under the stars.

Every place is the center of the world.

— JOHN BURROUGHS

Message from the Ulster County Executive Patrick K. Ryan

Ulster County is a truly remarkable place. From the wilderness of the highest Catskill peak, to the Hudson River shore and from the cliffs of the Shawangunk ridge to our farm lands and valleys, it is not hard to see why generations have been drawn to this landscape for recreation as well as inspiration. However, there is a hard truth we must all face. The impacts of carbon pollution and global climate change are not just distant problems, their impacts are already being felt right here and now. For example, changes in temperature and storm frequency are impacting our homes, livelihoods and our natural communities. Given what we know, we must wonder whether future generations will have the same opportunity to experience this jewel we call Ulster County.

In Ulster County we do our best to show others that we can do things differently in government. We can be leaders. We can change the course of government. And that change, hard as it may be, will not only benefit us, but will show the way for others in similar circumstances and benefit the future generations that call Ulster County home.

This document, the Climate Action Plan for Ulster County Government Operations, charts a new path for our operations. Implementing this plan will allow us to continue our net carbon neutral government operations and further meet energy conservation and generation goals, doing our very best to curb carbon pollution. However, implementing this plan also builds on a process that allows the county government to make systemic and integrated improvements to operations necessary to sustain lasting change. It is a roadmap to a goal as well as a process to create a culture that embraces change.

The environmental achievements of County government and the greater community are substantial. However, we need to do more to protect this precious place we call home and do our part to show others that the tough choices needed to address climate change are obtainable.

The quote from John Burroughs, opposite, one of our country's most famous naturalists and a long time Ulster County resident, truly bridges the generations. The "Seer of Slabsides," who found his inspiration and solace in the woods of Ulster County, reminds us that real change starts with us—that to solve even the biggest, most daunting challenges, we start at home. Climate change has been called the greatest challenge of our generation. Please help me in rising to this challenge, starting with the opportunity that is beneath our feet, in this home we call Ulster County.

ULSTER COUNTY EXECUTIVE

244 Fair St., P.O. Box 1800, Kingston, New York 12402
Telephone: 845-340-3800
Fax: 845-334-5724

PATRICK K. RYAN
County Executive

MARC RIDER
Deputy County Executive

EXECUTIVE ORDER NO. 1-2019

REGARDING THE COUNTY'S USE OF RENEWABLE ENERGY FOR THE YEARS 2019 AND 2020

WHEREAS, the County of Ulster has a clear governmental interest in protecting the environment and human health within the County and beyond; and

WHEREAS, overwhelming consensus exists among the world's leading climate scientists, the Intergovernmental Panel on Climate Change (IPCC), regarding the impacts of greenhouse gas emissions and carbon pollution including a rapid and unprecedented increase in atmospheric temperatures; and,

WHEREAS, it is in the best interest of the County to accelerate the reduction of carbon pollution by maximizing its usage of locally generated renewable energy, reinforcing its commitment to protect the environment and human health in Ulster County and beyond; and,

WHEREAS, pursuant to Section C-25(B) of the Ulster County Charter, the Ulster County Executive has the power and duty necessarily implied or incidental thereto to "supervise, direct and control the administration of all departments" of the County; and,

WHEREAS, starting in 2014, Ulster County has purchased 100% of its electricity from renewable energy sources; and,

WHEREAS, this environmental leadership, commitment to renewable energy and net carbon neutral government operations has been recognized by the NYS Department of Environmental Conservation and the United States Environmental Protection Agency; and,

WHEREAS, pursuant to Section C-74(B)(2) of the Ulster County Charter and Section A16-1(B)(2)(a) of the Ulster County Administrative Code, the Purchasing Director has the authority and the discretion to execute utility contracts.

NOW, THEREFORE, I, PATRICK K. RYAN, County Executive of the County of Ulster, in accordance with the aforementioned and in furtherance of my statutory duties, do hereby order and direct the following:

1. It shall be the responsibility of the Department of Purchasing, in close coordination with the Department of the Environment, to ensure that for the years of 2019 and 2020, 100% of the County's electricity is purchased directly from local renewable energy sources or by obtaining Green-e Energy certified Renewable Energy Certificates (RECs).

2. Ulster County shall endeavor to continue to operate a net carbon neutral government and furthermore decrease greenhouse gas emission associated with its operations (through conservation, efficiency, on-site/local renewable generation) by 25% by 2025 and 80% by 2050 using the County's 2012 greenhouse gas emission inventory as a baseline.

3. Ulster County shall endeavor to supply 100% of its annual building and fleet electricity usage from locally generated renewable energy sources by the year 2030.

4. It shall be the responsibility of the Department of Environment, in close coordination with the Departments of Purchasing, Planning and Public Works, to implement the June 2019 Climate Action Plan for county government operations to meet the County's carbon emission reduction goals, drive deployment of clean technology and improve climate resilience.

5. It shall be the responsibility of the Department of the Environment Coordinator to act as the Climate Smart Communities Coordinator for government operations.

6. Ulster County government shall support ways to decrease energy use, decrease greenhouse gas emissions and increase the use of green power across our community and sets a goal of decreasing community wide greenhouse gas emissions by 80% by 2050 (below 1990 levels) using the regional GHG emissions inventory as a baseline.

7. This Executive Order shall take effect immediately and shall remain in effect until otherwise superseded or revoked.

The County of Ulster

Patrick K. Ryan, County Executive

Dated: June 18, 2019
Kingston, New York

GOVERNMENT OPERATIONS
Climate Action Plan

TABLE OF CONTENTS

IV

Implementation Roadmap 39

V

Next Steps: Amplifying and Expanding County Climate Action 71

APPENDICES

LIST OF FIGURES

LIST OF TABLES

Acknowledgements

The Ulster County Government Operations Climate Action Plan was prepared by the Ulster County Department of the Environment (UCDoE) from 2018–2019.

The UCDoE would like to thank all the County departments and staff who participated in the planning process and provided feedback on this plan including the Planning Department, Public Works Department, Purchasing Department, Ulster County Area Transit, Information Services Department, Office of the Ulster County Sheriff, Emergency Management, Health and Mental Health Department, Office of Economic Development and Office of Employment and Training.

Special thanks to all those that reviewed and submitted comments on the draft document including: the Ulster County Environmental Management Council, the Ulster County Climate Smart Committee, Hudson Valley Regional Council Clean Energy Communities staff, Climate Action Associates staff, and NYS DEC Office of Climate Change staff. Fabia Wargin Design provided graphic design services.

Amanda LaValle, Mandy Wolfson, and Nick Hvozda of the Ulster County Department of the Environment.

Introduction

Municipal governments provide a wide variety of important and essential services, but in so doing, consume valuable resources including equipment, supplies, and energy. This use of resources on a daily basis comes at costs to both the environment and to taxpayers as it consumes financial assets as well as resulting in Greenhouse Gas (GHG) emissions. In 2018, Ulster County spent $3.12 million on utilities (fuel, electricity and heating) and emitted 9,238 metric tons of greenhouse gases (CO2e).

The scientific consensus is clear and unwavering. The burning of fossil fuel has increased atmospheric greenhouse gas levels and is the leading driver of climate change. This document, a Climate Action Plan (CAP) for Ulster County government operations, focuses on the reduction of greenhouse gas emissions due to government operation. It also prioritizes actions which save tax payer dollars and meet multiple needs and objectives within County government.

Ulster County government has made substantial achievements in environmental sustainability and climate action, including operating a net carbon neutral county government operation. However, within Ulster County Government we believe there is a role for this plan in both strengthening and focusing our efforts to achieve measurable reductions in the energy use and emissions associated with our operation.

In addition, this Climate Action Plan sets a clear path forward to meeting the directives of the County Executive and County Legislature to reduce greenhouse gas (GHG) emissions associated with operations by 25% by 2025, purchasing 100% renewable energy for government operations, and operating a carbon neutral government operation. It is important to note though that offsets are not counted as actual reductions in emissions, or as progress toward GHG reduction goals. The GHG accounting in this inventory report assumes the absence of all offsets.

Background

Ulster County is a mid-sized New York county with a population of 180,000 located in the mid-Hudson Valley. The County enjoys a diverse landscape with remarkable natural features including over forty miles of Hudson River shoreline, the Shawangunk Ridge, and the Catskill Mountains. These natural resources have significance far beyond the borders of Ulster County. Ulster hosts two City of New York water supply reservoirs as well as significant acreage in both the City of New York Water Supply Watershed and the Catskill Park. Contained within this 1,161 square miles are globally significant forest habitats in the Shawangunk Ridge and the Catskill Forest, which are home to numerous rare, threatened and endangered species, hundreds of miles of mountain streams, the Hudson River Estuary, as well as regionally significant agricultural and recreational resources.

Ulster County government employs approximately 1,200 full-time staff and manages an operating budget of approximately $330 million. Ulster County is located in the Cold Climate Zone as defined by the US Department of Energy and in International Energy Conservation Code (IECC) Climate Zone 6. From 2012 to 2018, Ulster County had an average of 5,699 heating degree days (HDD) and 842 cooling degree days (CDD) annually. Like other municipal governments, Ulster County provides a diverse range of services to the community, including road and bridge maintenance, social services, law enforcement,

and public health services. The majority of government functions are funded through property tax and other tax dollars.

Plan Focus

This plan focuses directly on Ulster County government operations in order to identify ways to reduce energy consumption, increase renewable energy generation, and offset any impacts of the remaining fossil fuel combustion. This plan focuses solely on reducing GHG emissions attributed to Ulster County government operations. The focus areas and actions contained within are targeted primarily toward reducing Scope 1 (Direct) and Scope 2 (Indirect) emissions (Figure 1). However, measures that quantify and reduce Scope 3 emissions, such as employee commutes, are also included.

The most immediate goal, as reiterated in Executive Order 1 of 2019, is to reduce GHG emission by 25% (of our baseline) by 2025. This CAP includes a list of actions which will enable us to meet and exceed this goal. Also included in this CAP is some analysis of reductions necessary to meet the 2050 goal of reducing GHG associated with operations by 80%.

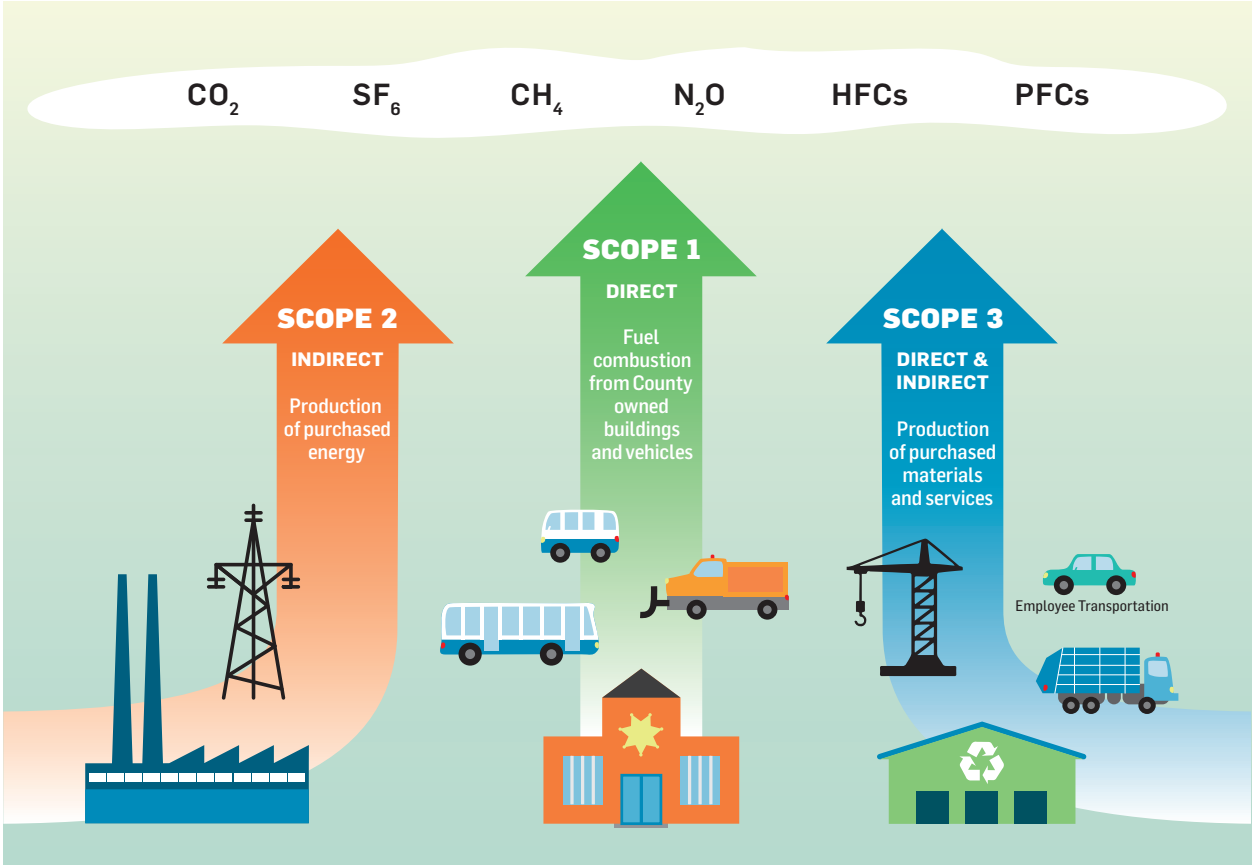


Figure 1. Operational Boundaries of GHG Emissions (World Resources Institute)

Planning to both mitigate and adapt to the impacts of climate change is critical; actions to mitigate and adapt to the likely impacts of climate change will be addressed starting in 2020 through the Ulster County Climate Change Adaptation & Resiliency Planning Project, which will yield a climate change vulnerability and resilience plan (see Section VI for additional discussion). As such, climate change adaptation strategies and actions are not included in this plan.

The emphasis of this plan on efficiency of use and conservation of energy for county government operations can reduce energy expenses and increase efficiency of operations, allowing money and staff time to be directed to other important efforts. It can also result in improved comfort for employees and improved local air quality which has public health benefits. In addition, Ulster County has been successful to date in leveraging utility programs, grant funds and other opportunities to implement energy conservation measures. This plan will further allow Ulster County to continue to take advantage of these unique opportunities as they become available.

Although the recommendations of this plan are generally framed in terms of GHG emissions reductions, there are multiple benefits of implementing this plan to the County, taxpayers and the greater public.

Plan Framework

This plan consists of four main components (Figure 2). Each component represents a distinct body of work or programmatic element portions of which have already been completed or are currently being undertaken. Together these components form a comprehensive summary of our past actions, our strategy for moving forward, as well as a list of projects which will directly lead to a quantifiable reduction in GHG emissions.

The first component is the Environmental Leadership & Ulster County Sustainability Guide which documents our progress and achievements. Ulster County has been recognized for its innovative approach to environmental action. This guide provides information and documentation on both how we have gone about this significant body of work and what has been accomplished. Certain actions that are the most relevant to this CAP are highlighted in the body of this report. The "Sustainability Guide" which includes a comprehensive compendium of actions is included as a link in Appendix D.

The second component of this Climate Action Plan is the Ulster County Carbon Neutral Operations Strategy. This strategy serves as both a framework for decision making as well as a guide for net carbon neutral operations. It is based in the principles of building science and engineering yet provides an approachable, understandable and consistent way to approach climate action measures. This section details the framework and provides further information on how Ulster County achieves net carbon neutral operations.

Ulster County Climate Action Plan Framework

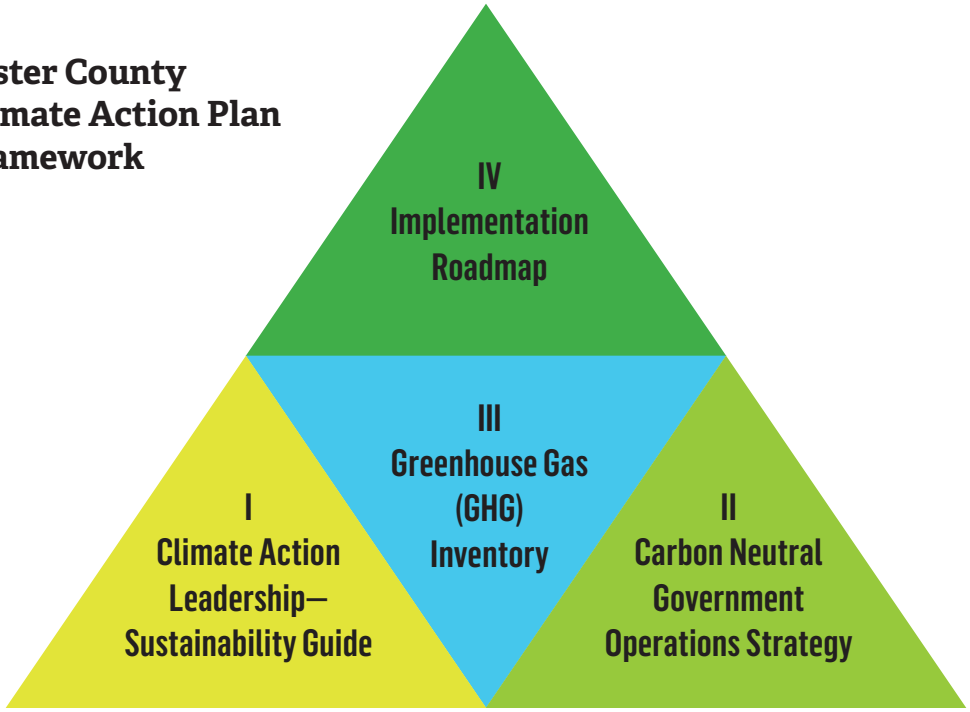


Figure 2.

The third component is the Greenhouse Gas Inventory. It is essential that any plan or action includes a comprehensive analysis of energy use by the County's operations. The County currently produces annual reports on both building and fleet vehicle energy use. These reports inform the GHG Inventory which is the baseline for our quantification of reduction and helps us to better understand the energy intensive and GHG intensive portions of our operation and evaluate GHG reduction actions.

The fourth and final component is the detailed list of potential projects which reduce energy use and increase the use of renewable energy. This section, the Implementation Roadmap, focuses on the major sectors of energy use within County government operations. The Carbon Neutral Operations Strategy is applied as the framework for identifying and prioritizing action.

Plan Development

This plan was developed in response to Executive Order (EO) No. 2-2018 Regarding the County's Use of Renewable Energy which states the following:

> *It shall be the responsibility of the Department of the Environment, in close coordination with the Departments of Purchasing, Planning and Public Works, to develop and implement a Climate Action Plan for county government operations to further reduce the County's carbon footprint and to maximize its use of sustainable and renewable energy sources for its energy needs.*

The Department of the Environment met with relevant County departments to discuss opportunities for climate action initiatives throughout 2018. Since the scope of the plan is County Government operations, the coordination focused on the operational departments. These departments included: Planning Department, Purchasing Department, Department of Public Works, Office of the Ulster County Sheriff, Emergency Management, Health and Mental Health Department, Area Transit, Employment and Training and Information Services.

The meetings with departments played an important role in vetting potential actions items as well as providing operational context, information on capital planning initiatives, and various related planning initiatives.

Public outreach and comment on this plan

The plan was released for public comment in the early spring of 2019. Since the plan is focused on Ulster County government operations, public review and participation in this plan was completed through outreach and discussion with two specific groups:

1) Ulster County Environmental Management Council (UC EMC): the EMC is composed of representatives from municipal level conservation advisory councils, environmental commissions and environmental boards. The EMC also has an equal number of at-large members from Ulster County. The Ulster County EMC's mission is "to review and advise the county and local governments on present and proposed methods of using, protecting and conserving the environment for the benefit of all the people."

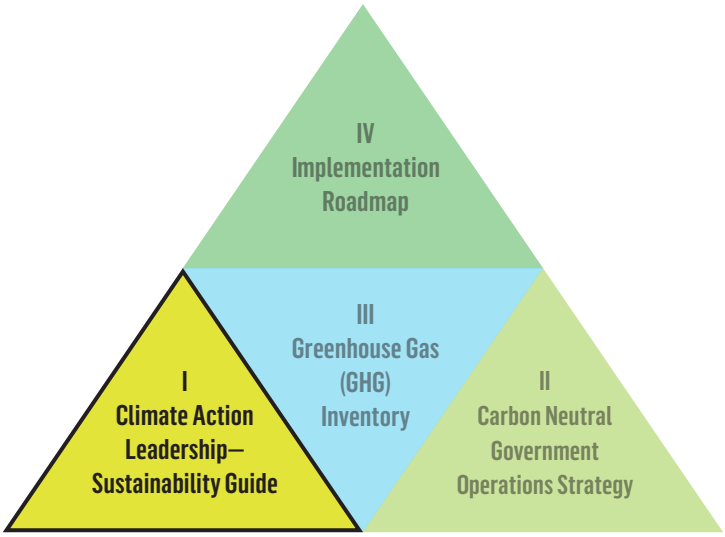
2) Climate Smart Committee: The Climate Smart Committee is a volunteer task force that promotes and supports climate action, mitigation and adaptation in the community. The Committee is designed to act as an advisory board or steering committee that advises and collaborates with the local government to accomplish plans, programs, and activities that are part of the Climate Smart Communities certification program. The task force consists of community members and municipal representatives.

Both the UC EMC and the Ulster County Climate Smart Committee serve as important conduits to environmental action at the municipal level in Ulster County. They are a way of discussing best practices as well as further interacting with local efforts in which this plan can bolster and catalyze ongoing local effort. Valuable comments were received from both groups and changes were incorporated into the final document.

Several public presentations about the draft plan were made: one to the regional Climate Action Planning Institute and one to a public information forum at Lifebridge Sanctuary. In addition, technical review comments were also received from NYS DEC Office of Climate Change staff, Hudson Valley Regional Council Clean Energy Communities staff, and Climate Action Associates.

Climate Action Leadership and Sustainability Guide

The Hudson Valley and the Catskills have long been revered for their inspiring beauty and natural resources and the area is often considered the birthplace of the modern environmental movement. Ulster County in particular has a long-standing history of environmental action and a deeply rooted environmental ethos. It is not a surprise that municipal and county governments have also taken on this commitment to environmental sustainability in earnest.

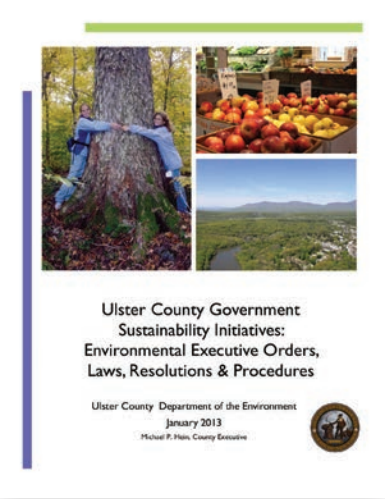


The efforts of Ulster County Government to reduce GHG emissions and operate a carbon neutral government demonstrate a comprehensive examination of sustainability across our operation. The implementation demonstrates remarkable innovation in local government.

In 2008, the Ulster County Legislature passed an Energy Policy pertaining to county government operations. In 2010, a comprehensive ASHRAE Level 3 energy audit of County facilities was performed. Then in 2012, a GHG Inventory of government operations was completed. The combination of these documents served as an initial climate action plan for significant energy efficiency and renewable energy deployment at County facilities. Since 2008, the Department of the Environment has been successful in securing over $2.8 million dollars in federal, state and utility company sponsored program funding to implement those projects and initiatives.

The Ulster County Sustainability Guide

In 2013, the Ulster County Department of the Environment produced the *Ulster County Sustainability Guide.* The guide compiled a diverse set of policies, procedures, local laws and legislative resolutions addressing sustainability and environmental actions. This guide was meant to not only document the current initiatives and resolutions but also to provide an easy to use reference for other municipalities as they evaluate their sustainability and climate action initiatives. This guide has been updated to include actions through June of 2019 and is provided as a link in Appendix D to this Climate Action Plan.



