


TOWN OF

Winchester

MASSACHUSETTS

Climate Action Plan | 2020

Winchester's Wright-Locke Farm has recently installed solar panels on its 1827 Barn and Squash House. This 54,000 kW array will provide green power for all the Farm's electrical needs, with excess production flowing into the grid. The project demonstrates a commitment to promoting renewable energy solutions right here in Winchester and represents one of the few installations of solar panels on buildings listed on the National Register of Historic Places. In addition to generating clean electricity, the Farm has also installed electric air source heat pumps for its Farmhouse, replacing an inefficient oil-fired boiler that had reached its end of life. Solar panels and electric heat pumps are significant steps in reducing the Farm's carbon footprint.

a message from
Town Manager, Lisa Wong

Welcome to Winchester's 2020 Climate Action Plan, our Town's roadmap to address climate change

A year ago, when I charged the Climate Action Plan Committee with updating our Town's preparedness for climate change, two major reports had captured world-wide attention in documenting the urgent need to prepare for the impacts of climate change due to already-existing greenhouse gases in our planet's atmosphere. These reports clearly spur communities to:

Take responsibility for the planet – i.e. take actions to reduce carbon pollution, AND take responsibility for ourselves – i.e. take actions to increase community resilience to prepare for the impacts of carbon pollution already present in the atmosphere.

Today, as our Town actively copes with COVID-19, the planet's climate continues to change. A balance of resources is needed to protect our community today and into the future, both from COVID-19 and from climate change. We know that this summer will bring new challenges here in Winchester from extreme heat. We also know that the next months and years will see extreme weather of all sorts. The 2020 Climate Action Plan positions Winchester to embark on a systematic series of steps to reduce climate risks to our health and prosperity.

Winchester has a long history of commitment and connection to our environment, evidenced by our protection of open spaces including our beautiful Town Common, local parks, the Fells, and Wright-Locke Farm. In more recent years our community has navigated the increasing impacts of climate change by adopting a series of energy conservation and other mitigation efforts aimed at reducing Winchester's GHG emissions.

Last Spring, our Select Board committed Winchester to an 80% reduction of our GHGs by 2050, a goal aligned with the Massachusetts Global Warming Solutions Act. The goals of the Winchester 2020 Climate Action Plan are to meet these GHG reduction targets, and to simultaneously bring our Town to a new level of climate-preparedness; simply put, to reduce emissions and increase resiliency.

When the recommended actions are successfully implemented, the Town will have greater coordination of resources in reducing GHG emissions, and in reducing risks due to increased heat waves, more frequent and extreme flooding, vector-borne diseases such as EEE, WNV, and Lyme, harmful cyanobacterial blooms in our waterways, and other climate impacts. Our community will have new and enhanced avenues for communications to build together the systems needed to meet ever-changing climate impacts within Winchester and in collaborations with our neighboring communities. And we will become a more resilient community with the depth of resources to recover from climate disasters.

In addition to the Select Board's 80x50 commitment, I personally commit to ensuring an appropriate balance of town resources to reduce climate risks and protect the lives and livelihoods of residents, while continuing to do our part in conserving energy and reducing polluting sources that cause climate change.

As we work together to navigate through the COVID-19 crisis, the importance of planning and taking action early to reduce the worst effects of foreseeable emergencies has become clear. It is in this context that I wholeheartedly endorse this 2020 Climate Action Plan and urge all Winchester residents and business owners to help implement the plan without delay.

Lisa A. Wong

Developing Winchester's 2020 Climate Action Plan

Winchester's Climate Action Plan Committee was established and charged with updating the Town's 2011 Climate Action Plan by Town Manager, Lisa Wong, on March 12, 2019. Much has changed since 2011, including extraordinary new challenges to our Town and community as we navigate life during the COVID-19 pandemic.

It is more apparent than ever that advance planning reduces risks during a crisis. It is also apparent that climate change will not wait for COVID-19 to abate. Climate change continues to threaten the health and livelihoods of our community every day. Research from teams of scientists world-wide continuously demonstrates that Winchester is facing more frequent and extreme heat waves, with predictable increases in illness and deaths; increased flooding events, with the resultant impacts on health, property and increased insurance costs; changes in weather patterns including milder winters, leading to increases in vector-borne diseases; and locally unprecedented patterns of cold, wind, ice, snow and other weather events, with disruptions in transportation, lost work days, increased employee absenteeism, reduced customer days, and disruption of upstream supplies for our business community.

Our eighteen member Committee was intentionally assembled with broad community representation to improve our understanding of how climate change impacts us locally.

The Committee met bi-weekly for a year. An initial retreat with community leaders involved in writing Winchester's 2011 Climate Action Plan was held to ensure continuity of vision and efforts. A systematic analysis of the 2011 Plan was conducted, with outreach to community leaders to assess which recommendations should be included in the 2020 Plan. Regular updates were made to the Town Manager and at televised meetings of the Select Board and Town Meeting regarding process and progress.

On April 22, 2019, Winchester's Select Board committed the Town to reducing greenhouse gas emissions (GHGs) by 80% by 2050.

The Committee set two goals for the 2020 Climate Action Plan:

- Reduce carbon pollution (the primary contributor to greenhouse gases, or GHGs)
- Increase community resilience

The 2020 Climate Action Plan presented here provides the Town with a roadmap to reach these two goals. When simultaneously implemented, these twin goals of aggressively reducing Winchester's carbon pollution and enhancing community resilience, will help Winchester meet our commitment to reduce our contribution to greenhouse gases and protect our vibrant community from the most disastrous impacts of climate change.

The Climate Action Plan will be updated regularly to reflect the best available science and forecasted conditions within the Town and will allow integration of new strategies and technologies as they become available.

Ruth Trimarchi, on behalf of the Climate Action Plan Committee:

Wei Chen
Lily Daley
Sue Doubler
Ingrid Geis
Lance Grenzeback
Tom Howley
Anne Leiby, *Co-Chair*
Max Lu
Zeina Marchant
Archie McIntyre
Ken Pruitt
Kim Roeland
Steven Shea
Clara Santos
Ann Storer
Ruth Trimarchi, *Co-Chair*
Frans Wethly
Yanxia Wu

Acknowledgments

The Climate Action Plan Committee has benefited tremendously from the strong municipal leadership of our **Town Manager, Lisa Wong** and **Select Board members**:

Michael Bettencourt;

Mariano Goluboff;

Amy Shapiro;

Susan Verdicchio;

Jacqueline Welch;

as well as the ongoing support of Town staff and department heads for their time and guidance in prioritizing short- and long-term actions.

We would like to thank:

TOWN STAFF

Brian Szekely, Town Planner

Beth Rudolph, Town Engineer

Jennifer Murphy, Director of Public Health

Philip Beltz, Director of the Council on Aging

Jay Gill, Director

Nick Parlee, Transfer Station Coordinator

LeeAnn McGahan, Business Manager of the Department of Public Works

Judy Evans, Superintendent of Schools

Ann Wirtanen, Director

Theresa Maturevich, Assistant Director of the Winchester Public Library

Susan McPhee, Energy Conservation Coordinator
Michelle Vibert, Director of Human Resources

Liora Norwich, Executive Director, Center for Social Justice

Heather von Mering, Chair of the Planning Board and Steering Committee for the Master Plan, for ongoing assistance in aligning the Climate Action Plan with the Master Plan as the two processes overlapped during the past year.

CONVERSATIONS WITH

Energy Management Committee

Conservation Commission

Traffic and Transportation Committee

Personnel Board

Michelle Bergstrom, School Committee Chair

John Suhrbier, Winchester Housing Partnership Board Chair

NEIGHBORING COMMUNITIES

Kate Hanley, Concord Director of Sustainability

Julie Wormser, Deputy Director, Mystic River Watershed Association

Rebecca Winterich-Knox, Mass Climate Action Network

Bob Zogg, Chair Carlisle Energy Task Force

Fred Cunningham, Sherborn Energy Committee Member

The Committee would also like to thank the following for vetted information and helpful conversations in aligning Winchester's 2020 Climate Action Plan with MA state law, existing reports, plans, directives and anticipated initiatives:

MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS (EEA)

Ben Miller, Technical Lead, Global Warming Solutions Act

Neal Duffy, Regional Coordinator, Green Communities Division

Carolyn Meklenberg Municipal Vulnerability Preparedness (MVP) Program Regional Coordinator for Greater Boston

MASSACHUSETTS DEPARTMENT OF ENERGY RESOURCES (DOER)

Ian Finlayson, Deputy Director, Energy Efficiency Division

Alexis Washburn, Climate and Buildings Program Analyst

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)

John Fischer, Deputy Division Director, Solid Waste Materials Management

The Committee is grateful to David Gauthier, Executive Director of our local television station, WinCam, for graciously facilitating extensive use of the large state-of-the-art meeting room this year.

We are grateful to all of them and thank them for strengthening this Plan.

A Message from the Winchester High School Environmental Club

"The Winchester High School Environmental Club believes that the 2020 Climate Action Plan is an urgent priority for the future of our Town. We agree with members of the **Sunrise Movement** in saying "We are ordinary young people who are scared about what the climate crisis means for the people and places we love. Everyone has a role to play." We know that substantial action on climate change is most effectively made at the local level, and hope that the support of our local government will inspire our peers, as future leaders, as well as all residents and businesses in Winchester, to continue the efforts made by those creating the Climate Action Plan. Change can and will be enacted."

Clara Santos, Lauren Mcdowell, Mackenzie Murray, and Lia Cagnetta on behalf of The Winchester High School Environmental Club

TABLE OF CONTENTS

Introduction

From more intense storm events causing flooding to high heat days leading to poor air quality, our small town is already experiencing the impacts of climate change. The need for urgent action is well recognized by international, national, state, and local agencies and governments. In Winchester, these changes continue to create unacceptable risks and costs to the Town, residents, and businesses. For example, over the past several decades, the Town of Winchester has experienced devastating flooding along the Aberjona River and its tributaries, which has endangered public safety, disrupted businesses, and schools, and led to significant economic losses totaling more than $25 million.

Winchester will strive toward net zero greenhouse gas (GHG) emissions, with a commitment to reach at least an 80% reduction of GHG emissions by 2050; and interim goals of 40% reduction by 2030 and 60% reduction by 2040.

GOAL ADOPTED BY WINCHESTER SELECT BOARD, 4/22/19

We can reduce these risks and costs by reducing the carbon pollution created when we burn fossil fuels such as coal, oil, and natural gas that still power and heat most of our buildings and vehicles. However, due to the ability of greenhouse gases like carbon dioxide to remain in the atmosphere for decades we must prepare ourselves for the impacts that will come with the changes we are already committed to from past activities. Enhancing our entire community's resilience to these changes will be essential.

Carbon Pollution: Carbon pollution refers to those emissions of carbon dioxide (one of several greenhouse gases (GHGs) and by far the largest contributor to climate change) that are created through human activities, such as burning fossil fuels, and are emitted into the atmosphere at a rate faster than they are absorbed by oceans and other carbon sinks. This is leading to an increased warming of the planet which disrupts climate cycles, endangering the health and welfare of all living creatures on Earth.

Goals

The Winchester 2020 Climate Action Plan is organized into two distinct sections encompassing these overarching goals:

» Reduce carbon pollution

» Increase community resilience

The Climate Action Plan Committee is confident that we have laid out appropriate, actionable steps for Winchester to reach 80% reduction of carbon pollution (GHGs) by 2050, and to significantly reduce the risks to health and property that climate change brings. We recognize that this is a complex Plan and will require a great deal of integrated work by residents, businesses, and Town staff. To fully implement the Plan will require years. We must begin now. Putting off action "until tomorrow" means bigger impacts, higher costs, and greater risk of disasters. We can learn by observing temporary reductions in GHG emissions as the world economy slows due to the COVID-19 pandemic, and we will be wise to use this time to plan for the next crisis, almost certainly a climate crisis. Acting now will require active and informed involvement of every member of the community.

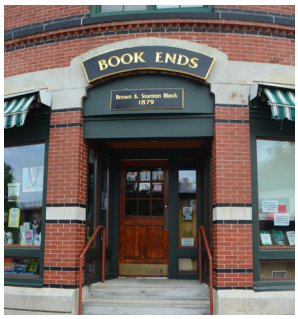
The #1 action to successfully implement Winchester's 2020 Climate Action Plan is to hire a SUSTAINABILITY DIRECTOR. We strongly recommend that the Town accomplish this as early as possible in 2020. Additionally, a new Climate Action Committee will need to be assembled and begin work as soon as this Plan is in print.

Strategies and Actions

To achieve these goals, the Climate Action Plan recommends strategies and actions in these areas:

I. Reduce Carbon Pollution

Energy Supply
Increasing the supply of carbon-free electricity ("greening the grid")



Buildings
Improving energy efficiency and eliminating the use of fossil fuels in new & existing buildings

Transportation
Shifting from gasoline-and-diesel-powered engines to carbon-free electric- battery powered engines; and minimizing private vehicle travel by improving transit, bike, and pedestrian transportation

Solid Waste
Reducing the emissions created by production, transportation, incineration, and decomposition of solid waste

II. Enhance Community Resilience

- Reducing the risks to public health and safety due to climate change
- Ensuring the principles of resiliency are integrated into the daily operations of the Town government
- Prioritizing and incentivizing green infrastructure
- Developing funding mechanisms to ensure ongoing climate-preparedness

Winchester's Contribution to Climate Change

In 2017, Winchester generated more than 175,000 metric tons of carbon dioxide equivalent as a result of heating and cooling our homes and offices, using electricity, driving our gas- and diesel-powered cars and trucks, and disposing of our solid waste. That is the emissions equivalent to the annual electricity use in 29,847 homes, or more than 3.7 times the number of households in Winchester. Approximately 63% of emissions come from heating and cooling homes, businesses, and Town buildings; 37% from driving cars and trucks; and less than one percent from handling and disposing of solid waste.

