TOWN *of* TOPSHAM
CLIMATE ACTION PLAN 2025

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Special thanks to everyone in the Topsham community who lent their time, insights, opinions and stories to help shape this plan.

This work was supported by a Community Action Grant from the Community Resilience Partnership.

EXECUTIVE SUMMARY

BACKGROUND & PURPOSE

The Topsham Climate Action Plan (CAP) serves as a roadmap for reducing greenhouse gas emissions and increasing resilience to climate change impacts. This plan builds on Topsham's previous climate initiatives and aligns with the state's Maine Won't Wait climate goals. The CAP was developed with community input and supported by a Community Action Grant through the Community Resilience Partnership.

KEY CLIMATE RISKS & VULNERABILITIES

Topsham faces multiple climate-related challenges, including:

Extreme Storms & Precipitation
Increased flooding, power outages, and erosion.

Drought & Water Supply Risks
Impact on private wells and local agriculture.

Sea Level Rise & Flooding
Threats to low-lying roads and infrastructure.

Shifting Habitats & Agriculture
Changes to ecosystems and growing seasons.

Increasing Temperatures
Urban heat island effects and public health concerns.

Wildfire & Air Quality Risks
Potential for local wildfires and impact from regional wildfire smoke.

The plan also incorporates a Social Vulnerability Assessment to identify groups most at risk to the effects of climate change, including seniors, low-income households, and mobile home residents.

GREENHOUSE GAS EMISSIONS INVENTORY

Topsham's emissions are primarily from:

1. Transportation (gas and diesel vehicles)

2. Residential energy use (home heating oil and natural gas)

3. Commercial and industrial energy consumption

Municipal operations also contribute emissions, with vehicle fleets and building heating as the primary sources.

CLIMATE ACTION PRIORITIES & STRATEGIES

The Climate Actions Matrix outlines specific initiatives to reduce emissions and improve resilience, categorized into key strategy areas:

1. Sustainable Transportation

2. Energy Efficiency & Renewable Energy

3. Resilient Infrastructure

4. Protecting Natural Resources & Agriculture

5. Community Engagement & Public Health

6. Climate Governance & Policy

IMPLEMENTATION & NEXT STEPS

The CAP is designed to be a living document, with annual updates from the Town to track progress and refine strategies. Successful implementation will require collaboration between municipal departments, community organizations, and residents.

By taking action now, Topsham aims to reduce emissions, build climate resilience, and ensure a sustainable future for its community. Switching to renewables has been proven to save municipalities, businesses, and residents money.

INTRODUCTION & BACKGROUND

WHAT IS A CLIMATE ACTION PLAN?

An actionable plan to address risks and adapt to a changing climate. It offers a chance to come together as a community, share ideas and knowledge about how climate change affects us, and find positive solutions to help us all prepare and thrive.

Tackling climate change locally requires two key strategies: mitigation and adaptation. Mitigation focuses on reducing greenhouse gas emissions, while adaptation prepares communities for the impacts of climate change.

This plan calls for the Town to adopt the State's 2020 Climate Action Plan Maine Won't Wait's goals:

- **Decrease Greenhouse Gas Emissions below 1990 levels by 45% by 2023 and 80% by 2050**
- **Achieve carbon neutrality (sequester all the carbon we emit) by 2045.**

WHAT ARE THE BENEFITS?

ENHANCING PREPAREDNESS

By identifying vulnerabilities and developing strategies to address them, Topsham can be ready for extreme weather events, such as floods, droughts and storms.

REDUCING COSTS

Implementing energy efficiency measures, such as improved insulation, efficient lighting, and upgraded equipment can lower energy bills, saving money.

FOSTERING COLLABORATION

Planning provides an opportunity for community members to participate in decision-making, and work together for a stronger Topsham.

