

Westford Climate Roadmap v2

A plan to reduce net greenhouse gas emissions
to zero by 2050

Westford Clean Energy &
Sustainability Committee

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Introduction

A landmark climate report was released August 9, 2021 by the U.N.'s Intergovernmental Panel on Climate Change (IPCC). It was written by more than 230 leading scientists from countries around the world, and is part of the IPCC's [Sixth Assessment Report](#) — the most significant climate report published in years by the international science community. It states:

- Current atmospheric levels of carbon dioxide are the highest in at least 2 million years.
- The past decade is likely the hottest the planet has been in 125,000 years.

- It is unequivocal that the rise in global average temperatures since the 19th century has been driven by humans burning fossil fuels, clearing forests and loading the atmosphere with greenhouse gases like carbon dioxide and methane that trap heat.
- Ocean levels have risen 8 inches on average over the past century, and the rate of increase has doubled since 2006.
- Heat waves have become significantly hotter since 1950 and last longer in much of the world. Wildfire weather has worsened across large swaths of the globe. Bursts of extreme heat in the ocean – which can kill fish, seabirds and coral reefs – have doubled in frequency since the 1980s.

The report says that if we make immediate, drastic cuts in emissions, we can stabilize the climate at about 1.5 degrees Celsius of warming compared to pre-industrial levels. The report states “Global net human-caused emissions of carbon dioxide (CO₂) will need to fall by about 45 percent from 2010 levels by 2030, reaching ‘net zero’ around 2050.” Carbon sequestration – removing CO₂ from the atmosphere – is also vital to mitigating climate change. These efforts must be implemented at all levels of government, business and community.

Climate change will impact Westford. There will be more very hot days and more droughts. Hurricanes and nor’easters will hit New England more often, and there will be more floods. The warmer climate will be inhospitable to some native species and promote some invasive ones. Westford is not isolated, so the effects of climate change across the country and the world will impact us in many other direct and indirect ways.

This Roadmap to net zero greenhouse gas (GHG) emissions has been created by the Town of Westford Clean Energy and Sustainability Committee (CEASC). It follows from a net zero resolution passed at the Special Town Meeting in October 2020. Its purpose is to plan specific and measurable actions and guide Westford’s Town government, residents, and businesses, to achieve net zero emissions of GHGs by 2050. This is consistent with similar goals on local, state, national, and international levels. The initial version of this Roadmap, created in 2021, serves as a baseline to be refined and revised based on future developments.

Many of the efforts to reduce GHGs in the next three decades will depend on tax incentives and rebates, new standards and laws, major infrastructure improvements, and new technologies. Many of these are beyond the scope of the Town of Westford, its residents, and its businesses. However, our individual and corporate actions are essential to the success of our net zero GHG goals. The choices we make about our transportation, our home and business electricity, heating and cooling, land use, and our lifestyles underpin this effort. Our purchasing decisions, voting behaviors and lobbying efforts will all help create the policies and changes we require to meet our goal of net zero greenhouse gas emissions. We must raise our voices in public forums and the media, as well as in private, to persuade everyone that we all play a part in the future we create and we need to be united.

Is Climate Change Affecting Us Locally?

On the last day of 2021, the Boston Globe reported on studies indicating that local “winters are becoming shorter and summers longer, jeopardizing much of the region’s unique ecology, economy, and cultural

heritage.” “In Massachusetts, winter temperatures have surged an average of nearly 7 degrees Fahrenheit” since 1900. During this 21st century alone, “Massachusetts lost 12 days of snow cover.”

Here in the Northeast we’ve seen “far fewer rivers and lakes icing over in winter, less precipitation in the form of snowfall, and earlier blooming of everything from lilacs to apple trees.” The Globe also noted that “the Northeast was warming more rapidly than any other part of the country, except Alaska,” while “the Gulf of Maine ... is among the fastest-warming bodies of water on the planet.”

They report that “The warmer winters have allowed more invasive insects to survive in areas where they couldn’t before.” “Tree pests ... are expanding their ranges throughout New England, decimating forests in their path, while deer ticks are thriving... increasing the prevalence of Lyme disease.” Our neighbors in Concord have witnessed more than half of the wildflower species in a study area declining or going extinct.

Clearly, we in Massachusetts are already affected by climate change. Spring and summer of 2021 were among the hottest and wettest for the area, and the summer 2022 drought was equally extreme. Such irregular weather patterns must now be expected, including the prospect of hurricanes making their way further northward as the planet warms. Our tax dollars are supporting government agencies such as the Federal Emergency Management Agency (FEMA) that help our neighbors throughout the country recover from increasingly frequent fires and floods. When climate events disrupt our food production and businesses nationwide, we again pay a price when we purchase food and goods. Yes, climate change has effects globally, nationally, and locally.

Why Net Zero?

Climate scientists have made it clear that the world needs to reduce net greenhouse gas (GHG) pollution to zero by 2050 to avoid catastrophic climate change, and Westford has committed to achieving this. The goal is consistent with:

- Worldwide efforts to reduce GHG pollution, including the Paris Climate Accord, which was signed by the European Union, China, Russia, India, Japan and more than 170 other countries.
- The Inflation Reduction Act (IRA), signed into law by President Joe Biden on August 16, 2022. It aims to achieve a 50% reduction in greenhouse gas emissions (from 2005 levels) by 2030.
- Massachusetts’ Next Generation Roadmap, overwhelmingly passed by the State Legislature and signed by Governor Baker on March 26, 2021.

What Does Net Zero Mean?

A greenhouse gas is any gaseous compound in the atmosphere that absorbs infrared radiation, thereby trapping heat. This is commonly referred to as the “greenhouse effect” because these gases act like the glass in a greenhouse: they let visible light in, but block heat from escaping. Carbon dioxide from fossil fuel combustion is the principal GHG. Methane from natural gas and organic decomposition is also a large contributor. The

greenhouse effect leads to global warming and other changes in climate. To halt global warming, we must stabilize, and ultimately reduce, the amount of greenhouse gases in the atmosphere.

When we think about net zero, we are referring to the act of (1) reducing our GHG emissions into the atmosphere, and (2) balancing the amount of GHGs we emit with the amount we can remove. Carbon removal can take numerous forms, from new technologies to land management practices such as preserving forests and wetlands to offset lingering greenhouse gas emissions. These actions will also increase climate resilience by providing shade and wind protection, removing air and water pollutants, and mitigating the impact of stormwater.

Methodology

The Clean Energy and Sustainability Committee created a Westford Climate Roadmap subcommittee to develop the first version of the Roadmap. Version 1 was completed in 2021 and presented to Town management, boards, residents, and businesses to seek their feedback and support throughout 2022. Version 2 was developed based on this collaboration.

The Roadmap subcommittee followed the guidelines developed by the Massachusetts Area Planning Council (MAPC) in its [Municipal Net Zero Playbook](#) and [Greenhouse Gas Inventory Tools](#).

The following plans were also used as foundation documents:

- [Massachusetts 2050 Decarbonization Roadmap](#)
- [Arlington's Net Zero Action Plan](#)
- [Westborough Climate Action Plan](#)
- [Sustainable Dedham Climate Action and Resiliency Plan](#)
- [Sustainable Concord](#)
- [Natick's Net Zero Action Plan](#)

How Do We Get There?

The journey to net zero GHG emissions in Westford will be challenging. Implementing this plan will require dedication and commitment from the Town, residents, and businesses over the next 30 years. We know we need to reach net zero by 2050 or earlier, and we have assessed where we are today. The Roadmap must start with the energy infrastructure, transportation systems, buildings, and policies of 2021. Along the way, all of these will undergo major changes and we will adjust the Roadmap to incorporate new technologies and developments.

This Roadmap serves as an organizing framework for our path to net zero. We know that we need to make our buildings and vehicles, the two major sources of GHG pollution in our community, much more efficient and powered by renewable electricity. It is essential to implement the net zero transformation as rapidly as possible, in the most affordable and least economically disruptive way. We also know that we must increase

our environment's ability to absorb CO₂ while simultaneously reducing our emissions. Emissions reduction alone will not get us to net zero.

To reach our net zero goal, our residents, businesses, and municipality will have to make key changes in the following areas:

- **Transforming the electric power supply to 100% renewable energy and producing more renewable energy locally**

To achieve net zero carbon emission, all of Westford's electricity sources must be renewable, such as solar, wind, and hydro power, or otherwise carbon-free, such as nuclear, and combined with electricity storage. Small-scale clean energy projects, such as home and business rooftop solar photovoltaics (PVs), can supplement power from the grid.

- **Electrifying our heating and cooling systems**

Switching to electric heating and cooling systems, like heat pumps, and electric cooking appliances, like induction cooktops, immediately reduces carbon emissions and improves indoor air quality, and these benefits only get better as our electric power supply gets cleaner.

- **Increasing the energy efficiency of our homes and building infrastructure**

Making existing buildings more efficient and constructing new buildings to high efficiency standards will reduce emissions and make energy bills more affordable.

- **Driving electric and plug-in hybrid vehicles**

Electric vehicles (EVs) are cleaner and cheaper to operate and maintain than gas- or diesel-powered vehicles. Driving an EV is one of the most impactful ways to reduce GHG emissions, especially when paired with renewable electricity sources for charging. Providing public access to EV charging stations is critical to the successful transfer to electric vehicles.