Figure 1 provides a summary of emissions by sector (Stationary Energy, Transportation, and Waste) and subsectors. As is common in small New England towns like Winchester, our buildings and our vehicles are the largest sources of carbon pollution.

FIGURE 1: Town of Winchester Greenhouse Gas Inventory Summary

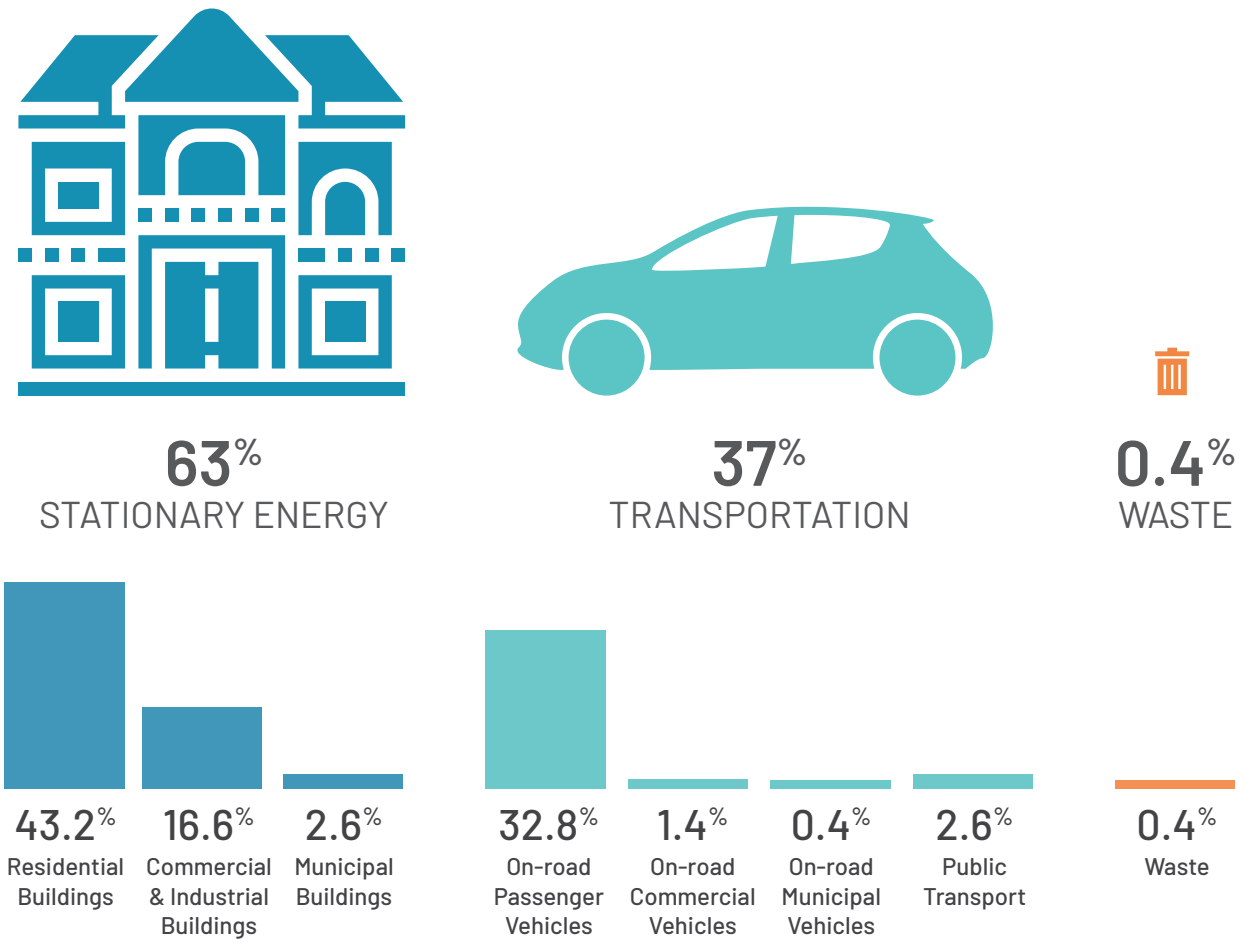
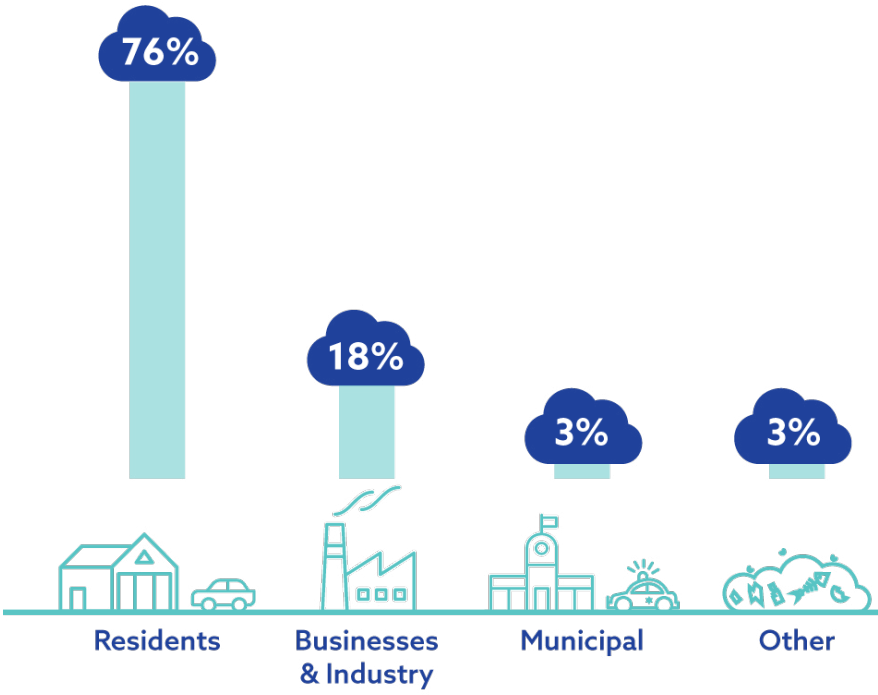


FIGURE 2: GHG Emissions by Responsible Party

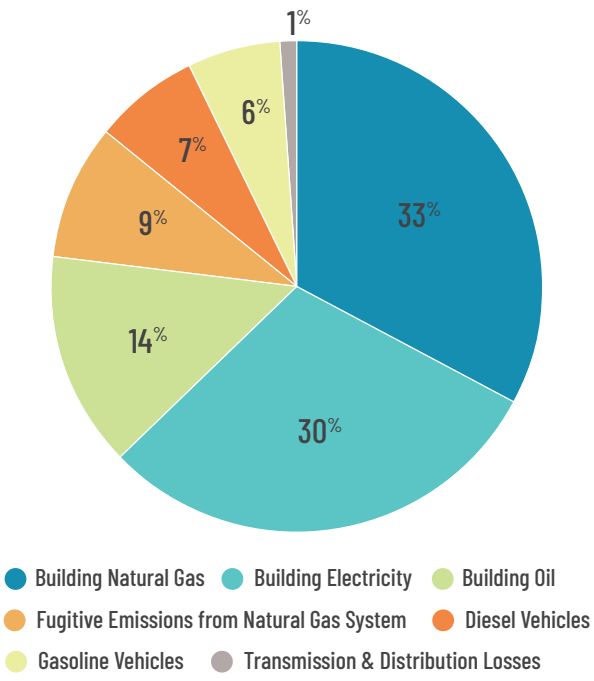


As a primarily residential community, our residents are contributing the most to our emissions, as is illustrated in **Figure 2**.

Residents are responsible for the vast majority of carbon pollution in Winchester: Residential Buildings 43.2% + Passenger Vehicles 32.8% = 76% of total GHGs in Winchester are created by residents.

It is important for the Town government to lead by example for the community. Tracking GHG emissions and reduction efforts is a way that the Town can hold itself accountable to the GHG reduction targets established. GHG emissions from municipal operations are incorporated into community-wide emissions and account for less than 3% of the total. **Figure 3** shows how that 3% breaks down.

FIGURE 3 : Breakdown of Municipal Emissions by Subsector



Impacts of Climate Change in Winchester

Climate Change Impacts

As the climate continues to change, Winchester can expect increases in:

- Extreme heat days and overall warmer average temperatures
- Frequency of precipitation falling in intense storm events
- Subsequent flooding
- Extended periods of drought

Each of these hazards bring a set of local impacts to Winchester.

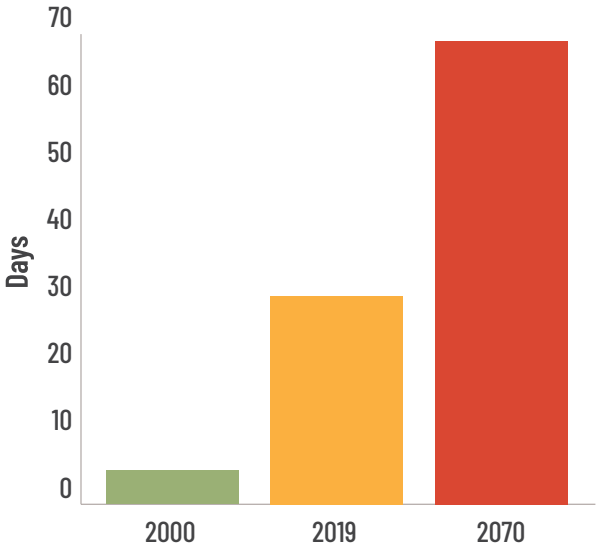
Extreme Heat & Warmer Average Temperatures

- More deaths and illness from heat stress among our growing number of senior citizens and other most-vulnerable populations
- Increased risks from vector-borne diseases
- Higher costs for air conditioning homes and businesses and more frequent electrical power brownouts
- More frequently unusable recreational areas, including Sandy and Borggaard beaches and nearby boating and fishing areas due to cyanobacterial blooms, which are caused by a combination of extended high heat, increased phosphorous and other nutrient runoff from stormwater, and other factors
- Increases in disease-carrying vectors such as rats, mice, mosquitoes, and ticks, with the resultant increased risks of Lyme disease, Eastern Equine Encephalitis (EEE), West Nile Virus (WNV), and other health risks
- Increased need for spraying and other measures to control these vectors, with the notable exception that ticks can only be controlled through public education regarding protective personal measures

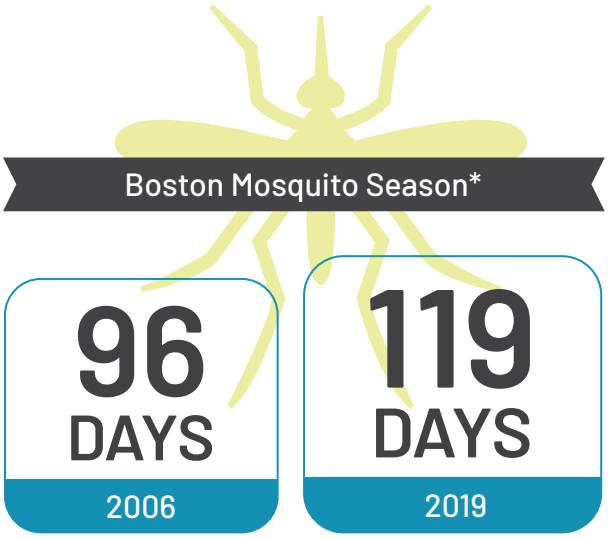
Drought

- Increased risk of wildfires in the Middlesex Fells Reservations and other forested areas
- Loss of crops at Winchester's Wright-Locke Farm and other regional farms that provide locally-sourced food

FIGURE 4
Number of Days Over 90 Degrees in Greater Boston



Source:
2018 Massachusetts State Hazard Mitigation and Adaptation Plan



*average days/year

Source:
Yamana and Eltahir 2013, NCBI, National Institutes of Health, Daymet Data, Oak Ridge National Laboratory (www.climatecentral.org)

Sea Level Rise

Winchester is not a coastal community; however, we are part of a metropolitan area that is at risk of rising sea levels and higher storm surges, and impacts to Boston and the surrounding areas could affect us.