UC Department of the Environment

Another critically important element of climate action initiatives in Ulster County is a thorough consideration of how to plan for and implement environmental initiatives

in County government. When the complex and interconnected nature of environmental issues like climate change are considered, it's not a surprise that attempting to manage and address environmental issues at a County level often requires the action of multiple departments that draw on many different types of expertise. Local environmental issues regularly cross traditional County department boundaries. From a County government perspective, the challenge then becomes: how do we effectively and efficiently integrate departments and individuals to address complex environmental issues?

The Ulster County Department of the Environment

The Ulster County Department of the Environment was created by Local Law # 17 of 2007, and with its creation, Ulster County embarked on an innovative way to meet the challenges of our modern environmental problems. The Department is responsible for coordinating programs and activities related to the environment across various County departments and agencies. The Department of the Environment is responsible for working with all the involved departments to increase efficiency and efficacy of projects with a variety of environmental implications. Department of the Environment responsibilities include supervising select environmental compliance responsibilities, providing a forum for various departments to share information on environmental projects, providing technical assistance to departments, and helping departments characterize and address existing enviromental needs. This helps the County to prevent duplication of services and ensures the County is balancing stewardship with financial accountability.

With this structural charge in mind, the Department of the Environment has historically been the convener for climate action related initiatives as well as for this Climate Action Plan. Executive Order 1–2016 directed the task of developing and implementing "a long term plan to further reduce the County's carbon footprint and to maximize its use of sustainable and renewable energy sources for its energy needs" to the Department of the Environment.

Current Climate Initiatives

Following is an abbreviated list of actions and initiatives which are directly pertinent to this climate action plan, its development and its implementation.

Community and Government Operations Greenhouse Gas Reduction Goals

Executive Order 1 of 2019 sets forth both government operation and community greenhouse reduction goals. The Ulster County Legislature, through Resolution 315 of 2019, affirmed this committment creating it as County policy. The stated goal for government operation is that:

> *Ulster County shall endeavor to operate a carbon neutral government and furthermore decrease greenhouse gas emissions associated with its operations (through conservation, efficiency, and on-site renewable generation) by 25% by 2025 and 80% by 2050 using the County's 2012 greenhouse gas emission inventory as a baseline.*

Ulster County Executive, Pat Ryan, signing Executive Order 1 of 2019.

EO 1 of 2019 also states that:

> *Ulster County government shall support ways to decrease energy use, decrease greenhouse gas emissions and increase the use of green power across our community and set a goal of decreasing community wide greenhouse gas emissions by 40% by 2030 and 80% by 2050 (below 1990 levels) using the regional GHG emission inventory as a baseline.*

NYS DEC Climate Smart Communities (CSC) Program—Certified Silver

Since its inception, the New York State Climate Smart Communities program has served as a guide for Ulster County's climate action initiatives. The Ulster County legislature passed Resolution Number 184 on August 16, 2011, adopting the Climate Smart Community pledge.

Ulster County has achieved Certified Silver status in the CSC program, a notable accomplishment. As of the drafting of this report there are 248 communities that have taken the Climate Smart Communities Pledge. Of those communities, only four have reached Silver, the highest certification level within the program. In addition to Ulster County, the City of Kingston has also achieved Silver certification status. Ulster County is the first County to have achieved Silver status.

The County was awarded two grants through the NYS DEC Climate Smart Communities

Grant Program. The first grant contract was for $261,000 for improvements to the UC Resource Recovery Agency organics recycling program including implementing a food waste diversion program at the UC Law Enforcement Center. The second grant agreement is funding the Ulster County Climate Change Resilience Planning effort which is underway.

The County continues to work towards implementing more of the identified actions in the CSC program and has used that program in part to guide actions identified and prioritized in the roadmap section of this Climate Action Plan.

NYSERDA Clean Energy Community Program

In 2016, the NYS Energy Research and Development Authority (NYSERDA) launched a new program to encourage municipalities in NYS to implement clean energy actions. The program required the completion of at least four "high impact" actions to qualify.

Ulster County was the first municipality in New York State to complete the program and received a $250,000 grant for energy efficiency improvement as a result. The Clean Energy Communities grant money was dedicated to improving the energy efficiency of the UC Law Enforcement Center, the building with the single largest energy consumption in the county's portfolio.

100% Renewable Power

Ulster County purchases 100% green power through onsite generation and the purchase of renewable energy certificates. The County started purchasing renewable energy at the 100% level in 2014 and has done so every year since. This has been at the direction of the County Executive in a series of Executive Orders and was recently adopted as Legislative policy. The most recent EO is found at the beginning of this plan, the prior EOs and new Legislative resolution are included in the Sustainability Guide for reference.

The United States Environmental Protection Agency (EPA) named Ulster County as one of the leaders in green power use and environmental sustainability, recently ranking the County as the 26th largest green power user on their "Top 30 Local Government" list, which represents the 30 largest green power users among local governments in the Nation. In addition, the County was recognized as a 2015 Green Power Purchasing leader by US EPA.

Ulster County Carbon Neutral Government Operations

Since 2015, Ulster County has purchased carbon offsets on the voluntary market to offset 100% of Scope 1 emissions as well as employee commutes (which are considered Scope 3 emissions) in addition to the Scope 2 emissions that are offset by the purchase of Renewable Energy Credits (RECs). The directive to operate a carbon neutral government is included in Executive Order 1 of 2019.

Large Scale Solar

In 2018, construction was completed at the closed former Town of Ulster landfill of a 1.9 mW solar installation. Through a power purchase agreement, Ulster County government is the single off-taker of the power produced by this installation and it provides locally generated, renewable energy for approximately 20% of the County's total electricity consumption. It will produce approximately 2.36 million kwh a year of electricity which is the electricity required to power approximately 291 homes for one year. The County worked closely with Ulster County Resource Recovery Agency as they own and maintain the closed landfill property. The County recently announced plans to pursue another large scale solar installation to double the County's local generation. This brownfield site is known as the Quarryville site and is currently under design.

Green Fleet Policy

The County developed a *Sustainable Green Fleet Policy*, enacted as local law, which requires: a comprehensive inventory of vehicles, fuel monitoring (including total fuel, average mpg, miles driven, vehicle function, estimated emission per mile),

Ulster County Solar Landfill Project

right-sizing and strategic deployment of more efficient and sustainable fuel vehicles. It further requires that 5% of the fleet will be Green Vehicles by 2020, and after 2020, 20% of new passenger vehicle purchases will be Green Vehicles. There is also required employee education on ecodriving techniques, and the policy stresses fuel conservation, fuel efficiency and the use of renewables.

Electric Vehicle Charging Station at the County Office Building Complex

As of September 2019, the County has deployed 17 plug-in hybrid vehicles and one all electric vehicle in the fleet. In addition, the County is expecting delivery of an additional three plug-in hybrid vehicles in 2019. The County exceeded the Green Fleet goal of 5% green vehicles in 2018, two years ahead of schedule.

EV Charging Station Network

Ulster County operates a network of 17 charging stations at County owned facilities. These stations are powered by 100% renewable energy and are available to Ulster County fleet vehicles as well as employees, residents and the general public. This is an excellent example of how a sustainability initiative can provide local and regional benefits beyond those to county government operations. In 2018, the County hosted 3,967 electric vehicle charging sessions of which 3,165 were public (non-fleet) vehicles. These sessions resulted in the avoided consumption of 1,129 gallons of gas. The use of electricity by fleet vehicles reduced County Scope 1 greenhouse gas emissions by 2.1 metric tons.

Biodiesel Use

Starting in 2015, Ulster County Area Transit (UCAT) public transit buses have used a 5% biodiesel blend (B5) when operationally feasible. In 2018, UCAT used the B5 blend in its diesel-fueled transit vehicles approximately 54% of the time, reducing GHG emissions (CO_2e) by 35.9 metric tons.

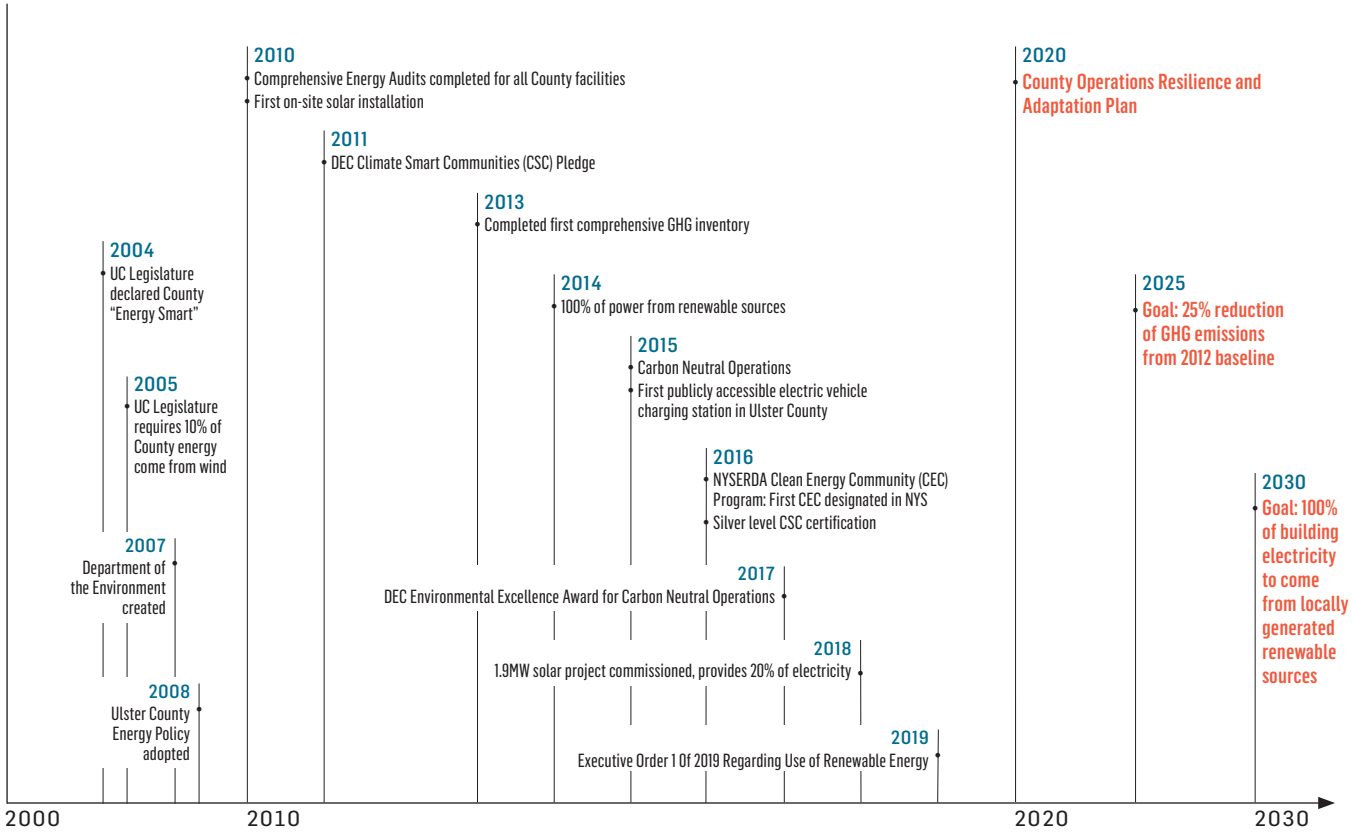
Building Benchmarking

Resolution No. 447 of 2016 established "a policy to require annual public reporting of building energy consumption and benchmarking information for County Owned buildings." Ulster County uses the EPA Portfolio Manager application

to benchmark its properties. The County Department of the Environment generates an annual benchmarking report which is made publicly available on the Department of the Environment's website.

Building Energy Efficiency Measures

In 2010, using NYSERDA and Federal Energy Efficiency and Conservation Block Grant funding, Ulster County completed ASHRAE Level 3 audits of the County building portfolio, approximately one million square feet of building space. Since that time, the UC Department of Public Works has been implementing the recommendations of the audit. In 2015, the County embarked on a major capital plan to complete a portion of the HVAC, lighting and building envelope improvements that were recommended in the 2010 audit. Resolution # 316 of 2015 committed $2.5 million to complete this work, which is still ongoing. Another example of building efficiency measures that have been implemented are extensive interior and exterior LED lighting upgrades. Ulster County has completed LED retrofits (over five thousand bulbs) at County facilities. These improvements reduce the County's annual electricity demand by approximately 2,000,000 kwh/year.

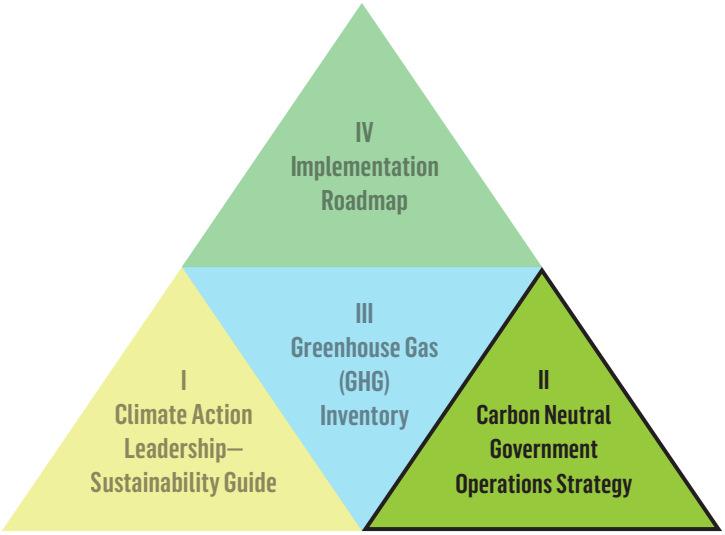


Ulster County's Climate Action Leadership Timeline

II

Carbon Neutral Government Operations Strategy

Ulster County has achieved a carbon neutral government operation through the purchase of carbon offsets in addition to generating renewable energy and purchasing renewable energy credits (RECs). Carbon offsets and RECs are one piece of our overarching strategy in which we commit to actual reductions in energy use and emissions to meet our goals. Over time, our goal is to reduce our energy demand, increase our use of locally generated renewable electricity, and lessen our reliance on carbon offsets and RECs.



Although more municipalities are sourcing their electricity from renewables, which is a significant achievement, purchasing renewable energy only offsets the electricity generation. It does not offset emissions associated with burning fuels for building heating or vehicle operation. The energy consumption and associated emissions from those operations can be significant. In 2018 Ulster County, electricity consumption contributed only 16% to our total emissions footprint; 84% of emissions resulted from the use of other fossil fuels. We are currently unaware of another New York municipality that offsets their emissions beyond those associated with electricity.

The results of the Carbon Neutral Operations Strategy are unique and have been recognized at the state and national level by the National Association of Counties, US Environmental Protection Agency, as well as the NYS Department of Environmental Conservation.

By design, the backbone of the strategy is a replicable method for examining energy use and carbon emissions at a municipal or organizational level. It also provides a prescriptive approach to reducing carbon emissions. The intent is that that by explicitly including this framework into decision making and communication, we not only ensure our best action, but enhance the organizational understanding of these concepts and their importance.

It is important to note that although Ulster County achieves a carbon neutral government operation through the purchase of offsets, we are simultaneously committed to achieving actual reductions in energy use and emissions to meet our goals.

The strategy is intended as a hierarchy of core principals, such as “don’t use more energy than necessary,” and “use energy efficiently if required.” Then, the strategy moves to the use of renewable energy (preferably as close to the demand source as possible). As a last step, it moves to using products such as Renewable Energy Credits (RECs) and Carbon Credits to mitigate the remaining unavoidable emissions. Throughout, use and progress must be monitored and evaluated. It is an explicit goal in the framework to reduce the need for RECs and Carbon Credits over time. The steps of avoid, conserve and generate are also critically important because beyond operating a carbon neutral government, it also remains a goal that the County will reduce emissions through conservation, efficiency, and local renewable generation.

The Ulster County Carbon Neutral Government Strategy

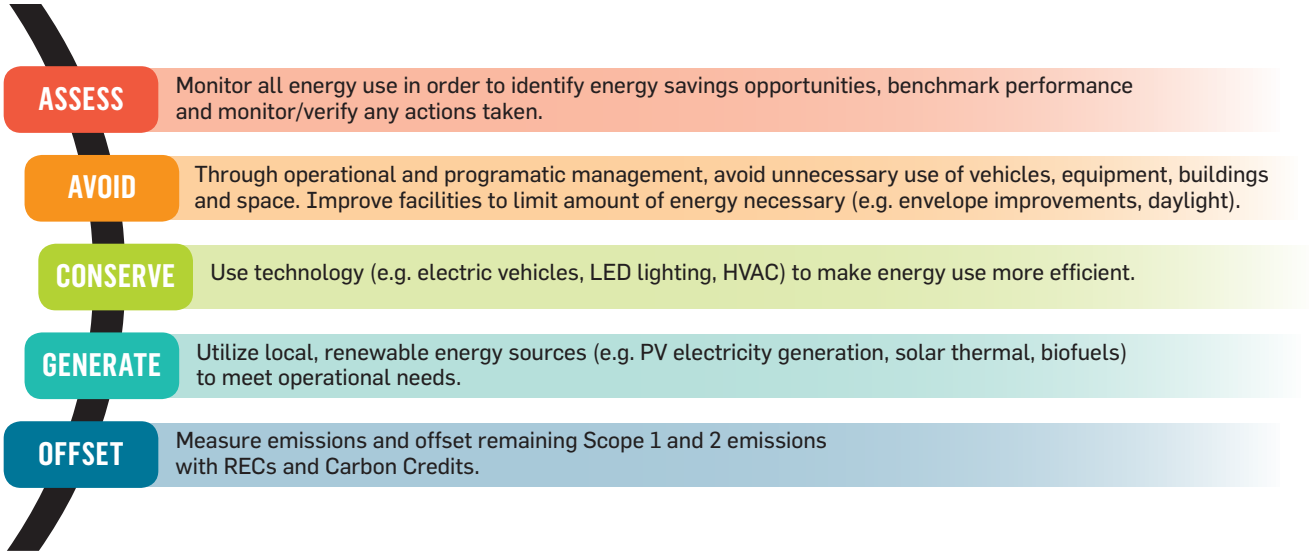


Figure 3. The Five Elements of the Strategy

This strategy is the articulation of fundamental concepts. This type of framework is not at all unfamiliar to building science professionals or to engineers. The elements in the strategy denote a basic progression which is essential in making sound decisions. However, in an often-complicated decision making environment, the County has chosen to make it explicit rather than an implicit framework in order to 1) underscore the importance of reducing energy use 2) demonstrate that any decision has been made within this greater context 3) keep focus on the operational tasks required to reduce the use of offsets to achieve carbon neutral operations.

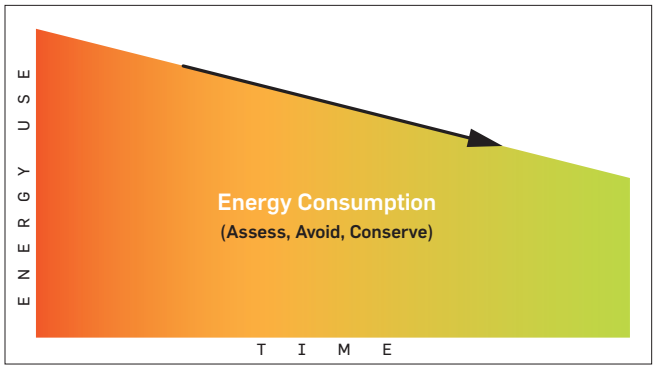
Assess

The backbone of any effort to reduce energy use or operate a carbon neutral operation is to actively monitor all energy use. The Ulster County Department of the Environment, along with the Department of Public Works, tracks and monitors the County's energy use and emissions including buildings and all vehicles. The resulting reports are summarized in Section III as the Ulster County Greenhouse Gas Inventory.

These assessment data are critical in that they help provide necessary information for energy audits. These data are also used by Ulster County to monitor the performance of energy efficiency improvement measures. The accounting is also required to quantify any renewable generation, as well as the offsets necessary to achieve zero carbon emissions. Data downloads and tracking can be automated through working with vendors or utility providers in certain situations.

Some of the additional benefits of assessment and monitoring include:

- Providing an audit function helping to uncover billing errors or inappropriate use;
- Showing spikes in usage related to malfunctioning or improper use of equipment;
- Providing the necessary baseline for energy audits and equipment studies;
- Providing the necessary baseline for GHG emission reduction efforts; and,
- Helping quantify longer term cost/benefit of potential energy savings measures.



Avoid

It is often said the most efficient use of energy is to not use it at all. Although this sounds simplistic, it is a critical first step and one that must be addressed.

The following examples describe ways the County can avoid energy use in accordance with this strategy:

- Consolidating operations to reduce the number of square feet necessary to conduct County business;
- Improving building envelopes to reduce the heating and cooling loads;
- Using building scheduling to ensure HVAC and lighting systems are not used when the building is unoccupied (e.g. temperature setbacks);
- Employing lighting sensors to shut off lights when not in use; and,
- Employing route-building software to help employees best consolidate and plan vehicle trips.

The benefits of "avoiding" expand to include the consolidation of operations which can reduce the cost of operation and maintenance. Reducing the energy demand of buildings often reduces the size and cost of any equipment (energy efficient or renewable) to be used. This can provide direct and indirect financial and energy saving benefits. Additionally, it can have ancillary benefits like added daylight and more airtight buildings which improve worker comfort and employee satisfaction.

The information on energy consumption and emissions has been used to support decisions regarding the County building stock and operations along with a facilities study which was conducted to determine which spaces were not being used efficiently. The County Legislature has supported efforts to reduce energy use by passing an energy policy as well as a requirement that new or renovated facilities meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED™) Silver standards.

To further reduce energy use, County employees are trained and reminded to practice sustainable behavior, and are growing more conscious of daily habits-like turning off lights, computers and other equipment when not in use—which can yield substantial energy savings. In addition, the County created an employee guide on sustainable driving behavior which includes a portion on anti-idling and route optimization. County employees are given financial incentives for taking public transit, and are encouraged to ride-share, bike or walk to work whenever possible.

Case Study: FLATBUSH ANNEX

The former City of Kingston Alms House located off of Flatbush Avenue was constructed between 1872 and 1874. Ulster County purchased and occupied the building starting in 1954. In 2014, the County began to consolidate operations, notably relocating the Health and Purchasing Departments from Flatbush Annex to office spaces in existing properties, reducing the need to maintain full-time operations at the property. The County completed the sale of the building in 2018. This consolidation of government operations has reduced County GHG emissions by approximately 125 metric tons per year—a 2.7% reduction from the 2012 baseline for the Buildings and Other Facilities sector. Additionally, the consolidation saves County taxpayers at least $60,000/year in avoided utility costs.

Conserve

Where energy use must take place, the next step is to evaluate whether energy efficient technologies or opportunities are being properly utilized to reduce energy consumption.

Examples of energy efficiency include:

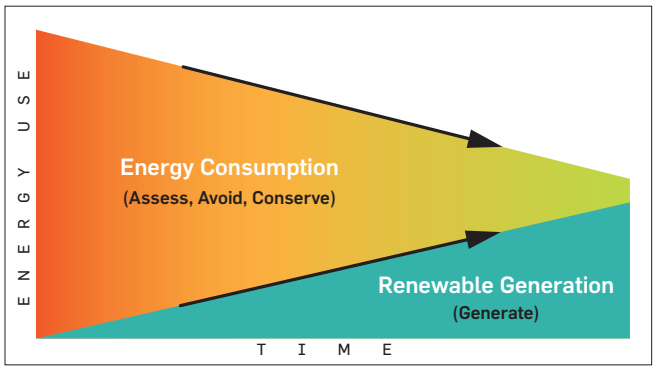
- Replacing fluorescent lighting with LED lamps
- Choose high efficiency HVAC equipment when making routine replacements

In 2010, a detailed investment grade energy audit of the County facilities was conducted. Since that time, the results have been continuously used to help determine energy-saving strategies. In addition, the County is currently in the process of producing "heating and cooling master plans" for both the UC Law Enforcement Center and the County Office Building, two of the larger energy users. These plans will provide a detailed path forward to decrease the energy consumption and increase reliance on renewable energy at these locations.

