

CITY OF MARTINSVILLE, VIRGINIA

ENERGY ACTION PLAN

A Plan for Saving Energy Costs and Creating a Resilient Community

April 2024



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GLOSSARY

Terms	Definition
Co-benefits	Additional benefits to emission mitigation efforts. Co-benefits include, but are not limited to enhanced economy, public health, water and air quality.
Emissions	Production of gases which are harmful to the environment and human health
Energy audit	An assessment of the energy requirements and loss for buildings
Energy consumption	Total amount of energy utilized within a time period.
Mitigation Strategies	Reducing emissions and the severity of greenhouse gases in the atmosphere.
Resiliency	The ability to recover and cope from severe climate events and maintain function.
Task force	A group of key community stakeholders engaged in dialogue and guiding the creation of an Energy Action Plan.

ACRONYMS

Acronym	Definition
ADUS	Accessory Dwelling Units
AEE	Association of Energy Engineers
AFOLU	Agriculture, Forestry, and Other Land Use
BEV	Battery Electric Vehicle
CH4	Methane
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
C-PACE	Commercial Property Assessed Clean Energy
C-SITE	Communities Sparking Investment in Transformative Energy
DERs	Distributed Energy Resources
DOE	Department of Energy
EAP	Energy Action Plan

EPA	Environmental Protection Agency
ESCOs	Energy Service Companies
EV	Electric Vehicle
GHG	Greenhouse Gas
HOA	Homeowners Association
HUD	Housing and Urban Development
ICLEI	International Council for Local Environmental Initiatives
IRA	Inflation Reduction Act
kWh	Kilowatt Hours
LSS	Large Scale Solar
MSW	Mixed Waste
MT	Metric Tons
N2O	Nitrous Oxide
PHEV	Plug-in Electric Vehicle
PV	Photovoltaic
RECs	Renewable Energy Credits
SBT	Science-Based Target
USDA	US Department of Agriculture
VDOE	Virginia Department of Energy
VDOT	Virginia Department of Transportation
VMT	Vehicle Miles Travelled

EXECUTIVE SUMMARY

The City of Martinsville presents this Energy Action Plan as a pathway for the community to conserve energy, save money, increase energy security and independence, and ensure a more sustainable and resilient community.

In the summer of 2023, George Mason University and the City of Martinsville agreed to work together to develop an Energy Action Plan. Over the course of the next twelve months, university faculty and students worked with municipality employees to (1) measure and model the municipalities' energy consumption and greenhouse gas emissions, (2) identify and invite key community stakeholders to join a task force, and (3) conduct a series of meetings with the task force to identify Energy Action Plan goals, strategies, and actions.

The municipality seeks to develop and implement this Plan for several reasons. First, residents face higher energy costs and increasing economic burdens when purchasing essentials, such as gasoline, diesel, heating oil, and electricity. Second, residents confront the realities of a changing environment with increased flooding, precipitation, and heat conditions, which have imposed hardships on human health, livelihood, and property damages—and these conditions will continue to increase and worsen in the future. Third, our region has been reliant on external energy resources—from power plants to oil companies—but the means to increase our energy self-resilience and independence exist with local energy technologies and energy efficient practices. And finally, the federal government has created opportunities that will convey significant amounts of funding to shift from costly energy sources to more efficient and clean energy sources, practices, and technologies. This funding is available to local governments. To date, larger urban areas have taken advantage of these funds, but more rural areas in Virginia must also avail themselves of the benefits of these funds.

To access these funds and opportunities, many of the federal and state grant opportunities for local governments require developing and implementing energy and climate action plans. By creating this Plan, Martinsville best positions itself to receive these benefits. The Energy Action Plan represents a community-driven, transparent, and equitable examination of the municipalities' energy consumption and emissions profile and the means to reduce, conserve, and protect its energy future. This plan represents our goals, strategies, and actions that we hope will assist our community in achieving greater energy savings, independence, and resiliency.

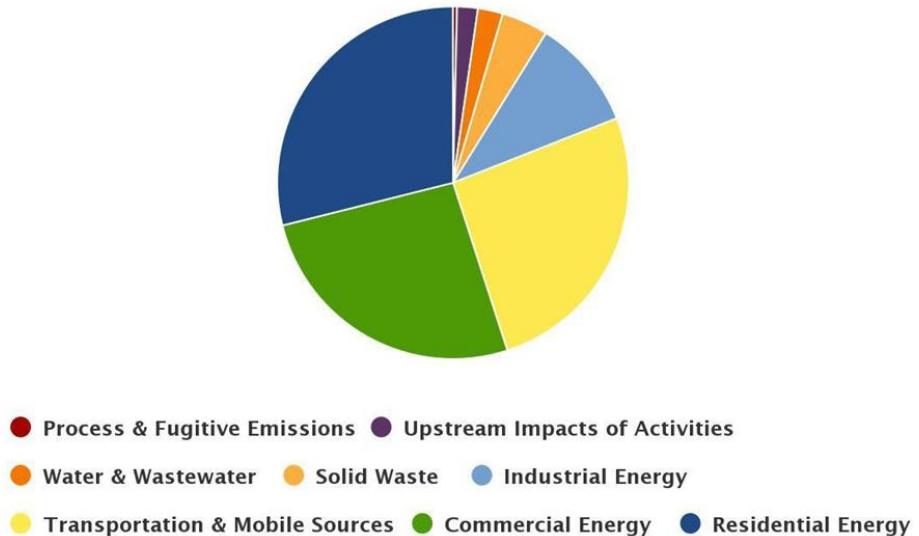
GOALS

Martinsville has an intermediate goal to reduce our community's greenhouse gas emissions by 50 percent by 2030 (from the base year of 2005). We also have a long-term goal to reach carbon neutrality by 2050. We use greenhouse gas emissions as a proxy to understand and set goals for energy savings and resilience. For every unit of greenhouse gas emissions that we reduce, we conserve energy, reduce costs, and make our community more resilient.

When we examine our community's highest sectors for energy consumption, our modeling reveals that the top energy sectors are:

- (1) Residential & Commercial Energy, and
- (2) Transportation.

CO2e By Category



We must address these two sectors if we want to meet our goals. Note, electricity is used by end-use sectors such as homes, businesses, and factories. We must examine consumption and emissions by end-use sector to assist with our understanding of energy demand and changes in energy use over time. Therefore, our Plan will focus on six end-use sectors:

Buildings
Electricity
Transportation
Water & Wastewater
Solid Waste
Land Use

We will also touch upon these two additional sector considerations because both are needed to meet our goals.

Partnerships
Organizational Structure

STRATEGIES

The community task force selected a set of strategies that will assist with achieving the overall goals of the Plan. The strategies identified below are considered higher level, qualitative descriptions that address the goals of conserving energy, reducing emissions, and enhancing community sustainability and resilience.

STRATEGY: BUILDINGS
Increase energy efficiency and deploy clean energy technology in existing buildings (residential and commercial).
STRATEGY: TRANSPORTATION
Increase alternative forms of transportation. Increase transition to electric vehicles.
STRATEGY: ELECTRICITY
Increase transition to clean and renewable energy sources.
STRATEGY: LAND USE
Improve management of lands and native trees.
STRATEGY: WASTE & WASTEWATER
Improve the quality of waterways.
STRATEGY: SOLID WASTE
Reduce the amount of solid waste going into landfills.
STRATEGY: PARTNERSHIPS

Develop partnerships with key stakeholders to advance energy efficiency and clean energy projects.

STRATEGY: ORGANIZATIONAL STRUCTURE

Create a structure and invest in human resources that assist implementing energy and sustainability initiatives.

SUB-SECTOR STRATEGIES

The community task force identified strategies for each of the six core sectors that will assist with achieving the intermediate and long-term goals. The sub-sector strategies identified below represent quantitative measures for each core sector.

BUILDINGS	
(1) Retrofit at least 100 residential housing units with cumulative energy efficiency improvements of 25% (existing buildings) by 2030.	(3) Retrofit at least 50 commercial building with cumulative energy efficiency improvements of 30% (existing buildings) by 2030.
(2) Convert 30% of fossil fuel residential building systems (e.g., space or water heaters) to highly efficient electric options (e.g., heat pumps).	(4) Convert 30% fossil fuel commercial building systems (e.g., space or water heaters) to highly efficient electric options (e.g., heat pumps) by 2035.
TRANSPORTATION	
(1) By 2030, the municipality should convert 30% of its publicly owned light-duty internal combustion engine vehicles to plug-in electric vehicles (PHEVs) and battery electric vehicles (BEVs) vehicles.	(3) Community: Increase PHEVs/BEVs to at least 12% of all light-duty vehicle registrations by 2030.
(2) By 2030, the municipality should convert 30% of its publicly owned medium and heavy-duty vehicles to PHEV/BEV or other clean vehicle technology (e.g., propane, natural gas).	(4) Community: Reduce 15% of passenger vehicle miles traveled by shifting to active or public transport (e.g., biking, walking, or taking the bus) by 2030.
ELECTRICITY SECTOR	
Transition 40% of the electricity used in the municipality to clean energy sources (e.g., solar, wind, hydropower, nuclear, and geothermal) ahead of Virginia's Renewable Portfolio (state law requires 45% renewable in 2035).	
SOLID WASTE	
Divert 40% of solid waste produced in the city (e.g., recycled, composted, reused) by 2030.	

ACTIONS

The community task force identified the following high-priority actions for the core sectors, which will assist with achieving the overall and sub-sector goals (medium and low priority actions are included in Chapter 3). In selecting actions, the community task force was guided by six principles: effectiveness, cost savings, feasibility, equity, co-benefits, and consistency with government plans.

BUILDINGS	
(1) Identify and evaluate how existing incentive programs (for example, Enterprise Zones) can incorporate energy efficiency and clean energy requirements or targets. Identify and address challenges to broader acceptance and adoption of the requirements and targets.	(2) Evaluate the municipality communication and dissemination on energy efficiency and clean energy technology information and identify recommendations to increase effectiveness of communication and engagement with citizens. For example, move beyond passive website and social media communications and consider partnering with schools, businesses, organizations, and utility (in electricity bill statements) to engage with public more actively.
(3) Pursue state and federal grants to establish a rebate program for transitioning to energy efficient and clean energy technology (for example, electric heat pumps, weatherization, solar water heaters or panels). As a prerequisite for participation in a rebate program, require the completion of a comprehensive energy audit. This rebate program should have a carve-out for low-income residents.	(4) Rezone areas that have abandoned buildings into multi-dwelling use and mixed-use retail. Create or expand incentives to attract building developers to re-purpose abandoned buildings into more energy efficient and clean technology applications.
(5) Inform and educate landlords and renters about “green leases” by creating a class and/or educational material targeted to landlords and renters.	(6) Issue a request for proposals to establish an agreement with an energy auditor to provide residential energy audits at a discounted price.
(7) Modify the commercial real estate tax exemption or reduction to apply energy-efficient upgrades on buildings.	
TRANSPORTATION	
(1) Pursue state and federal grants to support the purchase of clean electric or plug-in electric vehicles.	(2) Conduct training and education for government employees on the feasibility and cost-benefit of clean and alternative vehicles.
(3) Evaluate the creation of a public transportation system (buses) and provide recommendations for implementation. If created, provide a discount for low-income or senior citizens.	(4) Encourage and promote the availability of car-ride businesses to work with hospitals, health care providers, and other businesses to encourage alternative forms of transportation.

	Seek city-county partnership efforts on this action.
(5) Evaluate and produce a plan to create more bikeable and walkable pathways with an emphasis on connecting homes to businesses.	(6) Re-visit electric bike program with a new vendor and address issues from last vendor (for example, require that bikes be returned to docking station as part of rental agreement).
LAND USE	
(1) Develop a long-term plan for more sustainable development (green zoning plans for energy and water-efficient buildings, multi-family and mixed use, and transit-oriented development). Include multi-family housing through development, zoning, and land use policies. Convene a task force to provide recommendations.	(2) On public lands, plant more native trees and food forest tree plantings, create more green landscapes, and manage non-native plants.
ORGANIZATIONAL STRUCTURE	
(1) Create an energy and climate committee comprised of residents who are appointed and empowered to provide advice and recommendations to the City's leaders.	(2) Hire a Sustainability Specialist who will serve as the point person on all energy, climate, and resilience issues.

CONSISTENCY WITH COMPREHENSIVE PLAN

The City of Martinsville Comprehensive Plan 2021 provides the foundation and framework to help guide and base decisions on the City's future. The Comprehensive Plan confronts the challenges facing the City over the next twenty years. The energy sector presents a prevailing and omnipresent component of our lives. We need energy to fuel our vehicles, heat and cool our homes, and cook our food. Yet, energy and its contributions to our climate also raise the risks of increased flooding, precipitation, and heat events, which affect our health and quality of life.