- More frequent loss of access to jobs, health care, sports, and educational facilities in low-lying sections of Boston, Cambridge, Somerville, and Medford
- Extended closures of transportation hubs and services such as Logan, Amtrak, and MBTA
- Costly disruptions of supply chains bringing food, medicine, building materials, and fuels into the region

Intense Storms

» More power outages. We note that in meeting the challenge of the COVID-19 pandemic, robust use of the internet for communications and other purposes, is essential

» More violent storms, more rapid stormwater and snowmelt runoff

» More costly disruption of Town Center businesses, schools, and police and fire services

» The possible isolation of one or more of our schools while in session during a flash flood or other storm, with challenges to meet the medical and all other needs of stranded students and staff over an indeterminant period of time

» Downed trees, road closures, and transportation challenges including disruptions to upstream supply chains for food and other supplies

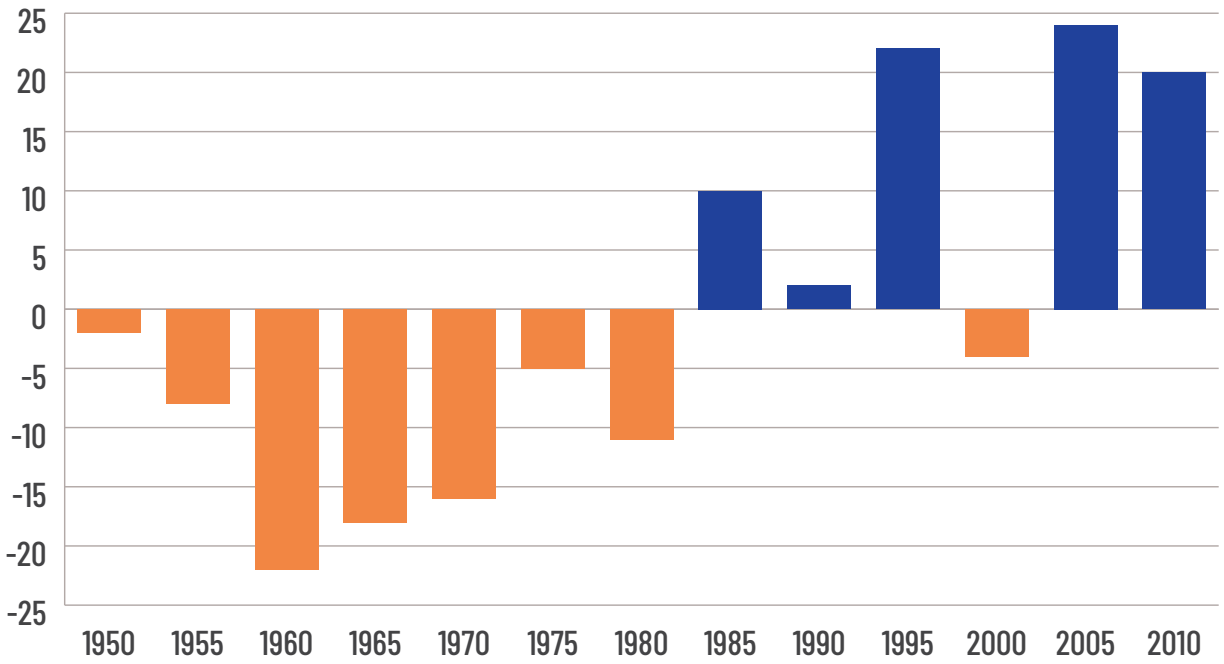
Flooding

» More frequent flash-flooding that overwhelms our drainage and flood control systems

» Higher flood insurance costs for businesses and residents in all neighborhoods along the Aberjona

FIGURE 5: When It Rains, It Pours

Change in Frequency of Heaviest Downpours in Massachusetts



Source:
Applied Climate Information System (rcc-acis.org); Heaviest downpours defined as top 1% of all rain events.
Shown as departure from 1950-2014 average.

FIGURE 6: FEMA Flood Zones and Areas of Repetitive Loss Sites (Winchester All Hazards Mitigation Plan, 2016)

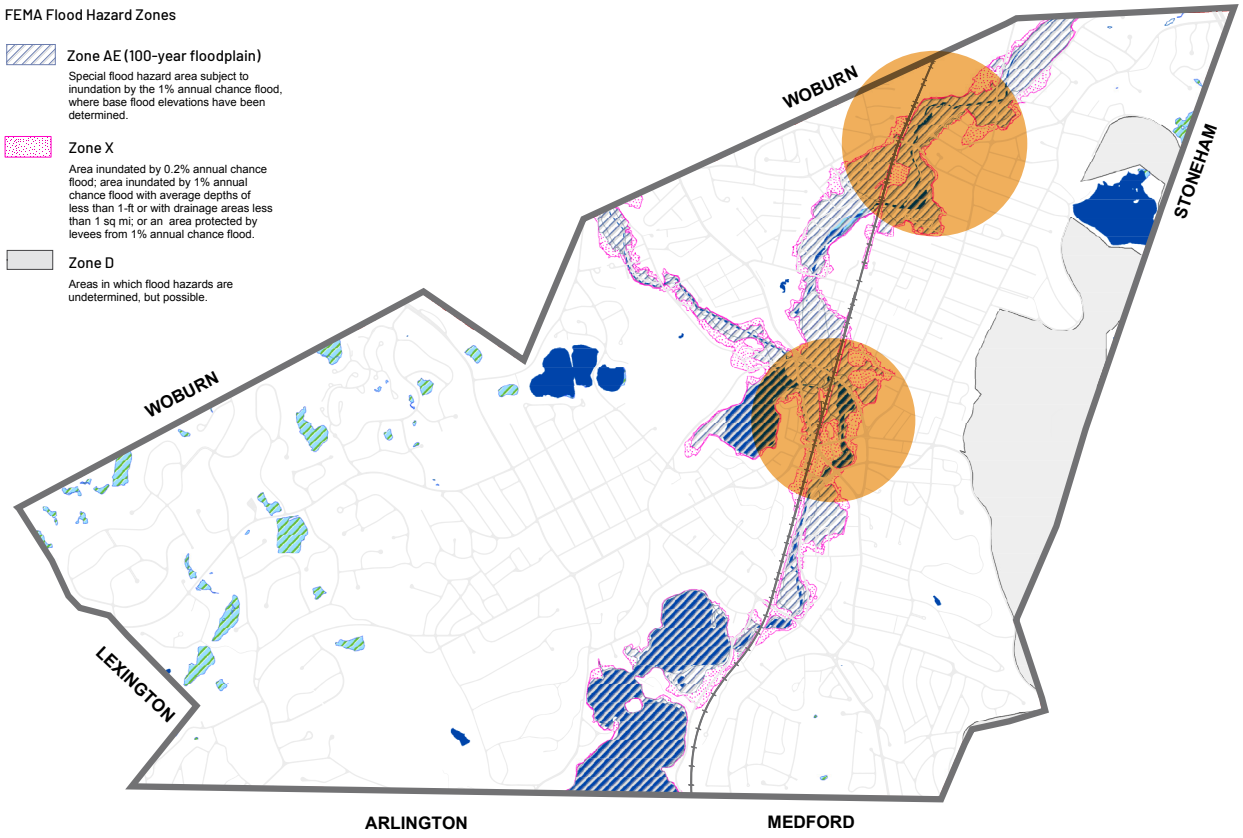
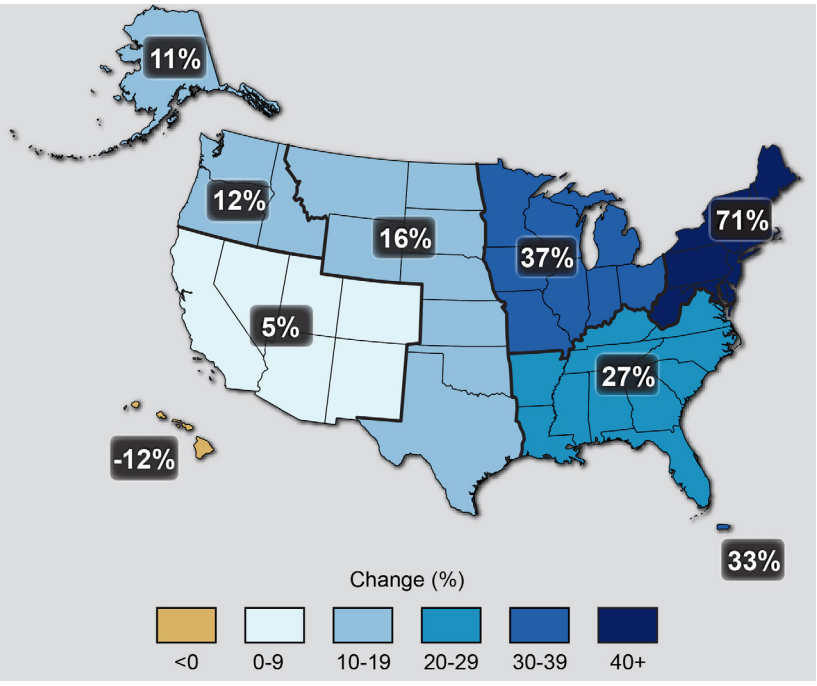


FIGURE 7: Observed Change in Very Heavy Precipitation



Source:
U.S. Climate Resilience Toolkit
https://toolkit.climate.gov/image/762

Winchester's Climate Action Progress

2000

Energy Management Committee

2010

Green Communities Designation

2011

- Climate Action Plan
- Climate Action Advisory Committee

2017

WinPower

2019

- HeatSmart Mass
- Climate Action Plan Committee
- Greenhouse Gas Inventory

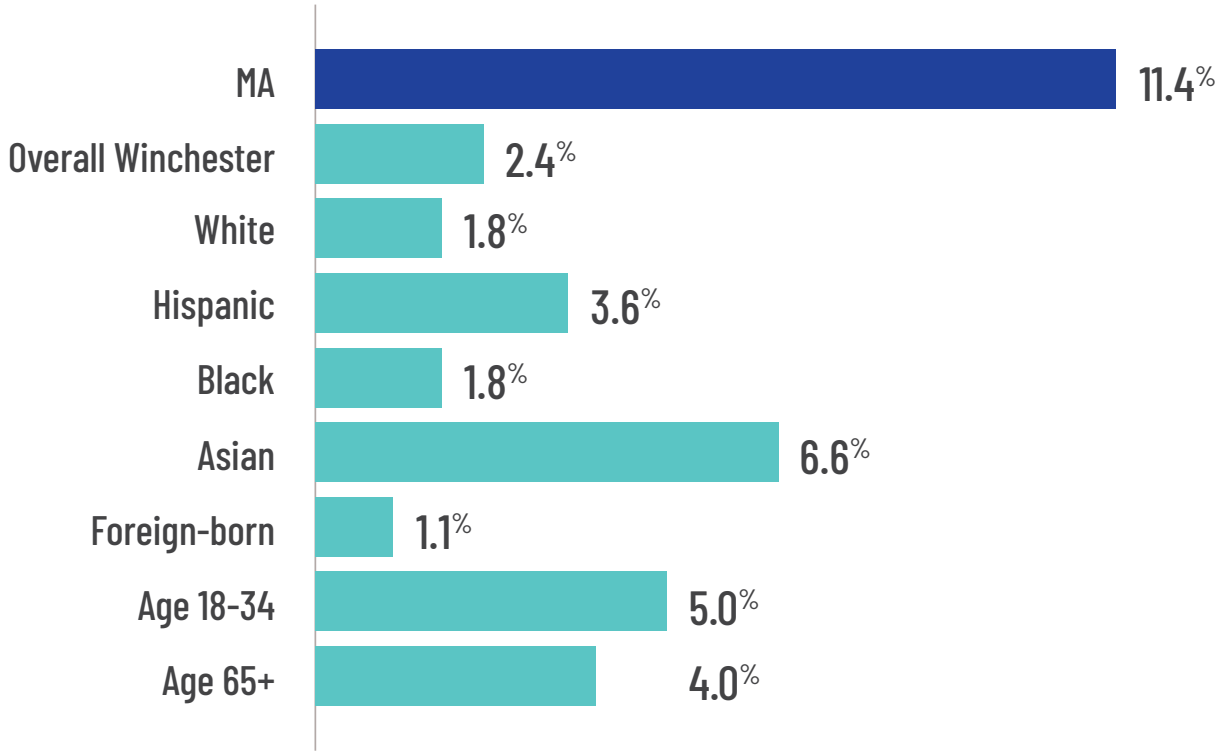
2020

Climate Action Plan

The Importance of Equity in Climate Action

While Winchester is one of the wealthier communities in Massachusetts, there are community members who are dealing with ongoing financial or health related stressors that could make them less able to prepare for and adapt to the impacts of a changing climate. Additionally, we are growing as a community and need to ensure that newcomers are made aware of and provided opportunities to support the implementation of our town's vision of a resilient future for all. To specifically address these needs, the 2020 Climate Action Plan has identified equity considerations, as appropriate to each identified action.

FIGURE 8: Percent of Individuals with Income Below Poverty Level (2016)



2.4%

Winchester residents that have incomes that fall below the poverty line (~529 residents)

163

Winchester households are receiving food stamps or SNAP benefits

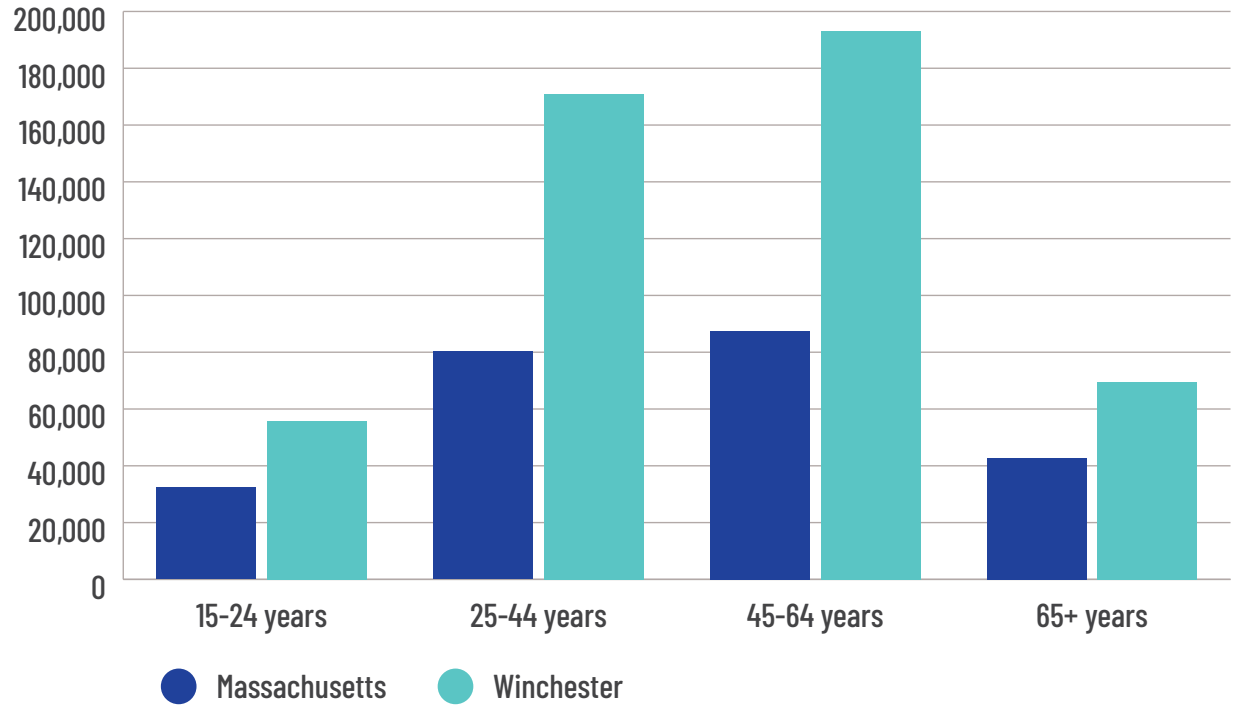
5.1%

Winchester public school students are categorized as economically disadvantaged (~238 students)

18-34 & 65+
AGE GROUPS

Winchester residents, as well as Hispanic and Asian residents, are more likely to fall below the poverty line

FIGURE 9
Median Household Income by Age of Householder (2016)



As we transition to a carbon free economy and build resiliency, we need to consider what steps need to be taken to make these changes accessible, affordable, and inclusive for all Winchester residents.