In addition, since 2014, the County has replaced light fixtures with LED lights at 16 facilities, with estimated savings of over 2 million kilowatt-hours per year of energy use—a yearly savings to Ulster County taxpayers of approximately $225,000.

The County continues to manage the fleet inventory to right-size vehicle purchases, use appropriate alternative and sustainable energy vehicles and reduce overall fuel consumption. All sedans purchased in 2019 will be hybrid plug-in electric vehicles. To support fleet operations, the County has installed 17 plug-in electric vehicle charging stations (a total of 34 plugs) throughout

the County. To date, this network has been available to employees and the public free of charge. Between when the first stations became operational in 2015 and the end of 2018, these stations have dispensed a total of 67 MWh of renewable electricity, avoiding approximately 17.5 metric tons of CO2e emissions.



Generate

While reducing energy demand to the lowest level feasible, the County intends to maximize the percentage of remaining energy use that comes from renewable sources. Renewable generation can significantly reduce emissions by reducing the need to purchase energy from fossil fuel derived sources. Increased local renewable generation also directly impacts the local electric grid through distributed generation, strengthening the local economy and workforce, and increasing resilience to fluctuations in energy markets. Generating renewable energy on site is the priority where possible. When not possible, purchasing renewable power from local sources is preferred and considered local generation for the purposes of this plan. However, Ulster County does not consider the purchase of RECs to be generation.

The Generate element includes energy from these sources:

- On-site generation of electricity (e.g. solar pv, wind or hydro behind the meter);
- Purchasing electricity from local Community Distributed Generation (CDG) sites;
- Purchasing electricity via a locally generated, third party (power purchase) ownership arrangement;
- Remote net metering from a County owned or County controlled site;
- On-site combustion of solid biomass, or biomass derived fuels; and,
- Mobile combustion of biomass derived fuels.

Currently, the County uses renewable energy from the following sources.

On-site solar PV In 2010, the County installed its first PV solar array at the Ulster County Salt Storage Facility in New Paltz. To date this installation has generated in excess of 270,000 kWh. In 2018, a 1.9 mW solar installation, through a power purchase agreement, came online at the closed Town of Ulster Landfill. This solar array generates enough renewable power each year to supply approximately 20% of the County's electricity needs.

Renewable biomass from biofuels
The County transit fleet uses a commercially-available biofuel blend whenever feasible.

Beneficial Electrification

Beneficial electrification is a term for substituting electricity for fossil fuel combustion in energy end-use applications. Since it is more feasible to use renewable energy sources to produce electricity, converting transportation for example to renewably produced electricity power is seen as an effective way to move beyond fossil fuels and decrease carbon emissions.

Emissions efficiency, which is defined as "service units provided per metric ton CO2e emissions created," is the most effective measure for Climate Action Plan conservation activities, as it compares the true climate cost of various technologies and energy sources with a common ratio. For buildings, the emissions metric is Btus of heat provided per MT CO2E or CO2e emitted by the heating system. For vehicles, the metric is miles traveled per MT CO2e emitted.

In most cases, electrification of services increases emissions efficiency. This is due to two trends:

1 **Lowering GHG emissions rates in the power sector:** State mandates such as the New York Clean Energy Standard (70% renewable by 2030) ensure that the proportion of zero emissions power in the utility provided mix will continue to increase. This trend allows electrified capital equipment which is purchased today to become more emissions efficient over its lifetime, which is not possible for conventional fossil fuel burning equipment.

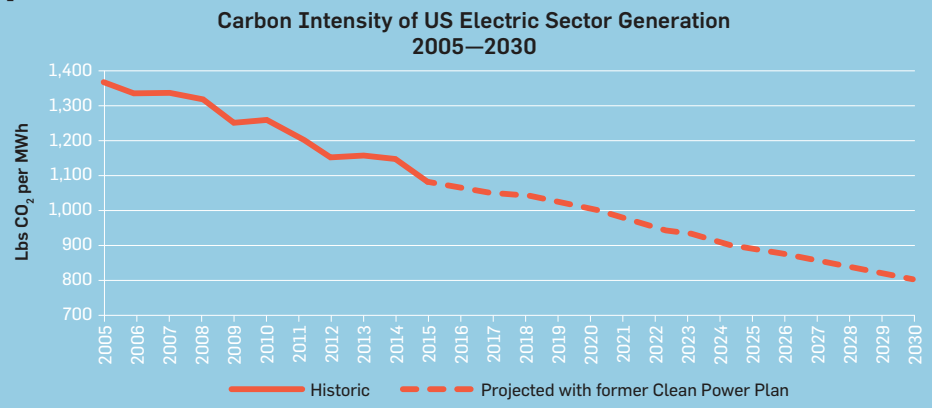


Figure 4. Carbon Intensity Trend [1]

2 **Increased efficiency of electric end use equipment:** Heat pumps and electric vehicles are more efficient at using energy to meet end-use needs. As technology improves, they will be able to provide services across a wider range of operating conditions.

At recent average County energy rates, replacing fossil fuel heating with heat pump technology would have the following impacts:

Fuel Replaced	Emissions Change	Cost Change
Electrify Natural Gas	77% decrease	3% increase
Electrify Fuel Oil	85% decrease	38% decrease
Electrify Propane	82% decrease	33% decrease

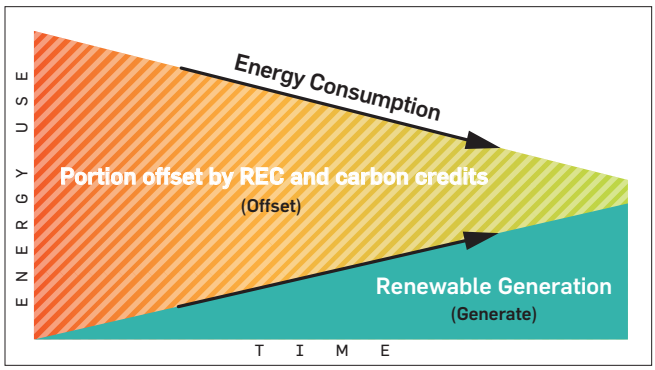
ASSUMPTIONS: *average electric coefficient of performance COP of 3.0, natural gas combustion efficiency 94%, Fuel oil combustion efficiency 83%, propane combustion efficiency 87%*

Implications and Barriers for Implementation:

- The County should expect electricity usage to increase over time in order to meet GHG reduction goals.
- Electric technology is currently feasible for small scale substitution (i.e. passenger vehicles, residential air source heat pumps) but is more difficult and costly to apply to larger applications such as commercial office buildings or snow plowing trucks.
- Electric HVAC systems have higher capital costs, but equipment will yield emission savings over lifetime.
- Electrification will increase loads on electric grid infrastructure.

1 https://www.sciencedirect.com/science/article/pii/S1040619016301075?via%3Dihub

Through the implementation of the Generate actions in this plan, the County will increase its capacity to generate energy onsite to supply its needs, and increase its usage of local renewable sources of energy.



Offset

Since renewable energy cannot be generated on site or locally for all government operations, renewable energy credits (RECs) and carbon credit offsets must be purchased to ensure carbon neutrality.

- **Renewable Energy Credits (RECs):** The County purchases certified renewable energy credits certified by the firm Green-e Energy to offset 100% of its grid supplied electricity use. Generally, these credits take the form of the renewable attributes created by wind power generation in the Midwest US. These credits offset only indirect (Scope 2) emissions.
- **Carbon Credits:** A large portion of County emissions are generated through direct (Scope 1) energy sources—specifically mobile combustion for the operation of fleet vehicles and stationary combustion for building heating. For these Scope 1 sources, the County purchases carbon credits to offset emissions. These offsets are verified by a third-party certification firm which reviews the projects to ensure they meet standards such as additionality.

Offsets, as the final element of the County Carbon Neutral Operations strategy, are less preferable means of carbon neutrality. The technology currently does not exist to accomplish the diverse array of services that the County must provide under the banner of one of the previous elements. For example, there is not a commercially available electric snow plow truck on the market today (nor a biodiesel product that functions in extreme cold temperatures). However, the intent of this Climate Action Plan is to continue to reduce the quantity of offsets that the County must purchase each year to maintain carbon neutrality.

The REC and Carbon Credit Market:

What are they?
How does one municipal purchaser help make a difference?

Organizations working to lower their emissions footprint have a variety of mitigation options at their disposal, including activities to reduce their direct emissions, activities to reduce indirect emissions like energy efficiency measures and switching to green power, and paying for external reductions. Knowing the differences between instruments like RECs and offsets is the first step to understanding their value.

RECs
RENEWABLE ENERGY CERTIFICATES

- Measured in megawatt hours (MWh)
- Convey use of renewable electricity generation; underlie renewable electricity use claims; and support renewable electricity development
- Can lower an organization's scope 2 emissions from purchased electricity
- Can claim to use renewable electricity from a low or zero emissions source
- Additionality tests not required.

COMMON TECHNOLOGIES

SOLAR | WIND | SMALL HYDRO | BIOMASS

CARBON OFFSETS

- Measured in metric tons of CO_2 or CO_2 equivalent
- Represent GHG emissions reductions; provide support for emissions reduction activities
- Reduce or "offset" an organization's scope 1 or 3 emissions, as a net adjustment
- Can claim to have reduced or avoided GHG emissions outside their organization's operations
- Additionality Test Required. Each project must ensure that it is beyond business as usual. Tests include legal/regulatory, financial, barriers, common practice and performance tests.

COMMON TECHNOLOGIES

LIVESTOCK BIOGAS | LANDFILL GAS | INDUSTRIAL GAS | SUSTAINABLE FORESTRY

Both offsets and RECs represent the environmental benefits of certain actions that can help mitigate GHG emissions. Offsets and RECs, however, are fundamentally different instruments with different impacts, representing different criteria for qualification and crediting in the context of inventory or emissions footprint.

Over time, the money spent to buy either carbon offsets or RECs is an important finance stream to many of these types of technologies and projects. The development of the carbon credit and offset markets have been critical in helping to expand and accelerate the steep decline in the cost of renewable energy and other carbon capturing technologies. Even small municipal purchases can collectively help to provide the revenue sources necessary to deploy this technology.

Adapted from US EPA Green Power Partnership. Offsets and RECs: What's the Difference

Future Action

The overall intent of the combined elements of the Carbon Neutral Operations Strategy, as depicted in the figures above is that, over time, the County's overall energy consumption will decrease (through *Avoid* and *Conserve* measures), the percentage of renewable energy will increase (through *Generate* measures), and the need to purchase RECs or Carbon Credits (*Offset* measures) will decrease while the County continues to operate a carbon neutral government. Over the life of this plan, the County will continue to improve the ability to track progress (through *Assess* measures) and ultimately mitigate emissions and increase operational reliance on locally produced renewable energy.

The cost of carbon credits, purchased to offset emissions does not represent what is known as the social cost of carbon. This value is the greater cost of carbon emissions to society and to the environment. As such, we believe it is important to continue to invest in reducing the carbon emission of our activities through this carbon neutral operations strategy. Quantifying the current costs of the Carbon Neutral Operations Strategy versus the true social cost of carbon is an important metric for examining how much we should be investing in green technology and applications.

It is important for the County to consider ways to actively research local carbon offset activities. This includes how the County manages forests, open fields, vacant parcels, or even right-of-way. There may be substantial opportunity to consider ways to further offset carbon emissions and promote sequestration of carbon through land management practices.

The Carbon Neutral Government Operations Strategy is used as the framework for planning and decision making. All actions in Section V of this plan, the implementation roadmap, are categorized and presented in terms of this strategy.

Table 1. Carbon Offsets and Social Cost of Carbon 2017–2018

Reporting Year	Carbon Offsets Retired (MT CO2e)	RECs Retired (MWH)	Actual Cost of Offsets (% of annual utility budget)	Social Cost of Carbon (% of annual utility budget)	Social Cost of Carbon
2018	7,775	10,892	0.5%	14.4%	$447,526
2017	7,338	11,914	0.4%	15.0%	$412,094

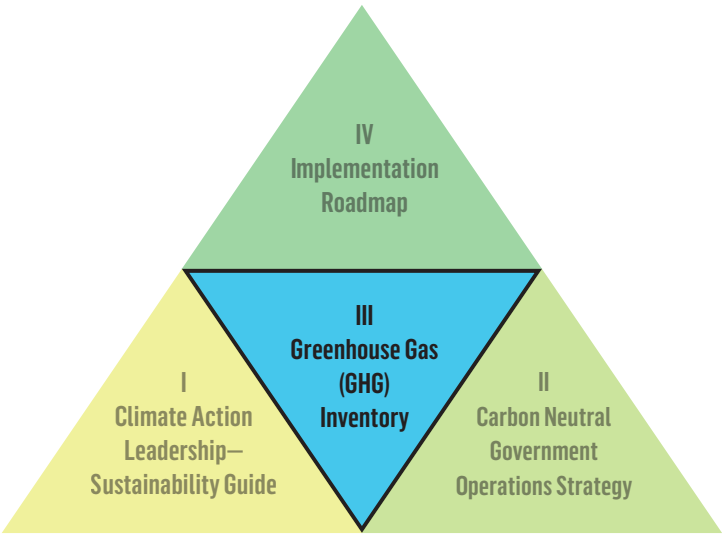
Notes:

- Table includes offsets for 100% of Scope 1 and 2 emissions only.
- Social Cost of Carbon values taken from the EPA's Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (May 2013, Revised July 2016)

III

Greenhouse Gas (GHG) Inventory for Local Government Operations

An accurate greenhouse gas (GHG) inventory is a critical component of a climate action plan. The inventory process sets a baseline year of GHG emissions using a scope and methodology that can be replicated in following years. This consistency in accounting allows the organization to measure and verify the effectiveness of GHG emissions reduction measures through time—with confidence that changes seen in emission levels are the result of government actions and are not due to changes in reporting methodology or organizational boundaries.



For Ulster County, the annual Greenhouse Gas (GHG) Inventory is a necessary tool for determining the quantity of offsets required each year to achieve net carbon neutral operations. These offsets are not counted as actual reductions in emissions or as progress toward GHG reduction goals. The GHG accounting in this inventory report assumes the absence of all offsets.

It is important to note that greenhouse gas inventories can differ substantially in scope and methods. They vary because of differences in the type of organization that is undergoing an inventory (e.g. a small municipality versus a state), they can vary due to the type of data that is available for conducting the inventory, and they can vary due to the goals of the inventory. However, in order for the inventory to be used for long term comparison and evaluation, the analysis methods must be consistent across time.

Data collection processes play an important role in achieving this consistency. The Ulster County Department of the Environment has improved its data collection methods through the preparation of two annual reports: the Green Fleet Policy Report and the Building Benchmarking Report. Both of these reports are mandated by legislative policy and provide the energy use information for annual updates to the County's GHG Inventory. The most recent versions of these reports can be viewed at the weblink provided in Appendix D.

Table 2. Distinction between GHG measures as applied toward reduction goals

Mitigation Type	Measure
Actual Reduction (counts toward operational goals)	Onsite generation (behind the meter) Local* Remote Net Metering Local Community Distributed Generation (CDG)
Offset (counts toward carbon neutral government initiative only)	Renewable energy credits (RECS), national origin Carbon credits, national origin

* Local is defined as generation physically within the same NY ISO load zone and utility territory as the utility meter being serviced by the load.

Progress towards Goals

In 2018, Ulster County government operations emitted 9,238 metric tons of CO2e.[1]
This is the equivalent to:

1,104
homes' energy use for one year

50.3
railcars' worth of coal burned

22,550,122
miles driven by an average passenger vehicle

Between the baseline year of 2012 and the most recent GHG inventory for 2018, Ulster County's actual emissions from government operations decreased by 2.4%.

Table 3. 2017–2018 Net Government Operations Carbon Emissions (MT CO2e) compared to Baseline

Category	2012	2017	2018
Total Government Activity Emissions	9,464	8,938	9,360
Local Generation (RNEM, CDG)	0	0	-122
Actual Government Emissions	9,464	8,938	9,238
Voluntary RECs	0	-1,600	-1,463
Carbon Credits	0	-7,338	-7,775
Net Government Operations Carbon Emissions	**9,464**	**0**	**0**

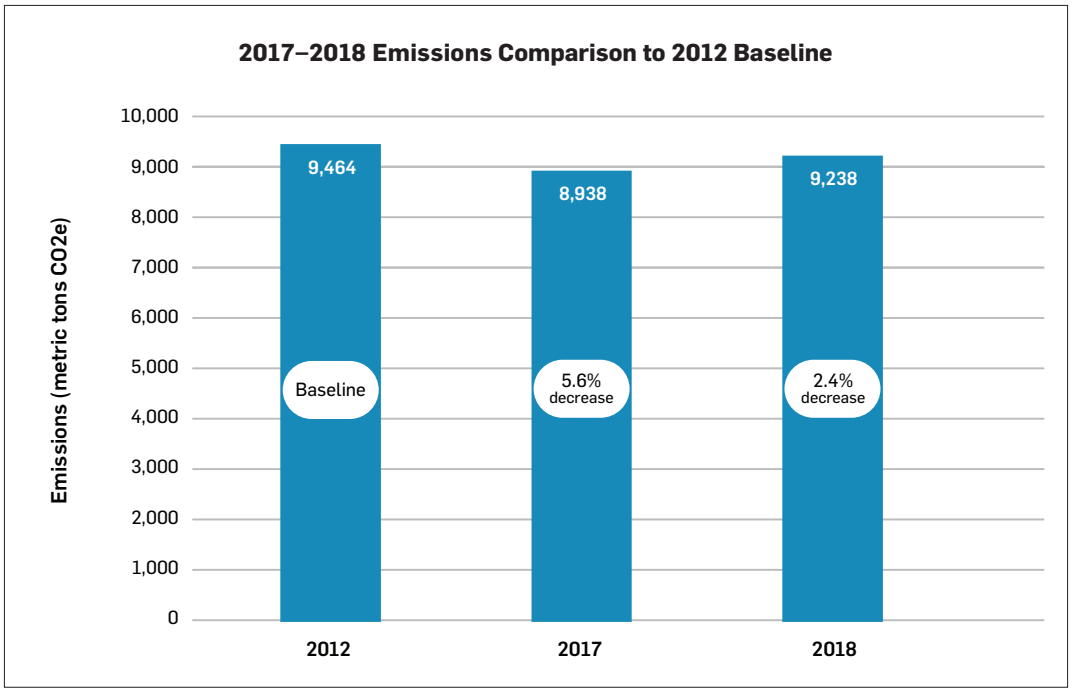


Figure 5.

1 Calculator available here: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

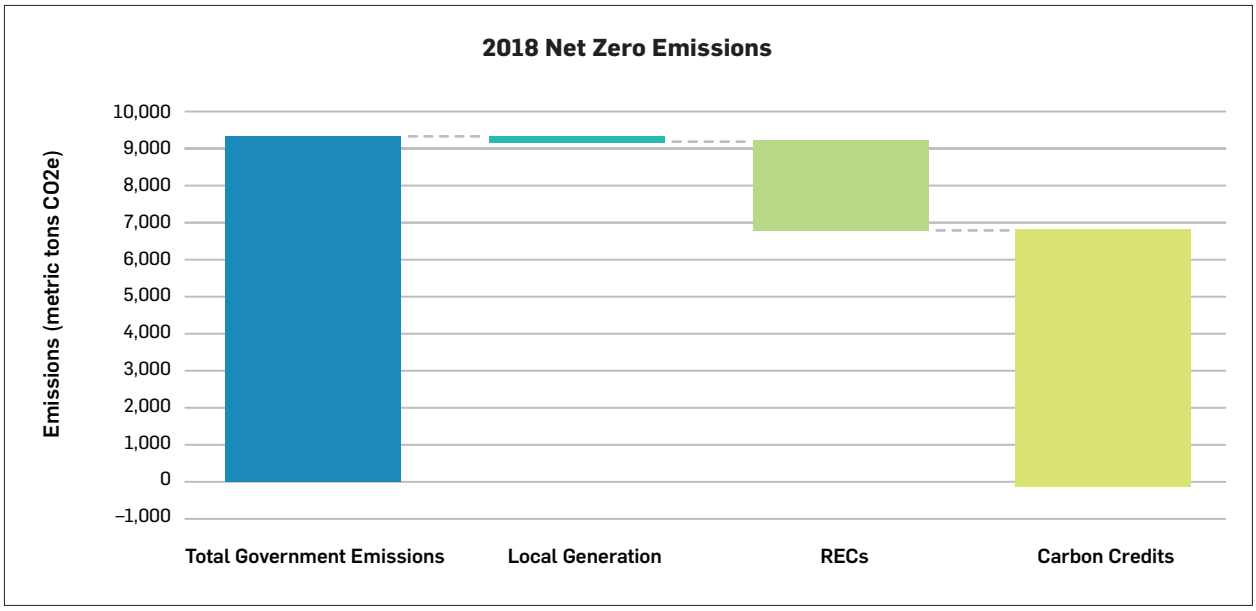


Figure 6. Activities yielding net zero emissions

The GHG emissions level each year is a function of numerous factors. Some factors are related to the quantity of services provided by the government and others are outside the control of the government, yet can impact the annual GHG emission levels significantly. The following external factors have contributed to the changes seen in emissions across sectors:

Table 4. External factors 2012 to 2018

Sector	Change in CO2e emissions 2012–2018	External Factors Influencing Sector Changes 2012–2018
Buildings and Other Facilities	–9.6%	• The electricity emissions factor decreased by 28% • The combined number of heating degree days and cooling degree days increased by 16%
Transit Fleet	–5.5%	• Added routes • Increase in number of gasoline vehicles in fleet
Vehicle Fleet	+9.9%	• The number of winter storm events increased by 100% • Flooding events increased by 50% • Wind events increased by 140% • Annual usage data dependent on fuel tank delivery schedules
Water Delivery	+30.7%	• Annual usage data dependent on fuel tank delivery schedules
Streetlights and Traffic Signals	–20.9%	• The electricity emissions factor decreased by 28%

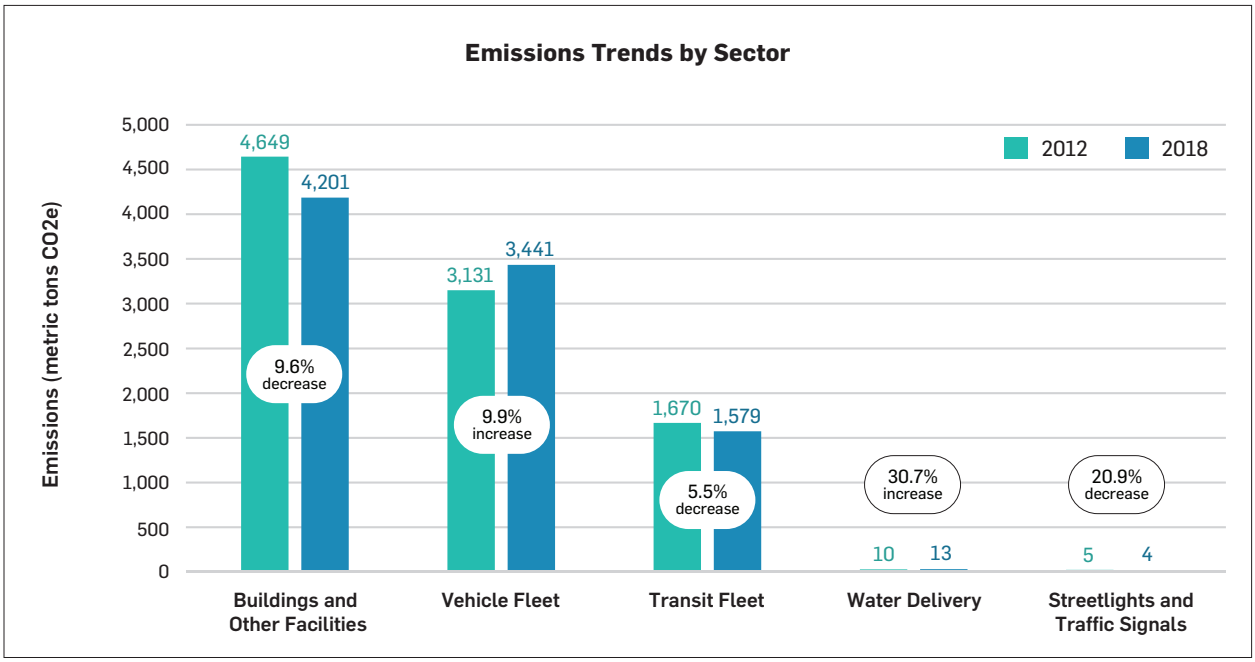


Figure 7.