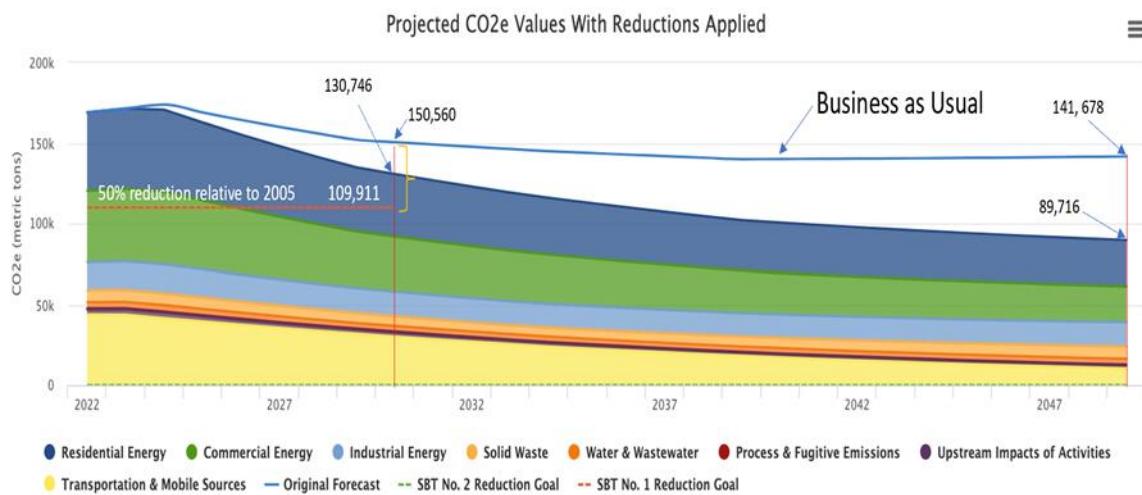
The Energy Action Plan is consistent with the recommendations of the City of Martinsville Comprehensive Plan 2021 in the following areas:

Comprehensive Plan	Energy Action Plan
Market the area as a desirable and affordable place for retirees to locate.	General provisions throughout the plan address the potential for making the City a more affordable and desirable location. See Chapter 3, Buildings—B1, B3, B7, B9, B10; Electric Sector—ES3, ES6
Continue to concentrate on providing a greater variety of recreational opportunities for all age groups, especially the young adults.	See Chapter 3, Land Use—L1, L2

Provide educational opportunities for all segments of the City's population; Continue to support efforts of the area educational institutions to keep the college age persons in the City, or encourage new individuals to locate here	See Chapter 3, Partnerships—P1, P2, P3
Promote entrepreneurial development and small business expansion.	General provisions throughout the plan address new business opportunities. See Chapter 3, Buildings—B2, B6, B7, B8; Transportation—T9, T11, Electric Sector—ES 1, ES5; Land Use—L2, L3
Encourage redevelopment of vacant buildings and industrial sites	See Chapter 3, Buildings—B4
Continue to encourage the growth of tourism.	See Chapter 3, Land Use—L1, L2
Market area as one of good quality air standards	General provisions throughout plan result in improved air quality. See Chapter 3, Buildings—B3; Transportation—T1, T5, T10; and Electric Sector—ES3, ES5.
Complete the network of walking and biking trails within and without the City.	See Chapter 3, Transportation—T10.
Explore and implement amendments to the zoning ordinances to encourage new and innovative housing throughout the City.	See Chapter 3, Land Use—L3; Buildings—B4, B11
Continue to develop a transit system, so that the community has inexpensive, accessible transit options.	See Chapter 3, Transportation—T8, T9

MEETING GOALS

If Martinsville takes no additional concrete actions to reduce emissions (“Business as Usual”), it will emit over 150,000 metric tons of CO₂ equivalent annually by 2030. The graphic below depicts emission reductions based on Martinsville implementing the *measurable* actions recommended by its task force. In this scenario, Martinsville will reduce almost 20,000 metric tons of CO₂ equivalent by 2030, but this is short of its 50% reduction target which would require an additional 20,000 metric tons of CO₂ equivalent reductions. It is important to note that this graphic only depicts the results of actions that can be measured by models. There are many actions, such as education, that can result in more emission reductions but simply cannot be modeled. If Martinsville implements all of its recommended actions, the City may meet both the intermediate and long-term goals.



CHAPTER I – INTRODUCTION

An energy action plan examines the sources of a municipalities' energy consumption and seeks to reduce this consumption, and in turn, reduce emissions of greenhouse gases. Within a municipality, energy is consumed from various end-use sectors, such as buildings, electricity sector, transportation, land use, water and wastewater, and solid waste. Each has its own means of consuming energy, and therefore each presents unique opportunities to reduce this consumption and emissions.

The first step in building an energy action plan involves understanding the current energy consumption levels in the municipality for each of the sectors identified above. For every unit of energy consumed, a unit of greenhouse gases is emitted. The use of greenhouse gases serves as a metric to understand the communities' energy and sustainability profile. This is accomplished by obtaining and analyzing data on energy use throughout the community. This data provides an inventory of past and current consumption, and most importantly, allows for projecting future scenarios involving reduction (mitigation) techniques and practices. This data is translated into a community profile to illustrate the main areas of energy consumption, which are important when prioritizing energy strategies and actions. For example, if the model finds that the transportation sector produces 10 tons per year of energy-related greenhouse gas emissions and the municipalities' goal is a 50% reduction, then the municipality will want to implement actions that reduce these emissions by half, or 5 tons per year. Thus, the municipality models greenhouse gas emissions to understand its current baseline, develop goals and strategies based on this baseline, and ensure and evaluate progress by reevaluating emissions.

Reducing energy consumption, and by extension greenhouse gas emissions, are important to ensure that Martinsville has a sustainable and resilient community. We want our citizens to save money on energy, and we also want our community to live in a more sustainable and resilient place. This requires reducing energy consumption. We are aware of the changes in our environment, from increased precipitation, flooding, and extreme heat days. By reducing our energy consumption, we are saving money and making our community a more comfortable and livable place.

Energy Action Plan: Development Process

GHG Modeling

To accurately calculate emissions for Martinsville, Virginia, George Mason University utilized the ICLEI Local Governments for Sustainability, USA ClearPath model and followed the protocol for a Community-Wide Greenhouse Gas Inventory. Energy consumption, solid waste and water

treatment characteristics are attributed to greenhouse gas emissions and were included in emission calculations. Utility providers supplied energy consumption data for buildings within Martinsville, Virginia. Non-utility energy consumption was retrieved from state and federal databases. This data was entered into the ICLEI ClearPath calculators to quantify emissions. The [U.S. Community Protocol](#) and [Martinsville GHG Inventory Memorandum](#) provide general and specified information regarding the 2022 Martinsville Community-Wide Greenhouse Gas Inventory.

Community Meetings

George Mason University worked with Martinsville government officials to identify community members to serve on a task force. The community task force members were selected based on their ability to represent diverse community needs, backgrounds, and professional experience. George Mason University approached each prospective member and reviewed the project goals and task force obligations.

The community task force met over four weeks in February 2024, meeting on consecutive Fridays for two hours per meeting. Each meeting was in-person, with some task force members appearing via video. The first two meetings focused on educating and exchanging information on key terminology, greenhouse gas models, energy mitigation strategies, and the results of the municipality greenhouse gas inventory. The community task force was provided with a binder of information that consisted of the goals and process, examples of guiding principles, examples of other municipality energy actions plans, and case studies on energy mitigation actions. The mitigation case studies and greenhouse gas modeling were developed by university students under faculty supervision. The mitigation case studies provided detailed information on potential energy reduction actions, strategies, and policies in each of the core sectors. The case studies also provided objective information on the action's effectiveness, cost, feasibility, equity, and co-benefits. The greenhouse gas modeling is discussed in detail in Chapter 2.

The latter two meetings were designed to facilitate community task force discussion on selecting actions that would assist the municipality in achieving its goals. Community task force members reviewed case studies and engaged in structured analytic techniques and dialogue to identify the recommended action items, priority status (high, medium, low, not a priority), and time frame for implementation (1 year, 2-3 years, 4+ years, continuous). Community task force members engaged in dialogue amongst themselves and interacted with local government officials. The meetings were recorded, and draft reports of the recommended action items were approved by both community task force members and local government officials.

Guiding Principles

Community task force members were given an opportunity to identify which principles should guide their decision making on their recommended actions. The guiding principles were then used to evaluate each potential action item. The guiding principles selected are:

Effectiveness

- The recommended action meets the goals of energy savings and efficiency and reducing greenhouse gas emissions.

Costs, Economic Benefits, & Savings

- The recommended action has a positive impact on the local economy and employment. State or federal funds and financing are available to implement this action. Citizens, businesses, and/or the government will likely save money.

Feasibility

- The recommended action can be implemented by the municipal government (currently or soon). The municipal government has control over this action or can advocate for policies that support the action. Consider availability of financing and return on investment.

Equity

- The recommended action ensures (or can be designed to ensure) equitable distribution of benefits to all parts of the community (e.g., for low and middle-income citizens).

Co-Benefits

- The recommended action provides benefits beyond energy savings and emissions reductions to the community, such as public health, quality of life, economic gains, social benefits, or other environmental benefits.

Consistency

- The recommended action is well integrated with established community plans and policies or should be included in such plans and policies.

CHAPTER 2 – MUNICIPALITY GREENHOUSE GAS EMISSIONS

A community greenhouse gas (GHG) inventory is a systematic and comprehensive assessment of all GHG emissions produced within a specific community or geographic area. This inventory provides a detailed account of the sources and amounts of greenhouse gases released into the atmosphere because of human activities within the community of Martinsville.

Key elements of a Community GHG inventory include:

1. **Emission Sources:** Electricity, Transportation, Solid Waste, Water and Wastewater, AFOLU (Agriculture, Forestry, and Other Land Use), Fugitive Emissions, and Grid Loss.
2. **Greenhouse Gasses:** Measurement of different types of greenhouse gases, such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and refrigerants. The reduction of each gas contributes to resiliency and sustainability.
3. **Data Collection:** Where the data comes from, such as vehicle miles traveled, reports from utility companies, and other relevant factors.
4. **Inventory Period:** The time frame in which the inventory is taking place.

Total Emissions

Martinsville's total greenhouse gas emissions in 2022 are estimated to be **169,091 metric tons of carbon dioxide equivalent (CO₂e)**. CO₂e is a conversion of other greenhouse gases, such as methane, to an amount of carbon dioxide with an equivalent amount of warming potential. Emission estimates were taken from internal sources, such as the Water Resources Department, and external sources, such as Southwestern Virginia Gas. In general, estimates from municipal and utility sources are higher quality than external sources such as U.S. Energy Information Administration estimates. To convert the provided data into CO₂e, we use the ICLEI ClearPath tool which uses various emissions factors depending on the data source and is based on Science-Based Target (SBT) guidance (emissions reductions targets in line with the latest climate science). Emissions data was categorized into the following: Residential Energy, Commercial Energy, Industrial Energy, Transportation, Solid Waste, Water and Wastewater, AFOLU (Agriculture, Forest, and Land Use), Fugitive Emissions, and Grid Loss.

Per capita emissions for Martinsville are about 12.6 metric tons of CO2e. While this is lower than the US average of 16, it is important to keep in mind that this only includes emissions for Martinsville and does not include other factors like air travel. It is also important to note that per capita emissions tend to be lower for urban areas and higher for rural ones. Municipal emissions are also comprised of emissions outside the boundaries of the municipality. For a comparison, Danville, VA has emissions of roughly 650,000 CO2e, which is per capita about 15.4 metric tons of CO2e.

Emissions by Sector

Figures 1 and 2 illustrate how total emissions of 169,091 are divided into sectors. From highest to lowest amounts of CO2e emissions, the sectors are:

- **Residential Energy - 48,857 CO2e**
- **Commercial Energy - 44,145 CO2e**
- **Transportation - 43,883 CO2e**
- **Industrial Energy - 17,226 CO2e**
- **Solid Waste - 7,257 CO2e**
- **Water and Wastewater - 3,869 CO2e**
- **Grid Loss - 3,244 CO2e**
- **Fugitive Emissions - 610 CO2e**

Most emissions fall under the energy and transportation sectors, which is typical for the US.