- **Reducing our solid waste**

Westford's trash is incinerated, which emits greenhouse gases. Reducing the volume of waste through new purchasing patterns and reuse will improve our carbon footprint and save money.

- **Protecting and enhancing Westford's forests, wetlands, and turf for increased carbon sequestration**

Woodlands, wetlands, and grasslands absorb carbon dioxide. Protecting and enhancing our natural landscapes will increase carbon sequestration and assist us in meeting our net zero goal.

- **Protecting the natural ecosystem so it continues to support diverse tree species and healthy soils, since thriving trees and soils can sequester large amounts of carbon**

Healthy soils and ecosystems sequester more carbon and support full food webs, which in turn provide us with a clean, healthy, and productive local environment in which to work, play, breathe, eat, and drink. Healthy lands, managed for invasive species control, native plants and animals, contiguous habitat, carbon sequestration, and water and air purification all make our town more resilient to the climate challenges ahead and help mitigate additional damage. The Massachusetts Clean Energy Plan for 2025 and 2030 enumerates several goals with regard to non-working lands in the Commonwealth: no net loss of carbon storage in wetlands, planting additional urban and riparian acres with new trees, and incenting forest owners and farmers to adopt smart carbon-management plans. The plan sums up by stating that current and future sequestration must be protected, managed, and restored.

- **Advocating for change**

At the polls, at work, at home, at the state house and the White House, with our vendors and suppliers, as stockholders, and as members of our virtual and live communities, it is vital to advocate for changes that enable our Roadmap to net zero by 2050.

- **Changing our personal greenhouse gas emissions**

Many personal habits emit greenhouse gases, and small changes can have big consequences. Reducing air travel, reducing food waste, composting, and decreasing meat consumption can all significantly reduce personal greenhouse gas emissions. Reducing purchases overall can affect not only our own contribution, but also that of companies which alter their behaviors when we all change our purchasing habits together.

Getting to net zero will require adhering to our Roadmap and revising our path as opportunities arise and goals are accomplished. Monitoring our progress over time will drive updates to the Roadmap, targeting areas of greatest need or opportunity. To monitor progress the CEASC established a baseline against which to measure progress (see GHG Inventory below). One limitation of the tool used for this purpose is its focus on emissions from buildings and transportation. These are major contributors of greenhouse gases, but the tool does not include a methodology for evaluating or monitoring the emissions resulting from personal behaviors. As a result, the Roadmap focuses on reducing the major GHG contributions of buildings and transportation, while acknowledging that personal behaviors of town residents also contribute to our overall GHG impact.

Getting There Equitably

As we transition to an economy based on renewable energy, we need to consider what steps need to be taken to make these changes accessible, affordable, and inclusive for all Westford residents. The specific needs of vulnerable populations such as the disabled, the elderly, the young, newcomers to town, those with limited resources, and those with limited English proficiency will be considered as we plan and implement actions.

We need to determine where inadequate transit options exist, which neighborhoods have a deficit of trees, which lack access to EV charging stations, and who may not have the resources to retrofit their homes with

heat pumps. Housing and climate policy are interrelated and a known source of inequity. We can set equitable housing policy and also ensure that all new housing in our town is renewable and resilient. We can rethink public transportation to increase access.

One avenue for making housing more equitable, accessible, and climate friendly is to allow for more dense housing along transportation corridors. Dense housing also lends itself to public transit, rather than personal vehicles, thus further decreasing carbon emissions from both the housing and transportation sectors simultaneously.

Providing good local jobs, affordable housing, public transit, public green spaces, and deliberate efforts to buy local, thereby shortening supply chains and limiting trucking, all contribute substantially to social equity, economic prosperity, and the health of our environment and climate. Federal and state government incentives are being put in place with recent legislation to provide opportunities for lower-income households to transition to clean energy and to purchase electric vehicles, in addition to promoting job training and transition into the clean energy jobs of the future.

With equity and climate justice in mind, all in our community will benefit from reduced carbon emissions, increased energy savings, improved air quality, and improved health. Together, we will have a stronger, more vibrant, more connected community.

Where Are We Starting?

Before deciding on future actions, it was important to understand our starting point. Our starting point consisted of two components: our current level of GHG emissions as well as the status of Westford's readiness to adopt the actions needed to achieve net zero. The CEASC conducted an initial inventory of Westford's GHG emissions to define our GHG baseline. The committee also made efforts to evaluate Westford's readiness status by conducting a survey of residents and by making presentations and having discussions of the initial version of the Roadmap with town groups and committees. The CEASC and Sustainability Coordinator will continue to monitor progress and educate and encourage town residents, businesses, and employees to meet the goals of the Climate Roadmap.

Greenhouse Gas Inventory

Although the inventory was performed in 2021, the year with the most complete data available was 2017. This GHG inventory serves as the baseline to measure future progress and provides us with the ability to focus our efforts for the biggest impact. Inventories in the following years will provide us with feedback to adjust our priorities.

The inventory used the [Metropolitan Area Planning Council \(MAPC\) Community Greenhouse Gas Inventory Tool and Step-by-Step Guide](#). For more information on this tool, please see ["GHG Inventory: What's Included, What's Not"](#) in the appendix.

The GHG source categories are Stationary Energy (buildings, electricity, heating, residential, commercial, government), Transportation (private, commercial, and municipal vehicles), and Waste (transport, incineration, decomposition).

The data sources for Stationary Energy were:

Electricity: National Grid
Natural gas: National Grid
Heating oil: mass.gov, mapc.org

For Transportation:

Vehicles: mapc.org

For Waste:

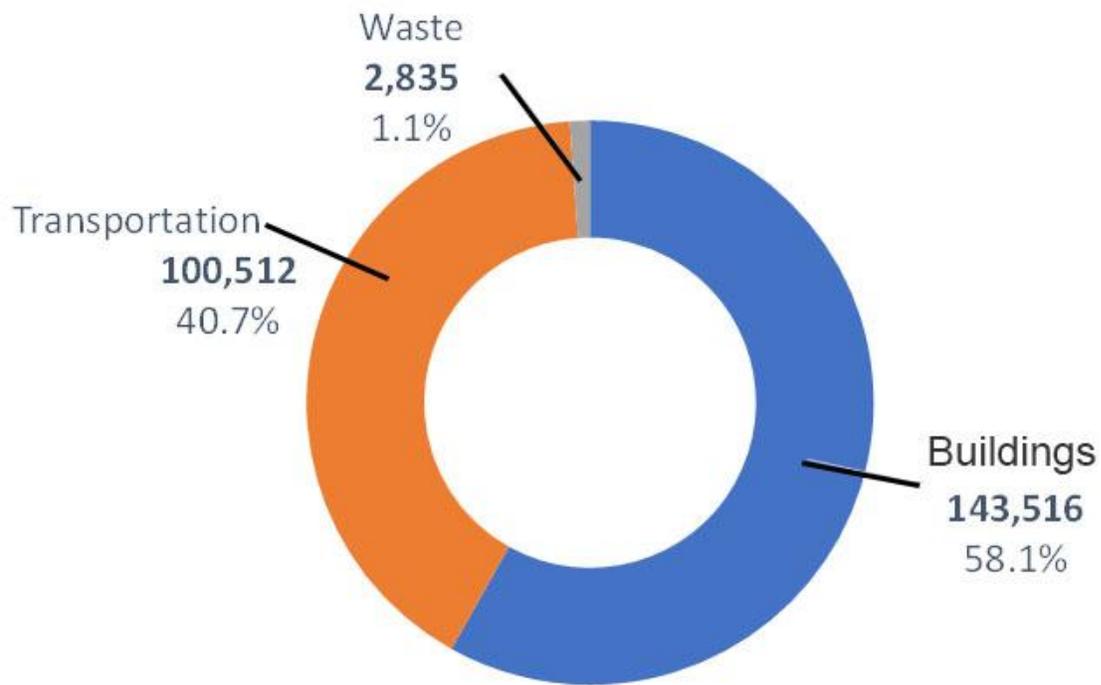
Residential: mass.gov/orgs/massachusetts-department-of-environmental-protection
Commercial: not included yet

The most recent year with data available for Stationary Energy was 2017, for Transportation was 2014 for private passenger and commercial, 2017 for municipal, and for Waste was 2017 (although 2020 is available). 2017 was recommended as the best common year for comparison among towns.