The specific needs of vulnerable populations such as the disabled, the elderly, the very young, newcomers to town, those with limited resources, and those with limited English proficiency will be weighed 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 electric vehicle charging stations; and who may not have the resources to retrofit their home 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 carbon-free and resilient. We can rethink public transportation routes to increase access.

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 community.

The following **Action Recommendations Summary Table** summarizes the actions the Climate Action Plan Committee recommends for Winchester to meet its overarching goals. The actions are categorized by focus area and goal and include details on ensuring equitable implementation of the action.

Action Recommendations Summary Table

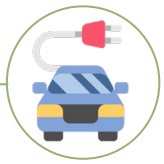
ENERGY

ACTIONS	EQUITY CONSIDERATIONS
EN1: Convert Municipal electricity supply to 100% carbon-free by 2035	
Study cost impacts to the Town of increased renewable requirements	Ensure additional costs do not impact essential municipal services, especially to those most in need
Identify funding source to offset future increased costs to the Town	Ensure funding is not pulled from other essential municipal services, especially to those most in need
Negotiate higher renewable increases in future energy supply contracts	Ensure additional costs do not impact essential municipal services, especially to those most in need
EN2: Increase WinPower default electricity supply to 100% carbon-free by 2035	
Continue education and outreach campaign to urge WinPower customers to opt-up to 100% carbon-free electricity	Additional cost to opt-up to 100% may not be feasible for all Winchester residents. Work with impacted communities to develop effective strategies to minimize or eliminate impact
Study cost and feasibility impacts of increased renewable requirements	Identify opportunities to avoid the increased cost negatively impacting low-income residents
Negotiate higher renewable increases in each 3-year WinPower contract	Identify opportunities to avoid the increased cost negatively impacting low-income residents
Design program for offsetting cost to underserved populations	The measure will ensure that rate increases will not negatively impact customers from underserved populations
EN3: Advocate for a 5% annual increase in the Massachusetts Renewable Portfolio Standard	
Select Board and Town Manager to collaborate with Winchester's legislative delegation to advocate for the annual RPS increase in the state legislature	Ensure equity is taken into account in legislation
Collaborate with organizations like Sierra Club, Massachusetts Climate Action Network, Mothers Out Front, and other municipalities to elevate advocacy efforts	This measure enhances equity by ensuring diverse organizations have a voice in advocacy

BUILDINGS

ACTIONS	EQUITY CONSIDERATIONS
BD1: Improve energy efficiency in existing buildings	
Enact point-based energy efficiency performance standards for new developments	This measure may enhance equity by potentially reducing utility bill costs for residents
Require disclosure of energy audits at time of sale for residential properties	Ensure all residents have equal access to resources to complete audit and understand the value
Promote Mass Save Energy Efficiency/GHG Scoring tools	Ensure all community members have access to tools
Develop a planning tool for building owners to estimate the energy reduction from various energy efficiency investments	Ensure all community members have access to tools
BD2: Transition to zero fossil fuels and promote onsite solar in existing buildings	
Promote and educate the public about air-source and ground-source heat pump technologies	Ensure all materials are available in multiple languages and mediums
Develop a planning tool for building owners; use natural replacement cycles to transition to clean energy and increased energy efficiency	Ensure all community members have access to tools
Encourage roof-top solar and solar hot water installations	Installation costs may be prohibitive to some residents. Work with impacted communities to develop effective strategies to minimize or eliminate barriers
Install solar panels on municipal buildings and parking lot canopies	N/A
BD3: Require new development meet new energy and fossil fuel free standards	
Adopt a Sustainable Building Design Policy for new municipal and school buildings to transition to net zero emissions	Must ensure that project selection is equitable across all areas of town
Require all new residential construction be EV ready and solar and solar storage ready	The additional cost to require EV ready and solar and solar storage ready status may increase the cost of purchasing and maintaining a home and make home ownership prohibitive to some residents. Find ways to minimize the impact
Require all new buildings be all electric	Utility costs need to be transparent
Adopt Home Energy Rating System (HERS) program requirements for all new residential construction	The initial cost to meet HERS program requirements may make home ownership prohibitive to some residents. Find ways to minimize the impact
Collaborate with other cities and towns to advocate for the adoption of State building code regulations requiring new residential construction be solar, solar storage and EV ready	Regional collaboration may bring down costs and provide more opportunity for funding
Advocate for State transition to net zero carbon stretch code	Ensure that the budget to locally implement net zero carbon stretch code does not impact budgets for maintenance or those from other departments

TRANSPORTATION



ACTIONS	EQUITY CONSIDERATIONS
TR1: Transition to electric vehicles	
Promote EV benefits to residents	Ensure all materials are available in multiple languages and mediums
Install EV charging stations at public buildings and facilities	Ensure installations are equitably distributed across town
Install solar panel canopies over parking lots and train stations to supply EV charging	Ensure installations are equitably distributed across town
Replace municipal fleet and contracted school buses with electric or hybrid vehicles (where practical models are, or become, available)	N/A
TR2: Promote safe alternative modes of transportation in and around town such as walking, biking, and shuttle services	
Continue carrying out goals as outlined in the town's 2016 Complete Streets Plan, such as creating street bike lanes (in traffic-heavy areas), bike lane shoulders, curb cuts and crosswalks, and maintaining and upgrading sidewalks	Ensure project selections prioritize underserved areas of Winchester
Install bike racks in high foot/bike traffic areas, including near public transit, and shopping areas	Ensure project selections prioritize underserved areas of Winchester
Undertake a town-wide bicycle and pedestrian study to establish a phased approach to creating a network connecting residents and visitors to key town destinations	Ensure project selections prioritize underserved areas of Winchester
Create local maps that illustrate key walking and biking transportation connections, and install water bottle filling stations around town	Ensure highlighted transportation connections and water bottle filling stations are equitably distributed across town
Collaborate with nearby towns and cities on the creation of additional bike paths, like the Greenway, that can connect residents to public transport hubs beyond Winchester, such as Alewife Station or the new Green Line station in Medford/ Somerville	Ensure the development and maintenance of paths allow for easy access to public transport hubs for all Winchester residents
Assess opportunities to run electric town shuttles to main destinations (public transit stops, shops, library, schools)	Ensure pick up stations for town electric shuttles provide equitable access to all Winchester residents
Evaluate free public school bus service for all students and charge Winchester High School parking fees	N/A

TRANSPORTATION

ACTIONS	EQUITY CONSIDERATIONS
TR3: Advocate for state/federal clean transportation legislation and funding and enhanced public transportation services	
Implement an equitable carbon pricing structure	Ensure equity is taken into account in legislation
Develop a timetable for transportation and school bus companies to convert to electric fleets	N/A
Standardize electric bus chargers	Consider infrastructure requirements during standardization to ensure chargers can be installed in a variety of locations and configurations
Increase EV rebates and lower off-peak EV charging rates	Consider offering tiered rebates to increase accessibility to all Winchester residents
Work with MBTA to increase frequency of all public transportation services	Ensure new service schedules equitably incorporate the use schedules of all Winchester residents

SOLID WASTE

ACTIONS	EQUITY CONSIDERATIONS
SW1: Assess options for and implement town-wide programs to achieve waste reduction goals	
Identify strategies to increase recycling and compost rates while working with current haulers	Potential increases to waste disposal rates due to the adoption of these strategies may negatively impact low-income Winchester residents
Complete a lifecycle cost assessment of current solid waste management system	N/A
Complete cost-benefit analysis of municipally-run curbside pickup programs	Ensure cost-benefit analysis includes examination of costs passed on to residents and how changes to programs may impact those costs
Develop and collect data for actionable metrics to measure Winchester's progress toward its Solid Waste Goal, which is in alignment with the Massachusetts waste reduction goals	Ensure actionable metrics selected for tracking are attainable across Winchester
SW2: Educate and engage residents and businesses on waste reduction strategies	
Develop and disseminate educational materials and resources to encourage waste reduction strategies	Ensure all materials are available in multiple languages and mediums
Create a waste reduction toolkit for residences and businesses	Ensure all materials are available in multiple languages and mediums
SW3: Advocate and promote at the State and regional levels for regionally focused solid waste legislation and resources that focus on waste minimization	
Engage elected representatives to develop legislation that discourages disposable packaging and single use products and to imbed true life-cycle costs at the manufacturer level	Ensure equity is taken into account in legislation, such as in relation to product costs
Promote the regionalization of waste management solutions so that proximate towns could achieve operational efficiencies	N/A
Support financial incentives for the reduction of municipal solid waste generated annually	Ensure incentives funding is not pulled from other essential municipal services, especially to those most in need
Advocate for alternative disposal strategies in Massachusetts' Solid Waste Management Master Plan	Ensure equity is taken into account in legislation

COMMUNITY RESILIENCE

ACTIONS	EQUITY CONSIDERATIONS
PUBLIC HEALTH & SAFETY	
CR1: Reduce health risks due to climate change	
Conduct ongoing public health campaigns regarding climate-caused threats due to increases in sustained heat events, vector-borne diseases, repeated flooding events, and other risk factors	Develop materials in Mandarin and other primary languages used in Winchester; bring workshops and materials to appropriate sites for maximal distribution, e.g. Jenks, Library, Schools, Lynch Sunday school for Winchester School of Chinese Culture, Temple Shir Tikvah and other Faith Communities, the Winchester Town Common Organization, after-school programs, Wright-Locke Farm etc.
Develop and continuously offer workshops on emergency preparedness	Workshops should be offered at a variety of days and times to accommodate working schedules and may consider offering childcare
Develop a Heat Response Strategy within the Town and in collaboration with neighboring municipalities. Consider innovative private/public partnerships, e.g. use of the Sanborn House as a limited daytime cooling center, with appropriate support from the Town	Winchester's vulnerable populations are less likely to have in-home A/C. The Town is encouraged to explore grants for seniors and others; to identify and develop cooling centers for day-time access; and to explore regional options for overnight cooling centers
Develop an emergency preparedness campaign that leverages preexisting communication channels and includes low-tech strategies to maximize reach to all populations	Ensure all materials are available in multiple languages and mediums
Promote broad participation in the Community Emergency Response Team (CERT) program	Encourage diverse representation of Winchester residents and businesses to optimize program results
RESILIENT TOWN OPERATIONS	
CR2: Ensure the principles of resiliency are integrated into the daily operations of the Town government	
Hire a full-time Sustainability Director to report directly to the Town Manager	The Sustainability Director will specifically iterate the equity considerations of implementing each significant decision/action
Establish a Climate Action Committee charged with implementing Winchester's 2020 Climate Action Plan	Encourage diverse representation of Winchester residents and businesses to optimize program results
Develop a Comprehensive Climate Communications Strategy, including a Sustainability Website	Ensure all materials are available in multiple languages and mediums
Incorporate well-defined and measurable sustainability objectives into municipal job descriptions and duties	Ensure objectives are attainable and do not disproportionately disqualify applicants who otherwise qualify for the core job objectives; Consider offering skills trainings to meet sustainability requirements

COMMUNITY RESILIENCE

ACTIONS	EQUITY CONSIDERATIONS
Ensure that individuals with climate expertise are represented on relevant Town Committees, Boards and Commissions	Including climate expertise is critical but must also balance other important perspectives
Continue to build collaborative relationships between regional entities and neighboring Towns to promote integrated responses to climate issues that cross municipal boundaries, including those associated with our waterways, air, transportation, solid waste management and health responses including identifying daytime and overnight cooling centers	Ensure equitable engagement for Winchester residents, businesses, Town staff, and those from neighboring Towns to ensure all regional needs are accounted and planned for
SUSTAINABLE FUNDING	
CR3: Develop sustainable funding mechanisms to ensure ongoing climate-preparedness	
Generate renewable revenue streams for community resilience projects (e.g. stormwater utility, tree preservation, student parking permits; WinPower, and other recurring revenue streams)	This measure must consider the impacts of increased costs on low-income residents
Identify and obtain grant funding to support projects	Ensure funding for project selections prioritize underserved areas of Winchester
Develop Winchester's voluntary Climate Fund (account number 8677-48311, aka the "Lemonade Fund") and explore legal options to offer local renewable energy credits	Prioritize projects in underserved areas of Winchester
GREEN INFRASTRUCTURE	
CR4: Prioritize and incentivize green infrastructure and low impact development practices	
Identify best areas to install green infrastructure and create systems to monitor effectiveness and track maintenance costs	Flooding disproportionately affects some homes and neighborhood areas in Winchester; Attention needs to be paid to equitable distribution of green infrastructure
Consider incentives to encourage infiltration management best practices (e.g. credit structure, stormwater utility fee)	May include accommodations for low income homeowners
Pass a town-wide Tree Preservation Bylaw	N/A
Amend zoning to include Landscaping Requirements to protect existing trees from potentially harmful impacts of construction	Ensure landscaping requirements are attainable for all residents of Winchester
Conserve and create open spaces to safeguard local biodiversity and facilitate large-scale animal movements	N/A
Study open space potential for flood storage and areas to conserve or construct wetlands	Prioritize projects in underserved areas of Winchester prone to flooding