Figure 1, Emissions by Sector

CO2e By Category

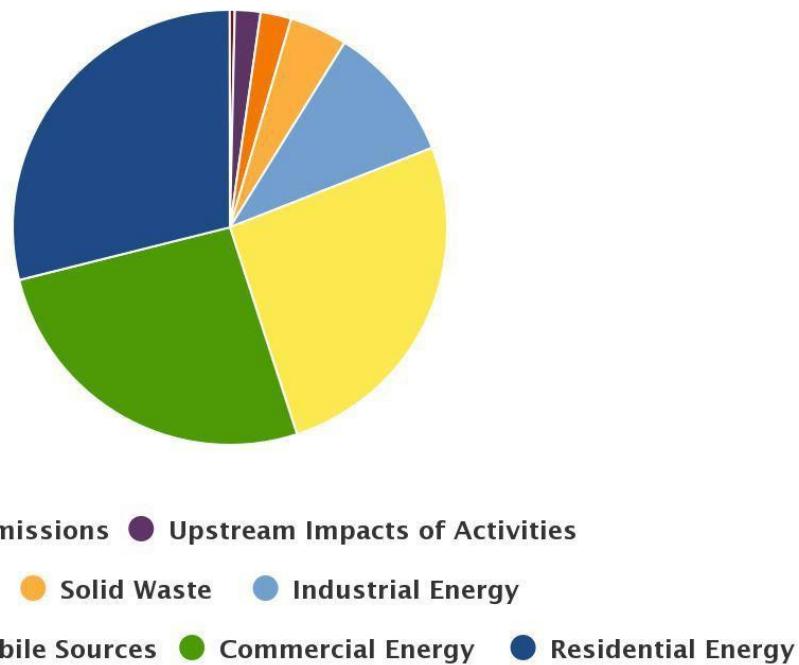
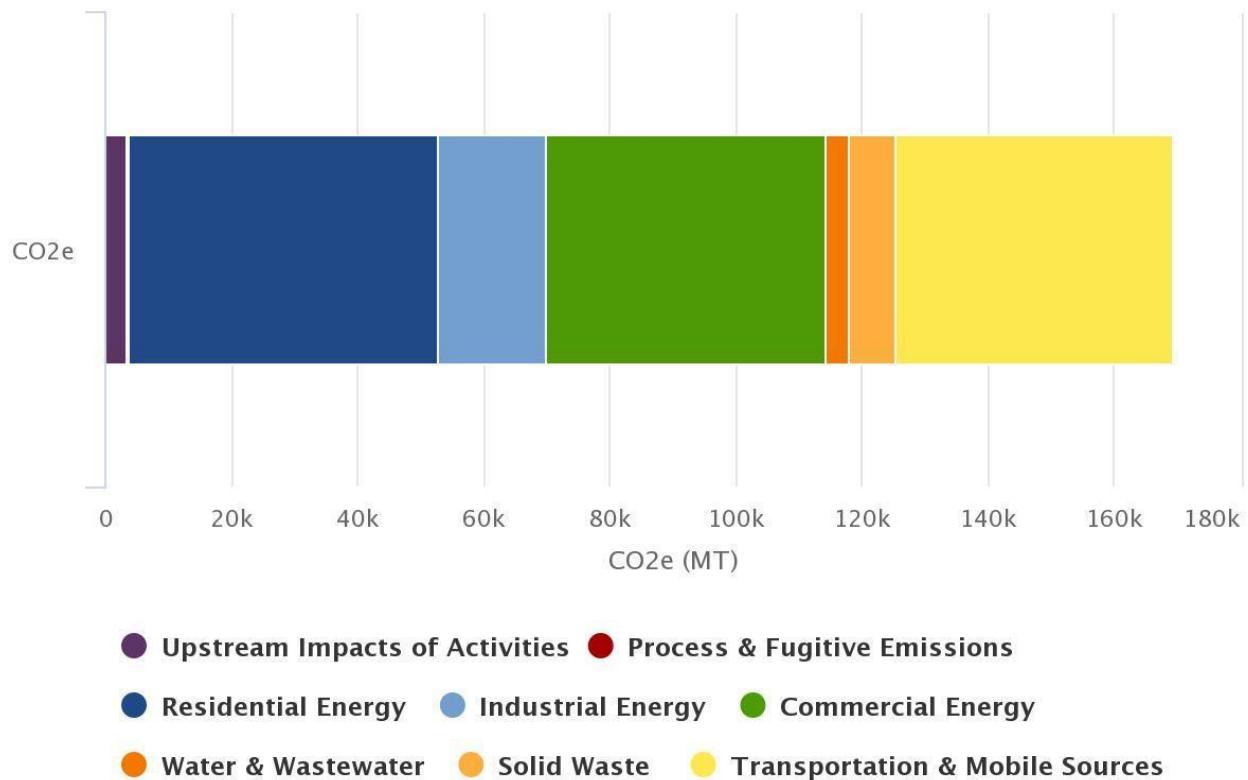


Figure 2, Emissions by Sector

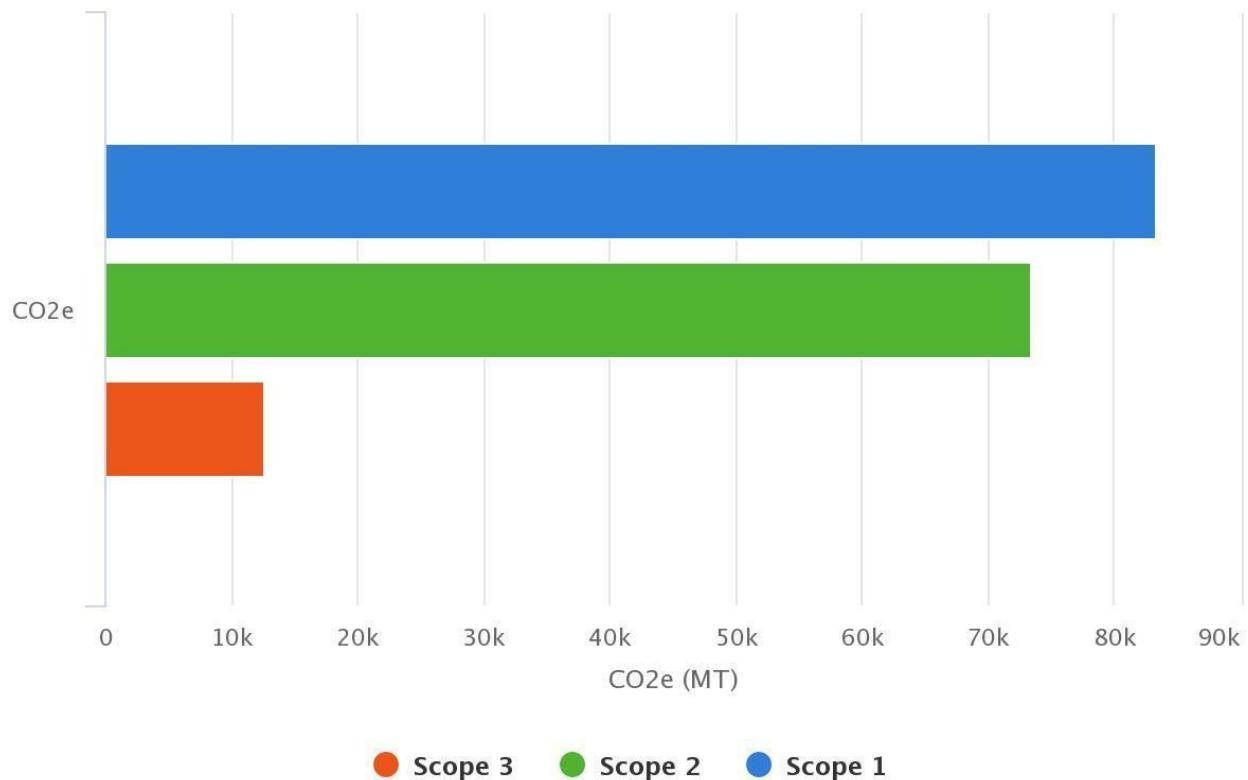


Inventory by Scope

Greenhouse gas emissions can also be divided into scopes 1, 2, or 3. Figure 3 represents Martinsville's emissions divided by scope.

- Scope 1 emissions are directly made by an entity.
 - For example, transportation can be scope 1 if it takes place within Martinsville's borders.
 - Scope 1 emissions – 83,207 CO2e.
- Scope 2 are emissions that an entity indirectly makes and are primarily from purchasing energy.
 - For example, energy purchased for heating and cooling homes.
 - Scope 2 emissions - 73,296 CO2e.
- Scope 3 are emissions an entity is indirectly responsible for but result from its activities.
 - For example, solid waste produced by residents and sent to a landfill outside of Martinsville's boundaries.
 - Scope 3 emissions – 12,589 CO2e.

Figure 3, Emissions by Scope



Residential Energy

Emissions from residential energy were calculated from the 2021 US Census Bureau's House Heating Fuel (B25040) Index and internal data obtained from Martinsville officials. These reports allowed us to estimate the 2022 emissions for the residential energy sector for Martinsville. Residential emissions are also divided up by type allowing for a more accurate emissions estimate. The categories are:

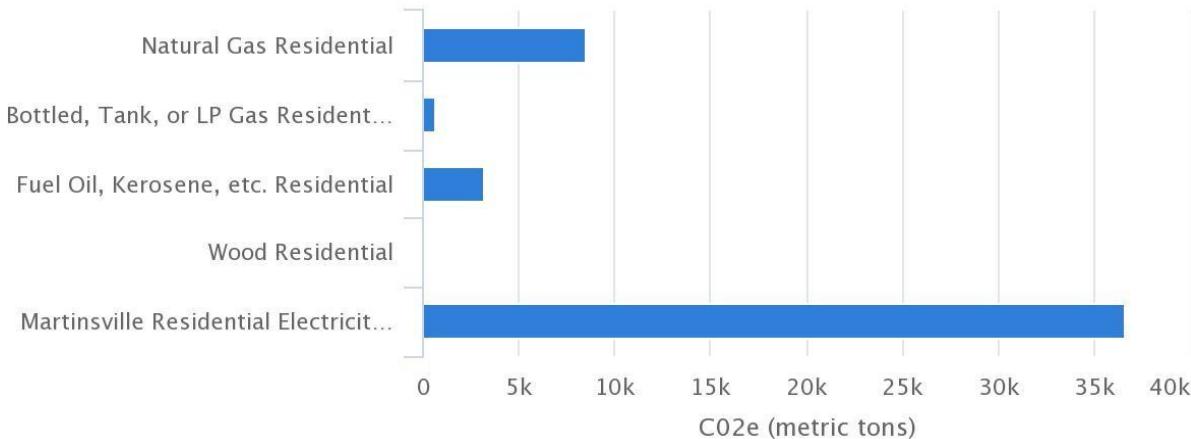
- Residential Electricity: The electricity used totaled 36,618 metric tons of CO2e emitted. This number was calculated from data obtained from Martinsville.
- Natural Gas Residential: Total Natural Gas use is 8,449 metric tons of CO2e. The data was obtained from Southwestern VA Gas.
- Other Stationary Fuels: Measured by using U.S. energy Information Administration's Virginia Non-liquid fuels consumption 2021 data and the US Census Bureau's House Heating Fuel (B25040) Index for Martinsville, VA.
 - Bottled, Tank, or LP Gas – 602 metric tons CO2e.
 - Fuel Oil and Kerosene – 3,170 metric tons CO2e.

- Wood – 19 metric tons CO2e.

Total emissions for the entire residential energy sector are 48,885 metric tons of CO2e.