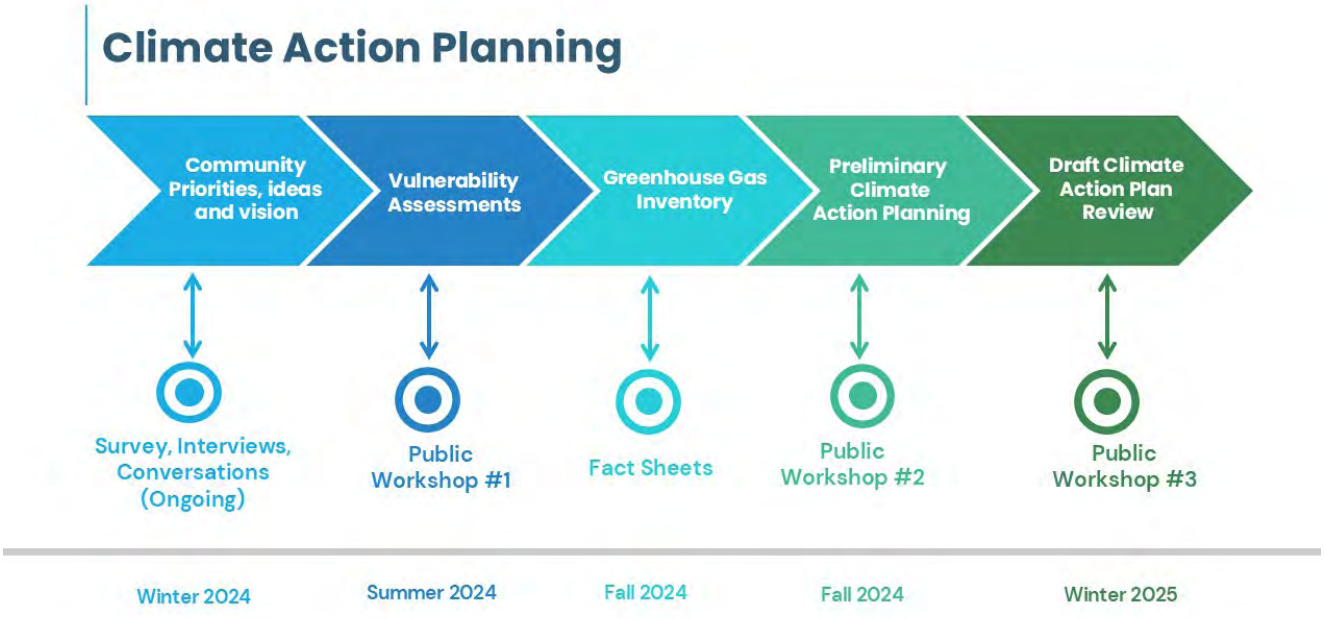
OUR CLIMATE ACTION PLANNING PROCESS

In 2012, Topsham adopted its first Climate Action Plan (CAP), focusing mainly on reducing carbon emissions. The current CAP builds on that foundation, expanding to include community engagement, and addressing new

challenges. It includes sections on the risks to town roads, neighborhoods, and infrastructure, identifies populations most vulnerable to the impacts of climate change, and outlines specific actions the town government can take to respond effectively.

Our Climate Action Plan efforts coincided with our 2022 enrollment with the Community Resilience Partnership program which funded this CAP. During the enrollment process the Selectboard passed a resolution committing to community leadership in reducing greenhouse gas emissions and increasing resiliency to extreme weather and climate change impacts. In addition, on January 25, 2022 the Town held a public meeting to identify climate actions the Town has or is planning on working on which have been carried over to this document.

In preparation for this Climate Action Plan, we followed a series of five steps, starting with asking the community for their ideas and concerns. Next, we conducted vulnerability assessments to understand climate risks, and completed a greenhouse gas inventory to see how Topsham contributes carbon dioxide in the atmosphere. After that, we gathered input on possible climate actions, which helped shape the final Climate Action Plan. Throughout the process, we held public workshops to collect feedback and ensure community involvement every step of the way.



COMMUNITY PRIORITIES & PERSPECTIVES

ENGAGING WITH RESIDENTS

Community collaboration is essential in climate action planning. The people who live and work in Topsham have the deepest understanding of the town. We asked for your experiences, perspectives and priorities through an on-line survey, tabling events, and a series of public workshops.

Topsham residents attend a Climate Action Plan workshop at the Town municipal building.

WHAT ARE PEOPLE SAYING?

"Being proactive is important because whether we like it or not, climate change is here."

"I am concerned about possible tax increases."

"The river walk by our home on Green Street and the Town Landing Road certainly has taken a hit in recent years."

"I often worry about my elderly neighbors when the power goes out for multiple days. One of them needs special care due to a health problem, which makes their household particularly vulnerable in those stressful moments. I'm also concerned about how the changing climate affects the growing season for our local farmers."

CONDUCTING SURVEYS

The Energy Committee conducted an online survey to understand the community's climate change concerns, with 257 residents participating. The survey results reveal widespread awareness of the significant and varied effects of climate change on Topsham's infrastructure and community and a desire to adopt the State's 2020 Climate Action Plan greenhouse gas reduction and carbon sequestration goals.

Top concerns included an increase in disease-carrying insects, more frequent power outages, and damage from extreme precipitation or flooding.

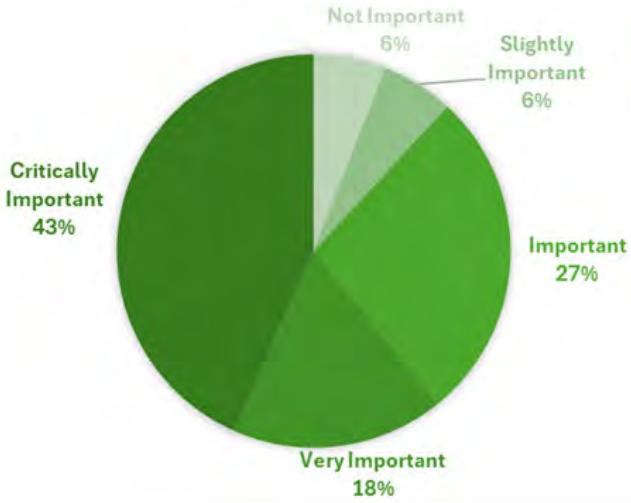
Other issues cited were property damage from wind and falling trees, impacts on recreation, loss of animal and plant habitats, and rising heat and humidity.