Reduce Carbon Pollution

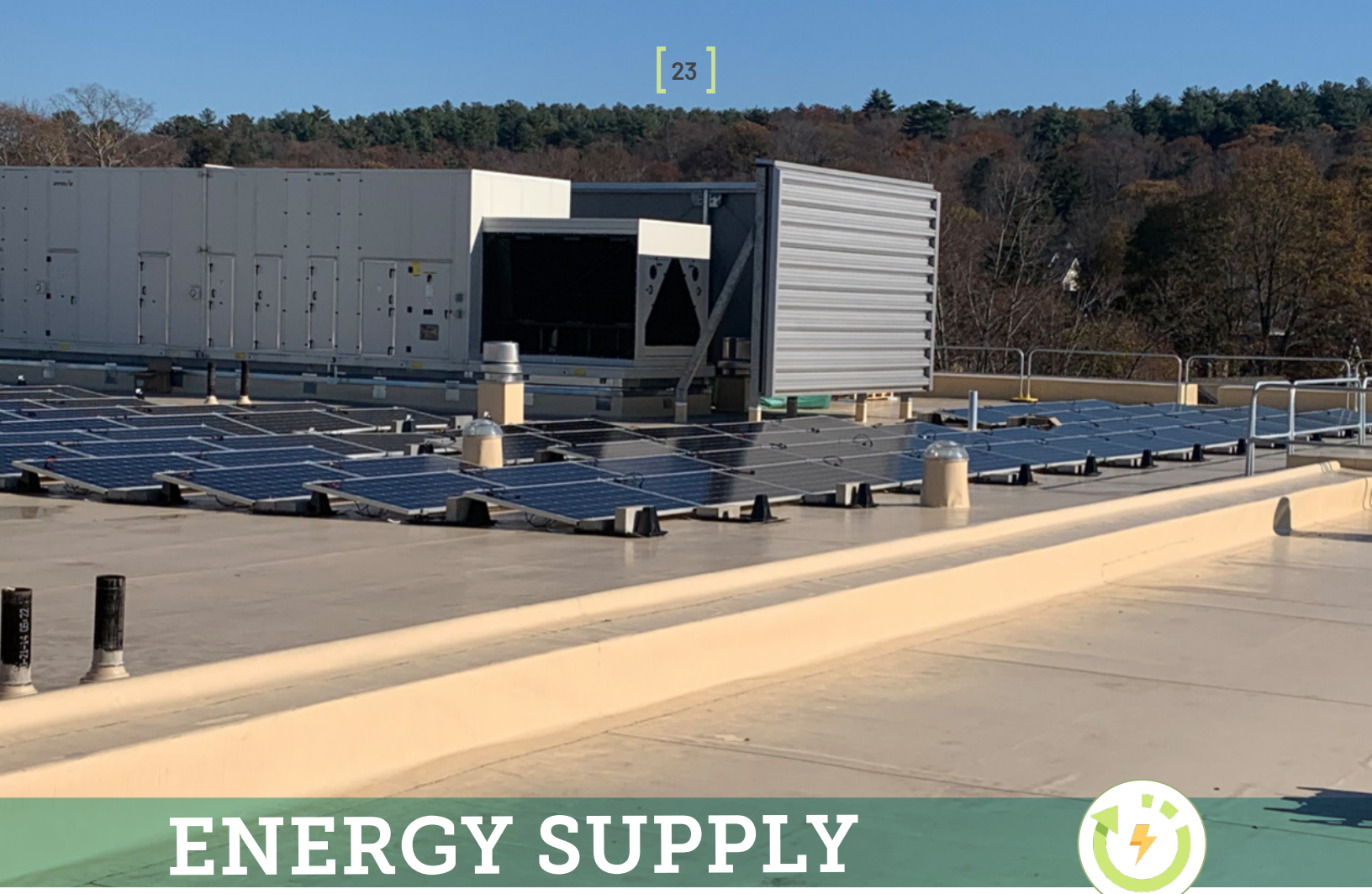
OVERARCHING GOAL 1:

Reduce Carbon Pollution 80% from the 2017 baseline by 2050

Eliminating carbon pollution from our community will be challenging, but the good news is that the recommended actions are practical, and the technology already exists. We also are not alone. With so many of our neighboring communities also feeling the impacts of climate change, many are actively reducing carbon pollution and enhancing their resilience. We can learn from each other and share the benefits.

This section of Winchester's 2020 Climate Action Plan focuses heavily on reducing carbon pollution attributed to energy supply and consumption. The Energy Supply chapter deals exclusively with measures designed to reduce GHG emissions from our electricity supply. Measures aimed at increasing energy efficiency, eliminating gas and oil systems and appliances, and producing on-site solar appear in the Buildings chapter as they are related to individual building-level decision-making rather than broader energy supply. Similarly, measures aimed at reducing the combustion of transportation fuels such as promoting walking, biking, mass transit and electric vehicles appear in the Transportation chapter.

The Climate Action Plan also addresses carbon pollution from Solid Waste, which is small overall, but the recommended actions represent an important opportunity to create a more sustainable community by thinking more about our purchasing and consumption habits.



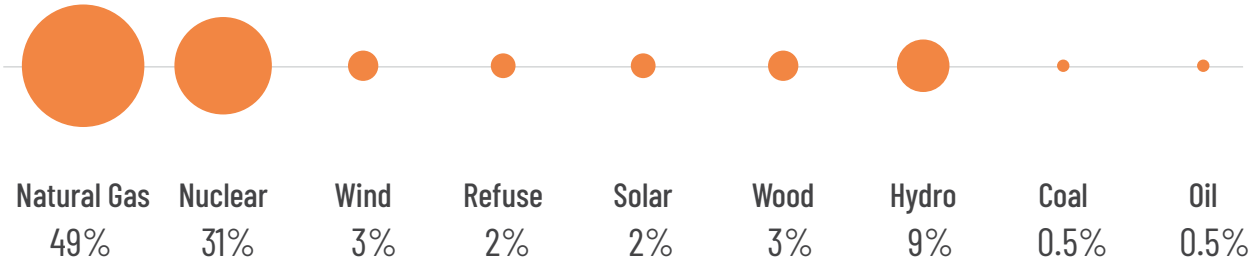
ENERGY SUPPLY

Carbon pollution primarily comes from the burning of natural gas and oil in Winchester for heating and cooking, from fossil-fuel-based electricity generation outside of Winchester, and from the burning of transportation fuels by vehicles registered in Winchester, regardless of where they drive.

A common approach to reducing carbon pollution in the climate action plans of cities and towns throughout Massachusetts and the U.S. is to electrify everything. Under this strategy, a community endeavors to eliminate the combustion of fossil fuels for heating, cooking, and transportation and instead to meet those needs entirely with electricity. For example, gas and oil boilers are replaced by electric heat pumps. Cooking is provided by electric resistance or induction stoves. Gasoline-powered vehicles are converted to electric vehicles, while we continue to encourage more bicycling and walking.

Goal: Increase supply of carbon-free electricity

FIGURE 10: 2019 New England Electricity Sources (ISO-NE)



For electrification to eliminate carbon pollution, the electricity supplied to Winchester must itself be generated by carbon-free sources like solar, wind, and hydro-power. That is the ultimate goal of electrification: an all-electric community powered by carbon-free electricity.

While our electricity supply is partially carbon-free due to Massachusetts' Renewable Portfolio Standard (RPS) and the town's Community Choice Electricity program, WinPower, we must pursue an increase in our use of renewable energy sources to achieve full carbon-free electrification.

Strategies and Actions

To achieve our goal, we recommend strategies and actions to assess opportunities to address the supply of renewable energy for the municipal government, the community, and the state.

EN1: Convert Municipal electricity supply to 100% carbon-free by 2035

- Study cost impacts of increased renewable requirements
- Identify funding source to offset future increased costs
- Negotiate higher renewable increases in future energy supply contracts

What is the Massachusetts Renewable Portfolio Standard (RPS)?

The RPS mandates electricity suppliers to include an annually increasing percentage of clean energy in their supply. In 2020, the minimum percentage is 16%, and will rise two percent per year to 36% by 2030. This rate of increase, while still more aggressive than in many states, is not enough to fully decarbonize Winchester's electricity supply by 2050. In fact, several states have recently pushed for more aggressive RPS legislation. In 2015, Hawaii established the country's first 100% RPS by 2045 and Vermont created an RPS of 75% by 2032.

EN2: Increase WinPower default electricity supply to 100% carbon-free by 2035

- Continue education and outreach campaign to urge WinPower customers to opt-up to 100% carbon-free electricity
- Study cost and feasibility impacts of increased renewable requirements
- Negotiate higher renewable increases in each 3-year WinPower contract
- Design program for offsetting cost to underserved populations

EN3: Advocate for a 5% annual increase in the Massachusetts Renewable Portfolio Standard

- Select Board and Town Manager to collaborate with Winchester's legislative delegation to advocate for the annual RPS increase in the state legislature
- Collaborate with organizations like Sierra Club, Massachusetts Climate Action Network, Mothers Out Front, and other municipalities to elevate advocacy efforts

About WinPower

In 2017, Winchester established the WinPower program in order to offer customers a default level of 25% electricity sourced by renewable energy in their supply. That was 10% more than required by state law. Customers can also choose electricity powered by 100% renewable energy for an additional charge. Our goal is to make that the default for all WinPower customers by 2035.

85% of Winchester's households participate in the WinPower program. Since the program's inception, participation in WinPower has resulted in the purchase of 10,968,094 kWh of extra renewable energy.

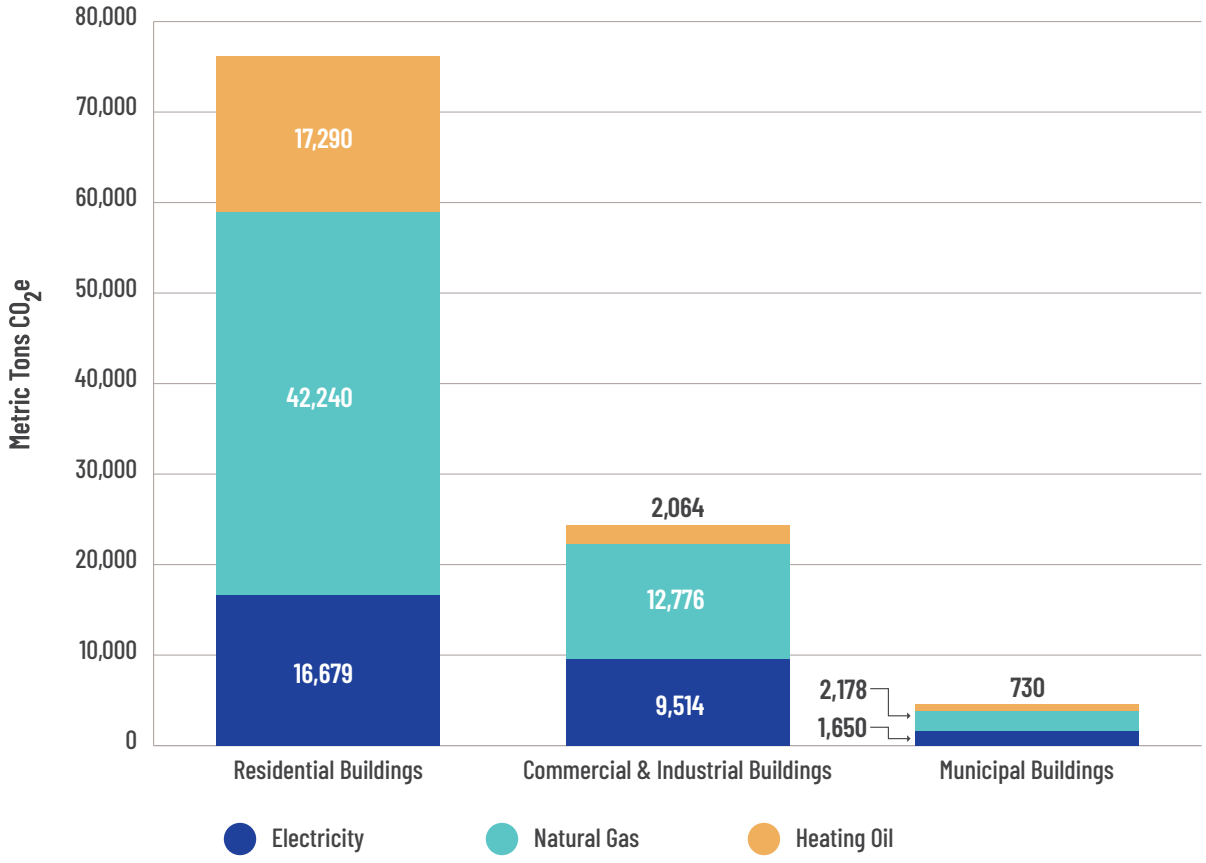
BUILDINGS

Winchester's buildings provide the single greatest opportunity for us to meet our greenhouse gas (GHG) reduction goal of 80% by 2050 from our 2017 baseline.

The energy we use to light, heat, and cool our homes, offices, municipal, and commercial buildings in Winchester account for more than half our total GHG emissions. In 2017, buildings produced 63% of Winchester's total GHG emissions with residential buildings being the largest contributor, producing 43% of the town's total emissions. **Figure 11** details the breakdown of emissions between building sectors and fuel sources. Natural gas is by far the greatest source of emissions at 50%, with electricity at 29%, followed by fuel oil at 21%.

Because single family homes make up over 75% of Winchester's residential buildings, homeowners have the ability to make a big impact when it comes to helping Winchester transition its buildings to a clean, healthy, sustainable, 100% renewable energy future. The strategy and tools exist, but it will take all of us as a community to achieve these goals. The best opportunities to do that are by increasing energy efficiency in our homes and transitioning away from fossil fuels.