Figure 4, Emissions from Residential Energy

CO2e By Record



Commercial Energy

Emissions from commercial energy were calculated from EIA and “OnTheMap” data, as well as internal data obtained from Martinsville officials. These reports allowed us to estimate the emissions for the commercial energy sector for the year 2022 for each municipality in Virginia. Commercial emissions are also divided up by fuel/ energy type, allowing for a more accurate emissions estimate. The categories are:

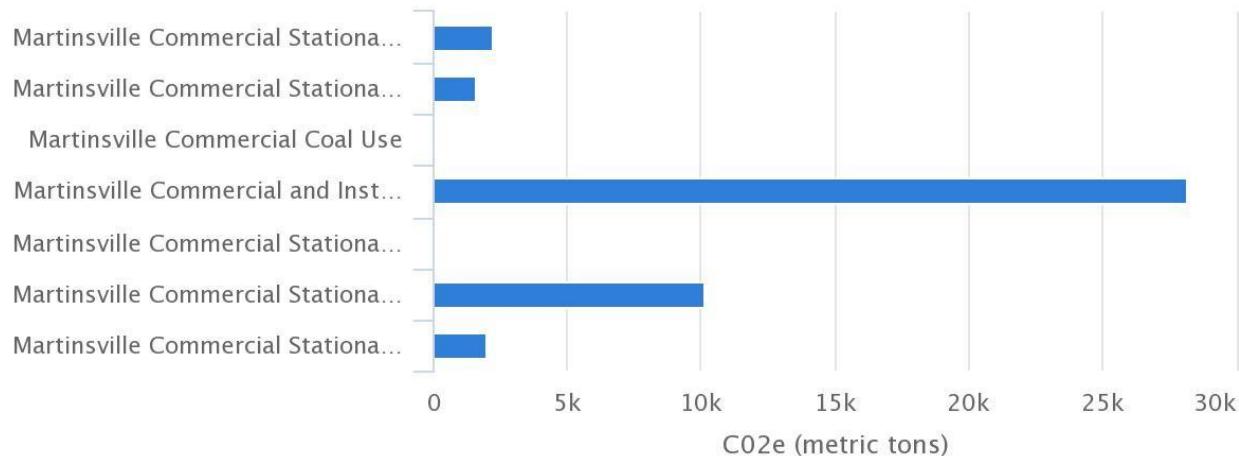
- Commercial and Institutional Electricity Use: Electricity use is estimated to be 28,145 metric tons of CO2e. Data for this was provided by Martinsville.
- Commercial Stationary Natural Gas: Total natural gas usage is 10,166 metric tons of CO2e. Data was provided by Southwestern VA Gas.
- Other Stationary Fuels: The US Census Bureau's "OnTheMap" and EIA's "Commercial Sector Energy Consumption Estimates 2021" tools were used to estimate fuel usage by number of jobs in the Commercial Sector in Martinsville.
 - Motor Gasoline – 2,205 metric tons CO2e.
 - Distillate Fuel Oil – 1,620 metric tons CO2e.
 - HGL – 1,994 metric tons CO2e.
 - Kerosene – 15.17 metric tons CO2e.

- Commercial Coal Use - Since anthracite and bituminous coal are the types of coal used the most in the region, we averaged their emission factors. Otherwise, the same method was used for 0.5 metric tons of CO2e.

In total, the emissions resulting from commercial electric consumption are 44,145 Metric Tons of CO2e.

Figure 5, Emissions from Commercial Energy

CO2e By Record



Industrial Energy

Emissions from industrial energy were calculated from EIA and “OnTheMap” data, as well as internal data obtained from Martinsville officials. These reports allowed us to estimate the emissions for the industrial energy sector for the year 2022 for each municipality in Virginia. Industrial emissions are also divided up by type, allowing for a more accurate emissions estimate. The categories are:

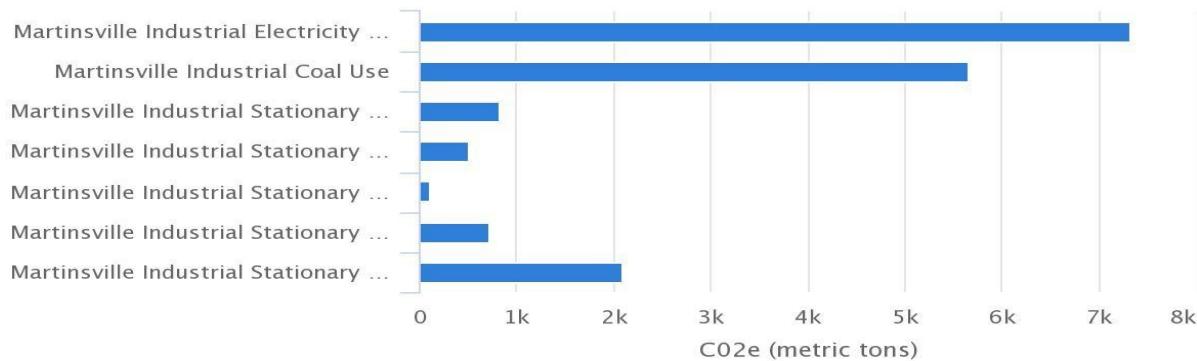
- Industrial Electricity Use - Electricity use is estimated to be 7,332 metric tons of CO2e. Data for this was provided by Martinsville.
- Industrial Natural Gas - Total natural gas usage is 823 metric tons of CO2e. Data was provided by Southwestern VA Gas.
- Other Stationary Fuels - The US Census Bureau's "OnTheMap" and U.S. Energy Information Administration's "Industrial Sector Energy Consumption Estimates 2021" tools were used to estimate fuel usage by number of jobs in the Industrial Sector in Martinsville.
 - Motor Gasoline – 514 metric tons CO2e.

- Distillate Fuel Oil – 2,080 metric tons CO2e.
- HGL – 722 metric tons CO2e.
- Kerosene – 106 metric tons CO2e.
- Industrial Coal Use - Since anthracite and bituminous coal are the types of coal used the most in the region, we averaged their emission factors. Otherwise, the same method was used for a total of 5,650 metric tons of CO2e.

As a result of all these calculations, we found that in total, the emissions resulting from the industrial electric consumption represented 17,227 Metric Tons of CO2e.

Figure 6, Emissions from Industrial Energy

CO2e By Record



Transportation

Emissions from transportation were calculated from the U.S. Department of Transportation's "Vehicle Miles Traveled" report. This report estimates the miles traveled for the year 2021 for each municipality in Virginia, which is the most recent year available when the inventory was conducted. Vehicle miles traveled are also divided up by vehicle type allowing for a more accurate emissions estimate since vehicles can be divided into categories which use different emissions factors and fuel sets. The factor set used for this inventory is the "2021 US National Defaults" provided by ICLEI (International Council for Local Environmental Initiative). The categories are:

- Passenger (Gas) - Includes motorcycles, cars, 2 axles 4 tires, and 2 axles 6 tires.
- Passenger (Diesel) - Includes buses.
- Freight (Diesel) - Includes 3 axle single unit trucks, 4 or more axle single unit trucks, 4 axle or fewer single trailers, 5 axle single trailers, 6 or more axle single trailers, 5 axle or fewer multi-trailers.

A total of 83,591,985 miles (about 134528259.51 km) were driven annually in the boundaries of Martinsville in 2021. By category:

- For passenger (gas) cars, miles driven were 82,461,534.75.
- For passenger (diesel), miles driven were 288,979.98.
- For freight (diesel), miles driven were 841,470.34.

This results in total emissions of 32,736. emissions (CO2e):

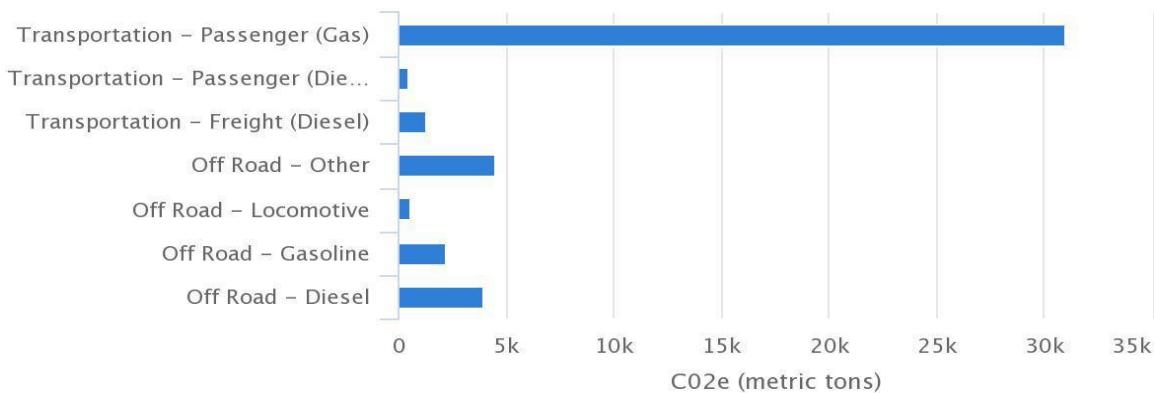
- 30,975 for passenger (gas)
- 450 for passenger (diesel)
- 1,311 freight (diesel)

Additional emissions for Off-Road Transportation were calculated from the U.S. Environmental Protection Agency's 2020 National Emissions Inventory Data tool. Emissions data was provided for the following categories by type of GHG emission: Gas, Diesel, Other, and Locomotive. Emissions by category (CO2e) were 2,182.5 for gasoline, 3,965.9 for diesel, 4,468 for other, and 532.15 for locomotive for total emissions of 11,148.55.

Total emissions for the entire transportation sector are 43,885 metric tons of CO2e.

Figure 7, Emissions from Transportation

CO2e By Record

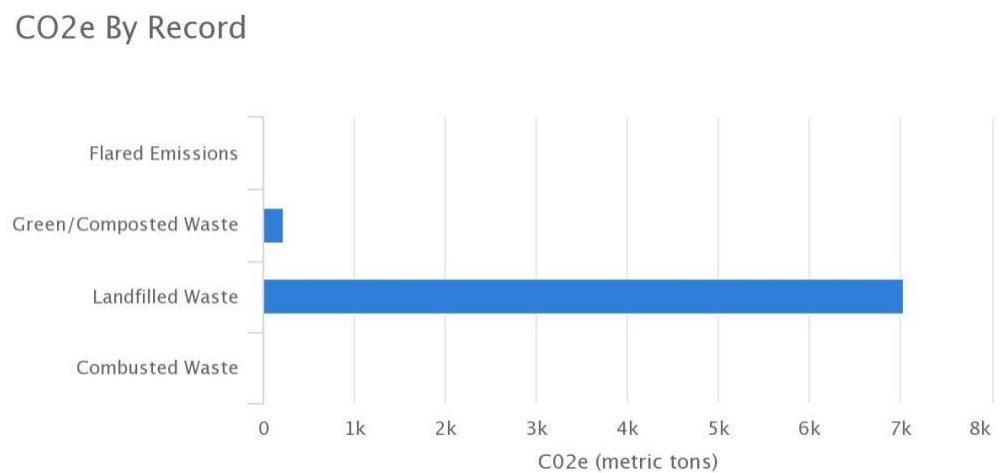


Solid Waste

Emissions from solid waste were calculated using the data supplied by Martinsville officials, which represented the raw tonnage of landfilled and composted waste. There were no reports of flared or combusted waste, meaning there is no documentation of methane (CH4) gas being captured or burned, which leaves the majority gases isolated to the landfilled waste. According to the U.S. Environmental Protection Agency, landfills are the third largest contributor of human related methane emissions, accounting for 15.5% of human methane emissions in 2021.

With a total of 8,978.75 tons sent to an off-site landfill in Pittsylvania County, this is classified as a Scope 3 Emission, and was calculated as 120.6 MT (metric tons) of methane (CH4), which was converted to 7,034.6 MT of its carbon dioxide (CO2) equivalent. Based on the 2022 Waste Management Plan for Henry County, the City of Martinsville, and the Town of Ridgeway, it was discerned that the landfilled waste was characterized as 37.5% MSW (mixed waste), as well as 17% attributed to green waste. The green composted waste represented a very small amount of solid waste emissions, which was calculated from 1,571.56 tons to be 6.9 MT of CH4, converted to roughly 221.52 MT of CO2e, with the U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator. Figure 8 shows solid waste emissions represented in metric tons of CO2e.

Figure 8, Emissions from Solid Waste



Water and Wastewater

Emissions for water and wastewater were calculated based on data collected from Martinsville's Water Resources Department. This data contains the amount of electricity used for the calendar year 2022 (in kWh), amount of natural gas consumed (in therms), the total population within Martinsville jurisdictional boundaries served, and the total population served outside of the boundaries.

For potable water treatment in the year 2022, approximately 1,153,765 kWh of electricity was used, and 5,279 therms of natural gas. The amount of potable water delivered for residents and businesses of Martinsville was 661.774 million gallons. The total population served by the potable water treatment plant was 14,517, of which 13,517 were in boundary. This record is important to note because it affects the scope of emissions produced by the treatment plant.

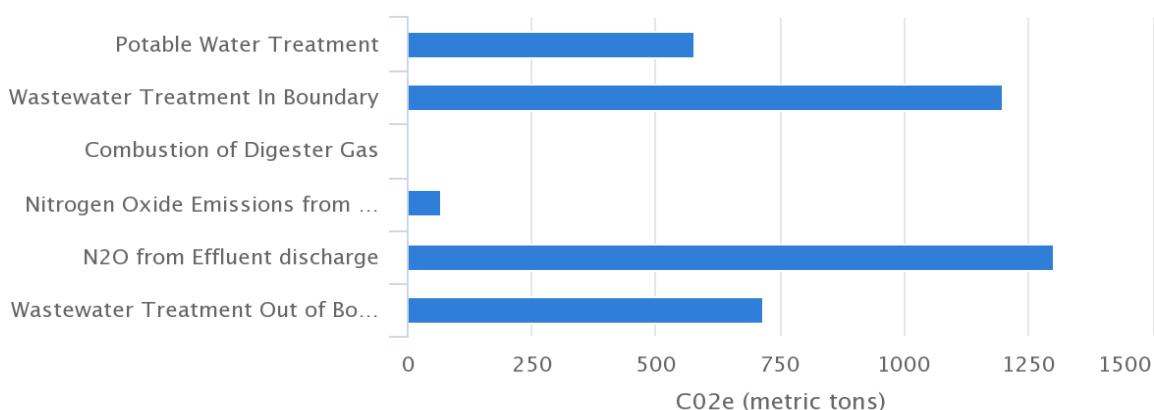
For wastewater treatment in the year 2022, approximately 3,890,400 kWh of electricity was used, and 11,209 therms of natural gas.