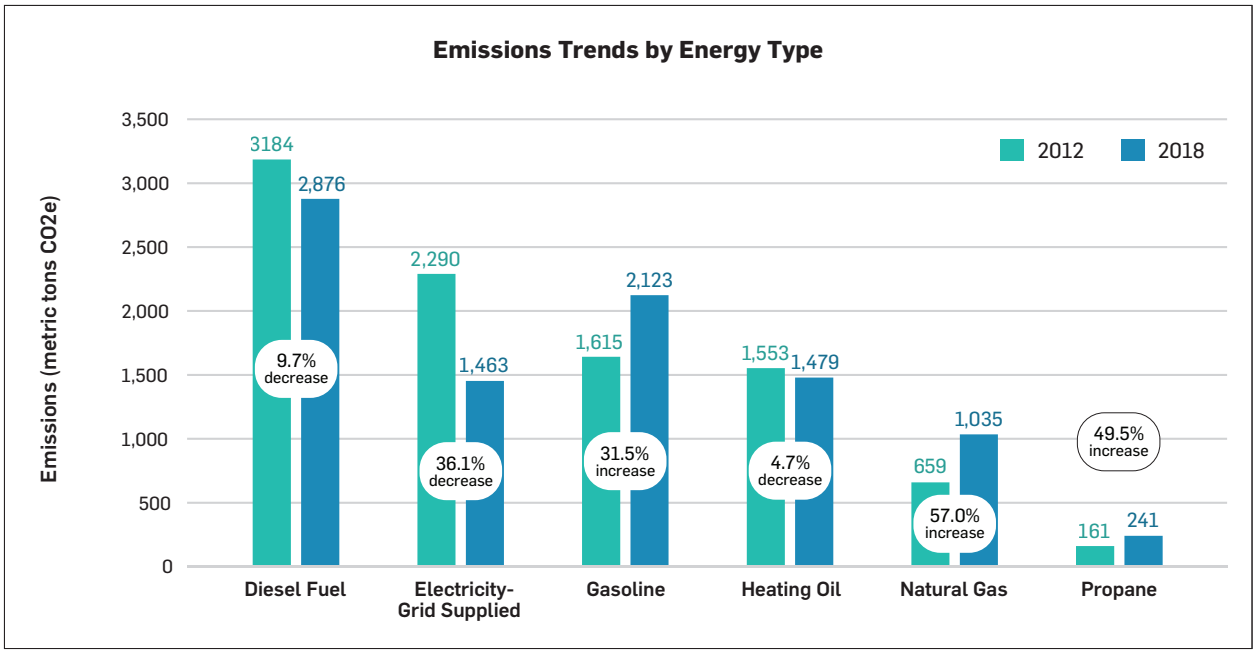


Figure 8.

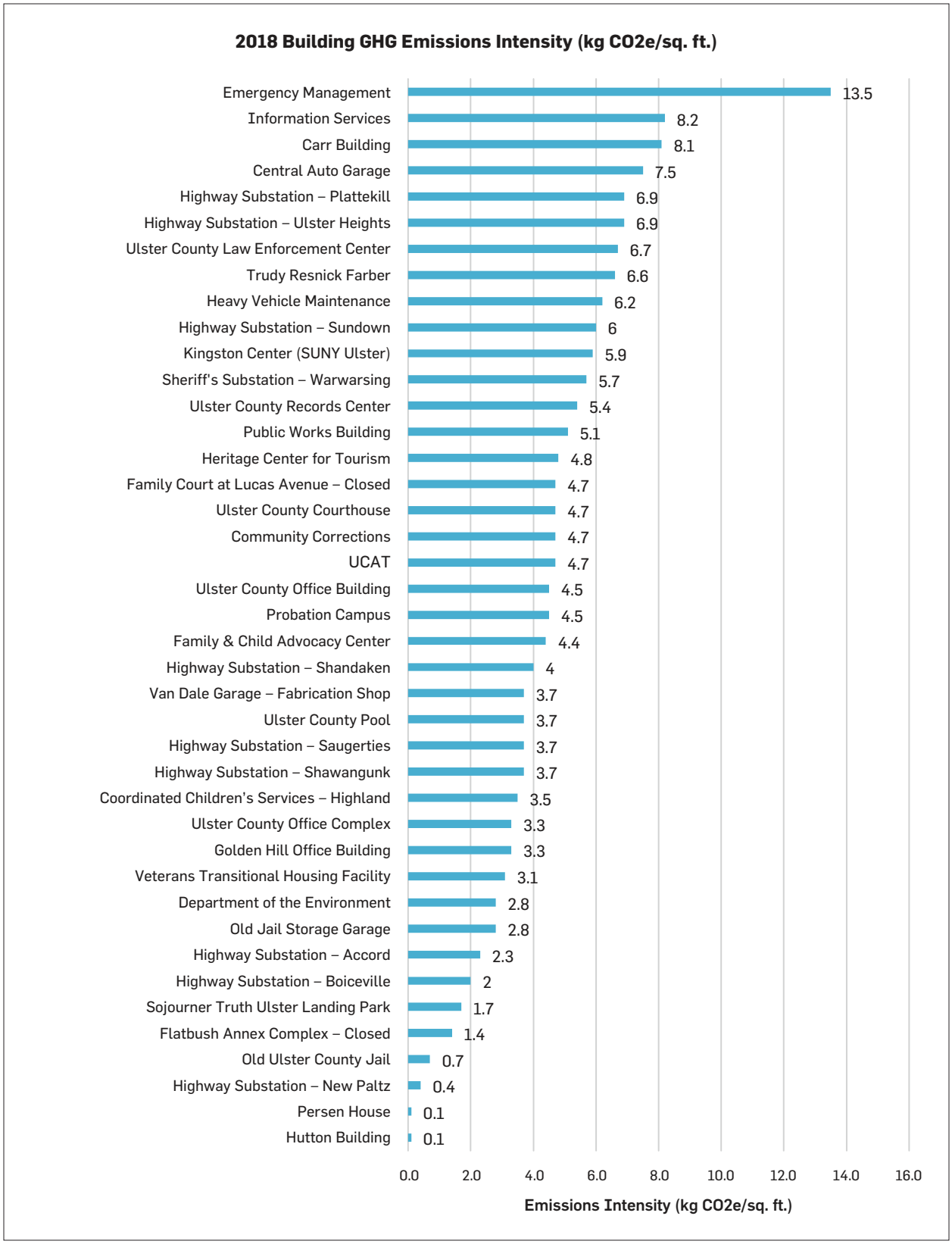
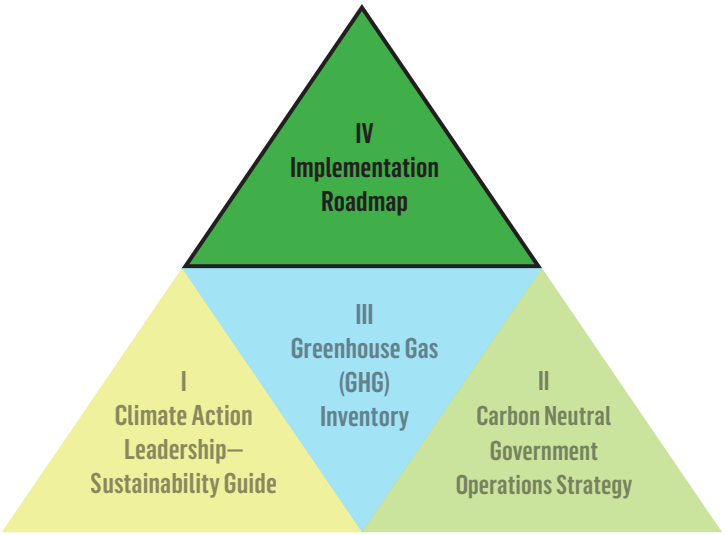

2018 Building GHG Emissions Intensity (kg CO2e/sq. ft.)
Emergency Management 13.5
Information Services 8.2
Carr Building 8.1
Central Auto Garage 7.5
Highway Substation – Plattekill 6.9
Highway Substation – Ulster Heights 6.9
Ulster County Law Enforcement Center 6.7
Trudy Resnick Farber 6.6
Heavy Vehicle Maintenance 6.2
Highway Substation – Sundown 6
Kingston Center (SUNY Ulster) 5.9
Sheriff's Substation – Warwarsing 5.7
Ulster County Records Center 5.4
Public Works Building 5.1
Heritage Center for Tourism 4.8
Family Court at Lucas Avenue – Closed 4.7
Ulster County Courthouse 4.7
Community Corrections 4.7
UCAT 4.7
Ulster County Office Building 4.5
Probation Campus 4.5
Family & Child Advocacy Center 4.4
Highway Substation – Shandaken 4
Van Dale Garage – Fabrication Shop 3.7
Ulster County Pool 3.7
Highway Substation – Saugerties 3.7
Highway Substation – Shawangunk 3.7
Coordinated Children's Services – Highland 3.5
Ulster County Office Complex 3.3
Golden Hill Office Building 3.3
Veterans Transitional Housing Facility 3.1
Department of the Environment 2.8
Old Jail Storage Garage 2.8
Highway Substation – Accord 2.3
Highway Substation – Boiceville 2
Sojourner Truth Ulster Landing Park 1.7
Flatbush Annex Complex – Closed 1.4
Old Ulster County Jail 0.7
Highway Substation – New Paltz 0.4
Persen House 0.1
Hutton Building 0.1
0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0
Emissions Intensity (kg CO2e/sq. ft.)

Figure 9.

IV

Implementation Roadmap

The final component of this Climate Action Plan for Government Operations is a comprehensive list of actions which could be taken to reduce GHG emissions due to our operations. This list was compiled after discussion with County staff and departments, reexamination of the 2010 comprehensive energy audits for Ulster County facilities, a review of current projects and initiatives, an examination of the Certification Manual for the NYS DEC Climate Smart Communities program as well as a review of other municipal climate action plans.



The roadmap is divided into the three primary sectors of activity identified in the GHG Inventory: buildings & other facilities, vehicle fleet, and the transit fleet. Two additional implementation areas were added to address actions that affect multiple GHG inventory reporting sectors. Consistent with the Ulster County Carbon Neutral Operations Strategy, the action items for each focus area are prioritized to ensure that efforts to reduce consumption are identified and implemented first.

GHG Emissions Operational Goals

For each primary reporting sector, this plan sets targets for reduction based on the 2018 GHG inventory update (operating period 2019–2025). By achieving these near-term targets, the County will achieve its 25% reduction in GHG emission by 2025 goal. The table below shows the target for each sector as well as the overall emissions reduction targeted in each sector by 2025.

Table 5. Emissions Reduction Targets

	GHG Emissions (MT CO2e)	GHG Emissions % change from 2012 baseline
2012 baseline	9,464	—
2017	8,938	5.6% reduction
2018	9,238	2.4% reduction
2025 goal	7,098	25% reduction
2050 goal	1,893	80% reduction

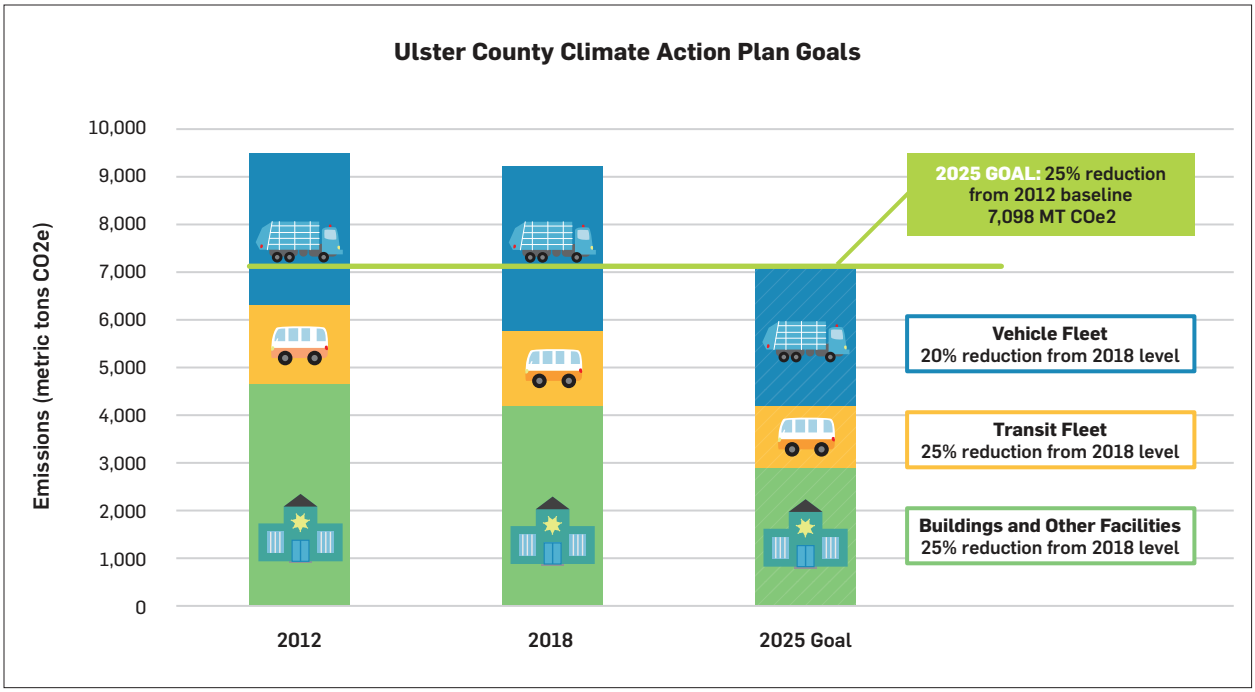


Figure 10. Climate Action Plan Goals by Sector

Initiative timeframe

Each action is identified for completion by 2025 by assigning a timeframe based on these terms:

Short:	1–2 years (2019–2020)
Medium:	3–5 years (2021–2023)
Long:	6–7 years (2024–2025)

Cost Estimates

Each action item has been assigned a subjective cost estimate by Department of the Environment staff. The cost estimate incorporates monetary cost as well as County staff time and resources required to complete the action. These estimates may change as available grant and incentive programs evolve.

Low: Able to complete with existing budget or budget amendment. Able to be completed within normal staff operations.

Medium: May require use of capital funding. May require external personnel resources through contract.

High: Requires capital funding. Requires additional staff or contracted personnel.

Focus Area #1: Buildings & Other Facilities

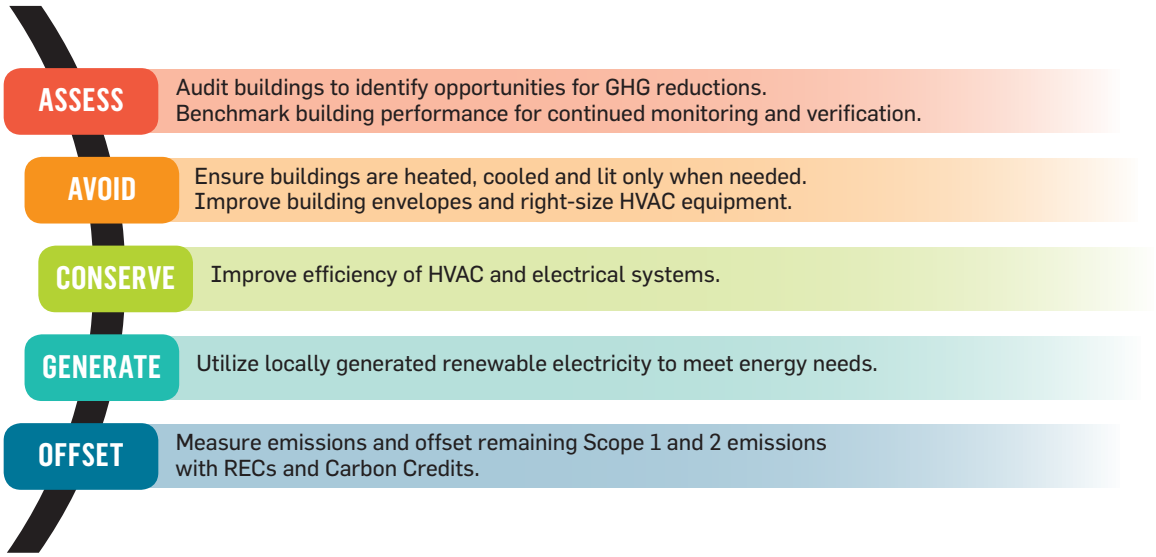


Figure 11. Buildings and Other Facilities GHG Reduction Strategy

Focus Area Goal: By 2025, reduce sector emissions by an additional **25%** (1,059.9 MT CO2e) from 2017 levels. This reduction will yield an overall 16.4% reduction from the 2012 baseline.

The GHG emissions from the Buildings and Other Facilities sector has decreased by 9.6% since 2012. This reduction illustrates the effects of the the County's systematic program of implementing energy-use reduction measures since the County's 2010 building energy audit.

To achieve additional reductions, the County must convert all electricity use to locally generated sources and work to electrify remaining fossil fuel heating applications through HVAC equipment upgrades. This process is dependent on the remaining useful life of equipment and capital planning limitations.

ACTION BF-14 Conduct rooftop solar assessment. **ACTION S3-4** Improve bicycle infrastructure at County properties.

Table 6. Buildings and Other Facilities Action Items

Action Number	Action	Strategic Priority	Impact	Cost	Timeframe
BF-1	Conduct additional building energy audits	Assess	Low	Medium	Medium
BF-2	Implement lighting controls in County owned buildings	Avoid	Medium	Medium	Medium
BF-3	Reduce and upgrade outdoor lighting	Avoid	Low	Low	Medium
BF-4	Update building automation systems & HVAC scheduling procedures	Avoid	Medium	Low	Short
BF-5	Assess feasibility of district heating system using County owned properties	Conserve	Low	High	Long
BF-6	Complete interior lighting upgrades for 100% of building area	Conserve	High	Medium	Short
BF-7	Green the lifecycle of office equipment	Conserve	Medium	Low	Short
BF-8	Install biomass heating systems at Highway Department Substations	Conserve	Medium	Medium	Medium
BF-9	Install geothermal heating and cooling system(s)	Conserve	Medium	Medium	Short
BF-10	Retrocommission low performing buildings	Conserve	Medium	Medium	Medium
BF-11	Upgrade HVAC equipment	Conserve	Medium	High	Medium
BF-12	Assess small wind turbine system(s) for County-owned properties	Generate	Low	Medium	Long
BF-13	Complete renewable energy feasibility studies	Generate	Low	Medium	Medium
BF-14	Conduct a rooftop solar assessment	Generate	Low	Low	Medium
BF-15	Evaluate brownfields for solar PV development through coordination with the EPA	Generate	Medium	Low	Medium
BF-16	Evaluate in-stream energy recovery system(s) for the Golden Hill water system	Generate	Low	Medium	Long
BF-17	Install additional solar PV system(s) using a third-party ownership model	Generate	High	Low	Medium
BF-18	Install battery storage technology on County property	Generate	Medium	Medium	Short
BF-19	Offset Scope 1 and 2 emissions from buildings and facilities	Offset	High	Low	Short

ACTION BF-1

Conduct additional building energy audits

An ASHRAE Level 3 energy audit of 27 buildings was completed in 2010. Many of the facility improvement measures identified by the audit have been implemented or planned through a series of HVAC/Weatherization capital projects, CP #s 394 through 402. These improvements are ongoing.

The County aims to conduct an updated comprehensive energy audit during the life of this plan. At a minimum, the County will complete an ASHRAE level 2 energy audit for greater than 75% of its buildings (by floor area.)

This audit will verify improvements since the 2010 audit and identify new energy conservation opportunities. The County will pursue cost-share funding through the NYSERDA FlexTech program to implement these audits."

ACTION BF-2

Implement lighting controls in County owned buildings

The County will audit its properties to identify opportunities in existing buildings to save electricity with the installation of lighting sensors and controls. These controls may include the following types: occupant sensing, time-switching, or daylight-responsive. Properties with building management systems will be audited and updated to ensure that lighting is used only when necessary. Lighting systems will be updated to meet or exceed the International Energy Conservation Code section C405 when possible.

ACTION BF-3

Reduce and upgrade outdoor lighting

The County will develop and execute a strategy to reduce the number of outdoor lighting fixtures or reduce the time in which the fixtures are in use. The County will conduct a comprehensive inventory of all outdoor lighting that covers street and area lighting (including those owned by the local utility), traffic signals, and off-street light fixtures (in parking lots and public parks, for example). During this process, the County will upgrade all remaining outdoor lights to LED fixtures.

ACTION BF-4

Update building automation systems & HVAC scheduling procedures

The County will update and institute a procedure for the operation of existing building automation systems (BAS) and programmable thermostats. The County will audit existing systems to meet procedural standards for setbacks, zone occupancy periods and lighting. Any system errors or malfunctions will be corrected through operating improvements. The County will evaluate needs for additional BAS where needed. Training on BAS operation will be solicited and conducted. For buildings where a BAS is not needed, programmable thermostats with WIFI capability (where able) will be installed.

ACTION BF-5

Assess feasibility of district heating system using County owned properties

The County will consider campuses of properties where a district heating system may be feasible and will integrate a feasibility study into any capital planning for HVAC upgrades at the potential sites.

ACTION BF-6

Complete interior lighting upgrades for 100% of building area

As of 2019, Ulster County has completed LED retrofits at most County properties. However, a few major properties are remaining for retrofit: the UC Office Complex DSS portion and the SUNY Ulster Kingston Center campus. Through this action, the County will target 100% of building area for LED lighting.

ACTION BF-7

Green the lifecycle of office equipment

Ulster County will participate as a partner in the State Electronics Challenge, a program administered by the Northeast Recycling Council, Inc. focused on environmental stewardship of office equipment. The County will use the program as paradigm to implement policies and procedures for energy efficiency in office equipment. The Department of the Environment will work with Ulster County Information Services to complete an initial benchmarking report, followed by an annual report on the status of program requirements and activities.

ACTION BF-8

Install biomass heating systems at Highway Division Substations

The County will install a wood pellet heating system to replace propane heating in one or more properties in the Department of Public Works' network of highway substations. A feasibility study will be included in a larger scope energy and logistics assessment (of the highway substation network) to determine if a wood pellet heating installation is appropriate as an energy source for each property. This feasibility study will consider types of available technology, proximity to the wood pellet source, availability of bulk delivery services, costs, permitting and other restrictions, and other related factors to implementing the system. If the study concludes that a wood pellet installation is feasible, the County will select suitable sites for the installation along with a contractor to develop and implement the system.

ACTION BF-9

Install geothermal heating and cooling system(s)

The County is currently conducting feasibility studies as selected large County properties for ground source heat pump (GSHP) systems through the NYSERDA/New York Power Authority (NYPA) Geothermal Clean Energy Challenge program. The County will continue to assess feasibility at County properties both within and outside the program. The County will consider installing a GSHP system in the Carr Building at 1 Pearl Street. A GHSP system was included as "Other

Measures Considered" in the County's 2010 energy audit. The auditor suggested a vertical loop field with 4 new heat pump units to serve the heating and cooling loads of the building. This measure would replace the need to replace the condensing steam boiler and associated distribution system.