When asked which climate-related impacts the plan should prioritize, respondents focused on addressing infrastructure impacts, human health issues, ecological impacts, extreme weather events, and changes to oceans and rivers. See **Appendix A** for details.

TALKING TO NEIGHBORS

Between March 2025 and February 2026, members of the Energy Committee shared information about the Climate Action Plan at several locations where a cross-section of Topsham residents can be found, including the transfer station, Swing Bridge Park on Earth Day, Town Meeting, and the library. In addition, committee members connected with residents of Cathance Trailer Park and River Llanding. Through these efforts, committee members were able to talk with Topsham residents about their climate concerns and provide information on how to get their voices heard at upcoming public meetings.

SURVEY: HOW IMPORTANT IS IT FOR TOPSHAM TO ADDRESS POTENTIAL IMPACTS OF SEVERE WEATHER?



PUBLIC WORKSHOPS

Topsham residents attend Climate Action Plan workshops

Workshop #1
July, 2024
Community input related to risks to vulnerable infrastructure and people.

Workshop #2
November, 2024
Community review of vulnerable infrastructure, vulnerable people and greenhouse gas inventory, plus input on desired priority climate actions.

Workshop #3
February, 2025
Community review of Climate Action Plan.

CLIMATE IMPACTS IN TOPSHAM

INFRASTRUCTURE VULNERABILITY ASSESSMENT

A climate change vulnerability assessment is a vital step in building resilience, helping communities identify risks to people, infrastructure, and ecosystems and finding ways to address those vulnerabilities. This vulnerability assessment highlighted infrastructure risks (see **Appendix B** for detailed Baseline Vulnerability Assessment). It evaluated the effects of climate change on transportation, critical facilities, and utilities like water and sewer systems. The assessment also considersed impacts on public health, private property, and natural ecosystems, creating a comprehensive picture of Topsham's climate resilience needs.

EXTREME STORMS & PRECIPITATION

Maine is getting more rain, and heavy storms are happening more often. Since 1895, Sagadahoc County's yearly rainfall has gone up by nearly 6 inches.

Big winter storms, with high winds, ice, and flooding, are the main cause of power outages and costly property damage in the area. Maine has some of the worst power outages in the U.S. and in Topsham, problems like no backup power at grocery stores and gas stations, along with poor cell phone reception in the town center, make power outages even harder for residents.

Heavy rain, runoff, and flooding can erode shorelines and areas with high water flow. While the overall risk of shoreline erosion in Topsham is low, it could impact the Pinewood Drive neighborhood. Pleasant Point Road is already experiencing erosion, and the town is working on solutions to fix the problem.

Stronger and more frequent rain storms could lead to heavy stormwater runoff, causing erosion, road washouts, and overwhelmed drainage systems. This runoff carries pollutants into ponds and rivers. These issues are expected to worsen stormwater management problems, especially near the Topsham Fair Mall.

Photo Courtesy of Alice Elliot, Topsham Heights

Frank J. Wood Bridge in Topsham during the December 2023 storm. The bridge was closed during the storm due to safety concerns. Photo: D. Scrapchansky, courtesy of the Town of Topsham

FLOODING AND SEA LEVEL RISE

Coastal communities in Maine face flooding risks from storm surges and heavy rain, which can threaten roads, town infrastructure, private property, and natural resources. These hazards pose challenges to residents' safety, health, and well-being. The Federal Emergency Management Administration's (FEMA) flood maps for Topsham show that some transportation infrastructure and private homes are at risk, while sewer and water systems face minimal threats.

Areas vulnerable to flooding in Topsham include Meadow Road, Foreside Road, Pleasant Point Road, River Road, Flowing Eagle Drive, the mobile home park on Toths Road, Pinewood Drive, Ward Road, parts of the Industrial Zone, Cathance River crossings, the Frank J. Wood Bridge, the Swinging Bridge, and the River Walk.

Topsham is home to three tidally influenced rivers: the Androscoggin, Cathance, and Muddy Rivers. These tidal areas are affected by both riverine and coastal flooding, increasing their vulnerability to changing water levels.

Topsham has three dams: the Pejepscot and Androscoggin/Brunswick dams on the Androscoggin River, and one on the Cathance River. These dams can increase the risk of up-stream riverine flooding, especially during extreme weather events.

During the winter of 2023-2024, Topsham experienced three severe storms which caused extensive flooding and a historic storm surge.