Per record, after converting to quantity of CO₂e emissions, this breaks down to:

- Potable Water Treatment — 579 metric tons CO₂e
- In boundary wastewater treatment — 1,201 metric tons CO₂e
- NO₂ Emissions from wastewater treatment — 68 metric tons CO₂e
- N₂O from effluent discharge — 1,302 metric tons CO₂e
- Out of boundary wastewater treatment — 716 metric tons CO₂e

Figure 9, Emissions from Water and Wastewater

CO₂e By Record



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AFOLU

AFOLU stands for Agriculture, Forestry, and Other Land Use. For Martinsville, only forestry contributes a sizable amount of greenhouse gas emissions. Forests act as greenhouse gas sink as they absorb carbon from the atmosphere and can reduce emissions in each area. As forests are converted to grassland, settlement, or other features, their ability to absorb carbon reduces. Emissions in this section are calculated from this reduction in carbon absorption as forests are converted or disturbed. Since forestry is a net carbon removal, data from this section is marked as information only since this inventory is only concerned with total emissions, and does not contribute to overall emissions.

Emissions from forest use were calculated through the LEARN tool from ICLEI which uses a land cover matrix and forest characteristics to estimate the annual loss or gain of forests in a specified area. Emissions for this sector total 1,678.32 metric tons of CO₂e and are broken down as follows:

- Forest to Grassland - 402.8 CO₂e
- Forest to Settlement - 1,033.3 CO₂e
- Forest Disturbances - 192.32 CO₂e
- Trees Outside Forests - 49.9 CO₂e

Total removals from forestry are 14,356 metric tons of CO₂e and are broken down as follows:

- Undisturbed Forests - 7,348.2 CO₂e
- Trees Outside Forests - 6,855.6 CO₂e
- Non-Forest to Forest - 152.4 CO₂e

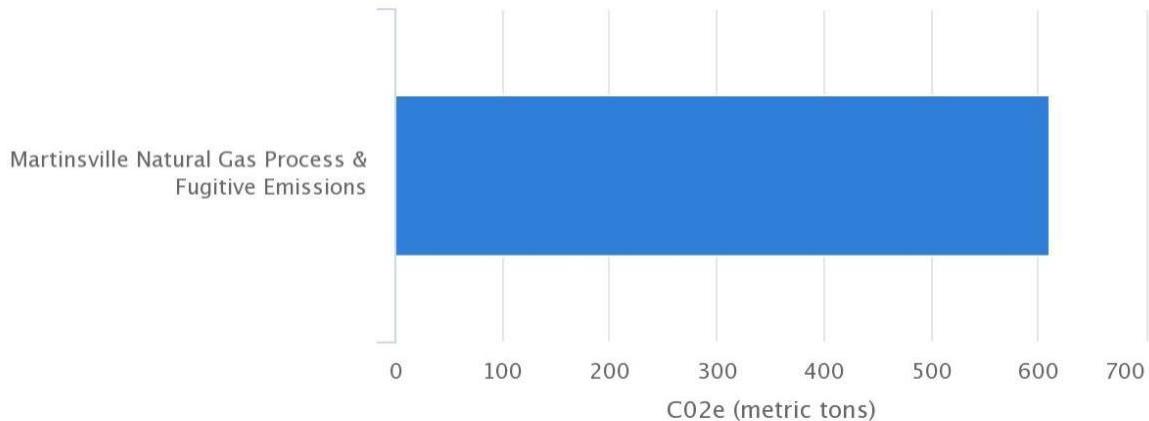
Process and Fugitive Emissions

Process and fugitive emissions are emissions of natural gas caused by accidental losses or releases. Fugitive emissions are calculated by applying a factor (or leakage rate) to the total amount of natural gas consumed. Natural gas consumed for three sectors (commercial, industrial, and residential) for the year of 2022 was summed as 3,516,040 therms. Applying a leakage rate of 0.3% yields fugitive emissions of approximately 610 metric tons for 2022.

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Figure 10, Emissions from Process and Fugitive Emissions

CO2e By Record

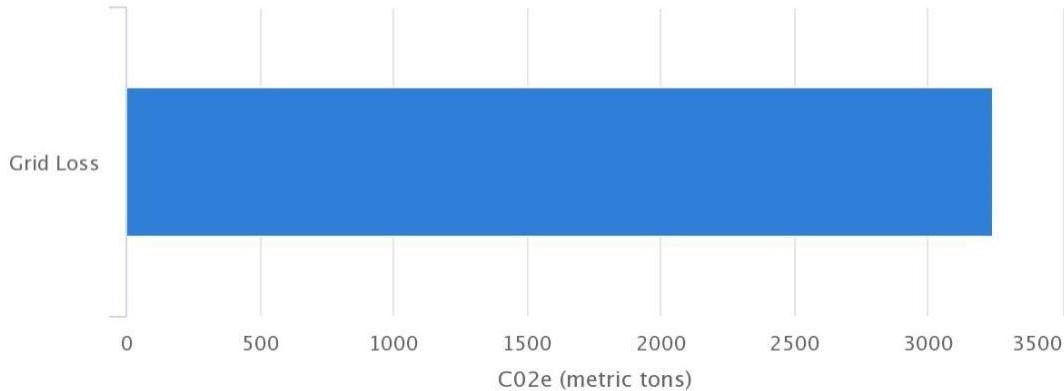


Grid Loss

Grid loss is the naturally occurring energy loss during the transmission of electricity. The U.S. Environmental Protection Agency's grid loss summary table estimates 4.5% of energy is lost in the region which contains the city of Martinsville. Using ICLEI's internal calculator, total electricity usage within the city of Martinsville of 151,018,406 kWh (Residential - 76,704,455, Commercial - 58,955,751, and Industrial - 15,358,200), and a grid loss factor of 4.5%, grid loss for Martinsville is 3,244.3 metric tons of CO2e.

Figure 11, Emissions from Grid Loss

CO2e By Record



CHAPTER 3 – GOALS, STRATEGIES & ACTIONS

Martinsville recommends an overall goal consistent with international, national, and regional goals—but influenced by local needs. Our goal is based on the best available science today which provides a pathway to conserve energy, reduce greenhouse gas emissions, and improve the resilience and sustainability of our community.

Our goal is to reduce our community's greenhouse gas emissions in the short-term by 50% by 2030 (from the base year of 2005). Since the U.S. has reduced emissions by approximately 15% in 2022, we can adjust our goal so that we only need to reduce emissions by 35% by 2030 relative to current levels. Our long-term goal would be to achieve carbon neutrality by 2050, which means the amount of greenhouse gases released into the atmosphere is equal to the amount removed.

The sections below outline the community task force recommended strategies and actions. Each section represents the core categories (buildings, transportation, electricity sector, land use, waste and wastewater, and solid waste). Within each section, there are four sub-parts: action, priority level, timeframe for implementation, lead government official, and comments.

GOAL: reduce emissions by 35% by 2030; achieve carbon neutrality by 2050.

All actions have been assessed by the community task force to comply with the guiding principles of effectiveness, feasibility, equity, and co-benefits.

Sector: BUILDINGS			
Strategy: Increase energy efficiency and deploy clean energy technology in existing buildings (residential and commercial).			
Sub-Sector Goals: (1) Retrofit at least 100 <i>residential</i> housing units (existing buildings) with cumulative energy efficiency improvements of 25% by 2030; (2) convert 30% of fossil fuel <i>residential</i> building systems (e.g., space or water heaters) to highly efficient electric options (e.g., heat pumps); (3) Retrofit at least 50 <i>commercial</i> building (existing buildings) with cumulative energy efficiency improvements of 30% by 2030; and (4) convert 30% fossil fuel <i>commercial</i> building systems (e.g., space or water heaters) to highly efficient electric options (e.g., heat pumps) by 2035.			
Actions	Priority	Timeframe	Gov't Dept
I. Identify and evaluate how existing incentive programs (for example, Enterprise Zones) can incorporate energy efficiency and clean energy	High	Short (1 year)	Community Development, Economic Development

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requirements or targets. Identify and address challenges to broader acceptance and adoption of the requirements and targets.			
2. Evaluate the municipality communication and dissemination on energy efficiency and clean energy technology information and identify recommendations to increase effectiveness of communication and engagement with citizens. For example, move beyond passive website and social media communications and consider partnering with schools, businesses, organizations, and utility (in electricity bill statements) to engage with public more actively.	High	Short (1 year)	Public Information, Community Planning
3. Pursue state and federal grants to establish a rebate program for transitioning to energy efficient and clean energy technology (for example, electric heat pumps, weatherization, solar water heaters or panels). As a prerequisite for participation in rebate program, require the completion of a comprehensive energy audit. This rebate program should have a carve-out for low-income residents.	High	Short (1 year)	Community Development, Electric, Chief Operating Officer
4. Rezone areas that have abandoned buildings into multi-dwelling use and mixed-use retail. Create or expand incentives to attract building developers to re-purpose abandoned buildings into more energy efficient and clean technology applications.	High	Medium (2-3 years)	Planning Commission, Community Development, Zoning, Economic Development
5. Inform and educate landlords and renters about “green leases” by creating a class and/or educational material targeted to landlords and renters.	High	Continuous	Public Information, Community Development
6. Issue a request for proposals to establish an agreement with an energy auditor to provide residential energy audits at a discounted price.	High	Short (1 year)	Electric
7. Modify the commercial real estate tax exemption to allow for energy-efficient upgrades on buildings to qualify.	High	Medium (2-3 years)	Community Development, Economic Development,

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			Chief Operating Officer, City Manager Office
8. Streamline permitting for buildings that install energy efficiency or clean energy technology.	Low	Short (1 year)	Zoning, Community Development, Planning Commission
9. Evaluate progress on financing program that allows property owners to pay for energy efficiency and electrification projects through their property tax bill (Commercial Property Assessed Clean Energy). Identify and address any challenges to participation in this program. Work towards increasing participation.	Low	Continuous	Community Development, Public Information, Chief Operating Officer, City Manager Office
10. Actively promote the availability of energy service companies (ESCOs—companies that contract with residential homeowners and commercial building owners to arrange financing for energy efficiency projects). Identify a list of ESCOs (non-endorsed list) and make this list available to residents.	Low	Continuous	Electric, Community Development, Planning Commission, Public Information, Chief Operating Officer, City Manager Office
11. Update zoning ordinance to allow for “green roofs.” Consider a pilot project at a public building and evaluate benefits. Disseminate findings of pilot study.	Low	Medium (2-3 years)	Community Development, Planning Commission
12. Partner with Chamber of Commerce to encourage real estate companies to promote energy efficiency and clean energy technology in home sales.	Low	Continuous	Economic Development, Chief Operating Officer, City Manager Office
<p>Comments:</p> <ul style="list-style-type: none"> • The City has Enterprise and Opportunity Zones already, so this is an issue of modifying these programs to include energy efficiency and clean energy requirements. There are already free permits, tax rebates, free electric hook-ups. 			