ACTION BF-10

Retrocommission low performing buildings

Retrocommissioning is the process of assessing, analyzing and adjusting the operational parameters of systems in an existing building to optimize the system's performance and satisfy current operational needs. The County will hire a consultant to retrocommission buildings that have been identified as low performing through the benchmarking process. For the County, low performing buildings will be selected using the metric of emissions intensity. The County's process will conform with the retrocommissioning requirements put forth in the NYS BuildSmartNY guidelines developed by NYPA. Retrocommissioning activities will be funded by the green revolving fund and offset to the extent possible by available funding and incentives.

ACTION BF-11

Upgrade HVAC equipment

The County will upgrade HVAC systems in government buildings to exceed the ASHRAE Energy Standard for Buildings Except Low-Rise Residential Buildings, 90.1 by at least 3 percent and meet the NYStretch Energy Code-2020 standard, if applicable. New HVAC systems must also qualify for the EPA ENERGY STAR rating, if applicable. Upgrades will occur as deemed necessary by the UC Public Works Department based on recommendations from the Department of the Environment. Buildings with high emissions intensity will be targeted for upgrades. The Department of Public Works will develop and maintain an inventory of all HVAC equipment in County-owned buildings to determine and anticipate equipment replacement cycles.

ACTION BF-12

Assess small wind turbine system(s) for County-owned properties

Based upon review of wind resource studies for New York State, the County has determined that large wind (>2 MW) systems are generally not economically feasible in Ulster County. However, in order to maximize the opportunities for distributed generation, the County will conduct an internal feasibility study for small- scale wind turbines at all County owned properties using the NYSERDA New York State Small windExplorer siting application. If warranted, the County will install a small wind turbine at one or more County facilities. The County will reference the NYSERDA Small Wind Turbine program to determine available incentives.

ACTION BF-13

Complete renewable energy feasibility studies

The County will complete at least three targeted renewable energy feasibility studies for technologies such as wind, solar, biomass, or geothermal. Depending on the scope and budget for the study, the County may elect to issue a request for proposals to hire an external consultant with expertise in analyzing and installing renewable energy systems. Completed and in progress energy master plan assessments will be used to inform further work determining feasibility of prospective projects.

ACTION BF-14

Conduct a rooftop solar assessment

The County will commission a study to assess the generation potential on rooftops of County owned buildings. The study will assess potential capacity, interconnection, roof condition, building energy needs, incentive structures, risks and cost. The study will make recommendations for prioritizing development of sites based on economic analysis.

ACTION BF-15

Evaluate brownfields for solar PV development through coordination with the EPA

The County Department of the Environment will work with the EPA's Solar Technical Assistance Team (STAT) to assist development of foreclosure eligible brownfield properties for solar PV production. In some cases, the County will procure a portion of the locally generated power through the Community Distributed Generation program.

ACTION BF-16

Evaluate in-stream energy recovery system(s) for the Golden Hill water system.

The County will evaluate feasibility of installing in-stream hydroelectric generation systems in the Golden Hill water system. Such a system may offer the ability to recapture a portion of the pumping energy used in the system.

ACTION BF-17

Install additional solar PV system(s) using a third-party ownership model

The County will install solar PV technology at 5 new or existing public facilities or public properties using PPA or a land lease model. The agreement will be designed for Ulster County to be the partial or sole offtaker of the power.

ACTION BF-18

Install battery storage technology on County property

The County will assess ways to integrate future County-managed solar PV development into the electrical grid with a battery energy system that can provide grid services. Energy storage offers the ability to make the local electrical grid more efficient by controlling the intermittency of solar PV production, managing demand peaks and allowing for expanded renewable development capacity.

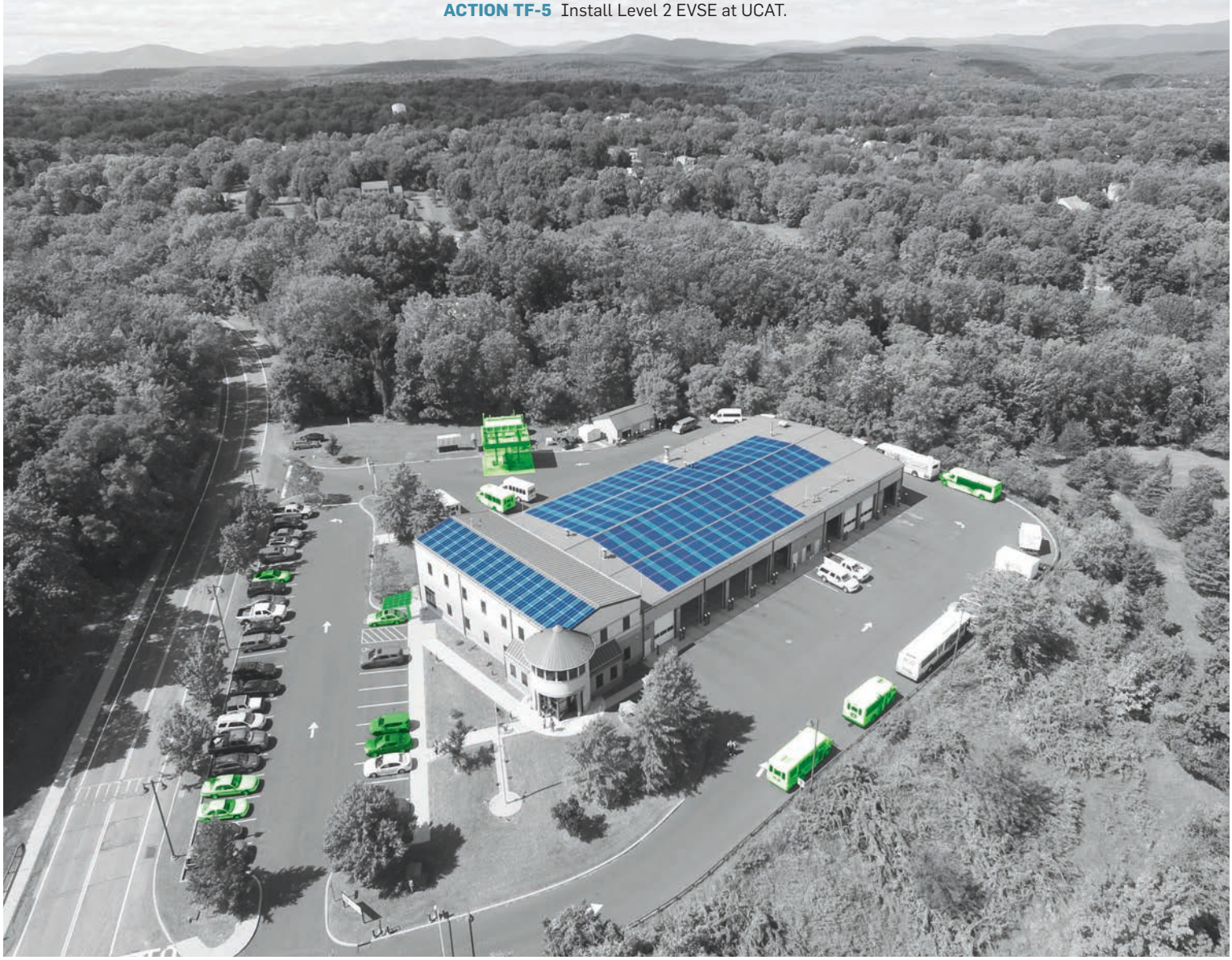
ACTION BF-19

Offset Scope 1 and 2 emissions from buildings and facilities

The County will purchase third-party certified carbon offsets to offset 100% of Scope 1 emissions from stationary combustion of fossil fuels in its buildings.

The County will also purchase Green-e certified renewable energy credits (RECs) on the voluntary market to offset 100% of its Scope 2 emissions from buildings. This purchase may take the form of a green power product provided by an energy services company (ESCO). If feasible, the RECs will be Clean Energy Standard (CES) Tier 1 and retired in the New York State Generation Attribute Tracking System (NYGATS). RECs will be purchased for 100% of annual usage (in kWh) regardless of the actual percentage of nonrenewable fuels in the mixture of power sourced by the utility.

ACTION BF-14 Conduct rooftop solar assessment. **ACTION VF-4** Execute UC Green Fleet local law for vehicle replacement schedule. **ACTION VF-7** Purchase full size electric bus(es). **ACTION TF-3** Increase biodiesel use in transit operations. **ACTION TF-5** Install Level 2 EVSE at UCAT.



Focus Area #2: Vehicle Fleet

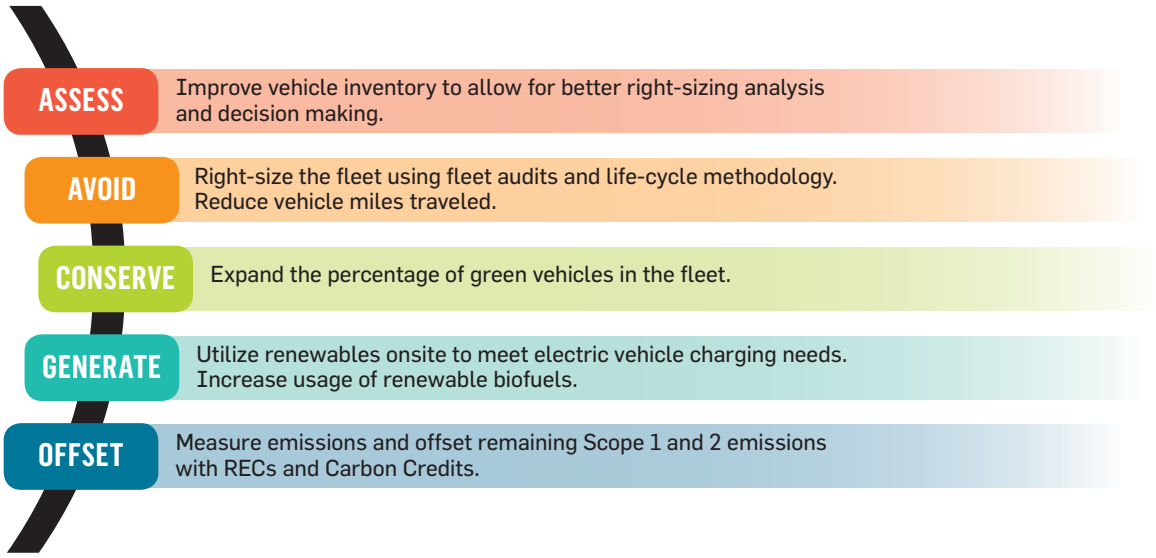


Figure 12. Vehicle Fleet GHG Reduction Strategy

Focus Area Goal: By 2025, reduce sector emissions by **20%** (670.9MT CO2e) from 2017 levels. This reduction will yield an overall 4.9% reduction from the 2012 baseline.

GHG emissions from the vehicle fleet can vary significantly from year to year due to changes to operational requirements, capital projects and extreme weather events. The Ulster County Green Fleet Law of 2015 sets green vehicle implementation goals and mandates annual tracking and reporting, but generally applies only to passenger vehicles. A large portion of the County's vehicle fleet emissions come from medium and heavy duty vehicles which are currently difficult to replace with existing technology.

Table 7. Vehicle Fleet Action Items

Action Number	Action	Strategic Priority	Impact	Cost	Timeframe
VF-1	Quantify vehicle miles traveled (VMT) for Highway Division heavy duty vehicles	Assess	Low	Low	Short
VF-2	Implement a vehicle location tracking system	Avoid	Low	Medium	Medium
VF-3	Adopt biodiesel blend for Highway Department vehicles	Conserve	Medium	Medium	Medium
VF-4	Continue to execute UC Green Fleet Local law vehicle replacement schedule	Conserve	Medium	Medium	Short
VF-5	Install additional EV charging stations to support fleet operations	Conserve	Low	Medium	Short
VF-6	Purchase electric grounds maintenance equipment	Conserve	Low	Low	Medium
VF-7	Purchase electric passenger transit vans for Sheriff's department	Conserve	Medium	Medium	Medium
VF-8	Train UC fleet mechanics to maintain and repair electric vehicles	Conserve	Medium	Medium	Medium
VF-9	Deploy solar PV EVSE system(s)	Generate	Low	High	Long
VF-10	Offset Scope 1 and 2 emissions from vehicle fleet operations	Offset	High	Medium	Short

ACTION VF-1

Quantify vehicle miles traveled (VMT) for Highway Division heavy duty vehicles

The Department of Environment will work with the DPW Highways Division to analyze data from the FuelMaster vehicle management system, which is installed on most Division heavy-duty vehicles. This analysis will provide insights to the Fleet manager and Highways Division Garage Supervisor to make decisions about routing, personnel training, and vehicle life cycle. This capability has been installed recently, but not fully incorporated into the County's green fleet data collection.

ACTION VF-2

Implement a vehicle location tracking system

The County will install an Auto Vehicle Locator (AVL) system to track mileage and analyze routing patterns of County owned vehicles. Analysis of fleet vehicle activity by the County's Fleet Manager and Department of the Environment will be used to make recommendations for fleet vehicle operating procedures aimed at reducing fuel consumption.

ACTION VF-3

Adopt biodiesel blend for Highway Division vehicles

The County will adopt a biodiesel blend fuel for heavy duty vehicles in public works fleet. Initially a B5 blend will be introduced where feasible, with the goal to increase the percentage of biodiesel in the fuel up to 20% (B20).

ACTION VF-4

Continue to execute UC Green Fleet Local law vehicle replacement schedule

Local Law No. 9 of 2015 mandates that a minimum of 5% of the fleet by 2020 are green vehicles. Thereafter, annually, a minimum of 20% of passenger vehicles purchased, leased or otherwise obtained will be green vehicles.

ACTION VF-5

Install additional EV charging stations to support fleet operations

The County currently operates 17 Level 2 (240V) EV charging station on County-owned properties. The County will use grant and rebate funding to install additional stations and make them available to the fleet and the public. Installation locations will be determined based on fleet needs.

ACTION VF-6

Purchase electric grounds maintenance equipment

The County will evaluate and purchase electric lawn care equipment: mowers, leaf blowers, trimmers etc. The UC Department of the Environment will assist DPW Buildings and Grounds Division with the procurement process. The use of this equipment will reduce Scope 1 emissions from combustion of gasoline.

ACTION VF-7

Purchase electric passenger transit vans for Sheriff's department

The County will purchase one or more fully-electric vehicles to serve as inmate transport vehicles. These vehicles will utilize the existing Level 2 EVSE at the Ulster County Law Enforcement Center. If possible, the County will utilize funding from the NY Truck Voucher Incentive program when it becomes available.

ACTION VF-8

Train UC fleet mechanics to maintain and repair electric vehicles

The Department of the Environment will work with the County's Office of Education and Training to seek grant funding to develop a training program for vehicle fleet mechanics to prepare the County's workforce to operate and maintain electric vehicles and equipment. This action directly supports the expansion of green vehicles in the fleet by reducing maintenance costs.

ACTION VF-3 Adopt biodiesel blend for Highway Department vehicles. **ACTION VF-4** Execute UC Green Fleet local law for vehicle replacement schedule.

ACTION VF-9

Deploy solar PV EVSE system(s)

Standalone EV charging technology exists that would allow for off-grid electric vehicle charging, fueled solely by solar PV panels built into the charging station canopy. Adoption of this technology would allow fully electric vehicles to operate in areas of the County where grid interconnection would be costly/difficult, where grid power is not available due to an outage, or where the operations are temporary. This technology also offers a mobile power supply for emergency operations, to be utilized by the Ulster County Emergency Services or the Sheriff's Department.

ACTION VF-10

Offset Scope 1 and 2 emissions from vehicle fleet operations

The County will continue to offset all mobile combustion and purchased electricity emissions from vehicle fleet operation.

Focus Area #3: Transit Fleet

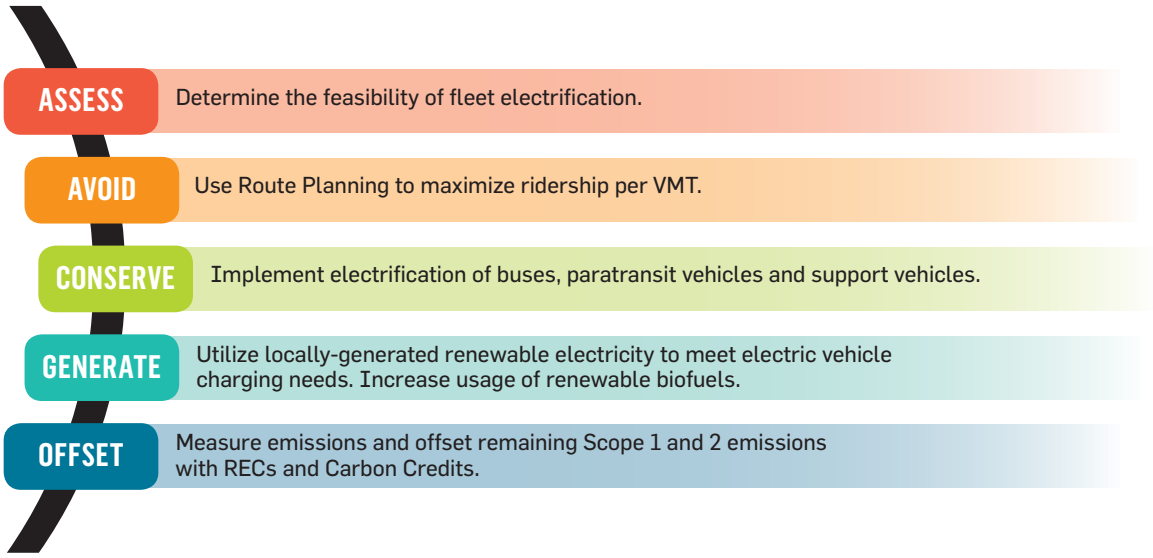


Figure 13. Transit Fleet GHG Reduction Strategy

Focus Area Goal: By 2025, reduce sector emissions by an additional **15%** (221.4 MT CO2e) from 2017 levels. This reduction will yield an overall 4.3% reduction from the 2012 baseline.

Electric technology exists for many transit vehicle applications today. Ulster County's approach to reduce emissions in the transit fleet sector is to purchase electric vehicles as their fossil fuel predecessors become due for replacement. Operational needs will be evaluated to ensure the technologies chosen are appropriate for the application and that sufficient charging infrastructure is in place.

Table 8. Transit Fleet Action Items

Action Number	Action	Strategic Priority	Impact	Cost	Timeframe
TF-1	Complete a Transit Fleet Electrification Study	Assess	Low	Medium	Short
TF-2	Modify transit routes and schedules to maximize passenger miles per unit GHG emissions	Avoid	Medium	Medium	Medium
TF-3	Increase biodiesel use in transit operations	Conserve	Medium	Medium	Medium
TF-4	Install DC fast charging equipment at UCAT facilities for bus charging	Conserve	High	Medium	Short
TF-5	Install Level 2 EVSE at UCAT	Conserve	Low	Low	Short
TF-6	Purchase electric paratransit vehicle(s)	Conserve	Medium	High	Long
TF-7	Purchase full size electric bus(es)	Conserve	High	High	Medium
TF-8	Purchase green vehicle(s) for UCAT support/ administrative fleet	Conserve	Low	Medium	Short
TF-9	Train UCAT mechanics to maintain and repair electric buses	Conserve	Medium	Medium	Short
TF-10	Offset Scope 1 and 2 emissions from transit operations	Offset	High	Medium	Short

ACTION TF-1

Complete a Transit Fleet Electrification Study

Ulster County has been awarded grant funding for a transit fleet electrification study. The County will contract with a vendor to conduct a technical feasibility assessment and a roadmap to suppor the deployment of electric transit vehicles in the UCAT fleet over an estimated 12 year replacement cycle. This roadmap would be designed to be a transferrable framework for transit fleets in the region to conduct a similar study. This study will include consideration and evaluation of EV bus charging infrastructure required.

ACTION TF-2

Modify transit routes and schedules to maximize passenger miles per unit GHG emissions

As part of its ongoing transportation planning initiatives, the County will analyze ways to decrease the VMT and emissions associated with the transit fleet operation while maximizing the number of passenger miles and increasing ridership. These improvements will ensure that the greatest number of County residents and visitors have access to high-efficiency transportation alternatives, reducing both transit fleet emissions and emissions from the regional community transportation sector.

ACTION TF-3

Increase biodiesel use in transit operations

Ulster County will source and use B20 biodiesel fuel for transit fleet, when operationally feasible. Currently, the transit fleet uses B5 biodiesel approximately 50% of the year. Increasing the biodiesel percentage in the fuel would reduce conventional diesel usage by approximately 9,500 gallons/year, saving 100 metric tons of carbon emissions. These emissions would be considered biogenic in origin and would not add to our Scope 1 emissions inventory.

ACTION TF-4

Install DC fast charging equipment at UCAT facilities for bus charging

The County will partner with NYPA to install at least 3 depot-style DC fast charge bus chargers rated at 150KW or greater at the UCAT bus garage. The County will utilize cost share funding provided through the Volkswagen settlement, a program managed by the NYS DEC.

ACTION TF-5

Install Level 2 EVSE at UCAT

The County will install multiple Level 2 EVSE stations at the UCAT headquarters and bus garage to service fleet support vehicles and demand service vans. The number of plugs will be determined based on operational scheduling and power needs.

ACTION VF-7 Purchase full size electric bus(es).

ACTION TF-6

Purchase electric paratransit vehicle(s)

The County will identify and adopt technology to electrify the paratransit fleet. Existing paratransit vehicles are 14-22 seat cutaway buses with lift capability that are powered by diesel or gasoline. The County's transit fleet electrification study will inform choices for adoption.

ACTION TF-7

Purchase full size electric bus(es)

The County will integrate 35' and 40' electric buses into its existing fleet. UCAT will seek federal and state funding, including VW settlement funding to offset the incremental cost above that of a typical diesel powered vehicle. This cost is expected to be approximately $250,000. UCAT will also install depot style DC fast-charging infrastructure in its bus depot to support the integration of electric buses.

ACTION TF-8

Purchase green vehicles for UCAT support/administrative fleet

Purchase one or more green vehicle for administrative and support use at UCAT. Vehicle shall be a plug-in hybrid or all electric vehicle. This vehicle will replace an existing conventional fuel service vehicle and will utilize a Level 2 charging station installed on site at UCAT.

ACTION TF-9

Train UCAT mechanics to maintain and repair electric buses

The Department of the Environment will work with the County's Office of Education and Training to seek grant funding to develop a training program for UCAT bus mechanics to prepare the County's workforce to operate and maintain electric buses.

ACTION TF-10

Offset Scope 1 and 2 emissions from transit operations

The County will continue to purchase carbon credits to offset Scope 1 mobile combustion emissions from transit operations. When the fleet begins to electrify, the County will purchase RECs to offset emissions from Scope 2 purchased electricity.

Focus Area #4: Policy & Procedure

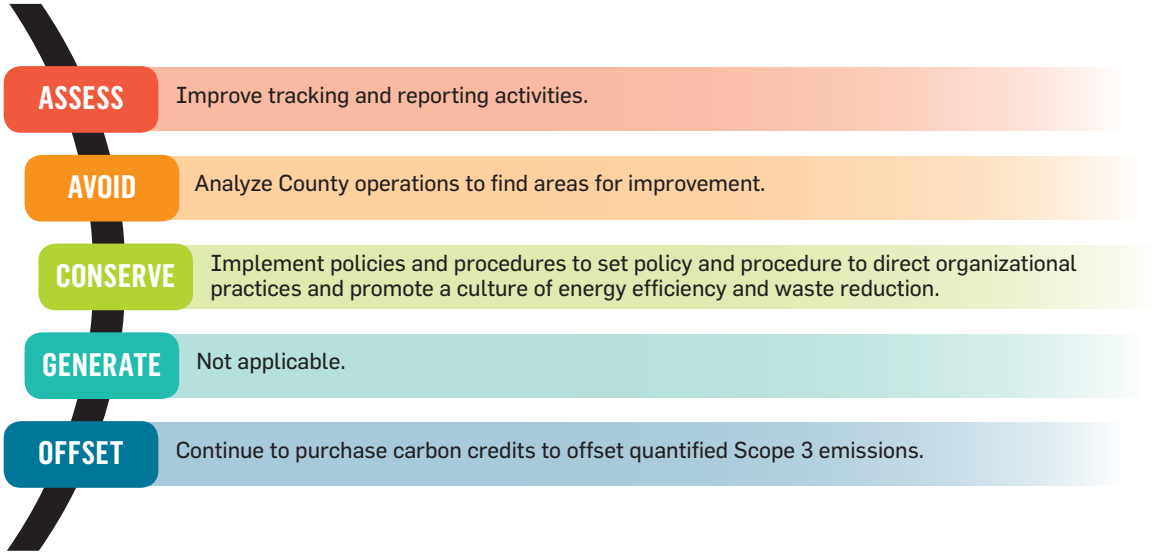


Figure 14. Policy & Procedure GHG Reduction Strategy

GHG emissions from County operations can be impacted by County employee decision-making processes and behaviors. These emission sources can cross boundaries between reporting sectors and are often dependent on structural choices made early in the planning process. Through the implementation of climate-conscious policies and procedures, the County can achieve long-term reductions of Scope 1, 2 and 3 emissions across all reporting sectors.