Maine suggests communities prepare for 1.5 feet of sea level rise by 2050 and 4 feet by 2100. In the short term, Topsham will see minimal impacts, but by 2100, low-lying areas near the Muddy River, including Foreside Road and Pleasant Point Road, could be affected. Freshwater wetlands around the Muddy River are likely to turn into tidal marshes over time.

Topsham is unique compared to other communities in Maine because much of the land that is vulnerable to flooding and sea level rise is conserved, which positions Topsham to enhance existing flood resilience through conservation.

Flooding on the Foreside Road Bridge during a recent storm. Photo courtesy of the Topsham Public Works Department.

Flooding on Pleasant Point Road during a recent storm. Photo courtesy of the Topsham Public Works Department

Residents in the neighborhoods of Ivanhoe Drive and Bay Park currently experience basement flooding during storms, which have been attributed to groundwater rise by the residents. Inundation in Bay Park has been an issue since the neighborhood was built, driven by a naturally high-water table. It is unclear if a rising groundwater table is the primary cause of basement flooding in Ivanhoe Drive, or if it is caused by surface water runoff during heavy rainfall. Understanding the primary cause of inundation will allow the Town to appropriately address residents' concerns.

INCREASING TEMPERATURES

Maine's climate is getting warmer. Average temperatures have risen by 3.5°F since 1895, with projections of another 2–4°F by 2050 and up to 10°F by 2100. Heatwaves, prolonged periods of abnormally hot weather, pose health risks to people, animals, and the environment and can lead to heat exhaustion, heatstroke, and dehydration, and often strain power grids due to increased demand for air conditioning. Heatwaves can also exacerbate drought conditions and contribute to wildfires.

Winters are warming the fastest, with Sagadahoc County seeing a 5.3°F increase in winter temperatures compared to a century ago. Warming winters reduce snowpack, alter the timing of snow melt, river flows and lake ice-out dates. These changes have cascading impacts on Maine's biodiversity, agriculture, inland lakes and streams, water cycles and winter-based recreational activities.

Areas like the Topsham Fair Mall and town center experience higher temperatures than tree-covered spaces like parks. This happens because buildings, roads, and asphalt surfaces absorb and retain heat, creating pockets of spiking temperatures, or Urban Heat Islands (UHIs). Developed and industrial areas along Lewiston Road near Lisbon Falls are also vulnerable to UHIs due to the lack of natural open spaces. UHIs expose people to extreme heat and drive up energy use as more air conditioning is needed to stay cool.

Air conditioning is key to preventing heat-related illnesses, but many homes and buildings in Maine lack it. Topsham residents are particularly concerned about power outages during extreme heat, which could endanger vulnerable groups like the elderly and disabled. Without reliable air conditioning, health risks rise significantly during heatwaves. To help, the Topsham Town Office serves as a cooling center during business hours for those without air conditioning.

Muddy River, Topsham. Photo courtesy of D. Scrapchansky.

SHIFTING HABITATS & AGRICULTURE

The distribution and range of species in Maine are moving in response to climate change, increased development pressures and habitat fragmentation from development. As habitats shift in response to climate change, development and habitat fragmentation further limit where and how species can move.

Climate change and development also enable the spread of invasive species like Japanese Knotweed and the Emerald Ash Borer, which harm farmland, forests, and property values. Warmer winters are expected to boost tick populations, leading to more tick-borne diseases and browntail moths, impacting local forests.

Maine's growing season has lengthened by two weeks since 1950, creating opportunities for farming but also increasing pests and water demands, which could affect Topsham's working farms.

DROUGHT

Maine's future drought trends are uncertain, but precipitation is becoming more unpredictable and variable. Rain increasingly falls in short, heavy bursts, which runs off quickly instead of replenishing aquifers. This may lead to more flash droughts, like those in 2020 and 2022. Maine is also experiencing "snow droughts," with less snowpack as

winter precipitation shifts to rain. In Topsham, this has reduced opportunities for winter activities like cross-country skiing and snowshoeing, as lakes and ponds freeze later and thaw earlier.

Drought impacts both water quality and quantity, raising concerns about water availability during prolonged dry periods. Around 50% of Mainers rely on private wells, making them more vulnerable to issues like dry wells and reduced water quality. In contrast, 55% of residents use public water systems, which are less susceptible but can still face challenges.

In coastal areas, rising sea levels increase the risk of saltwater intrusion into freshwater aquifers, further threatening water supplies during droughts.

Topsham's public water supply, managed by the Brunswick and Topsham Water District (BTWD), has proven resilient to drought. BTWD draws from groundwater wells with a capacity of 7–8 million gallons per day, far exceeding the peak demand of 3.5 million gallons. Protective zoning and land acquisitions help safeguard the aquifer. However, private wells, common in rural areas, are more vulnerable. Droughts can deplete groundwater reserves, causing wells to dry up, as seen in 2022 when six dry wells were reported in Sagadahoc County, including one in Topsham.