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- *Information and education are critical, so the more the municipality can do the better.*
- *Much of what the municipality provides by way of information is website based.*
- *No building rebate program exists.*
- *For a rebate program to work, there must be an energy audit done first. This allows the homeowner to make an informed decision based on the audit.*
- *Repurposing buildings, in many cases, requires that the City own or purchase the building.*
- *Enterprise Zones do offer fee waivers for building permits, but these waivers are not linked to energy improvements. There is mixed success on Enterprise Zones. Developers tend to depart after the incentives end, so lengthening the arrangement may be in order. Also, Enterprise Zone building improvements are given a tax break, but not necessarily for energy efficiency upgrades.*
- *Green leases are rental agreements in which tenants commit to or gain incentives by participating in water/energy conservation, waste reduction and recycling, use of nonhazardous cleaning products, or other sustainable actions.*
- *The City has streamlined the permitting for buildings that install energy efficiency or electrification technology.*
- *The City offers energy assessments, but these are not as good as an energy audit. Most energy auditors are from other cities some distance away.*

Sector: TRANSPORTATION			
Strategy: (1) Increase alternative forms of transportation. (2) Increase transition to electric vehicles.			
Sub-Sector Goals: (1) By 2030, the municipality should convert 30% of its publicly owned light-duty internal combustion engine vehicles to plug-in electric vehicles (PHEVs) and battery electric vehicles (BEVs) vehicles; (2) By 2030, the municipality should convert 30% its publicly owned medium and heavy-duty vehicles to PHEV/BEV or other clean vehicle technology (e.g., propane, natural gas); (3) Community: Increase PHEVs/BEVs to at least 12% of all light-duty vehicle registrations by 2030; (4) Community: Reduce 15% of passenger vehicle miles traveled by shifting to active or public transport (e.g., biking, walking, or taking the bus) by 2030.			
Actions	Priority	Timeframe	Gov't Dept
1. Pursue state and federal grants to support the purchase of clean electric or plug-in electric vehicles.	High	Short/Medium (1-3 years)	Electric, Public Works
2. Conduct training and education for government employees on the feasibility and cost-benefit of clean and alternative vehicles.	High	Short (1 year)	Human Resources, Chief Operating Officer, City Manager Office

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3. Disseminate information about the benefits of EV vehicles on websites and at public events.	Medium	Continuous	Public Information
4. As EV ownership increases, deploy more public EV charging infrastructure to meet demand.	Medium	Medium/Long (2-3+ years)	Electric
5. For publicly owned vehicles, purchase electric vehicles (replace existing internal combustion vehicles), for both light-duty and heavy-duty applications, <i>when the vehicle has reached its normal life expectancy and is scheduled to be replaced</i> . Seek state and federal grants to off-set costs of these purchases	Medium	Continuous	Public Works, Financing
6. If there is demonstrated demand for more EV charging stations, (1) change zoning requirements and enact parking ordinances for EV parking and charging infrastructure for new buildings, (2) streamline permitting and inspection procedures for EV charging infrastructure, (3) ensure an equitable distribution of EV charging facilities.	Low	Continuous	Community Development, Planning Commission
7. If EV charging stations increase in the future, install bi-directional charging stations to help build distributed energy resource (DERs) capabilities.	Low	Continuous	Electric
8. Evaluate the creation of a public transportation system (buses) and provide recommendations for implementation. If created, provide a discount for low-income or senior citizens.	High	Medium (2-3 years)	Public Works, Chief Operating Officer
9. Encourage and promote the availability of car-ride businesses to work with hospitals, health care providers, and other businesses to encourage alternative forms of transportation. Seek city-county partnership efforts on this action.	High	Continuous	Public Information, Emergency Medical Services, Chief Operating Officer
10. Evaluate and produce a plan to create more bikeable and walkable pathways with an emphasis on connecting homes to businesses.	High	Continuous	Public Works, Chief Operating Officer

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11. Re-visit electric bike program with a new vendor and address issues from last vendor (for example, require that bikes be returned to docking station as part of rental agreement).	High	Medium (2-3 years)	Chief Operating Officer, City Manager Office
<p>Comments:</p> <ul style="list-style-type: none">• <i>The education and outreach on clean and alternative forms of transportation should include local government employees.</i>• <i>The City and Henry County should form partnerships to collaborate on many of these action items.</i>• <i>Existing EV charging stations are not getting much use, but the transition to EVs will eventually happen and the City should be prepared.</i>• <i>The City has already evaluated the placement of EV charging stations, so as demand increases the City is prepared to install more charging stations.</i>• <i>At this time, due to low demand for EV charging the City will not amend zoning or parking requirements for EV charging infrastructure in new buildings.</i>• <i>The City does not have its own public transportation system. There is a train network, but it is regionally operated out of Roanoke.</i>• <i>Senior citizens receive free ride share.</i>• <i>The healthcare sector faces serious challenges with transportation options.</i>• <i>The City and Henry County should collaborate on many of these action items.</i>• <i>The electric bike share program failed because the vendor had supply-chain issues.</i>• <i>The electric bike program requires that there be bike lanes.</i>			

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Sector: ELECTRIC SECTOR				
Sub-Sector Goal: Transition 40% of the electricity used in the municipality to clean energy sources. (e.g., solar, wind, hydropower, nuclear, and geothermal) ahead of Virginia's Renewable Portfolio (state law requires 45% renewable in 2035).				
Actions	Priority	Timeframe	Gov't Dept	
1. Work with a solar company developer to survey and inventory all public buildings for solar PV potential (roof measurements, shade analysis).	Medium	Short (1 year)	Community Development, Electric	
2. Incorporate solar-ready design standards for use in permits and ordinances (e.g., uniform set-back standards).	Medium	Medium (2-3 years)	Zoning, Community Development	
3. Seek state or federal grant to fund a program to install clean and renewable energy technology for low-income customers.	Medium	Short (1 year)	Community Development	
4. Educate and inform residents about community solar programs (large array of PV panels strategically located offsite to serve community).	Medium	Continuous	Public Information, Electric	
5. Identify suitable locations for installing large scale solar projects in abandoned locations, closed landfills, and brownfields, and on public parking garages and buildings (post 2032).	Low	Continuous	Electric	
6. Evaluate utility-managed electricity demand reduction programs (tiered pricing throughout day, reduced consumption during high peak days, smart meters that reduce energy usage during peak times coupled with pay-back).	Survey residents and select programs that are more popular with residents (need to identify the best set of incentives to attract customers).	Low	Medium (2-3 years)	Electric
7. For large scale solar facilities, streamline facility permitting.	Low	Long (4-5 years)	Zoning, Electric	

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Sector: LAND USE Strategy: Improve management of lands/native trees. Sub-Sector Goal: None			
Actions	Priority	Timeframe	Gov't Dept
1. Develop a long-term plan for more sustainable development (green zoning plans for energy and water-efficient buildings, multi-family and mixed use, and transit-oriented development). Include multi-family housing through development, zoning, and land use policies. Convene a task force to provide recommendations.	High	Short/Medium (1-3 years)	Community Development, Public Works, Zoning
2. On public lands, plant more native trees and food forest tree plantings, create more green landscapes, and manage non-native plants.	High	Various	Public Works, Public Information, Community Development, Economic Development, Chief Operating Officer
(a) For private landowners, encourage and educate residents about the benefits of more native trees, green landscapes, and managing non-native plants.		Continuous	
(b) Partner with Chamber of Commerce to educate businesses (for example, Lowes) about the Bee City designation and the advantages of tree plantings and the right type of plants.		Continuous	
(c) Partner with the Harvest Foundation or United Ways to seek grants on this action item (for example, community gardens)		1 year	
(d) Contact local schools to join the effort.		Continuous	
3. Improve education and promotion on building Accessory Dwelling Units (ADUs) in existing primary residences to increase housing density.	Medium	Continuous	Public Works, Public Information
4. Evaluate incentives and/or penalties for property owners to increase and maintain tree canopy and expand tree planting initiatives. Consider applying this to Enterprise Zones (permit fee waivers).	Medium	Short (1 year)	Community Development, Planning Commission
<i>Comments:</i>			

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- The City has already begun considering land use planning and a new city parks plan. The action items here should be included in these plans.
- The City is a Bee City, and the education in this is good and should serve as a model.
- The Natural History Museum is a good venue for education.

Sector: WASTE & WASTEWATER			
Strategy: Improve the quality of waterways.			
Sub-Sector Goal: None			
Actions	Priority	Timeframe	Gov't Dept
1. Educate and inform residents about green infrastructure solutions for water conservation (natural or nature-based approaches such as constructed wetlands, rain gardens, and vegetation buffers). Include stories from residents about their efforts. Evaluate and promote the benefits of these solutions.	Medium	Continuous	Public Information, Water Resources
2. Evaluate the reuse or recovery of treated wastewater for non-potable purposes. Provide recommendations.	Medium	Short (1 year)	Public Works, Water Resources
3. Create and promote best management practices to reduce pesticides and chemical run-off into waterways.	Low	Continuous	Water Resources
4. Request that the water department investigate feasibility of low-carbon or carbon-neutral technologies for wastewater treatment (combined heat & power; anaerobic digestion).	Low	Medium (2-3 years)	Water Resources

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Sector: SOLID WASTE			
Strategy: Reduce the amount of solid waste going into landfills.			
Sub-Sector Goal: Divert 40% of solid waste produced in the city (e.g., recycled, composted, reused) by 2030.			
Actions	Priority	Timeframe	Gov't Dept
1. Evaluate and provide recommendations on food waste composting program and other recycling programs.	Low	Short (1 year)	Public Works
2. Partner with Henry County to increase availability of programs to divert waste to recycling and/or compost programs (for example, electronic waste, food waste).	Low	Short (1 year)	Public Works
3. Pursue a grant program to support composting and recycling programs.	Low	Short (1 year)	Public Works
Comments: <ul style="list-style-type: none"> • <i>City collects yard waste for composting.</i> • <i>Recycling curbside programs have not been cost-effective. A drop-off recycling program exists.</i> • <i>Strong desire to bring leadership in both City and County together to resolve issues.</i> 			

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Sector: PARTNERSHIPS			
Strategy: Develop partnerships with key stakeholders to advance energy efficiency and clean energy projects.			
Sub-Sector Goal: None			
Actions	Priority	Timeframe	Gov't Dept
1. Partner with Chamber of Commerce and affiliated businesses and organizations to increase and offer training opportunities for clean energy jobs and to encourage and facilitate energy and resilience-oriented practices and mentorship.	Medium	Continuous	Public Works, Chief Operating Officer, Economic Development
2. Partner with educational institutions to support clean energy businesses, training, and education.	Medium	Continuous	City Manager Office, Chief Operating Officer
3. Create a local green certification program to recognize local businesses making progress on energy efficiency.	Medium	Short (1 year)	Economic Development, Community Development
4. Educate and inform businesses to reduce hydrofluorocarbon emissions in refrigeration and air conditioning systems through leak detection programs and use of alternatives.	Medium	Continuous	Public Information
Comment: <ul style="list-style-type: none"> • A green certification program for businesses can attract businesses to come to your area. 			

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Sector: ORGANIZATIONAL STRUCTURE			
Strategy: Create advisory committee and hire specialists that assist with guidance and implementation of energy and sustainability initiatives.			
Sub-Sector Goal: None			
Actions	Priority	Timeframe	Gov't Dept
1. Create an energy and climate committee comprised of residents who are appointed and empowered to provide advice and recommendations to the City's leaders.	High	Short (1 year)	City Manager Office, Chief Operating Officer
2. Hire a Sustainability Specialist who will serve as the point person on all energy, climate, and resilience issues.	High	Short (1 year)	City Manager Office, Chief Operating Officer
Comment: <ul style="list-style-type: none"> <i>The money spent on paying someone to serve as the sustainability specialist pays for itself in short order. This person can assist in getting grants.</i> <i>There is a desire to ensure that the actions contained in this plan are followed through on.</i> <i>Greenhouse gas modeling should be done every 5 years.</i> <i>Energy Action Plan should be reviewed annually (Energy Action Committee would track and monitor actions continuously).</i> <i>Sustainability Specialist also keeps energy action plan front and center in City's work.</i> 			

CHAPTER 4 – IMPLEMENTATION

Martinsville's overall goal is to reduce community greenhouse gas emissions in the short-term by 50% by 2030 relative to 2005 levels (or 35% relative to 2022 levels). In Chapter 3, both sub-sector goals and actions were identified to achieve these overall goals. In many cases, the community task force recommended actions will contribute to meeting the sub-sector goals. For example, one of the sub-sector goals for buildings is to retrofit at least 100 residential housing units with energy efficiency improvements. An action that will support achieving this goal includes “Identify and evaluate how existing incentive programs (for example, Enterprise Zones) can incorporate energy efficiency and clean energy requirements or targets.” In this chapter, we will discuss how the recommended actions contribute to the overall goal and how the municipality can implement the action. We will also discuss how best to monitor progress towards meeting the goals.

Sub-Sector Goals

The sub-sector goals defined in Chapter 3 were approximated, as described below, to forecast potential emission reduction scenarios.

Buildings

- Retrofit at least 100 residential housing units with [cumulative] energy efficiency improvements of 25% (existing buildings) by 2030.
- 30% of fossil fuel building systems (e.g., space or water heaters) are transitioned to highly efficient electric options (e.g., heat pumps).
- Retrofit at least 50 commercial buildings with [cumulative] energy efficiency improvements of 30% (existing buildings) by 2030. 75% fossil fuel building systems (e.g., space or water heaters) are transitioned to highly efficient electric options (e.g., heat pumps) by 2035.
- 30% of fossil fuel building systems (e.g., space or water heaters) are transitioned to highly efficient electric options (e.g., heat pumps).