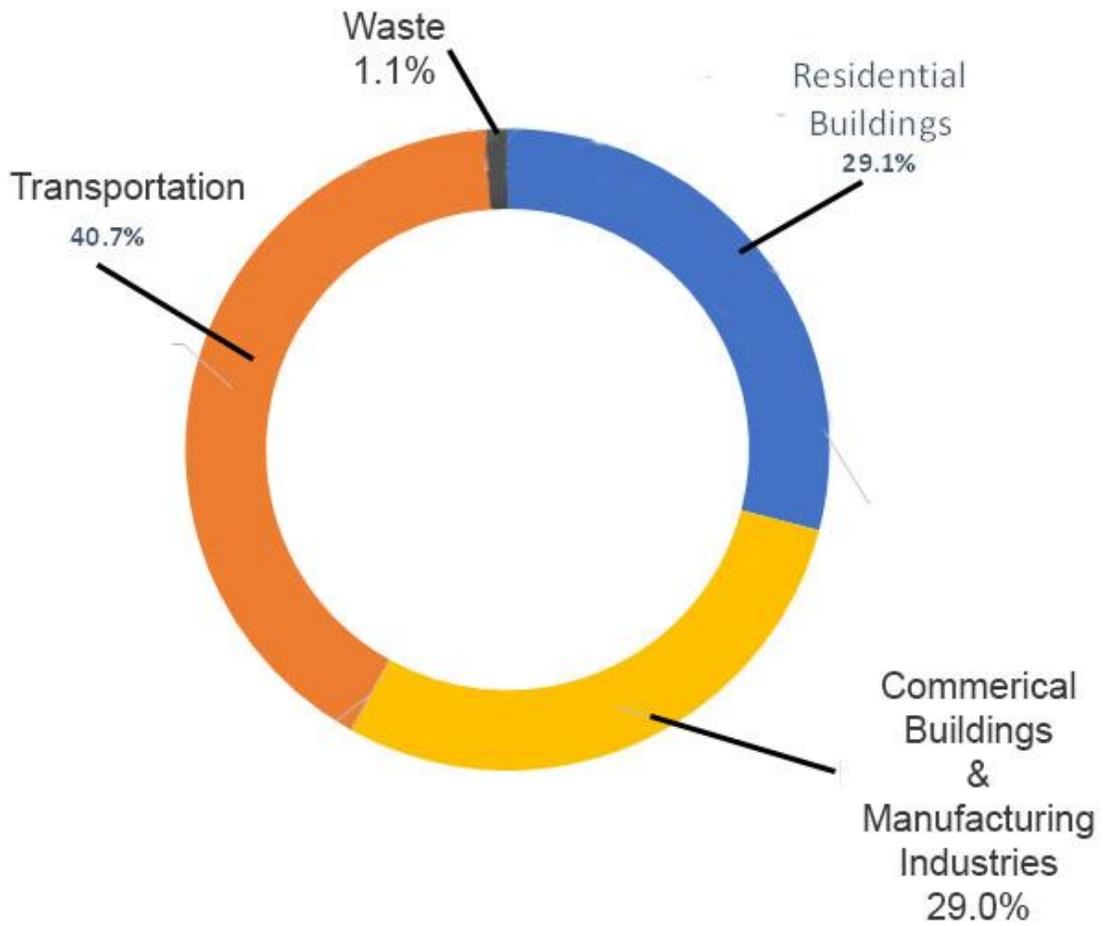
The MAPC tool produced the following graphs:

Westford's 2017 Emissions by Sector

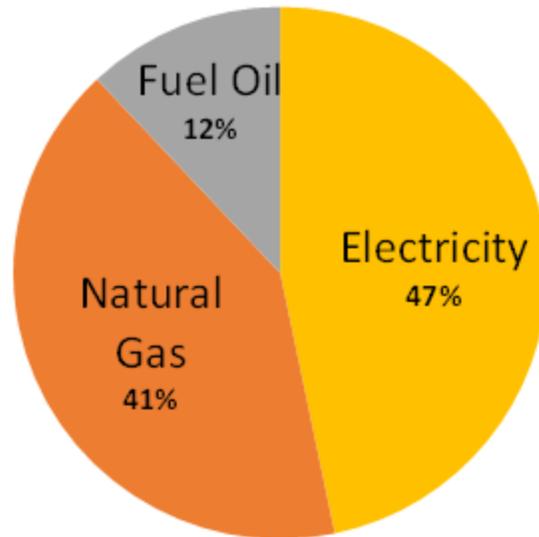
Megatons of Carbon Dioxide Equivalent



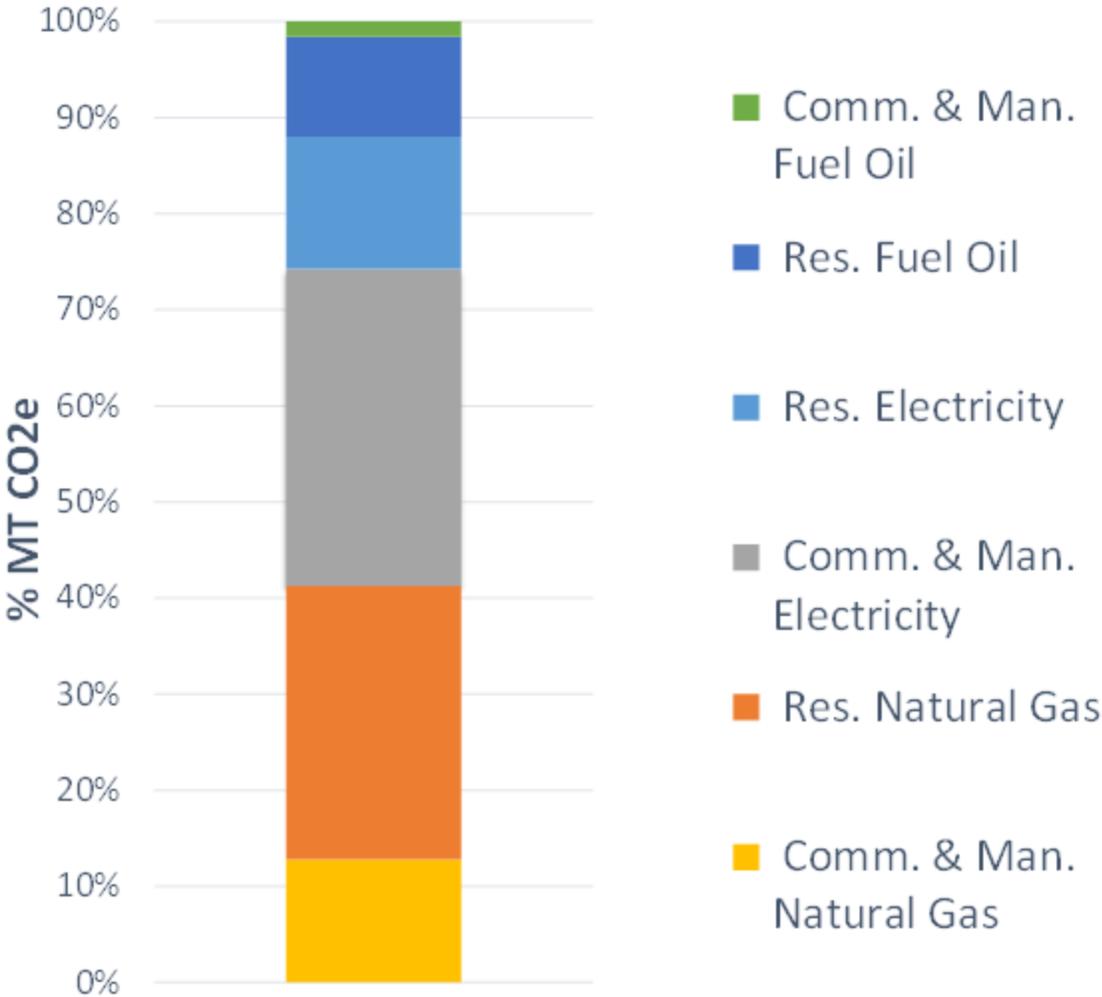
Percent of Westford's Total 2017 Emissions by Subsector



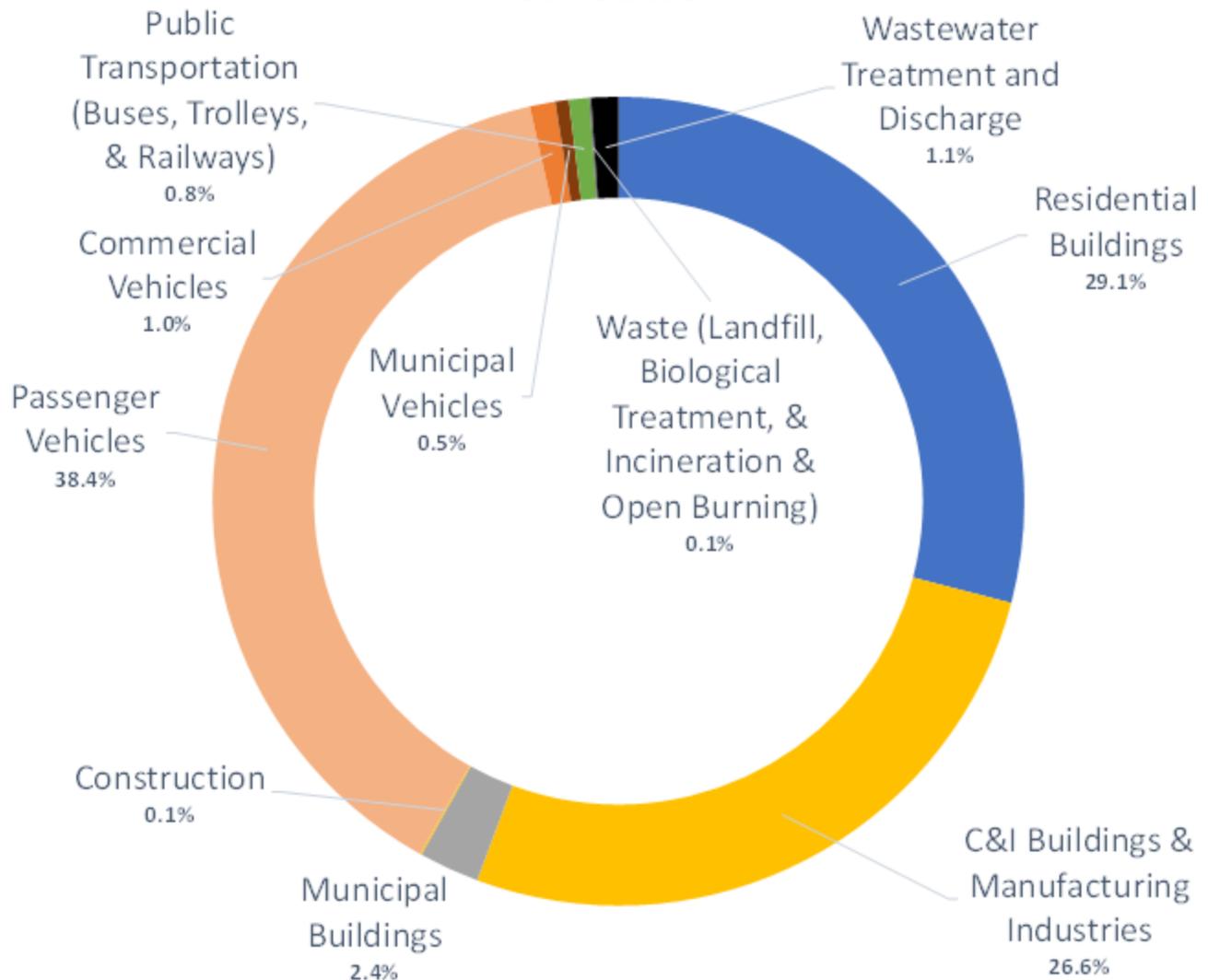
Percentage of Westford's 2017 Building Energy Emissions by Source Type