Agriculture is also at risk, with drought threatening irrigation-dependent farms. In the early 2000s, Maine farmers lost over $32 million in crop yields during a severe drought. Topsham's family-run farms along the Cathance River are central to its rural character but remain vulnerable to drought's effects on water-intensive farming.

WILDFIRE

Historically, wildfires in Maine were often caused by lightning during dry conditions, but today, human activities are the leading cause. There are two types of wildfires: wildland fires, which burn vegetation and forests, and Wildland-Urban Interface (WUI) fires, where developed areas meet undeveloped land that can fuel fires.

Although wildfires are uncommon in Maine, the state faces risks due to dense forest fuels, homes near forests, limited wildfire prevention awareness, and insufficient firefighting infrastructure. While Maine lacks a regular dry season, large fires can still occur during droughts.

Maine's most severe wildfire occurred in 1947, when months of drought led to out-of-control fires across the state. In Sagadahoc County, fires in Topsham and Bowdoin burned over 1,000 acres of farmland, brush, and timber in four weeks. Since then, most wildfires in Maine have been small, but the potential for major events remains a concern.

Most Topsham residents live in the Wildland-Urban Interface (WUI), meaning even with a low wildfire risk, a fire could significantly threaten infrastructure and public safety. Additionally, wildfire smoke from fires in Canada and western U.S. regions poses respiratory health risks to Maine residents.

Forested areas along the Androscoggin River. Photo courtesy of D. Scrapchansky.

SOCIAL VULNERABILITY ASSESSMENT

SOCIAL VULNERABILITY ASSESSMENT GOALS

Identify At-Risk Populations like the elderly, low-income families, or people with disabilities, who may face greater challenges during emergencies or adapting to changes.

Highlight Resource Needs like better housing, improved healthcare, or easier access to emergency services to help reduce risks.

Strengthen Resilience Planning to create actions that help the whole community prepare for, respond to, and recover from challenges.

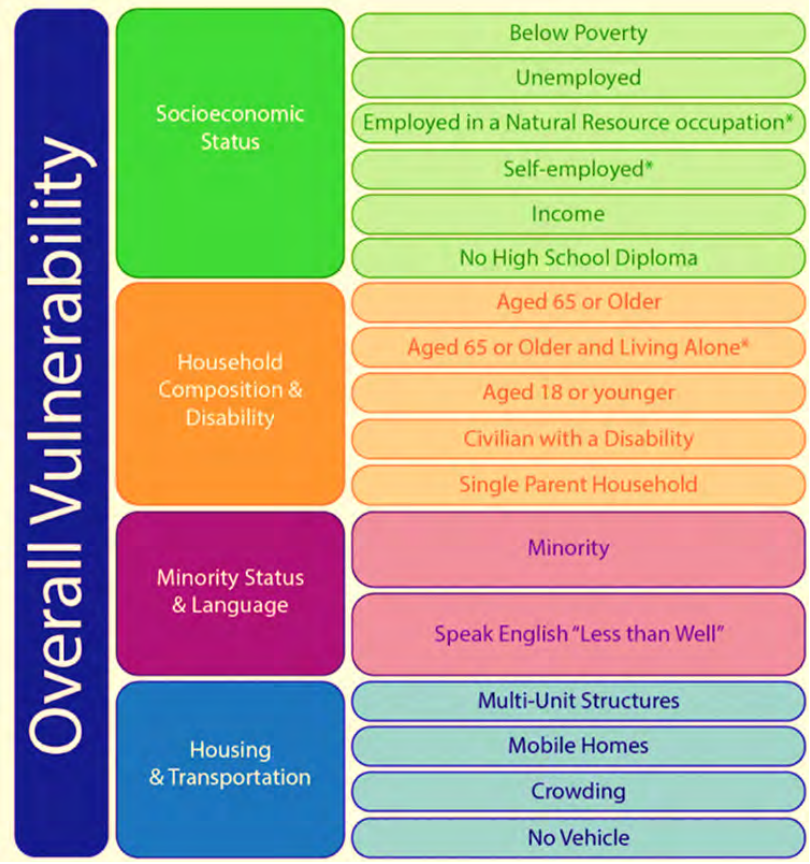
Promote Fairness to make sure plans include the needs of vulnerable groups, to build stronger communities.

This social vulnerability assessment (SVA) focused on the people of Topsham, identifying who may be more vulnerable, the factors contributing to their vulnerability, and which groups to consider, involve, and prioritize in climate-related plans and actions. It combined qualitative data from sources like the U.S. Census Bureau with qualitative insights from community surveys and workshops.

IDENTIFYING PRIORITY POPULATIONS

Researchers in Maine have created a Social Vulnerability Index (SVI) tailored specifically to our state's socioeconomic and demographic profile, reflecting local conditions. Based on four categories and 17 socioeconomic and demographic indicators from U.S. Census data, the Maine SVI adapts the Center for Disease Control's national index to better reflect local conditions. Social vulnerability to climate change can result from one or multiple factors, often compounded by their intersection. For instance, an older adult with a low income living in a mobile home may face multiple challenges: age increases susceptibility to extreme heat, financial limitations restrict access to cooling systems, and mobile homes are often less storm-resistant. See **Appendix C** for details.