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Transportation

- By 2030, the municipality should convert 30% its publicly owned light-duty internal combustion engine vehicles to plug-in electric vehicles (PHEVs) and battery electric vehicles (BEVs) vehicles.
- By 2030, the municipality should convert 30% its publicly owned medium and heavy-duty vehicles to PHEV/BEV or other clean vehicle technology (e.g., propane, natural gas).
- Community: Increase PHEVs/BEVs to at least 12% of all light-duty vehicle registrations by 2030.
- Community: Reduce 15% of passenger vehicle miles traveled by shifting to active or public transport (e.g., biking, walking, or taking the bus) by 2030.

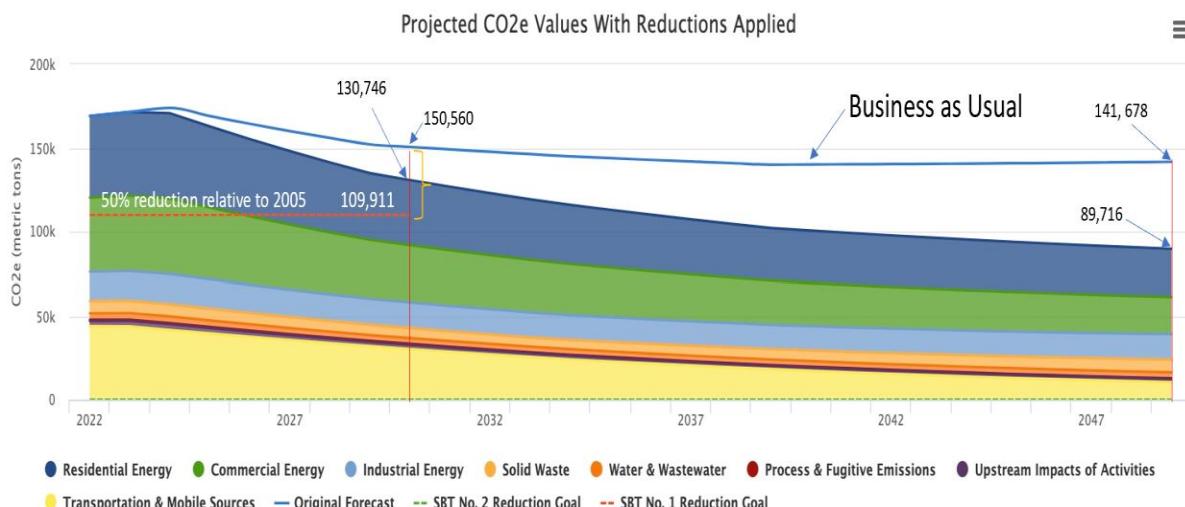
Electric Sector

- Transition 40% of the electricity used in the municipality to clean energy sources. (e.g., solar, wind, hydropower, nuclear, and geothermal) ahead of Virginia's Renewable Portfolio.

Solid Waste

- Divert 40% of solid waste produced in the city (e.g., recycled, composted, reused) by 2030.

Martinsville's 2030 target seeks to reduce greenhouse gas emissions (GHG) by 50% relative to 2005 levels by 2030. However, in 2022, the U.S. had reduced by ~15% of its GHG emissions. Thus, Martinsville only needs to reduce **35% of its GHG emissions relative to 2022**, as depicted here.



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If the above *measurable* sub-sector goals are successfully implemented, Martinsville should make progress towards meeting its goals. As the chart above depicts, Martinsville falls short of meeting its science-based targets by almost 21,000 metric tons of CO2e (130,746 - 109,911). However, this only accounts for the actions that can be measured by models. There are other, non-measurable actions that will contribute towards the goal. For example, educating the community about the benefits of electric vehicles and energy efficiency can result in decisions to make these purchases, which will result in financial savings and emissions reductions, but measuring educational impact is difficult, if not impossible, to measure. Therefore, additional benefits will likely accrue for the actions that cannot be modeled.

Next Steps

To implement the recommended actions, Martinsville must consider the steps necessary for successful implementation. Below, an implementation methodology is provided for some of the recommended actions. This provides guidance on preliminary steps towards implementing the action.

Buildings

Action Item B2: *Evaluate the municipality communication and dissemination on energy efficiency and clean energy technology information and identify recommendations to increase effectiveness of communication and engagement with citizens. For example, move beyond passive website and social media communications and consider partnering with schools, businesses, organizations, and utility (in electricity bill statements) to engage with the public more actively.*

Implementation Method:

1. Establish baseline understanding of communities' awareness and attitudes towards energy efficiency and clean energy technology. For example, conduct in-depth interviews with community members, conduct public focus groups, or issue surveys or polls.
2. Based on research results, develop a targeted communication strategy which seeks to disseminate objective information about energy efficiency practices and renewable energy resources.
3. Identify and work with key partners that will effectively convey the communication strategy. For example, partner with schools, associations, and businesses.

For more information: consult the Virginia Department of Energy website [here](#). For information on energy efficiency, consult VDOE's page [here](#). For information on clean energy, consult VDOE's page [here](#).

Action Item B3: *Pursue state and federal grants to establish a rebate program for transitioning to energy efficient and clean energy technology (for example, electric heat pumps, weatherization, solar*

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water heaters or panels). As a prerequisite for participation in the rebate program, require the completion of a comprehensive energy audit. This rebate program should have a carve-out for low-income residents.

Implementation Method:

I. Weatherization Assistance Program

The U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) reduces energy costs for low-income households by increasing the energy efficiency of their homes, while ensuring their health and safety.

Steps to Apply:

1. Determine eligibility for weatherization services.
2. Identify local weatherization provider.
3. Complete the weatherization application process.
4. Prepare for weatherization services.

For more information: Consult DOE's website [here](#).

2. The Green and Resilient Retrofit Program

The U.S. Housing and Urban Development Green and Resilient Retrofit Program is available for assisted multifamily housing. Direct loans and grants are available to fund projects that improve energy or water efficiency, enhance indoor air quality or sustainability, implement the use of zero emission electricity generation, low emission building materials or processes, energy storage, or building electrification strategies or address climate resilience.

For more information: Consult HUD's website [here](#).

Action Item B4: *Rezone areas that have abandoned buildings into multi-dwelling use and mixed-use retail. Create or expand incentives to attract building developers to re-purpose abandoned buildings into more energy efficient and clean technology applications.*

Implementation Method:

1. Market and promote the community's available vacant and underutilized buildings.
2. Create a community task force of key business stakeholders to assist with business-to-business outreach, local financing and marketing efforts, and understanding prospective new owner's needs.
3. Seek out experienced developers with specialization in repurposing historic buildings. These developers are familiar with tax incentives and economic tools and may be willing to engage with the municipality on this action.

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4. Advertise on “historic buildings for sale” websites. Because of the unique nature of historic properties, there are many national websites that specialize in marketing historic buildings that may be worth utilizing to appeal to historic property buyers. Consult this [website](#) for more information, including grant opportunities.
5. Consult with real estate professionals who specialize in commercial properties, are experienced with the local real estate market, and have knowledge of historic buildings.

For more information: This community [guide](#) provides further information on repurposing vacant and underutilized buildings.

Action Item B5: *Inform and educate landlords and renters about “green leases” by creating a class and/or educational material targeted to landlords and renters.*

Implementation Method:

1. Consult with Green Lease Leaders, an organization that provides reference guides for tenants and landlords, sample lease clauses, case studies, and recorded training.
2. Develop and disseminate outreach material based on their guides.

For more information: Consult the Green Lease Leaders [website](#).

Action Item B6: *Issue a Request for Proposals to establish an agreement with an energy auditor to provide residential energy audits at a discounted price.*

Implementation Method:

1. Outline the scope of the project, including an estimate of the number of audits per year and the type of audit (benchmarking, walkthrough, detailed, or investment-grade).
2. Identify different energy auditing firms, including those certified by the Association of Energy Engineers and AEE's Certified Energy Auditors.
3. Clearly state that you are seeking discounted pricing for the residential energy audits.
4. Evaluate proposals based on cost, qualifications and experience, and availability for your region.

For more information: For a list of energy auditors in Virginia, consult this [website](#).

Action Item B9: *Evaluate progress on financing programs that allow property owners to pay for energy efficiency and electrification projects through their property tax bill (Commercial Property Assessed Clean Energy). Identify and address any challenges to participation in this program. Work towards increasing participation.*

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Implementation Method:

1. For those who have participated in the program, survey participants to understand how this program can be improved.
2. Evaluate the progress of C-PACE in other jurisdictions. See how Fairfax County implements their program [here](#) and consult the Virginia Pace Authority [here](#). For a complete list of all Virginia municipalities and their C-PACE ordinances, see this [website](#).

Action Item B10: *Actively promote the availability of energy service companies (ESCOs companies that contract with residential homeowners and commercial building owners to arrange financing for energy efficiency projects). Identify a list of ESCOs (non-endorsed list) and make this list available to residents.*

Implementation Method:

1. Create brochures, flyers, and other promotional materials that highlight the benefits of energy efficiency upgrades and the services provided by ESCOs. For general information on how ESCOs operate consult DOE's website [here](#).
2. Organize workshops or webinars to educate homeowners, building owners, and businesses about the benefits of energy efficiency upgrades and the role of ESCOs.
3. Partner with local utilities, government agencies, non-profit organizations, and community groups to promote energy efficiency initiatives and ESCO services.
4. Highlight available incentive programs, rebates, and financing options that can help offset the upfront costs of energy efficiency projects.

For More Information: Consult DOE's list of qualified ESCOs [here](#).

Transportation

Action Item T1: *Pursue state and federal grants to support the purchase of clean electric or plug-in electric vehicles.*

Implementation Method:

Municipality should consider the following grants to apply and aid in the implementation of this action.

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<p><i>Congestion Mitigation and Air Quality Improvement Program</i></p> <ul style="list-style-type: none"> • Funds for local governments for transportation projects and programs to help meet the requirements of the Clean Air Act • Available funding: \$10,000,000 – \$505,000,000 • Available annually <p>Link</p>	<p><i>Charging and Fueling Infrastructure Discretionary Grant Program</i></p> <ul style="list-style-type: none"> • Funds for implementing publicly accessible electric vehicle charging infrastructure • Corridor Program: \$1,000,000 – no maximum. • Community Program: \$500,000 – \$15,000,000. • Available annually <p>Link</p>
<p><i>Grants for Buses and Bus Facilities Program</i></p> <ul style="list-style-type: none"> • Funding to replace, rehabilitate, and purchase buses and related equipment, including vehicles that produce low or no emissions (Low-No) for public transportation services. • Grants for Buses and Bus Facilities: \$115,000- \$54,000,000 • Low-No Bus: \$167,257-\$116,000,000 • Available annually <p>Link</p>	<p><i>Clean School Bus Program</i></p> <ul style="list-style-type: none"> • Funds for local governments to replace existing school buses with clean and zero-emission models • Serving high-priority school districts: Maximum of \$285,000 – \$375,000 per bus • Serving other eligible school districts: Maximum of \$190,000 – \$250,000 per bus • Funding available through 2026 <p>Link</p>

Action Item T2: Conduct training and education for government employees on the feasibility and cost-benefit of clean and alternative vehicles.

Implementation Method:

<p><i>The U.S. Department of Energy's Clean Cities program supports a network of nearly 100 coalitions across the country, which work to promote alternative fuels, advanced vehicles, and fuel-saving strategies. Many of these coalitions offer training programs and workshops tailored to government fleets and transportation stakeholders.</i></p> <p>Link</p>	<p><i>For the most objective information on the cost-benefits of EVs, consult DOE's website here</i></p>
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Municipality Energy Action Plan

Action Item T4: As EV ownership increases, deploy more public EV charging infrastructure to meet demand.

Implementation Method:

1. Start by electrifying government-owned vehicles and build the infrastructure needed for these vehicles. In parallel, begin to plan community locations to install EV charging spaces.
2. Create a plan for numbers and types of chargers by assessing local factors including electric vehicle numbers, access to home charging, and future targets.
3. Seek government funding and investments from developers, energy companies and local businesses. Deploying at scale can drive down charging infrastructure costs.
4. Collaborate with landowners, electricity companies and others to gain permissions, build support and get the technical details right.

For more information, consult C40's guidance on "Deploying Charging Infrastructure [here](#) and DOT's funding opportunities [here](#).

Action Item T5: For publicly owned vehicles, purchase electric vehicles (replace existing internal combustion vehicles), for both light-duty and heavy-duty applications, when the vehicle has reached its normal life expectancy and is scheduled to be replaced. Seek state and federal grants to off-set costs of these purchases.

Implementation Method:

Municipality should consider the following grants to apply and aid in the implementation of this action.