Percent of Westford's 2017 Building Emissions by Customer and Fuel



Percent of Total Westford's 2017 Emissions by Subsector



In summary, for Westford in 2017:

- Passenger vehicles account for almost 40% of GHG emissions.
- Residential buildings' electricity and heating are almost 30%.
- Commercial and industrial buildings' electricity and heating are slightly more than 25%.
- Municipal emissions (Town buildings and schools) are about 3%.

Westford's total emissions in 2017 are estimated at 247,000 MT CO₂e (metric ton carbon-dioxide equivalent). That is about 10 MT CO₂e per resident.

Community Survey

In the fall of 2021 the CEASC conducted a survey to understand residents' awareness of climate change and the town's level of enthusiasm for embracing steps needed to reduce greenhouse gas emissions. The survey also sought to understand residents' concerns and identify needs for education. The survey was conducted online, and was therefore not a statistically valid representation of town sentiment, but it did provide insights into the thoughts, enthusiasm, understanding, and concerns of those responding.

The survey was advertised both through Town outlets and social media and there were almost 400 respondents. Some of the findings from the survey, as well as possible implications for the CEASC efforts, are provided in this table.

Topic	Survey Results	Possible Implications for CEASC Efforts
Climate Change Acceptance	While the great majority of respondents felt that climate change was real and caused by humans, a sizable minority disagreed with at least one premise.	Be prepared to tout both the emissions reductions and the economic benefits of actions.
Lifestyle Changes	The majority of respondents said they'd consider making lifestyle choices, such as reducing consumption, driving, and meat-eating, as well as selecting sustainable food.	Create a resource that informs interested residents of emission-reducing lifestyle choices.
Energy Efficient Purchases	The composite ranking of the perceived importance in energy purchases was: 1. Making home efficient, 2. Increasing use of renewable power in Westford's aggregation program (POP), 3. Installing solar, 4. Buying an electric car, and 5. Installing a heat pump.	Create a resource that informs interested residents of purchase and installation options for home and transportation investments.
Costs	Cost is a concern, both in terms of saving money through rebates or subsidies and expending tax money if driven by local decisions.	Tout ability to find rebates through Mass Save. Be upfront with any known cost implications of Roadmap actions. Point out that most investments will pay for themselves over time.
Solar Panel Concerns	Of those responding that they would not consider solar panels on their homes, many cited rules by homeowner associations and others cited concerns regarding resale of homes.	Work with local real estate agents to understand buyer sentiments and to tout the possibility that buyers find free energy a benefit. Also engage homeowner associations to ascertain if relaxing these rules is possible.
Electric Vehicle	Of those responding that they would not consider EV	Tout recent strides in both

Concerns	purchase, the majority were concerned about driving range and the availability of charging stations. Other concerns included pollution from creating and disposing of batteries, as well as readiness of the grid to provide adequate energy.	concerns, and provide resources for newly interested consumers to engage with current owners. Engage with National Grid and MA Department of Public Utilities regarding plans to meet the need.
Heat Pump Concerns	There were many concerns that heat pumps could be inadequate for the New England climate, and there was also a general lack of knowledge about heat pumps.	Publicize heat pump information, such as the Westford Climate Action seminar among others.
General Concerns	Some repeated concerns include 1. The costs of either implementing green technology or of raised taxes to support doing so, 2. The readiness of the grid to support uptick in electrification, and 3. Efforts would not significantly impact climate change.	Keep common concerns in mind when engaging with the public, and be prepared to address those concerns with current information.
Resident Suggestions	<p>Suggestions for local actions to tackle local emissions included:</p> <ul style="list-style-type: none"> ● Provide a list of vetted contractors ● Place to hear from locals about their experiences ● Limit size of new homes in town ● Promote green burials ● Town should lead by example – stop idling of municipal vehicles and school buses ● Provide options for non-homeowners to make a difference ● Increase available sidewalks to town destinations ● Address waste in take-out and retail packaging (biodegradable?) 	Evaluate suggestions provided and implement those deemed fruitful.

What Have We Already Done?

Westford has already taken many steps towards reducing its energy use and GHG emissions and preserving natural land and carbon sequestration.

Clean Energy Supply

Westford implemented community choice aggregation (also known as “municipal aggregation”) for electric service for residents and small businesses in 2016. The 2021-2023 program sets the default option at 10% more renewable energy than the state requirement (dictated by the Renewable Portfolio Standard [RPS]), and includes “opt-up” tiers of 50% and 100% renewable energy. The environmental benefit of the new program is

expected to be significant. For example, the program is projected to reduce carbon dioxide emissions by over 1,800 tons per year, which is equivalent to the climate impact of approximately 360 cars. As of July 2022, 7657 residents and 731 businesses were enrolled, and 127 Westford residents had opted up to the 50% (48 residents) or 100% (79) levels.

As of mid-2022, Westford had over 650 installations of solar systems, totaling over 10.5 MW. Over the past years, groups including Sustainable Westford, Westford Climate Action, and the CEASC have organized events to inform residents of their options regarding going solar.

As for municipal government electricity supply, Westford contracts with solar projects in Hubbardston (1.2 megawatts, ~15% of Town electricity, for 20 years) and Charlton (2.4 megawatts, ~\$300,000 savings a year, for 20 years).

There is currently one rooftop solar installation on a municipal/school building in town. The Stony Brook Middle School installed a 36-kilowatts solar system that started operating in April 2011. Westford staff have considered proposals from solar installers for installing systems on several municipal and school buildings.

The Clean Energy and Sustainability Committee will continue to work with National Grid to coordinate upgrades and maintenance of the town's electrical grid and monitor their performance.

Buildings

Westford received Massachusetts Green Communities status, under the Department of Energy Resources (DOER), in December 2013. Since becoming a Green Community, Westford has received six Green Communities grants, totaling over \$1.2 million, targeting various energy efficiency improvements. These improvements include lighting, heating and cooling equipment, weatherization (insulation and high-performance windows), and energy management systems in municipal and school buildings. The Town has also converted parking lot lights to LED fixtures and converted streetlights to LED.

Town staff use the MassEnergyInsight software tool to monitor and minimize energy use.

Westford adopted the Board of Building Regulations and Standards (BBRS) Stretch Code in October 2013.

In 2021, Westford began to pursue an Energy Management Performance Contract for municipal and school buildings with a goal of receiving a free comprehensive energy audit and no-cost energy efficiency enhancements. A successful project could see over \$500,000 in yearly utility savings yielding \$10,000,000 worth of upgrades to building systems (lighting, HVAC equipment, plumbing, etc.).

According to Mass Save, in 2019 over 1,000 residential customers participated in energy efficiency programs, including receiving free home energy audits.

Transportation

Westford ordered three hybrid EV police Interceptors in 2021 to replace gasoline-powered vehicles. In 2022, the Town ordered an electric mail courier truck and an electric utility truck. The draft budget for FY 2024 includes additional EV vehicles to replace gasoline vehicles that are aging out of the fleet. Westford has installed 12 dual-head level 2 Electric Vehicle Supply Equipment (EVSE), commonly referred to as “charging stations,” at three locations in town – Town Hall, Westford Academy, and Abbot School – as well as chargers in municipal garages to service new Town EVs .

Public data sources show that as of May, 2022 EV registrations had grown to 1288 (978 plug-in hybrid electric vehicles and 310 battery electric vehicles).

Westford adopted a Complete Streets Policy in 2016, requiring streets to be designed with the needs of all users in mind (including cyclists and pedestrians). Westford has installed several bike lanes on streets.

The Lowell Regional Transit Authority (LRTA) Route 15 bus serves Chelmsford and Westford via Rte. 129/110.

Natural Resources

Westford Town government, along with the Recycling Commission, have worked to reduce solid waste and trash, promoting various recycling and diversion programs and activities, including electronics collections, household hazardous waste diversion, and composting education.