MAINE SOCIAL VULNERABILITY INDEX



Top: Johnson, Bell, and Hertz, 2016, Adapted from CDC/ASTDR SVI. * Indicates variables specific to coastal Maine. Right and Below: Input received from Topsham residents.

"I am especially concerned about our elderly or low-income neighbors and their homes affected by flooding or downed trees."

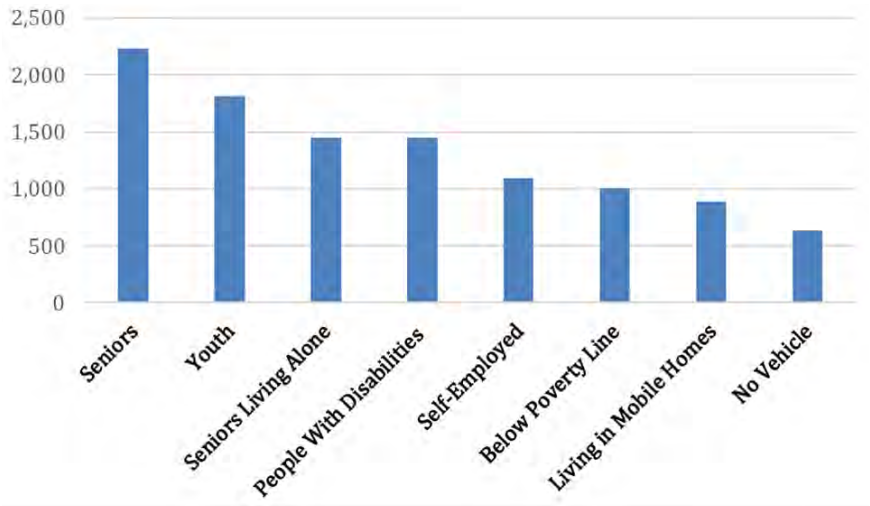
"Older individuals may be less resilient when it comes to managing new extremes in weather such as periods of power loss, extreme heat, and changes to the environment resulting in accessibility loss even temporarily."

"After storms, CMP should prioritize trailer parks & areas where low-income people reside, rather than higher income areas, which currently seem to get early attention after big storms."

"We are all vulnerable to climate change impacts, no matter where we live, work or recreate, no matter how old we are. And those who are struggling financially are likely to be impacted more: unable to bear the higher costs of food, heating and air-conditioning (if they even have that!) and gasoline. Beaches with public access are already being destroyed!"

WHO IS VULNERABLE?

The chart below illustrates the number of people in Topsham with specific vulnerability indicators. Individuals can appear multiple times if they have more than one indicator. For instance, a child living below the poverty line and residing in a mobile home park would be counted in all relevant categories. Those with multiple indicators are considered most at risk.



Topsham Residents with Vulnerability Indicators

Seniors (65+) are the largest vulnerable group – about 20% of the population, or just over 2,200 people. Next is Youth (about 1,800 people) and Seniors Living Alone and People with Disabilities (both with about 1,450)

While less numerous, Topsham also has vulnerable residents living below the poverty line (about 1,000), living in mobile homes (887) and without vehicles (634).

CLIMATE PLANNING CONSIDERATIONS

When considering climate actions, it is useful to ask the following questions:

Who in our community does this action serve?

How will vulnerable groups be involved in developing or prioritizing this action?

What needs of vulnerable populations does this action address?

How will this action increase the resilience of vulnerable populations?

TOPSHAM'S GREENHOUSE GAS EMISSIONS

GREENHOUSE GAS EMISSIONS

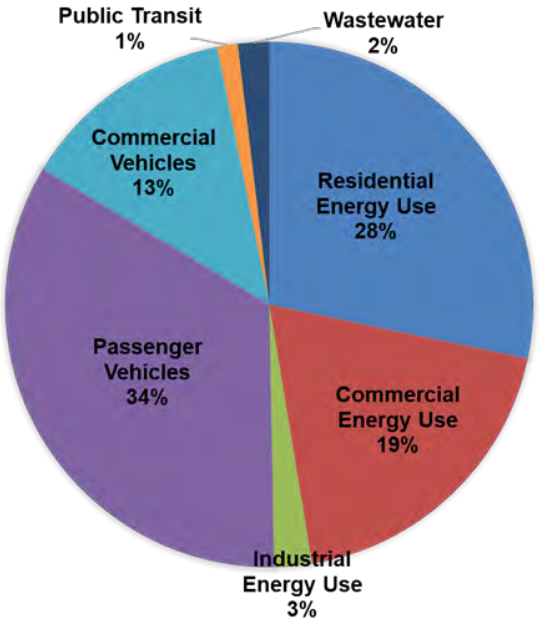
Greenhouse gases (GHG) like carbon dioxide, methane, nitrous oxide, and fluorinated gases trap heat, keeping Earth warm enough for life. However, human activities such as burning fossil fuels, farming, and industrial processes have increased these gases, driving climate change.