Figure 11: Building Sector Emissions by Fuel Type (2017)



Goal: Improve energy efficiency and eliminate the use of fossil fuels in new & existing buildings

A small but growing number of Winchester's buildings already are transitioning from oil and gas to solar and electric. To date, Winchester has participated in two state solar and electrification programs, Solarize Mass (2011-2012) and HeatSmart (2019). As a result, our town has installed over 175 solar systems, including installations on municipal buildings, churches, and banks, and 26 residents installed air-source heat pump systems at their homes. Continuing these trends can help us to achieve GHG emission reductions in Winchester.

The building actions and strategies for achieving our goal of an 80% reduction in GHG by 2050 are informed by the nature of our existing buildings, the new buildings that will be built, and the energy we use. In the Energy chapter of this plan, we have a very specific focus on transitioning to 100% carbon-free electricity. This Buildings chapter builds on that and focuses in on those strategies and actions we can take specific to our buildings to reduce emissions. GHG emissions are significantly reduced when building efficiency is increased with improvements to insulation, air sealing,

Make Efficiency and Emissions Data Available to Owners to Plan Improvements

Buyers and public officials need data in order to sequence the order of their actions, judge costs, and make informed decisions about which actions will have the greatest impact for their building. There are many options and data sources available to support this effort. The Climate Action Plan Committee would like to see the Town work to make this data accessible to all and require it at the time of sale

LED lighting, and other means. Similarly, replacing fossil fuel heating and cooling systems and appliances with carbon-free alternatives for heating and cooling systems, hot water systems, gas dryers, and gas stoves will provide a significant reduction in emissions, coming from natural gas and oil.

Strategies & Actions

To achieve our goal, strategies and actions have been identified that address efficiency and sources of energy in existing and new buildings.

BD1: Improve energy efficiency in existing buildings

- Enact point-based energy efficiency performance standards for new developments
- Require disclosure of energy audits at time of sale for residential properties
- Promote Mass Save Energy Efficiency programs and GHG Scoring tools
- Develop a planning tool for building owners to estimate the energy reduction from various energy efficiency investments

BD2: Transition to zero fossil fuels and promote onsite solar in existing buildings

- Promote and educate the public about air-source and ground-source heat pump technologies
- Develop a planning tool for building owners; use natural replacement cycles to transition to clean energy and increased energy efficiency
- Encourage roof-top solar and solar hot water installations
- Install solar panels on municipal buildings and parking lot canopies

BD3: Require new development meet new energy and fossil fuel free standards

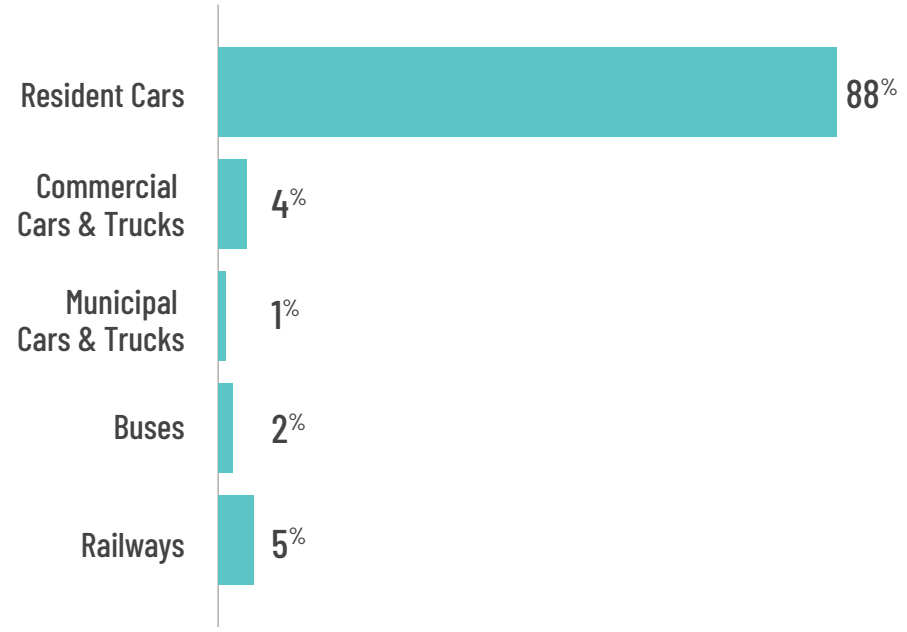
- Adopt a Sustainable Building Design Policy for new municipal and school buildings to transition to net zero emissions
- Require all new residential construction be EV ready and solar and solar storage ready
- Require all new buildings be all electric
- Adopt Home Energy Rating System (HERS) program requirements for all new residential construction
- Collaborate with other cities and towns to advocate for the adoption of State building code regulations requiring new residential construction be solar, solar storage and EV ready
- Advocate for State transition to net zero carbon stretch code

TRANSPORTATION

We travel over 134 million vehicle miles annually in our gasoline-powered private passenger vehicles and more than 70% of us are commuting to work alone. Two things are clear: we are very car-centric and residents will need to play a central role in reducing our town's emissions.

Goal: Reduce gasoline- and diesel-powered vehicle miles traveled and transition to electric vehicles

Figure 12: Transportation Related Emissions by Mode



Every time we utilize public transport for a trip, or walk or bike to replace one car trip, we are doing something good for the climate.

To lower our transportation emissions, we must reduce the number of miles we travel (also known as vehicle miles traveled - VMT) in gasoline- and diesel-powered vehicles. This Plan identifies three ways in which we can achieve this:

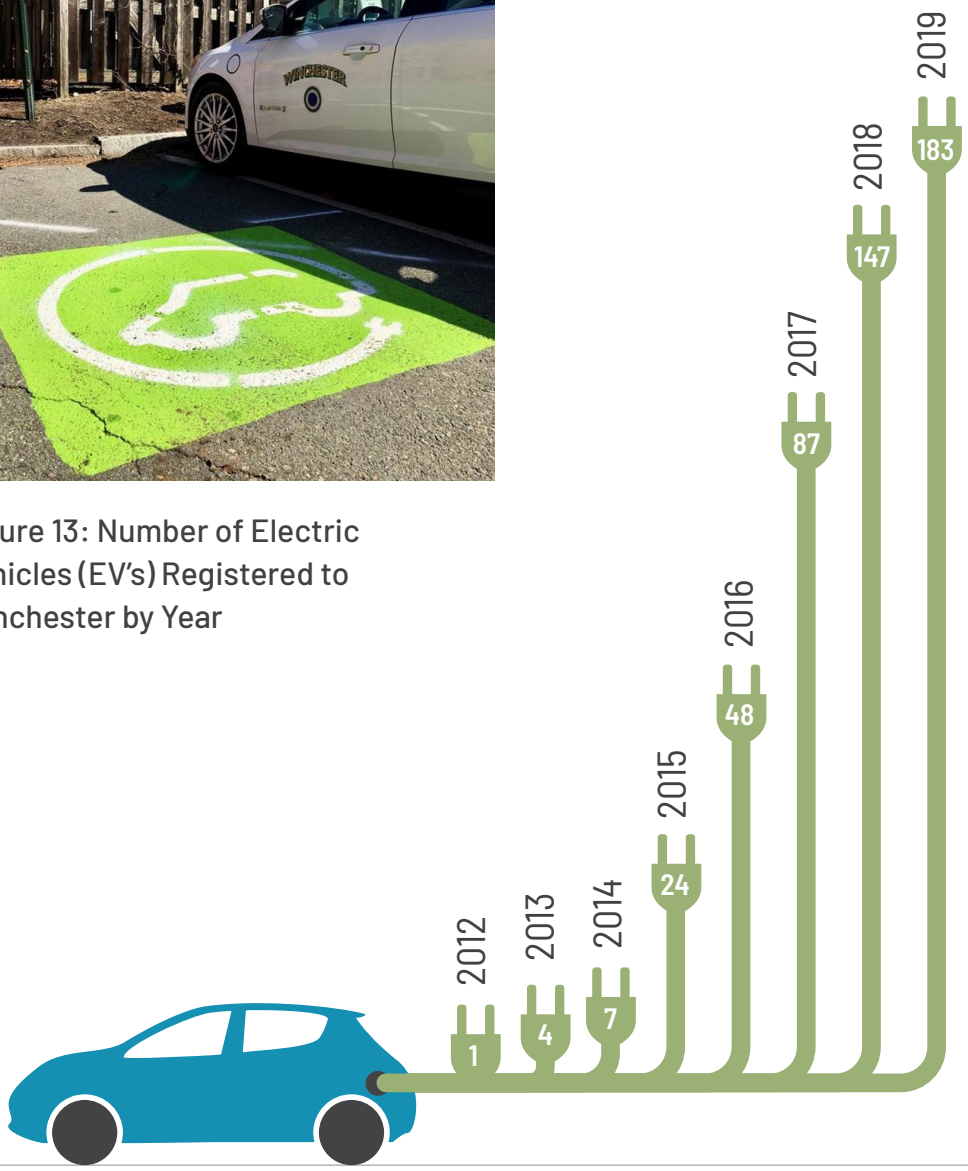
- Promote electric vehicles (EV) and build an infrastructure to make the transition to electric easy and convenient
- Make our town safer for walking and biking and promote shared travel, such as public transportation, shuttle services, and subsidized school buses
- Advocate for enhanced public transportation services and clean transportation legislation (and funding) at the state level

We, as residents, can begin to change behavior with our town's help and our state's support. By facilitating the transition to EV's and providing practical and attractive alternatives to driving, we can reduce our transportation emissions.

Strategies & Actions

To achieve our goal, the following strategies and actions have been identified to promote the transition to EV and to safe and convenient alternatives to driving. Advocacy at the state level for clean transportation legislation and better public transportation services is a critical strategy to help Winchester travel in a more sustainable way.

Figure 13: Number of Electric Vehicles (EV's) Registered to Winchester by Year



TR1: Transition to electric vehicles

- Promote EV benefits to residents
- Install EV charging stations at public buildings/facilities
- Install solar panel canopies over parking lots and train stations to supply EV charging
- Replace municipal fleet and contracted school buses with electric or hybrid vehicles (where practical models are, or become, available)

TR2: Promote safe alternative modes of transportation in and around town such as walking, biking, and shuttle services

- Continue carrying out goals as outlined in the town's 2016 Complete Streets Plan, such as creating street bike lanes (in traffic-heavy areas), bike lane shoulders, curb cuts and crosswalks, and maintaining and upgrading sidewalks
- Install bike racks in high foot/bike traffic areas, including near public transit, and shopping areas
- Undertake a town-wide bicycle and pedestrian study to establish a phased approach to creating a network connecting residents and visitors to key town destinations
- Create local maps that illustrate key walking and biking transportation connections, and install water bottle filling stations around town
- Collaborate with nearby towns and cities on the creation of additional bike paths, like the Greenway, that can connect residents to public transport hubs beyond Winchester, such as Alewife Station or the new Green Line station in Medford/Somerville.
- Assess opportunities to run electric town shuttles to main destinations (public transit stops, shops, library, schools)
- Evaluate free public school bus service for all students and charge Winchester High School students parking fees

TR3: Advocate for state/federal clean transportation legislation and funding opportunities and enhanced public transportation services.

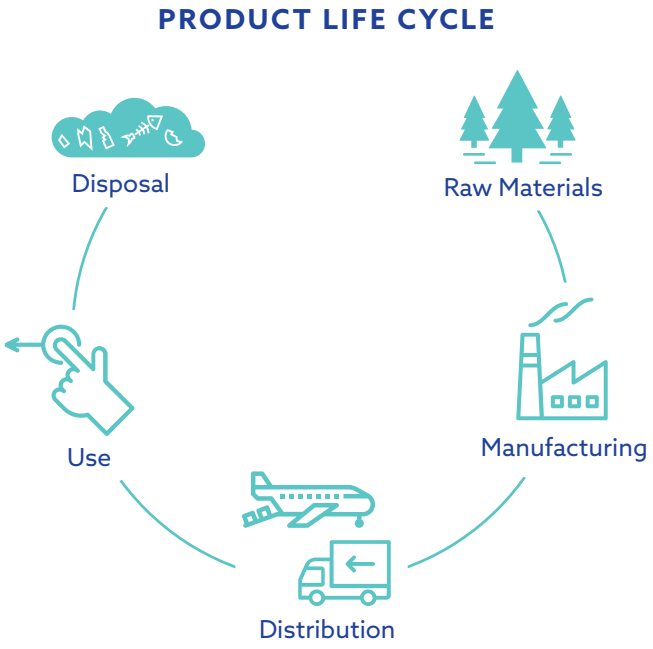
- Implement an equitable carbon pricing structure
- Develop a timetable for transportation and school bus companies to convert to electric fleets
- Standardize electric bus chargers
- Increase EV rebates and lower off-peak EV charging rates
- Work with MBTA to increase frequency of all public transportation services

SOLID WASTE

Greenhouse gas (GHG) emissions from solid waste disposal are low compared to other sectors. Winchester's GHG Inventory only counts GHG emissions from solid waste incineration, not the entire lifecycle emissions associated with creating new products that are increasingly designed for single or short-term use. This shift in product use leads to wasting of resources and energy as **Figure 14** demonstrates.

Goal: Reduce waste disposal 30% by 2030 and 90% by 2050

Figure 14: Product Life Cycle



To achieve emissions reductions from solid waste, we must minimize the amount of waste we each generate and divert through recycling and composting that which remains. We can also work to address solid waste as a region and as a state rather than on a town-by-town basis, which may make some programs more feasible.

Strategies and Actions

To achieve our goal, strategies and actions have been identified to assess opportunities to promote waste reduction, educate our community, and promote a regional approach to waste reduction and diversion options.