<p><i>Congestion Mitigation and Air Quality Improvement Program.</i></p> <ul style="list-style-type: none">• Funds for local governments for transportation projects and programs to help meet the requirements of the Clean Air Act• Available funding: \$10,000,000 – \$505,000,000• Available annually <p>Link</p>	<p><i>Charging and Fueling Infrastructure Discretionary Grant Program.</i></p> <ul style="list-style-type: none">• Funds for implementing publicly accessible electric vehicle charging infrastructure• Corridor Program: \$1,000,000 – no maximum.• Community Program: \$500,000 - \$15,000,000.• Available annually <p>Link</p>
<p><i>Grants for Buses and Bus Facilities Programs.</i></p>	<p><i>Clean School Bus Program.</i></p>

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<ul style="list-style-type: none">• Funding to replace, rehabilitate, and purchase buses and related equipment, including vehicles that produce low or no emissions (Low-No) for public transportation services.• Grants for Buses and Bus Facilities: \$115,000-\$54,000,000• Low-No Bus: \$167,257-\$116,000,000• Available annually <p>Link</p>	<ul style="list-style-type: none">• Funds for local governments to replace existing school buses with clean and zero-emission models• Serving high-priority school districts: Maximum of \$285,000 – \$375,000 per bus• Serving other eligible school districts: Maximum of \$190,000 – \$250,000 per bus• Funding available through 2026 <p>Link</p>
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Action Item T6: If there is demonstrated demand for more EV charging stations, change zoning requirements and enact parking ordinances for EV parking and charging infrastructure for new buildings. Streamline permitting and inspection procedures for EV charging infrastructure. Ensure an equitable distribution of EV charging facilities.

Implementation Method:

1. Prioritize site selection in lower-income and underserved communities.
2. Incorporate community input into investment decisions including site selection, mode preference, amenities, and design.
3. Ensure that priority communities where charging infrastructure will be deployed are also provided with targeted EV incentives and awareness campaigns.
4. Enhance mobility through strategies such as car share, mobility hubs, and EV infrastructure co-location with other transportation services.

For more information, read more on equitable distribution of EV parking infrastructure [here](#). For information on zoning requirements see DOE's guidance [here](#). For examples of parking ordinances see this [website](#).

Action Item T8: Evaluate the creation of a public transportation system (buses) and provide recommendations for implementation. If created, provide a discount for low-income or senior citizens.

Implementation Method:

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Applicable grant: Congestion Mitigation and Air Quality Improvement Program.

- *Funds for local governments for transportation projects and programs to help meet the requirements of the Clean Air Act*
- *Available funding: \$10,000,000 – \$505,000,000*
- *Available annually*

[Link](#)

Action Item T10: *Evaluate and produce a plan to create more bikeable and walkable pathways with an emphasis on connecting homes to businesses.*

Implementation Method:

1. Conduct a survey on desirability for walkable and bikeable pathways and potential locations.
2. Develop the plan and seek public review and comment.
3. Secure funding for the plan.

For more information, funding for bicycle and pedestrian can come from a variety of sources, such as from this biking [organization](#). Information on incorporating bikeable and walkable communities into municipality comprehensive plan can be found [here](#).

Electric Sector

Action Item E1: *Work with a solar company developer to survey and inventory all public buildings for solar PV potential (roof measurements, shade analysis).*

Implementation Method

1. Research and select a reputable solar company developer with experience in conducting solar assessments for public buildings. The Solar Energy Industries Association maintains a list of Virginia solar developers [here](#).
2. Draft a partnership agreement outlining the municipalities' needs.
3. Work closely with the solar company developer to conduct a preliminary assessment of public buildings to identify potential candidates for solar PV installations.
4. Engage relevant stakeholders, such as building owners, facility managers, and local government officials, to obtain necessary permissions and access to public buildings for conducting surveys and assessments.

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Action Item E2: Incorporate solar-ready design standards for use in permits and ordinances (e.g., uniform set-back standards).

Implementation Method:

1. When implementing solar ready design standards, consider using this “[Solar Ready Planning Guide](#)” by the National Renewable Energy Laboratory. The guide outlines and provides details on considerations when creating solar ready design standards.
2. Consider these residential solar ready [guidelines](#) from the City of Austin Development Services Department.

Action Item E3: Seek state or federal grant to fund a program to install clean and renewable energy technology for low-income customers.

Implementation Method:

1. DOE offers a program, Communities Sparking Investment in Transformative Energy ([C-SITE](#)), that supports local governments with implementing clean energy projects and programs for disadvantaged communities, energy communities, and small-to –medium-sized jurisdictions.
2. C-SITE supports initiatives that could cover enhancing building efficiency or electrification, promoting electric transportation, upgrading energy infrastructure, advancing microgrid implementation, fostering renewable energy projects, establishing resilience hubs, and facilitating workforce development.

For more information, DOE provides a list of federal grant opportunities [here](#). For rural areas, USDA provides grant opportunities [here](#).

Action Item E4: Educate and inform residents about community solar programs (large array of PV panels strategically located offsite to serve the community).

Implementation Method:

1. Provide information about community solar programs
2. Form community partnerships with community solar organizations
3. Schedule learning conversations with local stakeholders in your community to explore the possibilities for community solar development.

For more information, DOE provides general information on states implementing community solar projects [here](#). The Coalition for Community Solar Access provides resources on programs [here](#).

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Action Item E5: Identify suitable locations for installing large scale solar projects in abandoned locations, closed landfills, and brownfields, and on public parking garages and buildings.

Implementation Method:

1. [Argonne National Laboratory](#) (a DOE lab) provides resource maps to help identify the most suitable lands for renewable energy development.
2. EPA offers an interactive web [application](#) to identify contaminated lands, landfills, and mine sites for renewable energy development.

Land Use

Action Item L1: Develop a long-term plan for more sustainable development (green zoning plans for energy and water-efficient buildings, multi-family and mixed use, and transit-oriented development). Include multi-family housing through development, zoning, and land use policies. Convene a task force to provide recommendations.

Implementation Method:

Consider using the [EPA's Green Streets, Green Jobs, Green Towns](#) (G3) approach to implement more sustainable development. To implement a G3 approach a municipality should consider:

1. Repairing, resurfacing or replacing roadways and parking lots.
2. Repairing or replacing damaged sidewalks and curbs.
3. Upgrading or replacing utilities in the public right-of-way (e.g., sanitary sewer 4. systems, storm sewer systems, drinking water supply lines).
4. Redeveloping vacant or abandoned properties.

For More information, consult EPA's Green Infrastructure Design and Implementation program [here](#).

Action Item L2: On public lands, plant more native trees and food forest tree plantings, create more green landscapes, and manage non-native plants.

Implementation Method:

Applicable grants:

1. Virginia Trees for Clean Water Grant Program

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- Funds tree planting efforts that raise public awareness of the benefits of trees and impact on water quality
- Available funding: \$1,000- \$50,000

[Link](#)

2. Urban and Community Forestry Grant

- Funds projects that promote protection and enhancement of urban and community forest ecosystems, tree planting, the care of trees, and education
- Available funding: for matching grants, up to \$50,000 on a 50% of total project basis. For non-matching grants under the Inflation Reduction Act, \$250,000
- This is a reimbursement grant

[Link](#)

3. Community Forest Revitalization Program

- A technical assistance program that encourages local government and citizen involvement in creating and supporting long-term and sustained community forestry projects and programs in underserved and disadvantaged communities.
- Funds are administered through direct technical assistance instead of a typical dollar amount.

[Link](#)

Action Item L3: Improve education and promotion on building Accessory Dwelling Units (ADUs) in existing primary residences to increase housing density.

Implementation Method:

1. Develop educational materials on ADUs, such as brochures, guides, videos, and online resources that explain the benefits of ADUs, the process of building them, zoning regulations, financing options, and case studies of successful ADU projects. The City of Fredericksburg offers a complete A to Z guide on ADUs [here](#). The City of Alexandria also offers advice on policy and planning [here](#). Virginia DHCD offers some basic information [here](#).
2. Reach out to homeowners' associations (HOAs) and neighborhood groups to raise awareness about ADUs and address any concerns or misconceptions they may have. Provide information on how ADUs can benefit homeowners and communities while addressing housing needs.
3. Streamline permitting processes and zoning regulations for ADUs to make it easier and more cost-effective for homeowners to build them. Work with local officials to update zoning codes, reduce bureaucratic barriers, and expedite approval timelines. Arlington County provides information on permitting and zoning [here](#).

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Action Item L4: Evaluate incentives and/or penalties for property owners to increase and maintain tree canopy and expand tree planting initiatives. Consider applying this to Enterprise Zones (permit fee waivers).

Implementation Method:

1. Evaluate existing incentives and penalties related to tree canopy expansion and maintenance. Identify successful policies and lessons learned to inform the development of new strategies. Virginia law on replacement of trees during development process in certain localities can be accessed [here](#). Fairfax County issued four recommended proposals for ordinances on protecting tree canopies [here](#).
2. Conduct surveys, focus groups, or interviews with property owners to understand their perspectives, preferences, and barriers related to tree planting and maintenance. Determine what motivates or discourages them from participating in tree canopy initiatives.
3. Assess the effectiveness of various incentive options, such as tax incentives, grants, subsidies, rebates, or technical assistance programs, in encouraging property owners to plant and maintain trees. Analyze past experiences and case studies to determine which incentives are most effective and cost-efficient. See Arlington County's Tree Canopy Fund [here](#) and a regional guide on funding tree canopy programs [here](#).

Waste and Wastewater

Action Item W2: Evaluate the reuse or recovery of treated wastewater for non-potable purposes. Provide recommendations.

Implementation Method:

1. To pursue water reuse, the municipality needs to identify potential end-users who could enter into a contract to receive the reclaimed water for purposes such as irrigation, fire protection, vehicle washing, and street cleaning. This can be done by searching water records and potential land application sites. EPA provides information on resources, regulations, and guidelines [here](#).
2. Communicate with customers and the public about the benefits of reclaimed water: hold meetings with the reclaimed water customers to educate them about the benefits of water reuse for their facilities.

For more information, read the following [case study](#) about Water Reuse in Fairfax County:

Organizational Structure

Municipality Energy Action Plan

Action Item: *Create an energy and climate committee comprised of residents who are appointed and empowered to provide advice and recommendations to the City's leaders.*

Implementation Method:

1. Determine the scope, objectives, and potential structure of an energy and climate committee. For example, see the charter for the Montgomery County, MD Energy and Air Quality Committee [here](#). The committee is comprised of about a dozen county residents who serve 2-year terms. The committee meets once a month with an assigned county employee, and its members discuss energy-related issues of importance to residents and provide recommendations to the county executive and council.
2. Present the proposal to the city/county council or relevant governing body for approval. Advocate for the establishment of the energy and climate committee by highlighting its potential benefits for the community, such as promoting sustainability, reducing greenhouse gas emissions, and enhancing resilience.
3. Advertise the opportunity for residents to apply or nominate candidates for the energy and climate committee. Utilize various outreach channels, including social media, local newspapers, community newsletters, and neighborhood associations. Ensure outreach efforts are inclusive and accessible to all residents.

Communication and Outreach

The Energy Action Plan will be posted on the municipality's website. The municipality will engage in efforts to inform residents about the plan, including annual updates. The municipality will also utilize various channels such as social media, workshops, and community events to raise awareness and foster engagement.

The greenhouse gas emissions modeling and inventory will be updated every five years. The Energy Action Plan should be evaluated, and amended as appropriate, in this same five-year period.

Monitoring and Verification

Martinsville will seek to implement two action items that will be important to ensure effective monitoring and verification.

1. *Create an energy and climate committee comprised of residents who are appointed and empowered to provide advice and recommendations to the City's leaders.*

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2. Hire a Sustainability Specialist who will serve as the point person on all energy, climate, and resilience issues.

The energy and climate committee will consist of residents who volunteer to serve on the committee for a period, such as a two-year term, and meet monthly to discuss issues related to energy and the climate. A government employee serves as the liaison between the committee and the government. The committee has the potential to monitor and verify progress on the energy action plan and provide advice and guidance.

The sustainability specialist should be a new hire with responsibility for coordinating various parts of the energy action plan with the appropriate government offices. This person acts as the lead person to assist with implementation of the energy action plan.

CONCLUSION

The Energy Action Plan seeks to reduce the energy burden (costs) on Martinsville residents, as well as ensuring equitable distribution of the benefits of energy savings. The plan also seeks to ensure energy independence, security, community-wide sustainability and resilience.

This Plan represents a joint community-government effort at addressing mutual concerns about Martinsville's energy and climate future. The Plan's success will depend on continued engagement with community members, both inside Martinsville, throughout Virginia, and throughout the country.