ACTION PP-1

Develop materials management annual plan and report

The County will develop a tracking and reporting mechanism for solid waste, recycling and diversion across all government operations activities. This information will be summarized in an annual report that is developed by the County's Department of Public Works and reviewed by the Department of the Environment prior to release. Each annual report will update the solid waste management plan with new initiatives for the subsequent reporting year.

ACTION PP-2

Develop methodology for reporting emissions from contracted services

The County will develop a list of vital government services that are currently contracted with outside vendors to provide a better picture of emissions attributed to government operations. The intent will be to identify long term contracts and estimate emissions based on the quantity of services provided.

Table 9. Policy & Procedure Action Items

Action Number	Action	Strategic Priority	Impact	Cost	Timeframe
PP-1	Develop materials management annual plan and report	Assess	Low	Low	Short
PP-2	Develop methodology for reporting emissions from contracted services	Assess	Low	Low	Short
PP-3	Implement Social Cost of Carbon into capital planning and government operations decisions	Assess	Low	Low	Short
PP-4	Improve vehicle inventory	Assess	Low	Low	Short
PP-5	Seek grant funding for climate change mitigation projects	Assess	Low	Low	Short
PP-6	Track building energy efficiency upgrades	Assess	Low	Low	Short
PP-7	Track water usage for government buildings	Assess	Low	Low	Long
PP-8	Adopt a green building standard for existing buildings	Avoid	Medium	Low	Short
PP-9	Conduct life-cycle analysis for all new vehicle purchases	Avoid	Low	Medium	Medium
PP-10	Develop an organic waste program for government buildings	Avoid	Low	Low	Short
PP-11	Education and outreach for employee energy conservation	Avoid	Medium	Low	Short
PP-12	Encourage green business travel	Avoid	Low	Low	Medium
PP-13	Encourage UC Employee commuting on UCAT	Avoid	Low	Low	Medium
PP-14	Improve refrigerant management procedures	Avoid	High	Medium	Medium
PP-15	Integrate sustainability review procedures into the capital planning process	Avoid	Medium	Low	Short
PP-16	Right-size the local government fleet	Avoid	High	Low	Short
PP-17	Update the County's environmentally preferable purchasing policy	Avoid	Medium	Medium	Short
PP-18	Use vehicle tracking systems to monitor the anti-idling policy for County Highway vehicles	Avoid	Low	Low	Short
PP-19	Adopt a green financing mechanism	Conserve	Medium	Low	Short
PP-20	Develop a government ops waste reduction strategy	Conserve	Low	Low	Medium
PP-21	Incorporate waste & energy provisions in government contracts	Conserve	Low	Low	Medium
PP-22	Join EPA WasteWise program	Conserve	Low	Low	Long
PP-23	Adopt a PV-Ready construction standard	Generate	Medium	Low	Short
PP-24	Establish internal procedures to evaluate foreclosure eligible properties for clean energy siting potential	Generate	Medium	Low	Medium
PP-25	Conduct carbon sequestration planning for County Owned properties	Offset	Medium	High	Long

ACTION PP-3

Implement Social Cost of Carbon into capital planning and government operations decisions

The County will use federal and state estimates for the true cost of GHG emissions (Social Cost of Carbon, SC-CO2) as a metric for evaluating economic decisions related to Climate Action Plan projects. The Department of the Environment will quantify and compare the actual cost of voluntary carbon offsets to the SC-CO2 in annual GHG inventory reporting. This action will become part of the capital sustainability review checklist.

ACTION PP-4

Improve vehicle inventory

The County will track additional categories in its vehicle inventory to meet the standards of the Climate Smart Communities program. At minimum, the fleet inventory must include the following 11 categories for every four-wheeled vehicle owned or operated by the local government:

- Model year
- Year purchased
- Make
- Model
- Drivetrain type (2-wheel, 4-wheel, or all-wheel drive)
- Type of fuel/power source (e.g., gasoline, diesel, compressed natural gas, electricity)
- Miles per gallon (MPG) rating
- Mileage (i.e., the odometer reading)
- Class: light-duty, medium-duty, or heavy-duty
- Gross vehicle weight rating (GVWR) over 8,500 pounds: yes or no (This is a threshold often used for determining whether a vehicle qualifies as a heavy-duty vehicle and might therefore be deemed exempt from a municipal fleet efficiency policy.)
- Vehicle function (i.e., the tasks associated with the vehicle's use)

ACTION PP-5

Seek grant funding for climate change mitigation projects

The County's Department of the Environment will identify and pursue grant opportunities to further develop Ulster County Climate Action Plan projects in all phases.

ACTION PP-6

Track building energy efficiency upgrades

Ulster County tracks and will continue to track energy efficiency upgrades. These include routine replacements of lighting and HVAC equipment, as well as the implementation of energy conservation measures (ECMs) that have been identified through energy audits. Keeping track of improvements allows the county to apply for utility rebate programs and to quantify energy cost savings for financing future projects through its green revolving fund. Energy savings estimates allow the County to perform measurement & verification to ensure that expenditures are achieving the desired effect with regard to energy savings.

ACTION PP-8 Adopt a green building standard for existing buildings.

Energy efficiency projects are tracked using the Green Revolving Investment Tracking System (GRITS), a product of the Sustainable Endowments Institute (http://www.endowmentinstitute.org/).

ACTION PP-7

Track water usage for government buildings

The County will incorporate water tracking into EPA Portfolio Manager for buildings that are metered from the City of Kingston water supply. Other properties with metered water supplies will be added to the database as able.

ACTION PP-8

Adopt a green building standard for existing buildings

Resolution 383 of 2006 established green building standards for new County construction projects. This action would create a green building standard for existing buildings and a checklist for upgrades, and process for review, potentially creating a path to certification. The County will endeavor to adopt a policy that requires one or more of the following:

- Proactively upgrade existing buildings to a specific set of green building standards by a certain date
- Incorporation of green building standards when facilities are to be upgraded
- Apply green building standards to existing operation and maintenance programs

The County may reference existing green building design guidelines such as LEED for Existing Buildings or LEED Operations and Maintenance standards or, it may establish its own standards. If referencing an existing standard, it is not necessary to require buildings to be certified under the referenced program, as costs for certification can be prohibitive. Policies can instead require that buildings be certifiable under the guidelines. It is recommended that the adopted standards or policy specify the size and age of buildings to which the standards would be applicable.

ACTION PP-9

Conduct life-cycle analysis for all new vehicle purchases

The County Fleet Manager in coordination with the Department of the Environment will develop methodology and a procedure for calculating life cycle cost of new vehicles and document within the vehicle inventory. The life cycle analysis will inform vehicle replacement decisions, improving the overall efficiency of fleet operations.

ACTION PP-10

Develop an organic waste program for government buildings

The County will develop a program to provide organic waste collection and composting infrastructure in local government buildings for employees and visitors. If feasible, the County will contract with a third-party vendor to conduct regular pickup and hauling services. The contract will require that the mass of organic waste diverted be quantified and reported to the UC Department of the Environment.

ACTION PP-11

Education and outreach for employee energy conservation

The County's Department of the Environment will continue efforts to promote awareness of energy and resource efficiency practices among Ulster County employees, to include updating the "Energy Smart Office Procedures" page on the County intranet. The County will update and continue to disseminate the UC Government Energy Policy & Implementation Guidebook.

ACTION PP-12

Encourage green business travel

The County will develop an operating procedure to encourage green business engagements that minimize the need to travel, both internally and externally. The policy will include a decision matrix to assist managers who are evaluating travel requests to ensure that the individual is considering the ability to conduct the required business via teleconferencing or video conferencing. For internal County business, telepresence through existing IS systems will be encouraged and promoted. If possible, incentives will be developed to further encourage remote meetings.

ACTION PP-13

Encourage UC Employee commuting on UCAT

The Department of the Environment will promote the use of public transit by UC employees for commuting to work. To the extent possible, the County will use employee ride data from UCAT to inform estimates of GHG emissions from employee commuting.

ACTION PP-14

Improve refrigerant management procedures

The County will review and improve its refrigerant management procedures for HVAC systems at County-owned properties in accordance with Section 608 of the EPA's Clean Air Act. The procedure will mandate a periodic inventory of existing refrigerants, to include refrigerant type and mass of charge in equipment. Additionally, the procedure will require documentation of leaks, recharges, equipment replacement and reclaim of materials in order to calculate an annual leak rate. The procedures will recommend leak testing and repair for HVAC equipment when warranted. The procedure will set guidance for acquisition of new equipment containing alternative refrigerants (low-GWP or non-HFC) with reference to the EPA's Significant New Alternative Policy (SNAP) program. The County does not currently inventory emissions from refrigerants in its GHG inventory, but this action will make it possible to quantify Scope 1 refrigerant emissions and adjust the baseline accordingly.

ACTION PP-15

Integrate sustainability review procedures into the capital planning process

The County Department of the Environment, with the Department of Finance and the Department of Public Works, will develop a review process to ensure Capital project development, design and procurement processes integrate sustainability, energy efficiency standards and best practices. Applicable standards will be the NYS Energy Conservation Code, LEED, Energy Star, the NYStretch Energy Code - 2020 and Central Hudson energy efficiency programs, or others as defined by the Department of the Environment. The review process will take the form of a checklist that must be approved by the Department of the Environment before a project can proceed. The Department of the Environment may elect to require an approval at each phase of the project, to ensure vendors are complying with stated standards and requirements. Where applicable, a life cycle cost-benefit analysis will be conducted (throughout the design phase) to ensure that increased energy savings are captured wherever possible. If needed, in coordination with the UC Purchasing Department, the County's green revolving fund will be used to fund the incremental cost increase for a sustainable and/or energy efficient design over the best cost design.

ACTION PP-16

Right-size the local government fleet

The County Department of the Environment will work with the Fleet Manager to implement the fleet rightsizing initiative contained in the Climate Smart Communities program. This will consist of the following strategies: 1) Fleet analysis, 2) Optimization of Fleet assignments, 3) Reduction of Fleet size

ACTION PP-17

Update the County's environmentally preferable purchasing policy

Ulster County developed and implemented an environmentally preferable "green" procurement policy in 2011. This policy will be updated to meet the standards and consideration areas of CSC PE3 Action: Environmentally Preferable Purchasing Policy. The Department of the Environment will conduct an audit to ensure that this policy is being used in practice. The Department of the Environment will also conduct training with purchasing department personnel. To the extent possible, the County will mirror NY State Office of General Services (OGS) Green NY purchasing policies and utilize OGS specifications.

ACTION PP-18

Use vehicle tracking systems to monitor the anti-idling policy for County Highway vehicles

The Green Fleet Policy sets an anti-idling requirement for all County vehicles. Technology exists to enforce this requirement as well as to monitor idling time. The County's Department of the Environment will monitor the FuelMaster vehicle tracking system to make recommendations to the County's Department of Public Works for minimizing idle time in Highway Department vehicles.

ACTION PP-19

Adopt a green financing mechanism

The County will establish a financing mechanism for energy efficiency and renewable energy projects in government owned buildings. The fund will operate in the model of a green revolving fund which is wholly-funded by a fixed percentage of documented energy savings from completed energy efficiency projects. This fund will be used to fund new energy efficiency and renewable energy projects, or the incremental cost increase thereof, as well as the purchase of offsets and other climate action initiatives.

ACTION PP-20

Develop a government ops waste reduction strategy

Through the development of a materials management plan, the County will develop a strategy for reducing waste for government operations. This plan will also include a waste management procedure for government hosted events.

ACTION PP-21

Incorporate waste & energy provisions in government contracts

The Department of the Environment will work with the County Attorney's office to update the County's contract boilerplate language to meet the requirements of the Climate Smart Communities (CSC) PE3 Action: Waste & Energy Provisions in Government Contracts

ACTION PP-22

Join EPA WasteWise program

The County, led by the County's Department of the Environment and in coordination with the Department of Public Works, will conduct the prerequisite evaluations and complete the actions needed to qualify as an active participant in the EPA's WasteWise program.

ACTION PP-23

Adopt a PV-Ready construction standard

The County will develop a standard to make new construction buildings "PV-ready." This policy will become part of the capital planning sustainability checklist.

ACTION PP-24

Establish internal procedures to evaluate foreclosure eligible properties for clean energy siting potential

The Department of the Environment will lead an effort to develop procedures in County government for evaluating foreclosure eligible properties for distributed generation development. The County is well positioned to redevelop many sites on the foreclosure list that are undesirable to other potential owners due to brownfield status. The County will use working relationships with the EPA Solar Technical Assistance Team (STAT) and the DEC to assist with site assessment and release from liens, if applicable. The end goal will be a process to annually evaluate properties for environmental potential and benefits (i.e. open space, clean energy generation, etc.)

ACTION PP-25

Conduct carbon sequestration planning for County Owned properties

The County will assess existing County-owned properties (large tracts of land) for potential carbon sequestration projects using DEC (or other) guidance to maximize carbon sequestration. This activity may require work with a licensed forester and coordination with the County Soil and Water and other stakeholders. The study will quantify the terms required for additionality and the GHG impact potential under several cost scenarios (to be determined) with reference to the Social Cost of Carbon.

Focus Area #5: Scope 3 Emissions

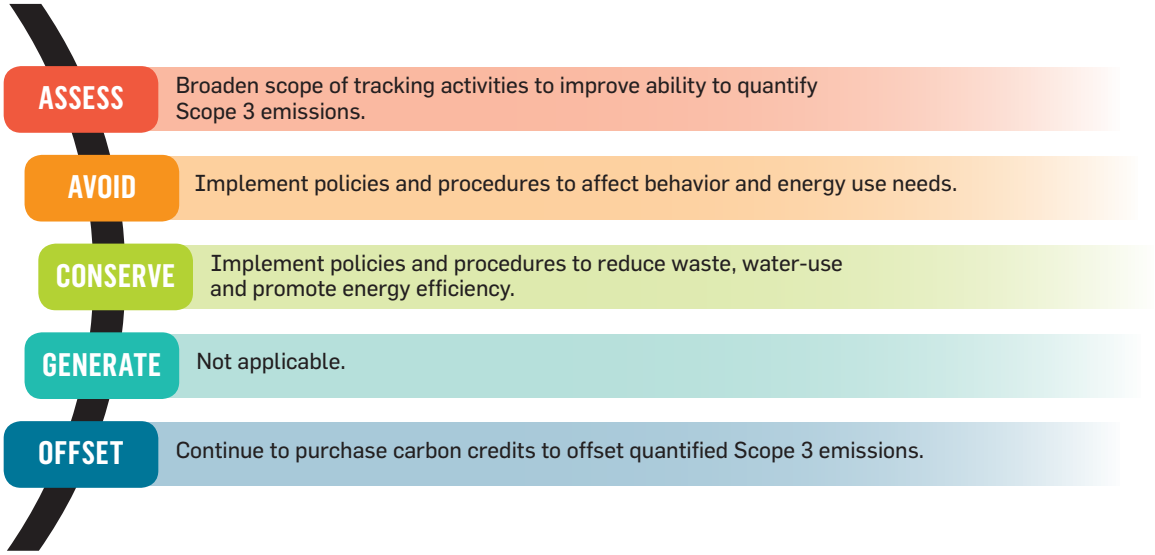


Figure 15. Scope 3 GHG Reduction Strategy

Scope 3 emissions are indirect emissions that are not covered in Scope 2. Per the Local Government Operations Protocol, reporting of Scope 3 emissions is considered optional, but encouraged to the extent possible. During the execution of this plan, the County intends to continuously improve data collection, tracking and reporting capabilities to extend the reach of the Scope 3 emission sources that the County government can quantify and mitigate.

To date, only Scope 3 emissions attributed to employee commutes have been estimated and reported. As a result, it is expected that the quantity of emissions reported in future GHG inventories will increase. Actions in this Focus area will target these Scope 3 sources:

- Employee Commute
- Employee business travel
- Emissions from contracted services
- Waste related emissions
- Supply chain emissions

Table 10. Scope 3 Action Items

Action Number	Action	Strategic Priority	Impact	Cost	Timeframe
S3-1	Conduct a government solid waste audit	Assess	Low	Medium	Medium
S3-2	Conduct employee commuting survey	Assess	Low	Low	Short
S3-3	Quantify business travel emissions	Assess	Low	Medium	Medium
S3-4	Improve bicycle infrastructure at County properties	Avoid	Low	Low	Medium
S3-5	Provide incentives for employee carpooling & transit	Avoid	Low	Low	Long
S3-6	Host employee ride & drive event	Conserve	Low	Low	Short
S3-7	Install water efficient fixtures	Conserve	Low	Medium	Long
S3-8	Offset emissions from employee commutes	Offset	High	Medium	Short

ACTION S3-1

Conduct a government solid waste audit

Assessing the amount and composition of the waste generated by local government operations is an essential step in establishing a baseline from which to measure waste diversion and reduction improvements over time. This baseline will inform decisions about waste management and will aid in quantifying potential cost and emissions savings. The waste audit plan will be developed by the Department of the Environment and will be executed by DPW staff. The Department of the Environment will synthesize and analyze the results, determining a baseline Scope 3 emissions estimate. Where possible, building waste streams will be tracked using the EPA Portfolio Manager application.

ACTION S3-2

Conduct employee commuting survey

The County will issue an annual employee commuting survey based on the template developed by the Hudson Valley Regional Council in the Climate Action Planning Institute Program. This survey will inform the assumptions of Scope 3 employee commute emissions estimates. The survey will be issued in an online format and in paper format when able. The Department of Environment will collect and analyze the data annually.

ACTION S3-3

Quantify business travel emissions

The County will collect travel reimbursement forms from the Finance Department to make an analysis of Scope 3 emissions from business travel to include airline

travel, rental cars and personal vehicle miles. This information will be included in an updated Scope 3 emissions baseline.

ACTION S3-4
Improve bicycle infrastructure at County properties

The County will install bicycle racks at all County properties. Bicycle racks will be sheltered when possible and located in a well lit location, positioned to ensure that building access is of comparable ease to that of vehicle drivers. Buildings with fewer than 10 employees, or in remote locations could be excepted.

ACTION S3-5
Provide incentives for employee carpooling & transit

The County will encourage resource-efficient behavior among their employees by developing programs to incentivize the use of alternative forms of transportation.

ACTION S3-6
Host employee ride & drive event

The Department of Environment and the DPW Fleet Manager will host Ride and Drive events for employees of departments that have EV fleet vehicles and EV charging stations. The aim of the program will be to get UC employees engaged with electric vehicle technology and become well-versed in how to operate and charge electric vehicles. The Department of the Environment will track the number of employees engaged in these events.

ACTION S3-7
Install water efficient fixtures

Water-efficient fixtures should be installed in County buildings to save money and reduce energy use. For new construction and renovation projects, water-efficient fixtures should be installed in bathrooms, kitchens, and any other relevant areas throughout local government buildings. Water-efficient fixtures may include low-flow or dual-flush toilets, faucet aerators, low-flow show-erheads, or waterless urinals. This action item will be included in a sustainability checklist that will be reviewed for all new capital projects. The County will endeavor to create an inventory of water fixture types by building and identify areas for improvement.

ACTION S3-8
Offset emissions from employee commutes

The County will continue to purchase carbon credits to offset emissions from employee commuting. Through surveys and best practice methods, the County will improve its estimates of employee commuting Scope 3 emissions.

ACTION BF-10 Retrocommission low performing buildings. **ACTION BF-18** Install battery storage technology on County property. **ACTION TF-5** Install Level 2 EVSE.

Implementation Plan

Metrics

Climate action plan progress will be measured using GHG emissions intensity metrics. GHG emissions intensity is calculated as GHG emissions per unit of service provided. These metrics will be reported in the annual GHG Inventory Report and other associated Ulster County annual reports (Benchmarking, Green Fleet.)

Through implementation of this Climate Action Plan, Ulster County will improve data collection methods to accurately quantify these metrics.

For each sector, these measures and metrics are listed below:

Table 11. Climate Action Plan metrics

Sector	Service measure unit	GHG Emissions Intensity Metric unit	Notes & Exceptions
Buildings and Other Facilities	Square feet (ft2)	Kg CO2e/square foot/year	Certain facilities are not included in the aggregate metric—such as communications towers and EV charging stations. Excepted facilities will be listed in reporting.
Streetlights and Traffic Signals	Number of light fixtures	Kg CO2e/fixture/year	
Transit Fleet	Vehicle Miles traveled (VMT)	Kg CO2e/mile	VMT includes service vehicles
Vehicle Fleet	VMT	Kg CO2e/mile	VMT does not include certain highway and grounds maintenance equipment.
Water Delivery Facilities	Gallons delivered	Kg CO2e/gal	Golden Hill water system only

Cost & Funding

All energy improvements are analyzed on period of return or the length of time which any increased cost associated with an improvement would be offset by the decreased energy costs. Wherever possible, grants and utility sponsored programs have been used to reduce the costs associated with energy efficiency improvements. To date, the County has focused on short term paybacks, less than five years, and has found many opportunities. There have been minimal costs associated with right-sizing and energy reduction.

The incremental cost of buying Renewable Energy Credits (RECs) was mandated by the County Executive to be budget neutral. Since initiating REC and carbon offset purchases, the County has been able to identify and use utility incentives to implement LED retrofits with short payback periods resulting in savings equal to the cost of offsets. With the creation of a Green Revolving Fund (GRF) in 2019, we anticipate that this relationship will be formalized by paying the cost of offsets from the GRF.

To date, the Department of the Environment has helped to secure over $2.2 million in outside implementation funding directly related to energy efficiency and GHG emissions reduction. This includes funding from: the US Department of Energy, NYS Department of Environmental Conservation, NYSERDA and Central Hudson. Additionally, many of these initiatives (such as the PV solar installation at New Paltz and extensive interior and exterior LED lighting retrofits) result in substantially lower energy consumption and energy bills for the County. As stated previously in this report, LED lighting retrofits alone are estimated to save over 2 million kilowatt-hours and $225,000 each year. We are confident that this plan will allow us to continue to leverage outside funding and identify projects with the best return on investment for the County.

Monitoring and Evaluation

Executive Order 1-2019 clearly states the goal of reducing GHG emissions associated with operations (through conservation, efficiency and on-site renewable generation) by 25% in 2025 and 80% in 2050. This plan identifies a series of actions, primarily focused on buildings and fleet which when implemented should result in meeting the 2025 goals. Since all emissions are tracked annually through the Building Benchmarking Report and the Green Fleet Report, there will be consistent monitoring and reporting towards this goal.

V

Next Steps: Amplifying and Expanding County Climate Action

The Ulster County Government Operations Climate Action Plan is focused on reducing the GHG emissions associated with county government operations. Although Ulster County Government manages a sizeable operation, it is a relatively small percentage of the overall County emissions. In addition, the plan is focused strictly on emissions reduction and does not include other activities which support the resilience of the County's operations and infrastructure to the effects of climate change. To create the community-wide emissions reduction necessary as well as respond to the impacts of climate change, we must act in ways to amplify and expand the scope of this Government Operations Climate Action Plan.