Westford has multiple entities working to preserve natural areas, including forests. The Conservation Commission is the Town body responsible for protecting Westford's natural resources. The Commission has over 2,100 acres of Town-owned land in its care and custody and is responsible for overseeing compliance with 67 permanent Conservation Restrictions on over 1,700 acres of land. It also has responsibility for overseeing the management of the facilities at East Boston Camps and the Hill Orchard. The Town Forest Committee is the Town body responsible for the care, custody, and management of the Town forests. The Westford Conservation Trust is a private, nonprofit, non-governmental organization with the purpose of preserving land and other natural resources. The Trust owns over 100 acres and holds Conservation Restrictions on over 400 acres, ensuring preservation.

Founded in 2001, the Westford Land Preservation Foundation provides local landowners with other options than full development when it is time to think about what will happen to their family-owned land. When feasible, WLPF works with landowners to achieve their goals, whether it is maximizing a financial return, preserving their land, or a combination of both, while preserving at least a portion of their land forever.

Town Governance

Westford established a volunteer-led Energy Committee in 2008 to focus on energy issues such as supporting reduction of energy consumption and promoting renewable energy. In 2021, the Energy Committee was

reconstituted as the Clean Energy and Sustainability Committee (CEASC) to focus on broader issues, including helping the Town achieve its goal of net zero greenhouse gas emissions by 2050.

In 2019, Westford hired a Facilities Director to focus on the planning, organizing, and coordinating of the operations and the operational budget of municipal and school buildings. Maximizing energy efficiency and considering energy options are part of the Facilities Director's job.

The Town of Westford applied for and was awarded an Efficiency and Regionalization Grant from the Massachusetts Department of Revenue in the spring of 2022 to fund a full-time Sustainability Coordinator for FY 2023 to be split evenly between the Towns of Westford and Carlisle. Susan Thomas was hired to fill this position in July 2022.

Roadmap Goals and Actions

Transform the Electric Power Supply to 100% Renewable Energy and Produce More Renewable Energy Locally

Achieving 100% renewable electricity is key to reducing Westford's baseline emissions from electricity consumption and is also critical because the electrification of cars and home heating and appliances is an important component of Westford's Roadmap. To fully realize the benefits of electrification, Westford should seek opportunities to transition to 100% clean electricity, while preserving equitable options for those less able to afford increased costs.

E1. Increase the percentage of renewable energy purchased through the Westford Power Options Program (Westford POP).

The 2021-2023 Westford POP contract sets the default level for customer electricity at 10% above the state's Renewable Portfolio Standard (RPS) Class I Compliance Standard for local (New England) renewable energy, and includes "opt-up" tiers of 50% and 100% renewable energy. The 2022 RPS Class I standard is 24%, increasing by 2%-3% each year until it reaches 40% in 2030. The Town should continue to implement Westford POP when it has the opportunity to renegotiate its next contract in 2023 (the current contract expires in November of that year). The Town should:

- Annually increase the default percentage of renewable energy in the contract in 2023 and in future contracts, until the default reaches 100% renewable energy.
- Maintain "opt-up" provisions for the next contract and continue to offer a basic level for residents seeking to "opt-down" to the minimum level required by the State.
- Continue outreach to residents to encourage them to "opt-up" to additional renewable energy content.
- Continue outreach campaigns with the business community to encourage them to participate in the program and to "opt-up" to the highest level of renewables possible.

STAKEHOLDERS: Select Board, Town Manager’s Office, CEASC, Sustainability Coordinator, Town’s energy consultant

LEADER: Select Board

E2. Increase Westford's local generation of renewable energy by 20% by 2030.

Partner with residents, businesses, and Town departments to facilitate the installation of rooftop, open space, and parking canopy solar arrays. As a baseline, in October 2022, NGRID reported that the number of connected solar arrays in town was 676 with a total of 10.5 megawatt maximum capacity under ideal conditions.

- Create a Solar Siting Plan by September 2023 that identifies the candidate locations for solar panels and recommends the optimum mix and distribution of sites to meet the town’s energy needs most efficiently.
- Work with our state legislators, residents, and businesses to maximize Westford's use of state resources. The Massachusetts Roadmap to 2050 legislation encourages participation in community solar projects, sets up a new grant program to help nonprofits afford solar panels, and changes state rules so that businesses or buildings with a large number of solar panels can more easily sell their excess energy back to the grid.
- Work with the Department of Energy Resources and Solarize Mass to help residents and businesses maximize incentives for residential and commercial solar projects. Focus attention on incentives for low-income residents and rental units.

TIMING: Immediately

STAKEHOLDERS: Business organizations in town (Rotary, Westford Business Association), Economic Development Committee, residents, Town Management (energy service company – ESCO), Westford Facilities Director, MA Department of Energy Resources, Massachusetts Clean Energy Center, CEASC, Planning Board, Permanent Town Building Committee, Affordable Housing Committee, Sustainability Coordinator, others as appropriate

LEADERS: Clean Energy and Sustainability Committee

E3. Annually increase the percentage of renewable energy in Westford’s municipal electricity supply, until it reaches 100% renewable energy.

Westford should progressively increase the amount of renewable electricity in its municipal electricity contracts until reaching 100% for municipal operations. Westford is on a fixed-price energy supply contract that ends in December 2023. Following the lead of Westford's POP program, the Town should prioritize purchases of MA Class I RECs to support local (New England) renewable energy development. At all points of implementing this action, the Town should consider cost impacts to taxpayers in Westford.

TIMING: With the next contract; to be negotiated in late 2022/early 2023
STAKEHOLDERS: Select Board, Town Manager, energy providers, CEASC, Facilities Director, Sustainability Coordinator

LEADER: Select Board with recommendation from the Town Manager's Office, CEASC, and the Sustainability Coordinator

E4. Provide support and public recognition to any businesses setting a timetable to reach 100% renewable electricity by 2030.

- Massachusetts recently enacted An Act Driving Clean Energy and Offshore Wind. This legislation includes a requirement that the Department of Energy Resources establish a program requiring large buildings across the Commonwealth to report energy usage on an annual basis. Westford should use this data to work with local businesses to set emission reduction standards and access state programs.
- Westford's businesses use more than twice as much electricity as our residents. Building emissions are the greatest source of GHG emissions in our town, and 32% of building emissions are due to electricity usage by the commercial and industrial sector.
- Survey our business community to determine their current climate action goals, including their purchase of renewable energy in their electricity contracts.
- Conduct an education and outreach campaign for business owners to commit to 100% renewable electricity. Provide positive publicity for those who make the pledge.
- Strategically engage with businesses to promote the Silver (50%) and Gold (100%) options in POP, including providing mechanisms for businesses to receive visibility for their participation, such as a window sticker.
- Utilize resources such as the Massachusetts Clean Energy Center which provides info on resources, incentives, grants, and tax credits for businesses.

TIMING: Working with businesses to reduce GHG emissions can begin immediately. Reporting from the Department of Natural Resources will not be available until 2025.

STAKEHOLDERS: Businesses and business organizations (Westford Rotary, Westford Business Association), Economic Development Committee, Sustainability Coordinator, Clean Energy and Sustainability Committee, Select Board, Town Meeting

LEADER: TBD/Economic Development Committee business liaison

Reducing GHG Emissions from our Buildings

Greenhouse gas (GHG) emissions from the building sector are the largest source of emissions in Westford, at about 58% in 2017. The majority of emissions from heating our homes, municipal buildings, and commercial spaces are from the direct burning of natural gas and fuel oil. Heating with these two fuels made up about 31% of our greenhouse gas emissions in 2017. Transitioning away from these fuels to renewable energy will be a key strategy to reducing GHG emissions moving forward.

Residential and commercial buildings each contribute about 29% of Westford's GHG emissions. Educational and pilot programs, incentives, and policy mechanisms will help to improve energy performance through efficiency, renewable energy generation, energy storage, electrification, and higher-performance building standards.

Installing clean, electric heat pumps to replace gas water heaters and furnaces cuts climate and health pollution. This is even true in Massachusetts where natural gas is still a substantial part of the electricity grid, and the climate benefits of electrification only improve as the grid continues to get cleaner over time. Heat pump technology has proven effective and efficient in Massachusetts homes and buildings.

Westford can lead by example by reducing emissions from municipal buildings. Policies and planning will enable new municipal and school buildings to achieve high sustainability standards, including net zero GHG energy sources and all-electric and resilient designs.

B1. Electrify our buildings including heating, cooling, property maintenance, and appliances.

Residents

Promote transition to electric heat pumps, appliances, and small engines when the time comes to replace existing systems, appliances, and equipment/tools.

- Create an ongoing "Electrify Westford" program and website to increase electrification and conversion to all-electric, energy-efficient heating, cooling, water heating, and appliances. Include information on rebates and discounts, with a special focus on assistance for low-income residents. Use case studies from residents.
- Provide access to a community "efficiency and electrification coach" advisory service that will help participants evaluate options.
- Sponsor events and communications with residents promoting solutions and information sharing about experiences with equipment, installation, and vendors.
- Publish equipment/installation prices to create price transparency and more competitive prices.
- Publish list of qualified installers and seek discounted appliance and HVAC pricing from participating contractors and manufacturers.
- Work with contractors and manufacturers to discount HVAC equipment.
- Promote Mass Save programs and the adoption of electric home appliances and yard equipment.