SW1: Assess options for and implement town-wide programs to achieve waste reduction goals

- Identify strategies to increase recycling and compost rates while working with current haulers
- Complete a lifecycle cost assessment of current solid waste management system
- Complete cost-benefit analysis of municipally-run curbside pickup programs
- Develop and collect data for actionable metrics to measure Winchester's progress toward its Solid Waste Goal, which is in alignment with the Massachusetts waste reduction goals

SW2: Educate and engage residents and businesses on waste reduction strategies

- Develop and disseminate educational materials and resources to encourage waste reduction strategies
- Create a waste reduction toolkit for residences and businesses

SW3: Advocate and promote at the State and regional levels for regionally focused solid waste legislation and resources that focus on waste minimization

- Engage elected representatives to develop legislation that discourages disposable packaging and single use products and to imbed true life-cycle costs at the manufacturer level
- Promote the regionalization of waste management solutions so that proximate towns could achieve operational efficiencies
- Support financial incentives for the reduction of municipal solid waste generated annually
- Advocate for alternative disposal strategies in Massachusetts' Solid Waste Management Master Plan

Enhance Community Resilience

OVERARCHING GOAL 2:

Enhance Community Resilience

RESILIENCE: The capacity of a community to reduce, absorb, and recover from the impacts of climate change

Winchester must greatly increase our level of preparedness to meet the escalating impacts of climate change. Community Resilience, the capacity of a community to reduce, absorb, and recover from the impacts of climate change, is now necessary to address climate change impacts due to existing greenhouse gases (GHGs) in the atmosphere.

This chapter outlines the immediate next steps the Climate Action Plan Committee recommends to enhance preparedness in the municipal, commercial, and residential sectors of the community. The Committee also recommends continued collaboration with regional entities, and exploration of new regional alliances, to address issues that transcend Town boundaries. These include impacts to our waterways, transportation system, and public health (vector-borne illnesses).

To protect the health and well-being of Winchester residents, properties, and businesses, it is critical to prepare for significant increases in sustained heat events; flash floods; power outages; vector-borne illnesses; harmful cyanobacterial blooms which impact recreational activities; degradation of air quality; the ability to cope with repeated extreme weather challenges, including excessive rain, drought, wind, ice and snow storms at traditional and nontraditional times of the year; and shifts in seasonality, including disruption of animal migration patterns.

The actions recommended here will ensure Winchester's ongoing ability to reduce risk, recover from climate disasters, and keep us on the path to a more sustainable future.

To effectively reduce local risks from climate change, Winchester must *simultaneously* reduce carbon pollution *and* increase community resilience.

Action to Date

Winchester has a number of resiliency initiatives in place, which the Committee would like to acknowledge. Initiatives to 'reduce carbon pollution' and initiatives to 'increase resilience' often overlap in their impacts. Therefore, the Committee wants to celebrate over a decade of targeted efforts by the Town to reduce flooding risks and to conserve and manage municipal energy use, which effectively increase community resilience. Additionally, our Schools, Health, Fire, Police, DPW, Library, Conservation, Engineering, Planning and many other municipal departments, continuously upgrade responses to climate considerations.

Late in 2019, the Town of Winchester completed the Municipal Vulnerability Preparedness (MVP) planning effort funded by the Commonwealth of Massachusetts. The result of this initiative is a summary of findings report that highlights four climate hazards for Winchester: flooding, drought, intense storms (Nor'easters) and extreme heat. It is our intention here to build on these recent and current initiatives.

CR1

PUBLIC HEALTH AND SAFETY

Goal: Reduce health risks due to climate change

ACTIONS

- Conduct ongoing public health campaigns regarding climate-caused threats due to increases in sustained heat events, vector-borne diseases, repeated flooding events, and other risk factors
- Develop and continuously offer workshops on emergency preparedness
- Develop a Heat Response Strategy within the Town and in collaboration with neighboring municipalities. Consider innovative private/public partnerships, e.g. use of the Sanborn House as a limited daytime cooling center, with appropriate support from the Town
- Develop an emergency preparedness campaign that leverages preexisting communication channels and includes low-tech strategies to maximize reach to all populations
- Promote broad participation in the Community Emergency Response Team (CERT) program https://www.ready.gov/cert

CR2

RESILIENT TOWN OPERATIONS

Goal: Ensure the principles of resiliency are integrated into the daily operations of the Town government

ACTIONS

- Hire a full-time Sustainability Director (see Appendix A for more details) to report directly to the Town Manager
- Establish a Climate Action Committee charged with implementing Winchester's 2020 Climate Action Plan
- Develop a Comprehensive Climate Communications Strategy, including a Sustainability Website
- Incorporate well-defined and measurable sustainability objectives into municipal job descriptions and duties
- Ensure that individuals with climate expertise are represented on relevant Town Committees, Boards, and Commissions
- Continue to build collaborative relationships between regional entities and neighboring Towns to promote integrated responses to climate issues that cross municipal boundaries, including those associated with our waterways, air, transportation, solid waste management, and health responses including identifying daytime and overnight cooling centers

CR3

SUSTAINABLE FUNDING

Goal: Develop sustainable funding mechanisms to ensure ongoing climate-preparedness

ACTIONS

- Generate renewable revenue streams for community resilience projects (e.g. stormwater utility, tree preservation, student parking permits; WinPower, and other recurring revenue streams)
- Identify and obtain grant funding to support projects
- Develop Winchester's voluntary Climate Fund (account number 8677-48311, aka the "Lemonade Fund") and explore legal options to offer local renewable energy credits

On Saturday, October 7th, 2019, a 10 year old girl stopped by the Climate Action Plan Committee's table at the Winchester Farmers' Market to ask some questions. Three weeks later she handed her mother $40 raised from her lemonade stand and asked her mother to donate it to the Winchester Climate Action Committee. It took the Town Comptroller, and a vote by the Select Board, to establish Account # 8677-48311, Winchester's voluntary Climate Fund. The simplicity of this action, and the trust given that we will use this $40 wisely, is humbling. Perhaps this Fund will grow over time, perhaps not, but if we listen to our children they will lead us to the future our planet needs.

CR4

GREEN INFRASTRUCTURE

Goal: Prioritize and incentivize green infrastructure and low impact development practices

ACTIONS

- Identify best areas to install green infrastructure and create systems to monitor effectiveness and track maintenance costs
- Consider incentives to encourage infiltration management best practices (e.g. credit structure, stormwater utility fee)
- Pass a town-wide Tree Preservation Bylaw
- Amend zoning to include Landscaping Requirements to protect existing trees from potentially harmful impacts of construction
- Conserve and create open spaces to safeguard local biodiversity and facilitate large-scale animal movements
- Study open space potential for flood storage and areas to conserve or construct wetlands

"Green Infrastructure" is a relatively new term to describe flood control techniques. Winchester has addressed flooding issues which have plagued our low-lying town for many years using "Low Impact Development" techniques. LID comprises a mixture of "gray infrastructure" (concrete pipes, barriers and other physical structures) to collect, divert and move water out of Winchester, and some "green infrastructure" (trees, shrubs, berms, swales, rain gardens and green roofs) to prevent flooding. New extreme storm levels, increased amounts of impermeable surfaces in Winchester and upstream from our Town, and a new understanding of the benefits of nature-based solutions to flooding, lead the Committee to recommend that the Town actively look for opportunities to install Green Infrastructure wherever possible, and to consider pilot projects such as microparks, and to educate and support homeowners in installing green infrastructure throughout Town. The goal of green infrastructure is to allow our natural systems to do what they were designed to do, absorb, clean, and redirect water.

GREEN INFRASTRUCTURE:
https://www.massaudubon.org/content/download/21135/296280/file/Intro-to-LID_March-2017.pdf

and:
http://www.pvpc.org/sites/default/files/PVPC%20Green%20Infrastructure%20Plan%20FINAL%2002-18-14.pdf

Implementing this Climate Action Plan

The Town of Winchester is committed to taking action to meet its 80% GHG reduction target by 2050 and to enhance community resilience to climate change. Collectively, these actions will significantly reduce risks to our community. The recommendations in this Climate Action Plan will help get us there. It will take action from all sectors - municipal, commercial, and residential to make this a reality. We all have to step up and do our part to implement the Climate Action Plan in order to meet our two overarching goals to reduce our GHG emissions and to increase community resilience.

Implementation Steps

- Present draft Plan to Select Board for Approval
- Create the Climate Action Committee to oversee implementation of the Climate Action Plan
- Prioritize actions for the next fiscal year's budget
- Hire a Sustainability Director to drive implementation from the municipal side
- Establish a Comprehensive Climate Communications Strategy to educate the community regarding climate action and plan implementation
- Identify community partners to take the lead on the implementation of key actions

Appendices

Appendix A - Sustainability Director – Fact Sheet

Appendix B - Climate Action Committee

Appendix C - Comprehensive Climate Communications Strategy

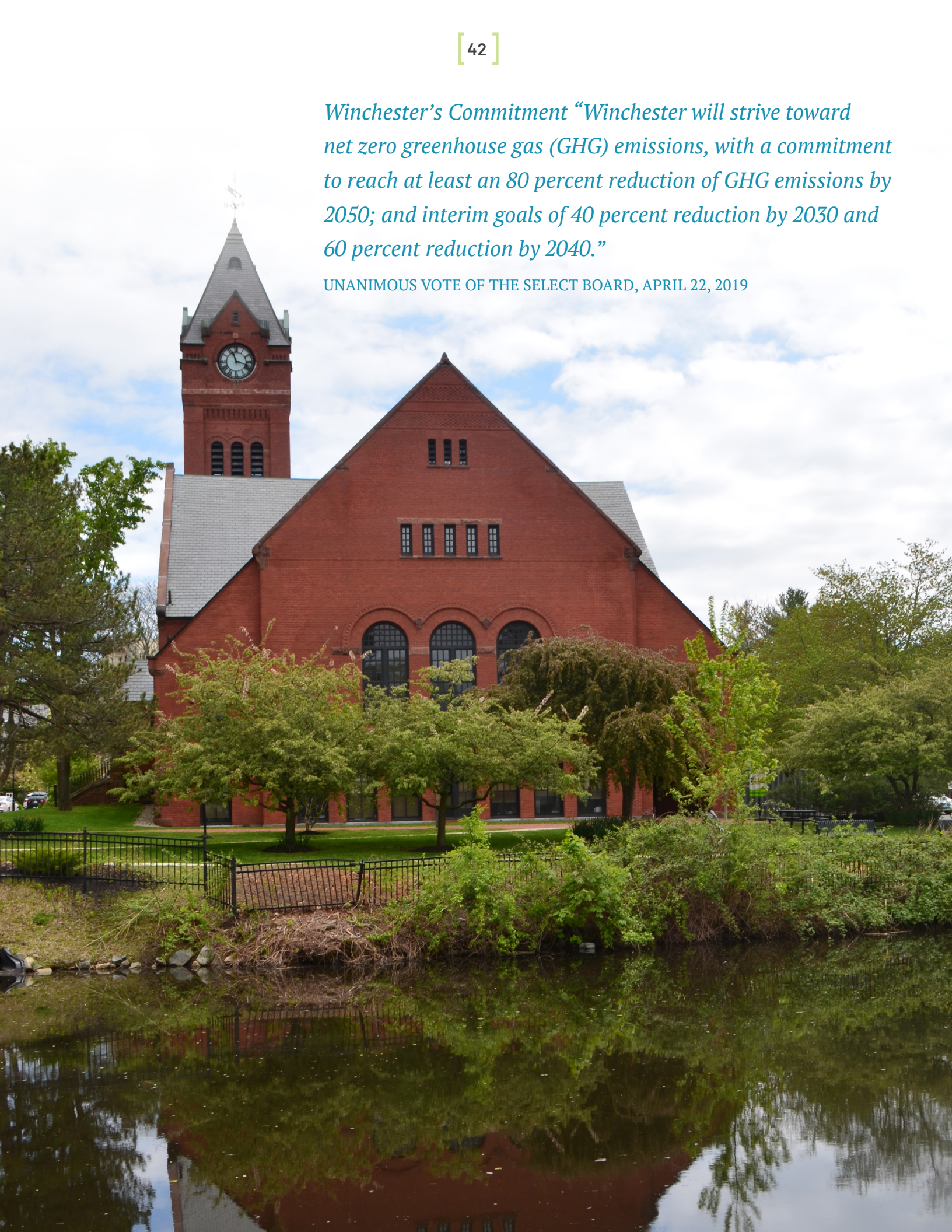
Appendix D - GHG Inventory

Appendix E - Public Outreach

Appendix F – References

Winchester's Commitment "Winchester will strive toward net zero greenhouse gas (GHG) emissions, with a commitment to reach at least an 80 percent reduction of GHG emissions by 2050; and interim goals of 40 percent reduction by 2030 and 60 percent reduction by 2040."

UNANIMOUS VOTE OF THE SELECT BOARD, APRIL 22, 2019



APPENDIX A

Sustainability Director – Fact Sheet

What will a Sustainability Director do?

Winchester's Sustainability Director will increase the Town's resiliency to the impacts of climate change on health, safety, and property. The Sustainability Director will work with town departments, committees, residents, businesses, and state and regional agencies to develop and direct actions that mitigate risk due to more frequent heat waves, extreme storms, flooding, insect-borne diseases and other effects of climate change. A decisive response to systematically address climate risks will greatly impact the quality of life in Winchester.

Essential Functions

- Improve Winchester's climate-preparedness for impacts on health, safety and property
- Identify, apply for, and implement grants to reduce energy use and address climate vulnerabilities
- Make significant progress toward achieving GHG goals set by the Select Board and monitored against 2019 GHG Inventory
- Collaborate with staff across departments; nearby municipalities; regional and state agencies; and other organizations
- Engage the public, municipal Committees and Boards, and the commercial sector in sustainability initiatives
- Develop a comprehensive climate communications strategy, including development and management of a robust town Sustainability Website, educational materials, workshops, and other events

What is the R.O.I. for a Sustainability Director?