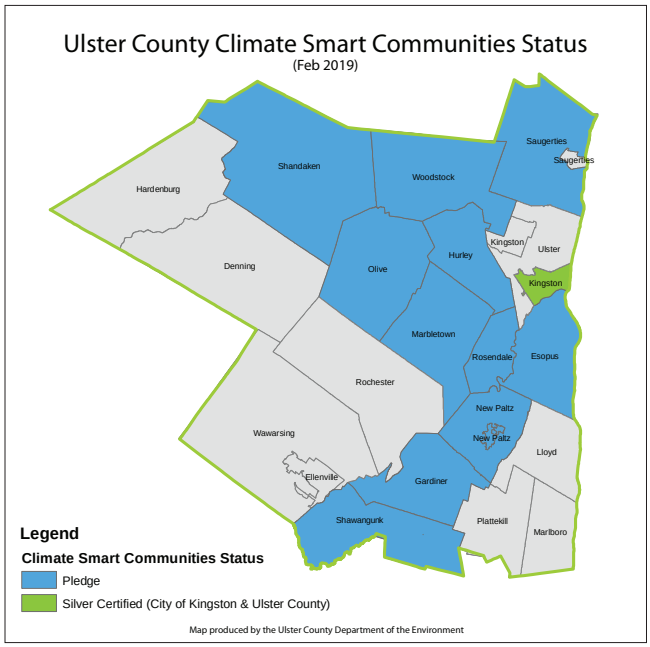


Figure 16.

Using this Plan as a Framework for Other Municipalities and Organizations

There are twenty-three municipalities in Ulster County, not including the County government. Thirteen of those municipalities are registered NYS DEC Climate Smart Communities, having already pledged to take climate action in their community. The City of Kingston and Ulster County are the only communities certified with the Climate Smart Communities program (as of May 2019), and both have reached the Silver level, denoting high involvement and action. Also, as of May 2019, the City of Kingston is the only other municipality to have a municipal operations Climate Action Plan in Ulster County (although some other communities are working on plans).

To involve more Ulster County municipalities in climate action and the role of a government operations Climate Action Plan, direct municipal outreach as well as workshop sessions through the Ulster County Environmental Management Council are proposed. Municipalities that have already committed to climate action, through the CSC pledge, should be encouraged to complete a government operations CAP and could use Ulster County's plan as a template. Communities that have yet to take the CSC pledge, will continue to be encouraged to do so.

Another key way to expand the benefits of this CAP is for Ulster County to extend implementation opportunities to the municipalities whenever possible. Ulster County has successfully done this in the past with electric vehicle charging station through active outreach and technical support for Ulster County municipalities to site, apply for grant funding and install EV charging stations. This effort has yielded a robust municipal EV charging station network in our area. Another area of opportunity is training of municipal staff in energy efficient and green operations and maintenance. For the County's implementation of this CAP this is a key implementation activity which would also support green workforce development. A significant opportunity exists to extend any scheduled training opportunity to other municipal employees in Ulster County. Similar types of training initiatives have been offered on the topic of municipal stormwater management (and compliance with the NYS DEC MS4 program) for many years.

Other large institutions in Ulster County managing significant facilities and or fleets could also benefit from learning more about this plan. Opportunities for this outreach exist through the Ulster County Department of Economic Development.

Expanding on the Scope of this Plan

Adaptation and Resiliency on the County Level

An immediate next step, building on the work of this Climate Action Plan, is for Ulster County government to actively engage in planning for the impacts of climate change to our operations. This initiative, the Ulster County Climate Change Adaptation & Resiliency Planning Project, is currently underway with grant support from the NYS DEC. The scope of this project includes these four main elements:

1. Characterize local climate change hazards
2. Identify and assess Ulster County Government operations vulnerabilities to climate change hazards
3. Develop strategies and tools to address recognized hazards and vulnerabilities for Ulster County Government
4. Support Ulster County municipalities in similar planning and adaptation efforts

Why Adaptation and Resiliency? What Does Climate Change Mean for Ulster County?

There is scientific consensus that New York State and the Hudson Valley will see increases in temperature, increases in average annual precipitation as well as an increase in the frequency and intensity of precipitation events, as well as rising water levels along the Hudson River (ClimAid, Mid-Hudson Regional Sustainability Plan).

Annual temperatures are projected to increase between 4 and 6 degrees F by the 2050s and annual precipitation is projected to increase by 3-10% over the same period for our area (ClimAid). These primary climate impacts will lead to secondary climate impacts including flooding, drought and heat waves. Climate effects of these primary and secondary impacts include: property damage, crop damage, reduced water quality, reduced air quality, increased number of high heat index days and increased exposure to vector borne diseases.

Ulster County's landscape diversity leads to a wide range of potential impacts and emerging hazards from a changing climate. Our agricultural sector could see impacts due to invasive species and heat stress. Impacts to habitat could potentially effect regionally significant pathways or refugia for plants and animals as they respond to climate change. Hudson River level rise, along with increased storm surge, will impact infrastructure, property and safety along the shoreline.

For flooding in particular, there is ample documentation of our existing vulnerability. According to the NOAA Storms Events Database, there have been 115 flooding events in Ulster County since 1996. Eleven of those events have been damaging enough to warrant a Presidential disaster declaration. Ulster County ranks second in New York State for Presidential disaster declarations between 1960 to 2012 and sustained an estimated $470 million in flood losses in that same period (2014 NYS Hazard Mitigation Plan). Increased intensity and frequency of storms will lead to more flood events and economic losses.

The Adaptation & Resiliency Plan will describe and assess climate change impacts and perform adaptation planning at a County level with the goal of developing implementable mitigation measures. Implementing the final plan will allow Ulster County to make significant strides in adapting to climate change at the County level while simultaneously supporting other Ulster County municipalities in undertaking similar efforts.

Community Wide Climate Action Planning

The City of Kingston is the only municipality, to date, in Ulster County to complete a community level plan. A Community Climate Action Plan significantly increases the complexity of both the planning and analysis as well as the depth and breadth of the recommendations. However, the possibility to quantitatively reduce emissions through implementation are significantly greater.

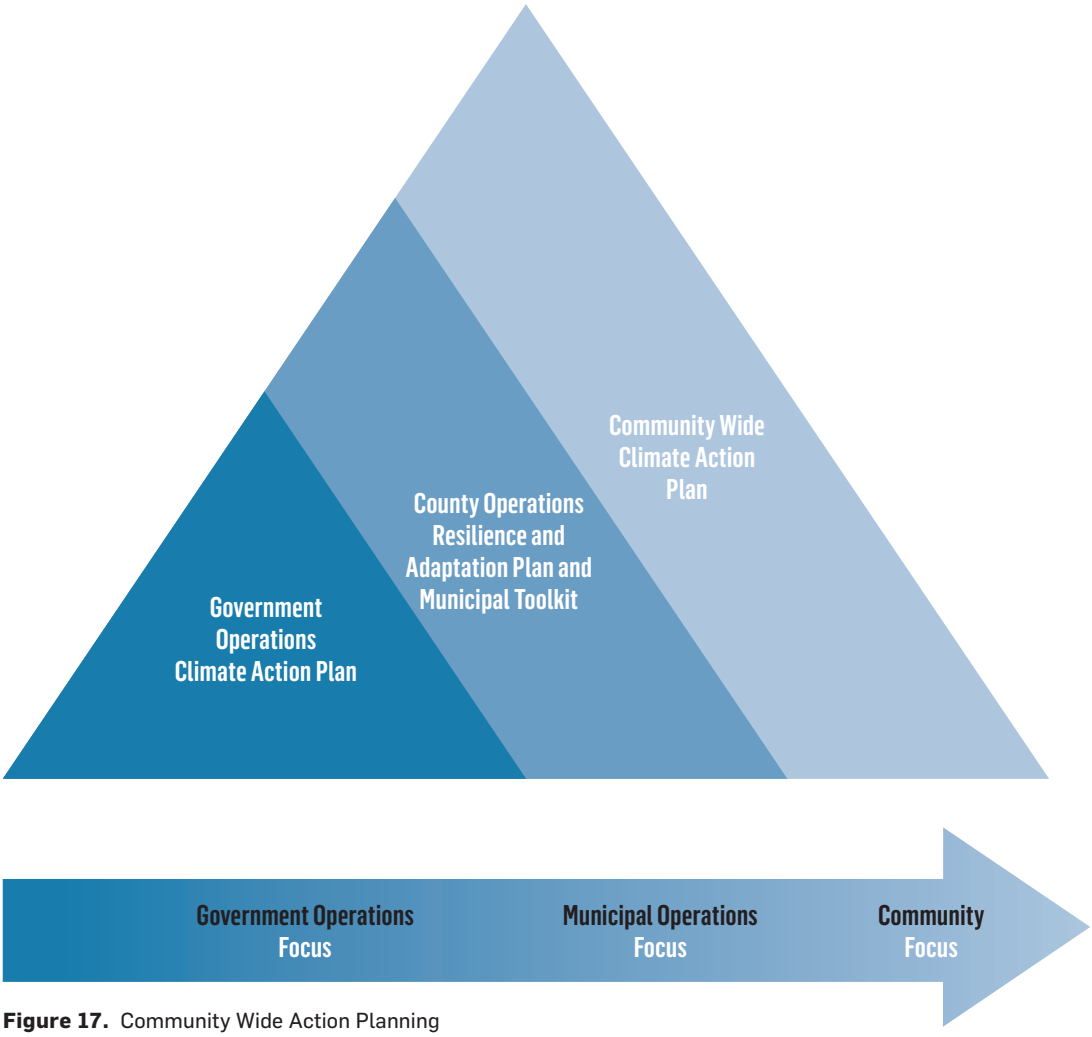


Figure 17. Community Wide Action Planning

A Community Climate Action Plan for Ulster County will build on the growing efforts by municipalities towards community wide energy efficiency and deployment of renewable energy. Plan development at the County level could also be used to link to significant economic development and workforce development initiatives

Building on other Plans and Initiatives

The process of drafting the Adaptation & Resiliency Plan or any County level Climate Action Plan will build on and work with many other important projects including:

Culvert Assessment

Ulster County completed an assessment of over 500 County and municipal culverts documenting their suitability for aquatic organism passage as well as hydraulic capacity. A goal of this effort, funded by the NYS DEC, was to assess the capacity of the culverts to pass flood flows under a range of future storm runoff scenarios and identify those most undersized to accommodate future flows. The County recently received another round of funding, through the New England Interstate Water Pollution Control Commission, to expand this assessment work and develop shovel ready designs for culvert replacement.

Core Habitat Mapping

Ulster County worked with the Green Infrastructure Center (gicinc.org) to develop and subsequently refine a core habitat data layer. This data layer provides information on corridors important for the landscape scale migration of organisms as climate change impacts the suitability of certain areas for those. Additionally, these data could be used to prioritize areas which could also provide carbon sequestration services.

Healthy Ulster

Ulster County Department of Health and Mental Health is engaged in a diverse and robust public health planning initiative focused on increasing the health of Ulster County residents through physical, programmatic and policy change. Public health impacts of climate change would be characterized and detailed through this proposed project and would be incorporated in the Healthy Ulster initiative.

Watershed Planning

It is important to include watershed assessment and characterization information from these various efforts in any County wide climate change planning effort. In addition, information regarding the characterization of vulnerabilities at the County level may be of use to these watershed planning level efforts.

UC Multi-Jurisdictional Hazard Mitigation Plan

More than one-hundred-fifty of the proposed mitigation projects identified in this plan are structure and infrastructure projects. The vast majority of these proposed projects/actions concern the relocation or protection of critical facilities and assets (to the 500-yr flood event) and the up-sizing of critical bridges and culverts in order to mitigate against the anticipated increase in intensity and frequency of future flooding events.

In addition, any next steps to expand and amplify climate action in Ulster County should take into close consideration these important regional and NY State level initiatives.

- **Climate Leadership and Community Projection Act** This recently enacted legislation sets ambitious greenhouse gas reduction goals for New York State. As implementation plans and guidance documents become available, they should be closely considered in any County level plan or initiative.
- **Community Risk and Resiliency Act (CRRA)** This Act is an important piece of state legislation which mainstreams the consideration of climate change into state and local laws. As guidance continues to be developed for the implementation of CRRA, the County will review these resources and implement them as appropriate.
- **Mid-Hudson Regional Sustainability Plan** This comprehensive and wide ranging plan, produced in 2013, continues to live on through various regional working groups. We anticipate further consideration of the important recommendations in this plan as well as working partnership with those groups continuing to work on implementation.
- **New York Rising** UC Department of Environment and Planning Department staff served on the planning committees for both the "Shandaken-Hardenburgh NYRCR Plan" and the "Ulster Communities NYRCR Plan." These plans covered a total of twelve local municipalities in the County, and resulted in numerous featured and proposed projects. Several of the featured projects are currently being implemented with allocated funds, however, many other proposed NYRCR projects remain very valid, but to date, have no implementation funding or resources dedicated to them. Any subsequent climate action planning effort could build off of and expand upon the local effort already invested in identifying assets and conducting the risk analysis to determine resiliency projects.
- **PATHWAYS**: **Wildlife Habitat Connectivity in the Changing Climate of the Hudson Valley** This document identifies predicted corridors necessary for species migration in response to climate change. These predictions along with the County's core habitat data would be a powerful resource to inform mitigation actions related to species and habitat conservation and adaption.

We also anticipate that any subsequent climate action planning effort will utilize and build on various existing County level planning documents and initiatives including: the UC Open Space Plan, the Greenway Compact, Housing Strategies Plan, Ulster Tomorrow, Comprehensive Emergency Management Plan, Year 2040 Long Range Transportation Plan, Multi-Jurisdictional Hazard Mitigation Plan Update, Ulster County Government Sustainability Initiatives Guide, and the Stormwater Management Program Plan.

Appendices

Appendix A:
GHG Inventory Methodology and Assumptions

To track progress toward our GHG emissions goals, all energy usage is monitored and tracked by the Ulster County Department of the Environment. The annual GHG emissions inventory is calculated by aggregating this data by sector, scope, source and type and converting to metric tons of CO2-equivalent (MTCO2e) using EPA conversion factors.

Ulster County Government Operations GHG Inventory Methodology

The County references the Local Government Operations Protocol, Version 1.1 (LGOP) as a standard for accounting and reporting GHG emissions from government operations. This protocol was developed by Local Governments for Sustainability (ICLEI).

To the extent possible, Ulster County sets organizational boundaries for emissions accounting using the operational control approach. Per the ICLEI definition, Ulster County has operational control over a building or facility if either of these two conditions exist:

- Ulster County owns the building or facility, OR
- Ulster County has full authority to introduce and implement operational and health, safety and environmental policies.

The County accounts for leased facilities where it is possible to obtain the necessary data. Currently, the County does not estimate emissions for spaces where only part of the building is leased and the space is not sub-metered.

ICLEI Reporting Sectors

The County currently reports the following sectors and scopes:

- Buildings and Other Facilities: Scope 1 & 2
- Streetlights and Traffic Signals: Scope 2
- Transit Fleet: Scope 1
- Vehicle Fleet: Scope 1 & 2
- Water Delivery Facilities Scope 1 & 2

Ulster County does not own or operate facilities in the following sectors:

- Wastewater Facilities
- Port Facilities
- Airport Facilities
- Power Generation Facilities
- Solid Waste Facilities

Other Process and Fugitive Emissions

Ulster County currently does not collect data or estimate values for process and fugitive emissions.

Biogenic source emissions

CO2 Emissions from biofuel usage are not included as Scope 1 emissions in this inventory in accordance with ICLEI protocol, as the carbon concerned is of biogenic origin

and would have been emitted to the atmosphere through the natural process of decay. Biogenic emissions totals from combustion of biofuels are tracked and reported as supplemental information in this report.

Ulster County assumes all gasoline purchased for fleet, transit and non-road purposes is an E10 ethanol blend (10% ethanol). Since 2015, the Ulster County transit fleet has used a B5 biodiesel (5% biodiesel) blend operationally approximately 50% of the year.

Optional Scope 3 Emissions

Ulster County currently reports one Scope 3 source: Employee Commute. Usage data was estimated for each reporting year based on current number of employees and assumptions based on employee home of record data and an employee survey conducted in November 2018. Additional notes on employee commute methodology are contained in Table 25.

In 2010, Ulster County installed its first renewable energy system at the New Paltz Highway Substation. This 30.6 kw PV system is located "behind the meter" at the substation.

Table 12. Renewable Generation Sites

Site	System Capacity	Interconnection Type	Installation Year
New Paltz Substation Salt Shed	30.6 KW DC	Behind the meter	2011
Town of Ulster Landfill	1.9 MW DC	Remote net metering	2018

Table 13. Total Renewable Energy Generation (onsite and local generation)

Reporting Year	Energy Generation (kWh)
2018	927,285 [1]
2017	37,447
2016	42,164
2015	37,793
2014	36,862
2013	40,358
2012	31,203
2011	25,754

1 The Ulster Landfill Solar project came online in June 2018.

As mandated in Executive Orders 1–2014, 1–2016, 2–2018, and 1–2019, Ulster County purchases 100% renewable power through the retirement of Green-e Certified Renewable Energy Credits (RECs), thereby offsetting Scope 2 emissions. Additionally, Ulster County offsets 100% of its Scope 1 and 3 emissions through the purchase of Climate Action Reserve certified carbon credits.

These offsets are not counted as actual reductions in emissions (i.e. as progress toward GHG reduction goals). The GHG accounting in this inventory report assumes the absence of all offsets.

Emissions Factors Disclosure

Ulster County uses emissions factors published by the EPA in the document *Emissions Factors for Greenhouse Gas Inventories*[1] (last modified 3/9/3018).

100-year global warming potential (GWP) multipliers were applied as published in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report.[2]

Ulster County does collect and maintain data on vehicle miles traveled (VMT) for vehicle fleet and transit fleet vehicles. However, to simplify the accounting process for mobile combustion, methane (CH4) and nitrous oxide (N2O) emissions were estimated on a per-gallon basis as described in the New York Community and Regional GHG Inventory Guidance (Version 1.0, September 2015).[3] To do so, CO2 emission values were multiplied by factors of 0.001 for CH4 and 0.018 for N2O to obtain an emissions value.

2012 Baseline GHG Inventory

Ulster County completed its first GHG inventory for government operations in 2012, which was subsequently set as the baseline year. The 2012 report included emissions from purchased electricity, stationary fuel combustion, mobile combustion from government vehicle fleets, as well as emissions from County employee commutes.

Baseline adjustments

The scope of Ulster County government operations has undergone structural changes since the 2012 baseline inventory. To accurately compare current operating conditions to the baseline year and quantify GHG increases or decreases over time, Ulster County normalizes its baseline to account for changes that are due to a change in the services provided by the government.

For example, in 2013, the Golden Hill Health Care center was sold to a private service provider and the County no longer needed to provide this service to its constituents. This change reduced the County's purchase of utilities and fleet

1 Available at: https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
2 Available at: https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html
3 Available at: https://www.dec.ny.gov/docs/administration_pdf/ghgguide.pdf

fuel significantly, saving approximately 3.5 MWh of electricity use, 53,000 gallons of fuel oil, and 1,500 gallons of fleet fuels per year. Because this was a divestiture of services, the 2012 baseline GHG inventory was updated to remove the emissions from this property and government function.

For its GHG inventory, the County uses the following set of rules to determine whether a baseline adjustment is warranted:

Golden Hill Health Care Center

Table 14. Baseline Adjustment Methodology

Structural Change	Baseline Adjustment?
New areas of government jurisdiction (or insourcing)	Yes
Acquisitions of property due to growth	No
Divestitures of property due to change in jurisdiction (or outsourcing)	Yes
Divestitures of property due to consolidation or efficiency of services	No
Access to energy use data that was not previously available	Yes

Table 15. Adjustments to Normalize 2012 GHG Baseline

Baseline Change	Effective Year*[4]	Reporting Sector	Scope	Change to Baseline Quantity (MT CO2e)
Golden Hill Health Care Center	2012	Buildings and Other Facilities / Vehicle Fleet	1 & 2	–1,216.4
Patriot's Project—Veteran's Housing	2014	Buildings and Other Facilities	1 & 2	+18.9
Sheriff's Substation Wawarsing**[5]	2015	Buildings and Other Facilities	1 & 2	+6.3
Family and Child Advocacy Center	2016	Buildings and Other Facilities	1 & 2	+9.7

4 Effective year is the first full calendar year of energy-use data.

5 No data available for 2012.

Table 16. 2012 Normalized Baseline Emissions Summary (Metric Tons)

		CO2e	CO2	CH4	N2O
SCOPE 1 DIRECT EMISSIONS	Mobile Combustion	4,801.5	4,709.8	4.8	86.9
	Stationary Combustion	2,372.7	2,366.0	2.1	4.6
SCOPE 2 INDIRECT EMISSIONS	Purchased Electricity	2,290.3	2,281.7	2.2	6.4
TOTAL		**9,464.5**	**9,357.6**	**9.1**	**97.9**

Table 17. 2012 Normalized GHG Emissions By Sector (Metric Tons CO2e)

		SCOPE 1	SCOPE 2
Buildings and Other Facilities	Purchased Electricity		2,279.4
	Stationary Combustion	2,369.1	
Streetlights and Traffic Signals	Purchased Electricity		4.8
Transit Fleet	Mobile Combustion	1,670.5	
Vehicle Fleet	Mobile Combustion	3,131.0	
	Purchased Electricity		
Water Delivery Facilities	Purchased Electricity		6.0
	Stationary Combustion	4.0	
TOTAL		**7,174.6**	**2,290.2**

Biogenic Emissions

In 2012, Ulster County emitted 115.3 metric tons of CO2e from biogenic sources. These emissions are attributed solely to the mobile combustion of ethanol.

Table 18. 2012 Biogenic Emissions (Metric Tons CO2e)

Sector	Biogenic Emissions
Transit	2.6
Vehicle	112.7
TOTAL	**115.3**

Optional Scope 3 Emissions

For the 2012 baseline, Ulster County estimated the anthropogenic Scope 3 emissions attributed to employee commutes as 2,341 MT CO2e. See Appendix C for assumptions and calculations.

Table 19. 2012 Scope 3 Emissions (Metric Tons)

		CO2e	CO2	CH4	N2O
SCOPE 3	Mobile Combustion	2,341.0	2,294.3	2.2	44.3

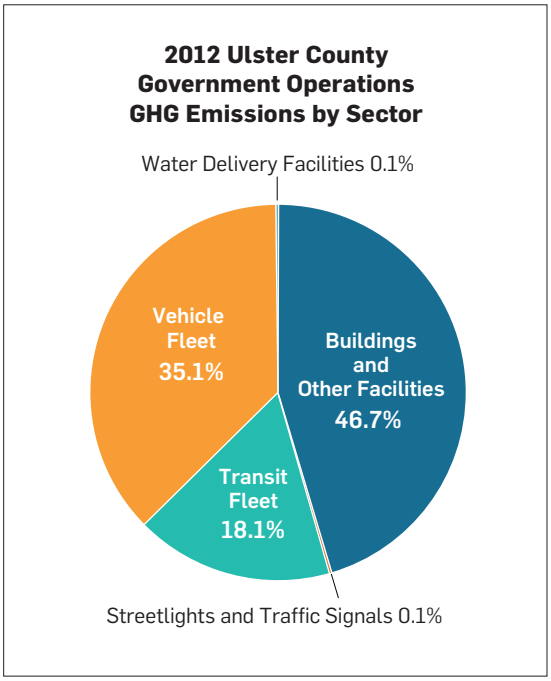


Figure 18.