TIMING: Can begin immediately

STAKEHOLDERS: Town Manager, CEASC, town residents, Select Board, Westford Climate Action, Mass Save, local HVAC companies

LEADER: Sustainability Coordinator, working with CEASC

Town Government and Schools

Install electric, energy-efficient heating, cooling, water heating and appliances in existing Town buildings, and use electric, energy-efficient tools for maintenance of buildings and properties. Make new buildings and major renovations fossil fuel-free.

- Conduct portfolio-wide energy efficiency assessment/audit, including inventory of equipment and building envelope status. Ensure that objectives include greenhouse gas emissions reductions, solar energy installations, and electric heating and cooling solutions. Prioritize implementation of recommendations to reduce greenhouse gas emissions and generate local renewable energy.
- All capital requests for heating and cooling equipment and appliances should include electric options, and the requestor must contact Mass Save and Westford’s Sustainability Coordinator to ensure that the Town takes advantage of all financial incentives.
- Long-term capital and maintenance plans should incorporate production of renewable energy or “ready” infrastructure.
- New buildings and major renovations of existing buildings should follow the guidelines defined in the [Westford Municipal Sustainable Building Guidelines](#) document.
- Support training opportunities for Town departments, boards, and committees, as well as developers, on building standards such as LEED, net zero, Passive House, and other high-performance standards, like CORE.
- Encourage the use of electric landscaping equipment and other small engines.

STAKEHOLDERS: Town Manager, Sustainability Coordinator, energy service company (ESCO), Capital Planning Committee, Permanent Town Building Committee, Facilities Manager, School Committee, CEASC

LEADER: Facilities Director

Commercial / Industrial Sector

Transition to electric heat pumps and equipment when the time comes to replace existing systems.

- Implementation of Westford’s Roadmap will include online information with local resources for businesses to improve energy efficiency and transition to all-electric, energy-efficient heating, cooling, water heating, industrial equipment, and appliances.

- Encourage the use of electric landscaping equipment and other small engines. Consider a bylaw to speed adoption.

TIMING: Can begin immediately. Businesses are encouraged to purchase heat pumps when they replace their heating, air conditioning, and water heating systems.

STAKEHOLDERS: Local businesses, Rotary, Westford Business Association, Economic Development Committee, Town Management

LEADER: TBD/Economic Development staff person

B2. Increase the number of homeowners (by 50% by 2025), businesses (by 10% by 2025), and multi-family unit owners (by 50% by 2025) taking advantage of Mass Save incentives.

Residents

Develop and promote streamlined pathways for residents to sign up for Mass Save energy audits and follow through with recommended actions, including facilitating energy assessments, advising services, contractor lists, and information about rebates and incentives.

- Promote and provide education on home energy assessments, home energy efficiency improvements, and electrification through activities, including advice about appliances, materials, siting, and landscaping, distributing information through mailings, presentations, and events, and partnering with schools.
- Explore requiring disclosure of energy audits at time of sale for residential properties.
- Identify potential funding sources and grants for affordable housing owners and affordable housing management companies to pursue in order to provide green energy upgrades and improvements for affordable units to include but are not limited to programs such as:
 - Mass Save’s LEAN Multifamily Program, which delivers complete, cost-effective gas and electric energy efficiency measures for affordable housing across Massachusetts.
 - Mass Save’s Enhanced Residential Program, which provides rebates and incentives for heating and cooling, barrier mitigation upgrades (to allow for other upgrades) and weatherization upgrades for those with up to 100% Area Median Income.
 - Passive House New Construction, which can be applied to both affordable and market-rate new construction as design and performance incentives.
- Connect with Mass Save builder programs to educate contractors and subs on Passive House.
- Highlight examples of new construction that demonstrate high standards for sustainability and resilient design.

- Leverage existing expertise from building sustainability entities, such as Passive House Institute US, National Renewable Energy Laboratory, and USGBC LEED program.

TIMING: Can begin immediately

STAKEHOLDERS: Westford Climate Action, CEASC, community volunteers, Mass Save, local HVAC companies, Affordable Housing Trust

LEADER: Sustainability Coordinator, working with the CEASC

Commercial/Industrial Sector

Partner with Westford businesses to increase their energy efficiency and reduce GHG emissions

- Improve energy efficiency and insulation, taking advantage of Mass Save incentives
- Take advantage of incentives and tax credits, including joining the Property Assessed Clean Energy (PACE) Massachusetts for energy efficiency improvements
- Use smart thermal-management systems
- Use water- and energy-use tracking/monitoring
- Use native and adaptive landscaping that does not need irrigation

TIMING: Can begin immediately

STAKEHOLDERS: Local businesses, Rotary, Westford Business Association, Economic Development Committee, Town Management

LEADER: TBD/ Economic Development staff

B3. Review all policy documentation in Westford to include building codes, zoning, and other bylaws, to identify candidate changes that could increase efficiency and reduce GHG emissions.

Work with existing Town committees to identify candidate policy and regulations which are candidates for revision. Possible areas to consider include:

- Work with Westford Town government to understand the process for changing Town bylaws. Seek their recommendations for candidate bylaws to evaluate for change.
- Work with the Planning Board and the Zoning Board of Appeals on changes which may be feasible when working with developers.
- Work with the Conservation Commission on regulations governing the use of Town land and the preservation of carbon sequestering woodlands and soils.
- Work with the School Committee on any additional policies which could complement the Sustainability Policy adopted in 2021 and Sustainability Goal identified in 2022.

- Work with the Affordable Housing Trust to identify candidate changes to the documentation governing affordable housing development in Westford.

TIMING: Can begin immediately

STAKEHOLDERS: Town Manager’s Office, Land Use Management, Sustainability Coordinator, CEASC, Planning Board, Conservation Commission, School Committee, Affordable Housing Trust

LEADER: CEASC

B4. Research the Specialized Stretch Code and if appropriate, create a warrant article for Town Meeting to adopt and advocate for its passage using template language to be provided by the Department of Energy Resources/Green Communities as a starting point. If appropriate, network and strategize with other towns with the same goal.

This effort seeks to achieve some of the actions from V1 of this Roadmap. Specifically:

- Establish a baseline of sustainable design standards within the Zoning and Planning Board requirements for all new construction and major renovation of both commercial and residential sectors. Reference Somerville's "Sustainable & Resilient Building's Questionnaire."
- Require large, new buildings subject to the Planning Board’s review to demonstrate strong environmental performance and an ability to achieve net zero emissions.
- Require large commercial building owners to report on energy use, similar to such requirements in Boston and Cambridge. Monitor the success of smaller local communities, such as Ashland, Wellesley, Natick, and Westborough, who have also identified this action in their preliminary net zero plans.
- Engage with builders and developers to understand barriers to designing and building net zero.

TIMING: Research can begin immediately

STAKEHOLDERS: Facilities Director, Building Commissioner, Planning Board, Zoning Board of Appeals, Town Manager’s Office, Select Board, CEASC, Westford Climate Action, Sustainability Coordinator

LEADER: Clean Energy and Sustainability Committee

B5. Continue to advocate at state level for new building codes and policies that will enforce net zero.

- Monitor the new natural gas pilot program in the 10 participating towns.

TIMING: Can begin immediately

STAKEHOLDERS: Westford Climate Action, CEASC

LEADER: Westford Climate Action

B6. Partner with utility and others to initiate development of at least one neighborhood-scale shared ground source heat pump project or microgrid in Westford by 2028. Include mandated collection of metrics for use in planning for expansion of such projects.

- In suitable neighborhoods, the Town should partner with National Grid to promote low/zero carbon district heating and cooling systems or “geo micro districts” or “networked geothermal” projects.
- Plan development of neighborhood microgrid.
- The Town should partner with other towns and organizations that are currently studying this topic, such as the Home Energy Efficiency Team (HEET).
- Observe utility pilots.

STAKEHOLDERS: National Grid, neighboring towns, Land Use Planning, Engineering, Sustainability Coordinator, CEASC, building owners/occupants

LEADER: Sustainability Coordinator

B7. Work with advocacy group(s), such as HEET and Mothers Out Front, the Metropolitan Area Planning Council (MAPC), and Multi-Town Gas Leaks Initiative to advance the utility repair of known gas leaks in Westford.

National Grid and HEET have identified leaks and rated them. When roads are repaired, the Town coordinates with National Grid to fix those leaks. However, additional leaks are not currently addressed and need to be prioritized.

TIMING: Ongoing

STAKEHOLDERS: National Grid, Department of Public Works, residents, Sustainability Coordinator, CEASC, HEET, and other gas-leak repair advocacy groups, Westford Climate Action

LEADER: Westford Climate Action

B8. Partner with the Economic Development Committee in its bid for a staff person, to reduce GHG reductions in the business sector as outlined in the Roadmap.

- This person would assist our businesses in identifying energy savings opportunities.
- Responsibilities would include identifying businesses, collecting relevant data, and conducting supporting outreach to businesses so they can take part in the Roadmap efforts and achieve cost, energy, and emissions savings.

STAKEHOLDERS: CEASC, Sustainability Coordinator, Economic Development Committee, Town Manager’s Office, Select Board

LEADER: Sustainability Coordinator

Reducing GHG Emissions from Transportation

The Westford Greenhouse Gas Inventory indicates that more than 40% of Westford’s greenhouse gas emissions result from transportation, mostly from vehicles operated by Westford residents, businesses, and municipal/school fleets. Replacing vehicles powered by internal combustion engines (ICE) with electric vehicles (EVs) is one of the most impactful ways to reduce GHG emissions.