Return on Investment – A Sustainability Director brings in substantially more money than the cost of her/his salary +30% for benefits

- Concord's SD brought in over $800,000 in grants/2019; $150,000/2018
- Towns with Sustainability Coordinators have realized an annual ROI of between 4.2 to 8.3 times salary and benefits

Why now?

Winchester became a Green Community in 2010, after hiring an Energy Coordinator in 2009. The town has consistently reduced municipal carbon emissions while simultaneously bringing in millions of dollars in grants. Winchester's energy budget has remained essentially flat since 2009. Additionally, residential energy savings and emissions reductions are accomplished through programs such as HeatSmart, Solarize Mass, Senior Energy Grant, and WinPower.

Winchester is now poised to implement a robust 2020 Climate Action Plan that addresses the impacts of climate change not only on our municipal sector, but also residential and commercial. Two major reports released in 2018 made it clear that our community needs to prepare for climate impacts of carbon emissions that are already present in our atmosphere. To become more climate-prepared, Winchester needs to increase our resiliency in coping with increased flooding, heat waves, diseases carried by mosquitoes, ticks, and rats whose numbers are significantly increasing in our town due to milder winter weather and hotter summers, as well as the impacts of other extreme weather on property, health, and transportation.

In addition to the mitigation actions Winchester's Energy Management Committee and Coordinator continue to push forward, it is time to take the next step in becoming a more resilient Winchester and hire a full-time Sustainability Director to strategically bring our community to greater climate-preparedness.

Who will the Sustainability Director report to?

The Sustainability Director will report to the Town Manager. This structure reflects the interdisciplinary nature of the position and promotes effective and efficient collaboration and implementation.

Benefits

Towns with Sustainability Directors (or hiring)

Amesbury	Newton
Boston	Northampton
Cambridge	Quincy
Chelmsford	Somerville
Concord	Waltham
Lexington	Wellesley
Medford	

- Protect residents, businesses, workers, and visitors from the broadening impacts of climate change
- Increase grant funding for local projects benefiting quality of life
- Achieve Winchester's commitment to reduce GHG emissions
- Align Winchester with regional, state, and global initiatives
- Protect the local economy by protecting infrastructure and natural features that attract visitors
- Avoid overburdening staff with additional work
- Maintain leadership role as a Green Community
- Meet Winchester's responsibility to address climate change

APPENDIX B

Climate Action Committee (CAC)

Winchester has a strong base of highly qualified volunteers who are motivated to take action on climate issues, including the large base of individuals involved in writing this 2020 Climate Action Plan. Individuals with specific skill sets need to be appointed to a new Climate Action Committee charged with effectively implementing Winchester's 2020 Climate Action Plan. Working with the Sustainability Director, CAC efforts will significantly increase community engagement in the implementation of the 2020 Climate Action Plan. This proposed volunteer group will work closely with the Sustainability Director to implement the Plan.

The Climate Action Committee should be established immediately upon completion of the Climate Action Plan. The Town Manager will create the 7 - 9 member Climate Action Committee and will evaluate its effectiveness in three-year cycles. CAC will make regular reports to both the Town Manager and the Select Board, and not less than twice a year.

CAC Working Groups will include at least one CAC member, and may include any number of additional community members. Working Groups will be formed as needed and dissolved as their tasks are completed. Working Groups may include:

- **Communications.** Support the Sustainability Director in designing and building a Comprehensive Climate Communications Strategy, including development of content for a robust, interactive, data-driven Climate Sustainability webpage; Help to write an MVP Action Grant to support this initiative
- **Education and Outreach.** Curate educational opportunities; identify and vet programs and speakers for public presentation; identify and vet programs and speakers for schools, pre-schools, and after-school programs, including paid professional development summer opportunities for teachers
- **Metrics.** Establish appropriate metrics and target dates for each recommended action to reduce carbon pollution and to increase resilience
- **Projects.** Provide support for community climate projects, e.g. implementation of small-scale pilot projects for green infrastructure projects, pollinator pathways, and citizen science projects
- **Equity.** Ensure equity considerations as the Climate Action Plan is implemented
- **Advocacy.** Advocate for legislative climate action at the state/federal level

- **Municipal support.** Bring climate representation to other Town Boards and Committees
- **Business.** Work with the business community to implement relevant Climate Action Plan actions
- **Funding.** Identify grants and other funding streams; provide data to support grant writing by the Sustainability Director or other Town employees; may directly write grants
- **Greenhouse Gas Inventory update.** Work with the Sustainability Director to routinely update the GHG Inventory conducted by MAPC in 2019
- **Bylaws.** Bring forward and support Bylaw recommendations related to climate (Stormwater, Tree Preservation, Landscaping Requirements, and others)
- **Internships.** Coordinate unfunded climate internships for high school students, and support funded climate internships for college students, to report to municipal employees and committees

APPENDIX C

Comprehensive Climate Communications Strategy

What Is The Need?

To effectively inform and educate all Winchester residents regarding climate-preparedness.

The Comprehensive Climate Communications Strategy will include a Sustainability Website hosted on the Town's website, and a wide variety of communication strategies. Public events with speakers, workshops, and social media will bring emergency preparedness, incentive programs for heating/cooling and transportation programs, and health education into the community through existing and new communication pathways. The Sustainability Website will function as a continuously updated source to standardize climate messages for events.

Who Needs To Be Included?

Everyone, with a focus on vulnerable populations:

- **Senior Residents.** In Winchester the largest demographic living in poverty is females 75 years and older, representing a unique sector of our Town at risk for health impacts of increased heat, living in older homes without A/C, isolation due to extreme weather, and less familiarity with popular communication pathways such as webpages and routine use of social media
- **Children.** Winchester also has a large number of children due to the high quality of our schools. We have made significant inroads in connecting students with climate actions, including petitioning the Select Board to create two student seats on our Climate Committees and involving hundreds of middle and high school students, after-school programs, and Wright-Locke Farm students in the 2019 Climate Week
- **Individuals whose preferred language is not English.** Winchester's ethnic demographics are rapidly changing, with needs for appropriate language and cultural responses. As of 2017, 16.9% of Winchester residents (3.8K people) were born outside of the United States, which is higher than the national average of 13.7%. In 2016, the percentage of foreign-born citizens in Winchester was 14.6%, meaning that the rate has been increasing
- **Individuals who have recently moved into Winchester.** There is a need to set up climate communications and outreach to newcomers on an ongoing basis
- **Individuals with disabilities**

What Would be Included on a Municipal Climate Communications Website?

» **Climate emergency communications.** May include heat alerts, cyanobacterial blooms, flooding evacuations, power outages, EEE/WNV, and other alerts

» **Climate mitigation strategies.** May include tips on how to reduce household GHGs; incentives for fuel conversion; EVs and overall retrofitting of buildings; public transportation options, trail maps, bike paths; solid waste reduction techniques

» **Climate resiliency strategies.** May include information and incentives for installing green infrastructure such as raingardens, green roofs, trees with large mature potential, berms for flood control, pollinator pathways, and hedgerows on privately held properties; support for neighborhood communication networks, possibly utilizing existing Town Meeting Precincts and precinct captains; information regarding water reduction strategies

Who Would Be Responsible?

The climate communications website will be overseen by the Sustainability Director.

What Existing Communications Pathways Can be Utilized for Climate Communications?

» The Jenks Newsletter

» The Jenks Community Center

» Council on Aging (COA) voluntary database of vulnerable residents

» Schools newsletters

» Network for Social Justice weekly newsletter

» Winchester Town Common Organization

» Winchester Public Library Display Cases

» Wright-Locke Farm

» Faith Communities newsletters

» Winchester School of Chinese Culture

» Winchester Farmers Market

» Friends of the Fells

» Rotary Club of Winchester

» Winchester Chamber of Commerce

» After school organizations

» Massachusetts Climate Action Network

Our choices of food and other goods and services we consume, and travel choices (especially the frequency of our air travel), while difficult to measure town-wide and therefore not included in Winchester's GHG Inventory, have significant impacts on our carbon emissions.

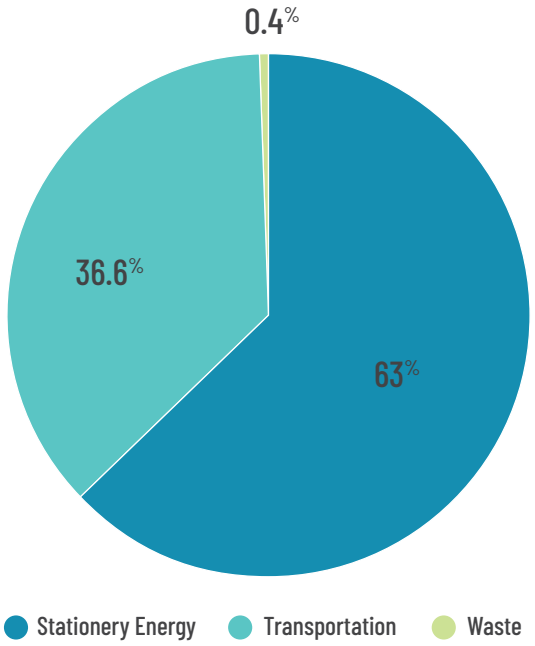
APPENDIX D

Summary of 2019 GHG Inventory

In the summer of 2019, Winchester engaged the Metropolitan Area Planning Council (MAPC) to conduct an inventory of several basic categories of the town's greenhouse gas (GHG) emissions during the year 2017, which was the most recent full year for which relevant data were available, with the sole exception of motor vehicle emissions, for which most recent available data were from 2014. The primary sectors covered by the inventory are:

- **Stationary Energy,** which includes emissions from the energy (electricity, natural gas, fuel oil) that we use to power and heat our homes, business and municipal buildings, and operations
- **Transportation,** which includes emissions from on-road vehicles registered in Winchester and public transportation
- **Waste,** which includes emission for disposal of Winchester's solid waste and treatment of its wastewater

The inventory estimated that in 2017 the town emitted a total of 176,293 metric tons (MT) of "carbon dioxide equivalents" or "CO_2e"[1], attributable to the above sectors as follows:



1 CO_2e is a widely accepted unit of measure of greenhouse gas emissions that includes emissions of the primary greenhouse gases carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), and is the unit of measure used in the inventory and this report

A full copy of the GHG Inventory is available on the Winchester Climate Action Committee's webpage: https://www.winchester.us/267/Climate-Action-Advisory-Committee

The current inventory was conducted using MAPC's recently released Community GHG Inventory Tool, which was developed by MAPC and DNV GL Energy Services USA, Inc. as part of a multi-community project designed to create a suite of resources for Massachusetts cities and towns to set ambitious climate goals and create plans to take action. This tool follows the inventory methodology set forth in the 2014 Global Protocol for Community-Scale Greenhouse Gas Inventories (Global Protocol), which is a widely recognized standard for reporting requirements for community GHG inventories and provides detailed accounting guidance for quantifying GHG emissions associated with a range of sources and activities. For more information about MAPC's Community GHG Inventory Tool and its scope and methodology, please see https://www.mapc.org/resource-library/community-ghg-inventory-resources/.

The methodology prescribed by the Global Protocol and used by MAPC in the current inventory differs in several material respects from the methodology used in conducting the GHG inventory that was included in Winchester's 2011 Climate Action Plan. Due to the differing methodologies, the results of the two inventories do not lend themselves to comparison. Going forward, the current inventory will serve as the baseline inventory against which emissions in future years are measured. Using MAPC's inventory tool will enable Winchester to conduct GHG inventories in future years using the same methodology, so that the town will be able to evaluate its progress over time.

Although the 2017 inventory captures primary emissions sources that reflect key leverage points the town can target to achieve significant reductions in its greenhouse gas emissions, it does not include several broad categories of emissions sources that may well equal or exceed the emissions included in the inventory, for example emissions from:

- town employee and resident air travel
- the cultivation, processing, manufacture, and transportation of the food we consume
- the manufacture and transportation of the many goods and services we consume

Such sources were excluded from the inventory because they can be difficult to monitor and control, estimating their emissions often relies on underlying estimates and methodologies that evolve over time and conducting an inventory that includes them would be far more expensive than the basic inventory conducted by MAPC. Nevertheless, it is crucial to note that even though they are not included in the inventory, these other sources of emissions present opportunities for the town and its residents to achieve significant reductions in greenhouse gas emissions and, accordingly, should not be overlooked when considering and recommending actions to reduce emissions.

APPENDIX E

Public Outreach

The Committee conducted extensive outreach and ran multiple public events to solicit input and build public understanding of climate change and appreciation of the need for the recommendations we make in the Winchester 2020 Climate Action Plan.

Climate Change Presentations and Events in Winchester, 2019

Chamber of Commerce
Climate Week 2019
Earth Day event
Farmers Market Community Organizations Day
Library Display
Martin Luther King Day (Service Day)
Middle and high school classes
Municipal Vulnerabilities Preparedness (MVP) planning grant Listening Sessions
Rotary Club
Social media including FB and Instagram
Sustainable Winchester
Town Day
Public Speakers
Jason Lewis, MA State Senator
John Rogers, Senior Energy Analyst, Union of Concerned Scientists
Jonathan Buonocore, Dept of Environmental Health, Harvard Chan School of Public Health
Julie Wormser, Deputy Director, Mystic River Watershed Association
Kasia Hart, Transportation Policy Analyst, and Alison Felix, Senior Transportation Planner, Metropolitan Area Planning Council
Katie Theoharides, MA Secretary, Executive Office of Energy and Environmental Affairs
Michael Day, MA State Representative
Monica Tibbits-Nutt, Executive Director, 128 Business Council and YEP! Youth Engagement Planning

APPENDIX F

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FOR MORE INFORMATION PLEASE CONTACT: The Winchester Climate Action Committee (CAC)