COMMUNITY-WIDE GHG INVENTORY

A greenhouse gas inventory measures emissions from activities in a community or organization, identifying major sources, tracking progress, and guiding decisions to reduce them. Reducing GHG emissions improves air quality, mitigates climate change, and saves money through lower energy use.

A community-wide GHG inventory of emissions from activities like energy use in homes and businesses, transportation, and waste management, provides a clear picture of a community's carbon footprint. See **Appendix D** for details.

TOPSHAM'S COMMUNITY-WIDE CARBON DIOXIDE EMISSIONS BY SOURCE



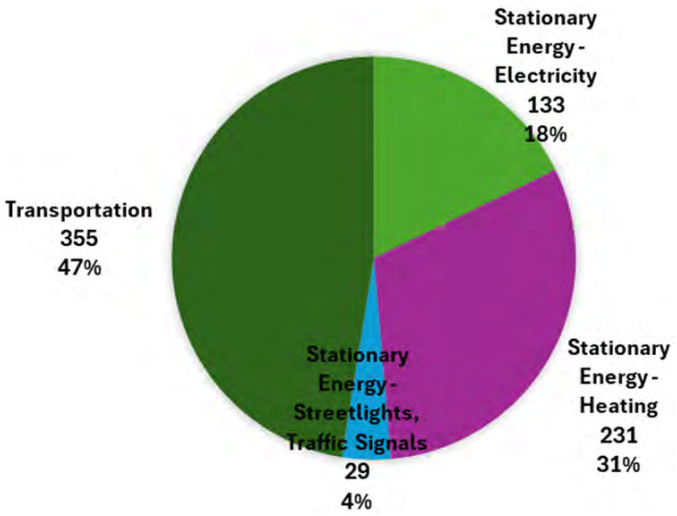
- Gas and diesel cars and trucks contribute the most to Topsham's municipal emissions, primarily used by public works and police operations.
- The Town primarily uses natural gas to heat municipal facilities. This cleaner-burning fuel generates fewer greenhouse gas emissions compared to heating oil.
- Municipal staff have already taken several steps to improve energy efficiency, including installing LED lights, heat pumps, and insulation, piloting a hybrid vehicle, and purchasing electric equipment.

MUNICIPAL GHG INVENTORY

A municipal GHG inventory is a count of emissions generated by a local government's operations. It identifies major sources, such as energy use in buildings, vehicle fleets, and waste management. This information helps the town develop targeted strategies to improve energy efficiency, lower emissions, and reduce costs.

Topsham Municipal Building

TOPSHAM'S MUNICIPAL CARBON DIOXIDE EMISSIONS BY SOURCE



- Gas and diesel cars and trucks contribute the most to Topsham's municipal emissions, primarily used by public works and police operations.
- The Town primarily uses natural gas to heat municipal facilities.

EXPLORING ENERGY TOPICS: MT.ARARAT HIGH SCHOOL

The Climate Action Plan process was bolstered even further by a partnership with MTA's AP Environmental Science class in the winter and spring of 2024. This class, led by teachers Daniel Gibson and Glenn Evans, took on three energy-related projects. The projects provided a more granular subset of data than the larger Climate Action Plan efforts as well as providing an important method for engaging young people in the process. The three projects spanned a wide range of topics and methods; from a student survey, to an in-depth analysis of the school's carbon neutrality, to a fieldwork intensive preparation of the carbon sequestration abilities of the MTA parcels. (See **Appendix D** for details)

MT.ARARAT HIGH SCHOOL STUDENT ENERGY SURVEY

A survey was conducted to gather students' opinions on climate change and the environment to better understand their views, knowledge, and priorities. Most students expressed concern about climate impacts, with extreme weather, flooding, and risks to populations near water ranking as top concerns. Observed impacts included property damage, power outages, and changing weather patterns. While many students supported taking climate action, they were often unsure how to implement solutions. The survey also revealed a lack of understanding about energy use and generation, suggesting a need for more education on these topics as part of the high school curriculum. Students proposed reducing plastic waste and improving recycling efforts as practical ways to decrease the school's climate impacts.

MT. ARARAT HIGH SCHOOL ENERGY USE AND EFFICIENCY ANALYSIS

An analysis was conducted to determine whether Mt. Ararat High School could achieve carbon neutrality within its campus and how the school could be more energy efficient. Here are some resulting conclusions:

- About 51% of the electrical energy that MTA uses comes from its solar panels.
- MTA uses about twice as much energy as it generates
- 1454 more solar panels are needed for carbon neutrality; space is available in proposed areas to install them.

It should be noted that this analysis did not take into consideration the carbon emissions associated with the school bus fleet, which would significantly increase their carbon footprint. We hope they will include that data into their next analysis.