In this document, an electric vehicle (EV) is defined as one that operates, partially or exclusively, on electrical energy from an off-board source that is stored on-board for motive purpose, and includes battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV).

T1: Develop and implement a comprehensive strategy to increase the percentage of new vehicle registrations that are electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) in Westford, aiming for EV/PHEV registrations to represent 15% of the new vehicle registrations by 2030, 40% by 2040, and 90% by 2050.

Residents

Promote the lease or purchase of electric vehicles or plug-in hybrid electric vehicles as the preferred option when replacing a vehicle. Note that MA law now bans the sale of new internal combustion engine cars after 2035 and substantial federal and state incentives exist to subsidize EV purchases.

- Partner with EV information resources, EV advocacy groups, and EV dealerships to assist residents in the investigation and acquisition of EV for personal/family use.
- Identify and recruit Westford residents with substantive experience/expertise in EV to serve as “coaches” to other residents interested in considering a change to EV for personal/family use.
- Identify and publicize the operating and maintenance advantages and environmental benefits of zero-carbon battery electric vehicles.
- Identify and maintain links to opportunities for EV incentives including federal and state tax rebates, manufacturer rebates, and other grants/incentives.

TIMING: Can begin immediately

STAKEHOLDERS: Sustainability Coordinator, CEASC, Westford Climate Action

LEADER: CEASC

Town Government and Schools

- Continue to prioritize EV alternatives in vehicle replacement decisions per the strategies detailed in the Fleet Electrification Assessment provided to the Town of Westford under the National Grid (MA) Fleet Advisory Services Program.
 - Maintain Town-owned/operated fleet baseline of current vehicles, identifying mileage, fuel use, duty cycle and age.
 - Continue to prioritize EV vehicles in selecting new vehicles.
 - Research EV alternatives that would meet or exceed current and/or anticipated future needs.
 - Partner EV purchases with charging infrastructure siting and selection.
 - Research possibilities for incorporating EVs into our student transportation contracts.
- Partner with Lowell Regional Transit Authority (LRTA) to transition Senior Road Runner transportation service to use low/zero-carbon vehicles.
- Develop and implement policies to require or incentivize private contractors that perform work for the Town to use low/zero-carbon vehicles.

TIMING: Can begin immediately

STAKEHOLDERS: Select Board, Town Manager, CEASC, Westford Climate Action, School Committee, Capital Planning Committee, Finance Committee, Facilities Manager, Sustainability Coordinator, School Finance Director, School transportation contractor

LEADER: Sustainability Coordinator and Assistant Town Manager

Commercial/Industrial Sector

- Establish plans and timeline to lease or purchase EVs as vehicles are replaced and EV alternatives become available.
 - Use EV incentives for businesses including federal/state tax benefits, manufacturer rebates, and other grants/incentives.

TIMING: Can begin immediately

STAKEHOLDERS: Local businesses, Rotary, Westford Business Association, Economic Development Committee, business ambassador/liaison, Select Board, Sustainability Coordinator

LEADER: TBD/Economic Development staff person

T2: Provide Westford with electric vehicle supply equipment, commonly referred to as EV charging stations, infrastructure to support transition to electric vehicles.

In this document, electric vehicle supply equipment (EVSE) is defined as equipment designed specifically to supply electrical power for charging EVs and includes Level 2 (240 VAC) and Level 3 (Fast-DC) supply equipment.¹

¹ Level 1 represents the normal 120 VAC electrical service in typical buildings including residential homes and businesses.

Town Government and Schools

- Establish plans and timeline to require or incentivize installation of publicly available electric vehicle supply equipment (EVSE), commonly referred to as EV charging stations, to promote the use of low/zero-carbon vehicles.
 - Formulate appropriate policies and publicize the availability of EVSE at Town Hall, Westford Academy, and Abbot/Millennium School and support management of these and future Town-owned/operated charging stations as usage grows.
 - Identify priority locations for most effective access/convenience to public charging for visitors/patrons/employees and require/incentivize installation and availability of publicly available EVSE.
 - Partner with National Grid to assess electric power grid upgrades required to support current and future EV charging demand.
- Establish plans and timeline for implementing the charging infrastructure necessary to support Town-owned/operated EVs.
 - Explore potential partnerships to encourage shared EVSE infrastructure for medium/heavy-duty vehicles.
- Establish plans and timeline for implementing the charging infrastructure necessary to support transition of school bus transportation to use EVs.
 - Investigate feasibility and infrastructure requirements to support “vehicle-to-grid” functionality for the school bus fleet during idle times; the stored electricity could provide grid services and thus revenue to the Town, especially during the summer months.

TIMING: Can begin immediately

STAKEHOLDERS: Regional land use organizations, Land Use Management, Engineering Department, Assistant Town Manager, Economic Development Committee, business ambassador/liaison, CEASC, Sustainability Coordinator, Westford Climate Action, School Committee, School Business Manager, School transportation contractor

LEADER: Sustainability Coordinator

Residents

- Partner with EV information resources, EV advocacy groups, and EV charging vendors to assist residents in the investigation of charging options, including acquisition/installation of Level 2 EVSE for home use.

TIMING: Can begin immediately

STAKEHOLDERS: Land Use Management, Building Inspector, Fire Department, Permitting, Sustainability Coordinator, CEASC, Westford Climate Action, local electricians

LEADER: CEASC

Commercial / Industrial Sector

- Seek to connect commercial property owners with funding opportunities to install EVSE, e.g. Volkswagen Settlement, MA Department of Environmental Protection Electric Vehicle Incentive Program (MassEVIP).

TIMING: Can begin immediately

STAKEHOLDERS: Local businesses, Rotary, Westford Business Association, Economic Development Committee, business ambassador/liaison, Sustainability Coordinator, Town Manager, Select Board

LEADER: TBD

T3: Develop an EV charging infrastructure site plan.

- Partner with the public and planning functions to understand the Town's goals with regard to land use, housing, tourism, and business development and make sure the plan supports these goals and avoids undermining them.
- Ensure the plan supports both grid resilience and capacity with batteries and renewable generation.
- Develop or incent conversion of the necessary charging infrastructure in concert with the growth of electric vehicles and fleets in town.

TIMING: Can begin immediately

STAKEHOLDERS: Town Meeting, Land Use Management, businesses, CEASC, Sustainability Coordinator, Select Board, Master Plan Committee (if active)

LEADER: TBD

T4: Develop a transportation plan to facilitate green options (e.g. walking, cycling, ridesharing, and EV use) for people who work, live, and visit Westford.

TIMING: Can begin immediately

STAKEHOLDERS: Town Meeting, Land Use Management, businesses, CEASC, Sustainability Coordinator, Select Board, Master Plan Committee (if active), Pedestrian Safety Committee, Westford Conservation Trust

LEADER: TBD

Solid Waste

Burning our solid waste, particularly waste that could be reused, recycled, or composted, is costly both in carbon and financial terms.

SW1: Develop waste reduction goals.

- With the approval of the Select Board, incorporate a new barrel limit (down from three in the current contract) and/or Pay-As-You-Throw (PAYT) program, in the new solid waste contract, by the end of FY 2023.
- Explore the option, precedent, appetite, market, and advantages/disadvantages of returning to multi-stream recycling with the new recycling contract.
- Increase the emphasis on reuse rather than recycling, so that people think of recycling not as their first option for disposing of things, but the second-to-last one.
- Continue to promote composting and evaluate the need for a community compost option.
- In conjunction with stakeholders, seek to build understanding of the reuse, diversion and recycling opportunities available to the business community, as well as the budget and carbon savings associated with changing disposal habits.
- Assist businesses and households in understanding the out-of-pocket savings to be achieved through reuse and purchases of recycled and minimally packaged products.
- Pursue federal Environment Protection Agency (EPA) funding for regional initiatives in solid waste recycling infrastructure and outreach to move toward a zero-waste economy.

TIMING: Can begin immediately

STAKEHOLDERS: Select Board, Town Manager's Office, Recycling Commission, Sustainability Coordinator, Westford Climate Action, Economic Development staff person, CEASC, Westford Community Compost, School Committee, Schools, Land Use Management, Agricultural Commission

LEADER: Sustainability Coordinator

Natural Resources

Emissions reduction alone will not get us to net zero. We must preserve and enhance the carbon sequestration potential of our natural resources.

In addition, sustainable practices that limit the use of poisons, leverage natural air and water purification cycles, control invasive species, replenish our soils, and provide habitat for biodiversity all contribute to a more resilient landscape less likely to succumb to the extremes of climate change and more capable of moderating them.

NR1: Identify and prioritize acquisition and protection of parcels of forest and wetland.

- Conduct forest inventory and establish carbon sequestration capacity of various land types and parcels throughout town.
- Create a Forest Management Plan that includes protecting and enhancing old growth in order to reduce heat effects, absorb CO₂, sequester carbon, and reduce the impact of extreme rain events.
- Identify resilient species, preferred land management strategies, and invasive species threats.
- Increase acreage of forested areas in town.
- Seek to preserve, not just replant trees, as older trees often sequester greater amounts of carbon.
- Offer workshops to teach boards and property owners how to maximize the carbon and water absorption of their properties through appropriate land management and to understand the linkages between healthy environmental cycles and climate, clean air, water, biodiversity, and human health, not least of all because it will save them money through reduced purchases of energy, water, lawn and garden products, and possibly even improve their property values.
- Encourage residents to shop in their yard and learn to grow things they might otherwise buy: food and flowers for themselves, food for birds, food for pollinators, food for wildlife.
- Develop and promulgate recommendations and regulations for landowners.
- Expand on the programs offered through the Health and Water Departments, as well as the Westford Conservation Trust, to educate all landowners about the benefits of sustainable land use practices and new homeowner practices to increase resiliency and biodiversity and to protect clean air and clean water.
- Adopt regenerative agricultural practices.