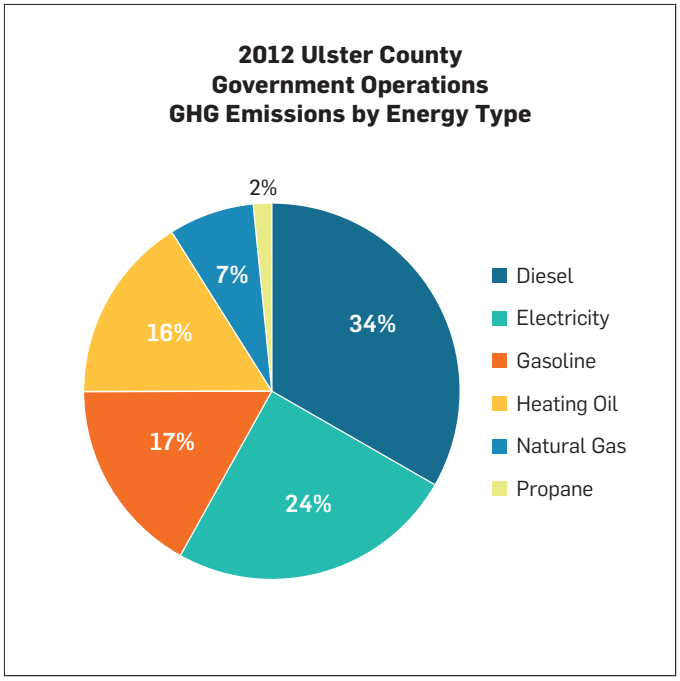


Figure 19.

2018 GHG Inventory Update

The GHG inventory for Ulster County was updated in 2019 using calendar year 2018 data.

Table 20. 2018 GHG Emissions Summary (Metric Tons)

		CO2e	CO2	CH4	N2O
SCOPE 1 DIRECT EMISSIONS	Mobile Combustion	5,018.7	4,921.8	5.1	91.8
	Stationary Combustion	2,755.9	2,748.8	2.3	4.8
SCOPE 2 INDIRECT EMISSIONS	Purchased Electricity	1,462.9	1,455.9	2.6	4.4
TOTAL		**9,237.5**	**9,126.5**	**10.0**	**101.0**

Table 21. 2018 GHG Emissions By Sector (Metric Tons CO2e)

		SCOPE 1	SCOPE 2
Buildings and Other Facilities	Purchased Electricity		1,452.2
	Stationary Combustion	2,749.2	
Streetlights and Traffic Signals	Purchased Electricity		3.8
Transit Fleet	Mobile Combustion	1,578.9	
Vehicle Fleet	Mobile Combustion	3,439.7	
	Purchased Electricity		1.1
Water Delivery Facilities	Purchased Electricity		5.8
	Stationary Combustion	6.7	
TOTAL		**7,774.6**	**1,462.9**

Biogenic Emissions

In 2018, Ulster County emitted 186 metric tons of CO2e from biogenic sources. These emissions are entirely attributed to the mobile combustion of ethanol and biodiesel.

Table 22. 2018 Biogenic Emissions (Metric Tons CO2e)

Sector	Biogenic Emissions
Transit	51.1
Vehicle	134.9
TOTAL	**186.0**

Optional Scope 3 Emissions

In 2018, Ulster County estimated the anthropogenic Scope 3 emissions attributed to employee commutes as 2,127 MT CO2e.

Table 23. 2018 Scope 3 Emissions (Metric Tons)

		CO2e	CO2	CH4	N2O
SCOPE 3	Mobile Combustion	2,127.1	2,084.6	2.2	40.3

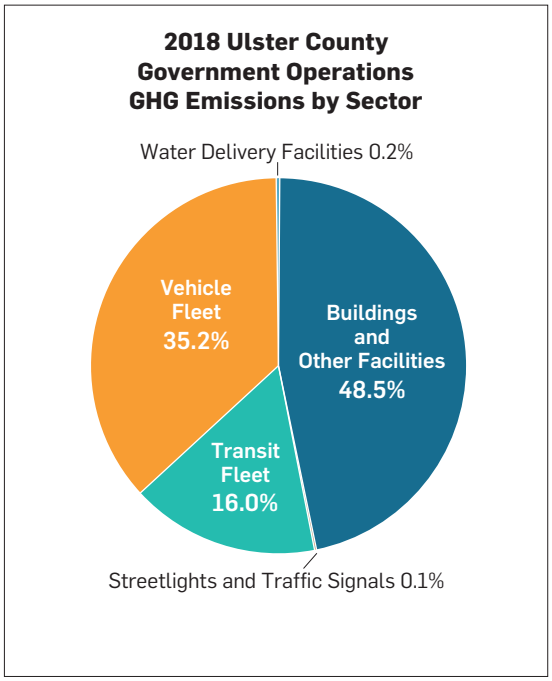


Figure 20.

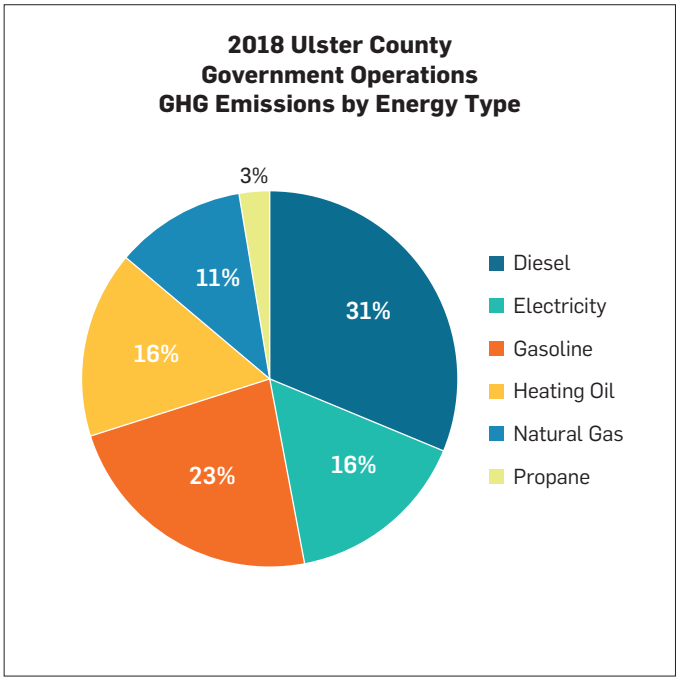


Figure 21.

Table 24. Scope 1 and 2 Activity Data from GHG Inventory by Energy Type

Energy Type	2012	2017	2018
Biodiesel (gal)	—	3,226	3,521
Diesel (gal)	306,069	269,670	276,476
Electricity (kWh)	12,305,084	11,913,628	10,811,574
Ethanol (gal)	20,056	25,135	26,562
Gasoline (gal)	180,508	226,218	239,060
Heating Oil (gal)	151,601	126,728	144,424
Natural Gas (CCF)	120,952	181,154	189,892
Propane (gal)	28,227	35,416	42,194

Scope 3 Employee Commute Calculations

The methodology below was developed by VHB Engineering, Surveying and Landscape Architecture, P.C. for Ulster County's 2012 greenhouse gas inventory using employee surveys and home address to work location mapping techniques.

Table 25. Assumptions for Employee Commute Calculations

Vehicle Type	Percentage of Employees Using	People per vehicle	Vehicle MPG
Single Occupancy Vehicle	81%	1	21.64
Carpool	10%	2.44	21.64
Motorcycle	1%	1	43.38
Transit	3%		
Bike	1%		
Walk	4%		
Work at home	0%		
Other	0%		

Average one-way commute length: 11 miles
Workdays per year: 240
Fuel type: E10 gasoline

Table 26. Employee Data

Year	Number of Full-time equivalent employees
2012	1,390
2017	1,257
2018	1,263

Appendix B: Completed Projects

Project	Completion Year	Estimated Annual Resource Savings (kBtu)	Estimated Annual Emissions Reduction (MT CO2e)
Ulster County Area Transportation (UCAT) / Lighting / Exterior lighting	2010	—	—
Ulster County Office Building / Lighting / Interior Lighting Upgrade	2011	118,618	5
Court House / Lighting / Interior Lighting Upgrade	2011	251,608	10
Golden Hill Office Building / Lighting / Interior Lighting Upgrade	2011	265,412	10
Information Services / Lighting / Interior Lighting Upgrade	2011	160,345	6
Ulster County Office Building / Lighting / Interior Lighting Upgrade	2011	118,617	5
Records Storage / Lighting / Interior Lighting Upgrade	2011	95,782	4
Ulster County Area Transportation (UCAT) / Lighting / Interior Lighting Upgrade	2011	106,113	4
Golden Hill Office Building / HVAC Equipment / Cooling Tower Replacement	2012	48,478	2
Public Works / HVAC Equipment / Cooling Tower Replacement	2012	13,873	1
Crown Street Lighting / Lighting / Exterior lighting	2014	—	—
Trudy Resnick Farber / Lighting / Exterior lighting	2014	29,855	1
Ulster County Office Building / Lighting / Exterior lighting	2014	56,537	2
Golden Hill Office Building / Lighting / Exterior lighting	2014	35,365	1
Heavy Vehicle Maintenance/Quarry / Lighting / Exterior lighting	2014	268,975	11
Ulster Avenue Office Complex (DSS, BRC) / Lighting / Exterior lighting	2014	198,903	8
Public Works / Lighting / Exterior lighting	2014	—	—
Ulster County Law Enforcement Center / Lighting / Exterior lighting	2015	668,609	26
Probation Department / Lighting / Exterior lighting	2015	43,639	2
Carr / Lighting / Interior Lighting Upgrade	2015	7,773	0
Court House / Lighting / Interior Lighting Upgrade	2015	186,797	7
Dept of Environment / Lighting / Interior Lighting Upgrade	2015	6,322	0
Emergency Management / Lighting / Interior Lighting Upgrade	2015	39,214	2
Golden Hill Office Building / Lighting / Interior Lighting Upgrade	2015	176,359	7
Probation Department / Lighting / Interior Lighting Upgrade	2015	47,420	2
Public Works / Lighting / Interior Lighting Upgrade	2015	34,007	1
Records Storage / Lighting / Interior Lighting Upgrade	2015	53,483	2
Trudy Resnick Farber / Lighting / Interior Lighting Upgrade	2015	126,708	5
Ulster County Area Transportation (UCAT) / Lighting / Interior Lighting Upgrade	2015	88,811	3
Ulster County Law Enforcement Center / Lighting / Interior Lighting Upgrade	2015	944,541	37
Ulster County Office Building / Lighting / Interior Lighting Upgrade	2015	344,824	14
Carr / HVAC Equipment / DHW Heater Replacement	2015	—	—

Appendix B: Completed Projects *continued*

Project	Completion Year	Estimated Annual Resource Savings (kBtu)	Estimated Annual Emissions Reduction (MT CO2e)
Court House / Lighting / Exterior Lighting	2015	60,491	2
Ulster County Law Enforcement Center / Scheduling / Building Scheduling	2015	1,199,290	69
Records Storage / Lighting / Exterior lighting	2016	—	—
Court House / HVAC Equipment / Replace cooling tower	2018	—	—
Ulster County Area Transportation (UCAT) / Lighting / Exterior lighting	2018	53,234	2
Quarry Mechanics Complex / HVAC Equipment / Install radiant system boiler(s) and controls	2018	—	—
Install HVAC/air exchange equipment	2018	—	—
Ulster County Law Enforcement Center / Lighting / Interior Lighting Upgrade	2018	2,476,177	97
Quarry Welding Shop / HVAC Equipment / Install HVAC / air exchange equipment	2018	—	—

Appendix C: Glossary of Terms and Acronyms

ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Additionality The principal that carbon offsets must represent real, permanent, verified, and enforceable reductions. Which must come from activities or project that are additional to what would occur under a business-as-usual scenario.

AVL Auto Vehicle Locator.

BAS Building Automation System.

Biodiesel Blend a blend of diesel and bio fuel, for example a 5% biodiesel blend will be denoted as B5, and a 20% blend will be denoted as B20.

Btu British thermal unit, a measure of heat equal to the amount of energy it takes to raise one pound of water by one degree Fahrenheit, also, the heat given by a common match flame.

CAP Climate Action Plan.

CAR Climate Action Reserve, one third party verification available for Carbon Credits.

CCF Centum Cubic Feet, representing 100 cubic feet

CDG Community Distributed Generation.

Carbon Credit a carbon credit is a third-party verified instrument representing the emissions reduction or removal of one metric ton of CO2e. Project-based offsets represent emissions reductions that are real, measurable, permanent, in excess of regulatory requirements and common practice and are additional to business-as-usual, net of leakage, and used only once.

CDD Cooling Degree Day.

CH4 Methane.

CO2 Carbon dioxide.

CO2e Carbon dioxide equivalent, wherein all greenhouse gas emissions are combined to a single metric; methane has 25 times the heat-trapping capability as carbon dioxide while nitrous oxide has 298 time the heat-trapping capability as carbon dioxide. For example, one pound of methane, one pound of nitrous oxide, and one pound of carbon dioxide, will have the equivalent heat-trapping capability of 324 pounds of carbon dioxide. It should be noted that methane and nitrous oxide are the only two other GHGs included in this report in the CO2e calculation.

Coefficient of Performance the ratio of the energy output to the input.

CRRA Community Risk and Resiliency Act.

CSC Climate Smart Communities.

Appendix C: Glossary *continued*

ECM Energy Conservation Measure.

EO Executive Order.

EMC Environmental Management Council.

EPA U.S. Environmental Protection Agency.

ESCO Energy Services Company.

EV Electric Vehicle.

EVSE Electric Vehicle Supply Equipment, a charging standard to ensure safe charging.

Gal Gallon.

GHG Greenhouse Gas. Carbon dioxide, methane, and other gases that accumulate in the atmosphere inhibiting radiant heat loss to space.

GRF Green Revolving Fund.

GRITS Green Revolving Investment Tracking System.

GSHP Ground Source Heat Pump.

GVWR Gross Vehicle Weight Rating.

GWP Global Warming Potential.

HDD Heating Degree Day.

HVAC Heating, Ventilation, and Air Conditioning.

ICLEI International Council of Local Environmental Initiatives, this membership organization is also known as Local Governments for Sustainability.

IECC International Energy Conservation Code.

IPCC International panel on Climate Change.

kW kilowatt, a measure of instantaneous electric power equal to one thousand watts.

kWh kilowatt-hour, an amount of electrical energy, as one kilowatt of power over a period of one hour. Equal to 3,412 British thermal units (Btu).

LED Light Emitting Diode.

LEED Leadership in Energy and Environmental Design, the most widely used green building rating system.

LGOP Local Government Operations Protocol.

MPG Miles per gallon.

MT Metric Ton, equal to 2206 lbs.

MW Megawatt, a measure of instantaneous electric power equal to one million watts.

MWh Megawatt hours, a measure of power over time.

Net Carbon Neutral Operations Strategy a strategy to achieve net zero carbon emissions by balancing carbon released with an equivalent amount offset.

N2O Nitrous oxide.

NYPA New York Power Authority

NYSDEC New York State Department of Environmental Conservation.

NYSERDA New York State Energy Research and Development Authority.

NYSOGS New York State Office of General Services.

Offset An action intended to compensate for the emission of carbon dioxide into the atmosphere by an entity, by reducing carbon emissions or sequestering carbon elsewhere. It generally takes the form of a tradeable market instrument that can be purchased and retired in equal quantity to the emissions produced.

REC renewable energy credit, or REC (pronounced: r**e**k), is a market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation. RECs are issued when one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a renewable energy resource. It is generally acceptable to claim the use of renewable power when retiring RECs from the North American market.

RNEM Remote Net Energy Metering.

Scope 1 emissions All direct GHG emissions (with the exception of direct CO2 emissions from biogenic sources).

Scope 2 emissions Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.

Scope 3 emissions All other indirect emissions not covered in Scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity (e.g., employee commuting and business travel), outsourced activities, waste disposal, etc.

SC-CO2 Social Cost of Carbon dioxide.

therm A unit of natural gas, equal to 100,000 Btu.

UC Ulster County.

UCAT Ulster County Area Transit.

UCDoE Ulster County Department of the Environment.

VMT vehicle miles traveled.

Appendix D: References and Additional Information

Building Benchmarking Report (2018)
Available here: https://ulstercountyny.gov/environment/sustainability-energy/building-energy-benchmarking

Emissions Factors for Greenhouse Gas Inventories (EPA)
Available here: https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Green Fleet Report (2018)
Available here: https://ulstercountyny.gov/environment/environment/sustainability-energy/green-fleet-initiative

Green Revolving Investment Tracking System
Available here: http://www.endowmentinstitute.org/

ICLEI LGOP Version 1.1
Available here: http://icleiusa.org/ghg-protocols/

Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report
Available here: https://www.ipcc.ch/assessment-report/ar4/

Mid Hudson Regional Sustainability Plan
Available here: https://www.orangecountygov.com/300/Mid-Hudson-Regional-Sustainability-Plan/

New York Community and Regional GHG Inventory Guidance (Version 1.0, September 2015)
Available here: https://www.dec.ny.gov/docs/administration_pdf/ghgguide.pdf

New York State Comprehensive Emergency Management Plan
Volume 1: New York State Hazard Mitigation Plan
Available here: http://www.dhses.ny.gov/recovery/mitigation/plan.cfm

NOAA Storm Events Database
Available here: https://www.ncdc.noaa.gov/stormevents/

Responding to Climate Change in New York State (ClimAID)
Available here: https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%20Reports/Environmental%20Research%20and%20Development%20Technical%20Reports/Response%20to%20Climate%20Change%20in%20New%20York

Ulster County Multi-Jurisdictional Hazard Mitigation Plan (2017)
Available here: https://ulstercountyny.gov/emergency-services/hazard-mitigation/draft-plan-update/

Ulster County Sustainability Initiatives Guide
Available here: https://ulstercountyny.gov/environment/department-environment

ULSTER COUNTY
DEPARTMENT OF THE ENVIRONMENT

environment@co.ulster.ny.us
845-338-7287
PO Box 1800
17 Pearl Street
Kingston, NY 12401

PE2 Action: Government Operations GHG Inventory

16 Points | BRONZE PRIORITY | SILVER PRIORITY

A. Why is this action important?

A greenhouse gas (GHG) emissions inventory is one of the first and most important steps in the local climate action process. A local government operations GHG inventory is an accounting, analysis, and report of the GHG emissions resulting from the day-to-day operations of a village, town, city, or county. It summarizes the GHG emissions from the consumption of energy and materials in government buildings, from wastewater and water treatment facilities, from municipal vehicle fleets, from government-owned outdoor lighting, and from other sources. All Climate Smart Communities should prioritize GHG inventories as a foundational step toward effective action. GHG inventories provide the data needed to set realistic goals and track progress toward reducing operating costs, energy use, and emissions.

GHG inventory reports identify the largest energy users and sources of GHG emissions (e.g., by building, sector, or department). As a result, GHG inventories help local governments select actions that offer a good return on investment and should be highlighted in subsequent climate action planning. Over time, as a local government builds its capacity to conduct GHG inventories on a regular basis, the process helps to increase the ability of the local government to operate efficiently and use taxpayer resources effectively.

B. How to implement this action

For detailed guidance on implementation, download the Climate Smart Communities (CSC) guide Developing a Local Government Operations Greenhouse Gas Inventory. The information below provides an overview of the process.

At minimum, the inventory must include the Scope 1 and Scope 2 GHG emissions from government operations for the specific village, town, city, or county that is applying for CSC certification. Examples of the emissions categorized as Scope 1 and Scope 2 are described below.

- Direct GHG emissions (known as Scope 1) - for example, from government-owned vehicles, onsite fuel combustion (e.g., natural gas, propane, or fuel oil), wastewater treatment facilities, landfills, refrigerant leakage
- Indirect GHG emissions (known as Scope 2) – for example, from purchased electricity

Reporting on Scope 3 emissions is optional for this action, though highly encouraged. Scope 3 emissions are the other indirect GHG emissions not included in Scope 2. These include emissions resulting from the extraction and production of purchased materials and fuels, transportation in vehicles not owned or controlled by the reporting entity, outsourced activities, and waste disposal. A common source of Scope 3 emissions that is often included in government operations inventories is employee commuting. (Note that some voluntary GHG reporting programs require reporting of emissions from specified Scope 3 sources.)

Below is a summary of the steps involved in creating a local government operations GHG inventory:

1. Put together a small team who will manage the GHG inventory process and define each member's responsibilities. Identify key contacts who will provide support and data throughout the project. The team should focus not only on producing the GHG inventory report, but also on creating a process and data collection templates that will make producing the inventory easier next time.
2. Review options for GHG inventory tools, and select a tool that is appropriate for local goals and resources. (Free Excel-based GHG tools are available; contact climatesmart@dec.ny.gov for details.) Confirm that the

GHG tool is compliant with the Local Government Operations Protocol (LGOP), a standardized set of guidelines for quantifying and reporting the GHG emissions associated with local government operations.

3. Prepare for the process by determining what will be included in the GHG inventory. Preparation involves selecting a baseline year, assessing which emissions the local government is responsible for, and deciding what government sectors, facilities, and emission sources will be included. The CSC program recommends including only those emission sources over which the local government has operational control. Keep the inventory practical and cost-effective by focusing on the largest sources of emissions; an inventory that covers about 95% of GHG emissions is acceptable and complies with the LGOP. Facility energy use, fleet fuels, and streetlights tend to account for about 90% of local government GHG emissions, for those governments that do not have significant refrigerant leakage and do not operate a landfill or wastewater treatment plant.
4. Gather and organize the data. Request data on energy use and other sources of emissions from relevant local government departments and agencies. Review the data for completeness and accuracy.
5. Enter the data and calculate GHG emissions using the selected inventory tool. Review the calculations to confirm accuracy. Identify key findings.
6. Develop a GHG emissions forecast, where feasible, to estimate how emissions are likely to grow in the near future. Some GHG tools have the capacity to create a simple business-as-usual projection, while other, more sophisticated tools can create a range of forecasts.
7. Develop the GHG inventory report, with charts and a narrative description of the results in a way that is accessible and clear.
8. Share the report with the community by making a copy publicly accessible.
9. Repeat the process every five years, at minimum.

C. Time frame, project costs, and resource needs

Developing a GHG inventory is a data-intensive task that involves costs related to staff time and, where applicable, time for consultants and/or interns. Project coordinators should review the available options for GHG inventory tools and select a tool that is appropriate for local goals and resources. Free GHG tools are available. Contact climatesmart@dec.ny.gov for details.

The total amount of time to produce the inventory depends on several factors, including the size and complexity of the local government, availability and quality of data, amount of resources dedicated to the effort, and promptness of contacts in providing data. The process can take a few months if the data are well organized and readily available. The first inventory process could take as much as a year. When procedures are put in place to enable regular updates of the GHG inventory, the time required will be reduced significantly as data collection improves and staff become familiar with the process.

D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this?

This action is applicable to all types of local governments. Planning departments or offices that lead climate and/or sustainability efforts are often responsible for managing the creation of GHG inventories. Cross-department involvement is often required to gather all the needed data. Local governments are encouraged to host a kick-off meeting at the beginning of the process and a meeting at the end to discuss the results with local government staff. If the local government chooses to organize a community event to share the report, a public relations officer or communications staff could be involved as well.

E. How to obtain points for this action

A local government operations GHG inventory report that is consistent with the requirements described here is eligible for a total of 16 points.

F. What to submit

Submit a copy of a local government operations GHG inventory report that was completed within five years prior to the application date. As described above, at minimum, the inventory must include the Scope 1 and Scope 2 GHG emissions

from government operations for the specific village, town, city, or county that is applying for CSC certification.

The inventory results can be presented in a report that is a standalone document, or they can be integrated into another report or plan. Provide evidence that the report was released to the public; for example, it could be posted on a government website or made available for review at a local library.

All CSC action documentation is available for public viewing after an action is approved. Action submittals should not include any information or documents that are not intended to be viewed by the public.

G. Links to additional resources or best practices

- CSC guide Developing a Local Government Operations Greenhouse Gas Inventory
- US EPA Local GHG Inventory Tools: Download free tools and sign up for updates.
- ICLEI - Local Governments for Sustainability USA, Inc.: ICLEI has a comprehensive GHG tool called ClearPath for conducting GHG inventories, forecasts, and monitoring at the community or government operations scale. Membership in ICLEI involves an annual fee based on municipal size and includes access to ClearPath.
- DEC CSC Pledge Element 2 – Local Greenhouse Gas Inventories

H. Recertification requirements

The recertification requirements are the same as the initial certification requirements.