TIMING: Can begin immediately

STAKEHOLDERS: Westford Land Use Management, Conservation Commission, Westford Conservation Trust, Sudbury Valley Trustees, MA Audubon, Westford Land Preservation Trust, CEASC, Westford Climate Action, community volunteers, Sustainability Coordinator, Health Department, Water Department, Agricultural Commission

LEADER: Sustainability Coordinator

NR2: Develop outreach and pursue additional resources to build on Westford's Tree and Invasive Species Plan.

TIMING: Can begin upon completion of current Municipal Vulnerability Preparedness (MVP) Action Grant

STAKEHOLDERS: Land Use Management, CEASC, Westford Climate Action, Sustainability Coordinator

LEADER: Sustainability Coordinator

Governance and Advocacy

Implementing Westford’s Roadmap to net zero will require a significant commitment by the entire community to challenge status quo approaches as the community strives to achieve very dramatic changes to reduce GHG emissions. Now is the time to lay the groundwork for the green policies we will need in the future. Support begins in the community. Leaders at the town, state, and national levels must continue to hear calls for planning and change in order to meet our net zero goals by 2050 efficiently.

This plan will require action by all stakeholders in the community, including residents, businesses, and municipal government. Changes to the Roadmap are inevitable and necessary to ensure the Town adjusts the path forward to account for Westford’s successes and failures, to take advantage of technical innovation, and to align local action with evolution of the state’s strategy for GHG reduction. As such, the implementation of the Roadmap should be flexible and resilient.

G1: Fund a full-time municipal Sustainability Coordinator position in Westford.

- The Town needs a variety of people from the Westford community to support successful implementation of this plan, including ongoing leadership to coordinate efforts by a variety of stakeholders. At a management level, the various strategies described in the plan will require administrative leadership and oversight by Town staff.
- In July 2022, Westford took advantage of grant funding to hire a Regional Sustainability Coordinator for one year. This position is shared with Carlisle. The Sustainability Coordinator has been effective in moving the Roadmap forward and communicating with Town departments.
- Recent federal legislation, such as the Infrastructure Act and the Inflation Reduction Act, and state legislation, such as recent Clean Energy and Climate Acts, have created unprecedented funding opportunities. This underscores the critical need for a full-time Town Sustainability Coordinator, who, among other things, will be responsible for maximizing incentives and submitting grant applications to subsidize the transition to clean energy.
- The CEASC must play a lead role to implement this plan in partnership with a Sustainability Coordinator. Community groups, such as Westford Climate Action, will be critical to communicating and implementing actions throughout the residential and businesses sectors.

TIMING: Immediate action required to secure funding in the FY2024 budget

STAKEHOLDERS: CEASC, Town Manager, Select Board

LEADER: CEASC (advocacy), Town Manager, Select Board (funding by Town Meeting)

G2: Work with our state and federal legislators, residents, and businesses to maximize Westford's use of state and federal resources.

- The Massachusetts Roadmap to 2050 legislation encourages participation in community solar projects, sets up a new grant program to help nonprofits afford solar panels and changes state rules so that

businesses or buildings with a large number of solar panels can more easily sell their excess energy back to the grid.

- Town staff, committees, and residents need to communicate with state and federal legislators to make sure the Town is aware of new and changing incentive programs.

TIMING: Continuous action required

STAKEHOLDERS: Sustainability Coordinator, CEASC, Westford Climate Action

LEADER: Sustainability Coordinator

G3: Local-level advocacy.

- Officials and committees in the Town of Westford must learn about the goals of net zero 2050, and develop plans to get there.
- Survey residents about their attitudes toward net zero and their willingness to act.
- Survey businesses about their current energy use and their company's policies toward climate change.
- Publicize this Roadmap to net zero and the work of the Clean Energy and Sustainability Committee and its allies.
- Encourage boards to adopt new standards, codes, and zoning to support green energy. Consider an [ordinance passed in Boston to reduce GHG emissions in buildings](#).

TIMING: Continuous action required

STAKEHOLDERS: Sustainability Coordinator, CEASC, Westford Climate Action

LEADER: Sustainability Coordinator

G4: State-level advocacy.

- Westford must partner with other towns and the state to share ideas, exchange information, and coordinate actions.
- Westford has been attending the North Central Climate Change Coalition (NC4) and should formally join the organization.
- We must lobby legislators and state officials to implement new policies, regulations, and incentives.
- We must coordinate with National Grid and other utilities about adding local power sources (e.g. solar panels), increasing capacity as electrification expands, and making the grid more robust.

TIMING: Continuous action required

STAKEHOLDERS: Sustainability Coordinator, CEASC, Westford Climate Action

LEADER: Sustainability Coordinator

G5: National-level advocacy.

- Continue to lobby national legislators and officials to implement new policies and regulations to ensure this funding is accessible to towns. For example, the method for tax credits being issued to municipalities has yet to be defined. Similarly some recent programs target larger political entities.
- New large-scale investments are required in infrastructure for clean power generation, electric transmission, and transportation.
- Monitor subsidies offered to purchase electric vehicles, install charging stations, convert oil and gas heating to electrical technologies, encourage clean power generation, and improve building efficiency.
- Promote legislation that holds large corporations responsible for their positions on climate change. Fossil fuel companies must transition from suppliers of carbon to leaders in renewable technologies. Other corporations must commit to minimizing GHG emissions from their operations.
- Support development of new technologies for power generation, energy storage, transportation, and carbon sequestration.

TIMING: Continuous action required

STAKEHOLDERS: Sustainability Coordinator, CEASC, Westford Climate Action

LEADER: Sustainability Coordinator

Appendix

GHG Inventory – What is Included, What is Not Included

Our GHG inventory used the [Metropolitan Area Planning Council \(MAPC\) Community Greenhouse Gas Inventory Tool and Step-by-Step Guide](#). This GHG Inventory tool and protocol follow the methods put forth by the 2014 Global Protocol for Community-Scale Greenhouse Gas Inventories (“Global Protocol”). The sectors and subsectors included in the tool align most closely with the BASIC level reporting for Global Protocol inventories. The GHG inventory accounts for emissions resulting from Westford’s homes, businesses and industries, municipal operations, large energy production facilities, passenger and commercial vehicles, public transportation, natural gas leaks, electricity line losses, municipal solid waste, and wastewater.

The GHG Inventory protocol that we used does not include "scope 3 sources," which are GHG emissions that are embodied in foods, water, products, and construction materials. Out-of-boundary transportation, such as airline travel, is also not included.

See the following charts.

Sectors and subsectors included in the Tool

Sector	Sub-sector	Emissions sources	Energy types
Stationary Energy	Residential	Energy use in residential buildings as well as losses from distribution systems	Electricity Natural gas Heating fuel oil Petroleum Products Various - may include natural gas, propane, diesel, and waste-to-energy
	Commercial, Industrial, and Manufacturing	Energy use in commercial, government and institutional buildings, manufacturing and industrial facilities, as well as losses from distribution systems.	
	Construction and Landscaping	Energy use from construction and landscaping equipment and activities.	
	Energy Industries	Stationary combustion of fuel in various equipment, such as boilers and generators.	
Transportation	On-road vehicles	All trips taken by passenger and commercial vehicles registered in the community. Portion of trips taken within the community boundary by on-road buses and trackless trolleys.	Gasoline Diesel CNG Electricity
	Railways	Portion of trips taken within the community boundary by public light and heavy rail.	
Waste	Solid Waste	Municipal solid waste disposed in/by landfills, incineration, composting, and anaerobic digestion	Landfill gas (methane)
	Wastewater	Process and fugitive emissions from treating wastewater	Not applicable

What is not included in the Tool?

Our primary goal for this guide is to simplify the process of developing a GHG inventory by using publicly available data sets, while maintaining high levels of accuracy and relevance in the data used. As such, some sources of GHG emissions that are covered by the BASIC level for Global Protocol inventories are not included in the current version of the Tool. The following subsectors are excluded from the Tool because public statewide data sets were either not available or not robust enough to support a method of estimating GHG emissions from community to community.



Stationary Energy

Agriculture, forestry, and fishing activities: emissions that result from direct fuel combustion to support these activities (e.g., machinery, generators, pumps, etc.)



Transportation

Commercial and national railways: passenger and freight activities associated with commercially owned railways servicing or running through communities

Waterborne navigation and aviation: ships, ferries, and other boats operating within the community boundary, and air travel occurring within the community boundary.

Off-road vehicles: emissions that result from airport equipment, agricultural tractors, chain saws, forklifts, snowmobiles, etc.



Waste

Industrial waste: waste generated from industrial processes and technologies.

For two subsectors, we have provided the option for communities to input local data where it is available. These are GHG emissions from (1) regional transit agencies (outside of the MBTA) and (2) private waste haulers servicing commercial facilities. While a comprehensive data source is not currently available for these subsectors, communities have the flexibility to input this data if they have access.

al/