MT. ARARAT HIGH SCHOOL FOREST CARBON STUDY 2024

The Mt. Ararat High School Student Energy Survey gathered students' opinions on climate change and the environment to better understand their views, knowledge, and priorities. Most students expressed concern about climate impacts, with extreme weather, flooding, and risks to populations near water ranking as top concerns. Observed impacts included property damage, power outages, and changing weather patterns. While many students supported taking climate action, they were often unsure how to implement solutions. The survey also revealed a lack of understanding about energy use and generation, suggesting a need for more education on these topics as part of the high school curriculum. Students proposed reducing plastic waste and improving recycling efforts as practical ways to decrease the school's climate impacts.

TAKING ACTION

TAKING ACTION

Topsham recognizes that responding to and preparing for climate change is a critical step toward a sustainable future. The Town's early actions to reduce its contribution to climate change reflects the Town's history and commitment to decrease the impacts of day-to-day activities on the natural environment while enhancing its vibrant quality of life. Mitigating climate change will require everyone - residents, businesses, government agencies and nonprofit organizations - to work together to implement this plan.

This plan provides a strategy to achieve emission reductions that will achieve the Town's target of decreasing GHG emissions below 1990 levels by 45% by 2030 and 80% by 2050, and achieving carbon neutrality by 2045. Successful implementation of the plan will require that staff and the Selectboard identify and commit resources to climate change mitigation activities, and to monitor and report on progress towards meeting emission reduction goals.

WHAT TOPSHAM IS ALREADY DOING

Over the last decade, the Town of Topsham has been steadily working to address the root cause of climate change: greenhouse gas emissions. In 2020, after efforts by local advocates, the Town entered into a solar power purchase agreement (PPA) to support the development of a solar farm in Skowhegan. Topsham's share of the solar farm generates approximately 800 megawatt-hours of clean, renewable, zero-emissions electricity each year. Topsham also adopted a solar energy ordinance that encourages development of larger solar arrays while providing the town with habitat mitigation fees that support conservation of natural habitat.

Municipal staff have also improved energy efficiency in buildings and facilities by replacing sodium vapor streetlights with new energy efficient LED fixtures, installing energy efficient lighting in municipal buildings, installing an EV charging station at the library and when practical, piloting a transition to hybrid vehicles and electric equipment.

In addition, the Town has also been working to improve climate resilience particularly related to flooding. The Town of Topsham Planning and Public Works Departments have been addressing stretches of road that are known to flood regularly. There are also two sections of Pleasant Point Road that have been eroded by storms and high tide events and the Town is working to address these areas.

CLIMATE ACTION PLAN

The list of priority climate actions incorporated ideas from other plans, like the 2019 Comprehensive Plan, Community Resilience Partnership application materials, the CAP survey, and the Energy Committee's work plan. In addition, community members shared their input during an in-person workshop where residents voted on additional actions from a matrix developed by The Southern Maine Planning and Development Commission. We improved the list by analyzing data from the Baseline Climate Change Vulnerability Assessment and Greenhouse Gas (GHG) Inventory to focus on local climate risks and emissions.

The list notates priorities, measurable goals, and identifies action leads to achieve the GHG targets associated with this plan. This process combined data analysis, community needs, expert advice, and public input. Public engagement included 16 committee meetings, two public surveys, eight interactive tabling events, three community workshops, and outreach at Westrum House and River Landing housing complexes.

It is understood that the Town of Topsham does not have the personnel or financial resources to implement many of the initiatives contained within this plan immediately. However, future Select Boards can use this list of strategies as they determine budgets and personnel for implementation each year.

Actions	Timeframe	Lead	Support
Strategy Area A: Embrace the Future of Transportation			
Accelerate Zero-Emission Vehicles			
Evaluate the purchase or lease of low or zero-emission vehicles for municipal owned vehicle fleets during the procurement process.	Ongoing	TM	EC
Install electric charging stations in public parking areas for hybrid plug-in and electric vehicles.	Ongoing	EC	Rec, DPW
Adopt ordinances to encourage electric charging infrastructure, including at multifamily dwellings, businesses, and public parking areas.	Short	P	EC
Improve Mobility and Reduce Vehicle Miles Traveled (VMT)			
Implement strategies that increase public transit ridership and alternative transportion modes, including bike and walking infrastructure.	Mid	P	Bike/Ped, EC
Conduct needs assessment for local transit (i.e. local bus) options to determine if transit options are needed for getting around Topsham.	Mid	EC	TM
Continue to support and enhance Regional Trail Systems	Ongoing	TM, P	Bike/Ped
Adopt land use and development policies in plans and codes that reduce the need for driving (e.g. locating schools, workplaces, and shopping near where people live; encouraging density of development near housing and transportation).	Ongoing	P	PB, Bike/Ped
Adopt a Complete Streets policy which addresses safety, bike/pedestrian uses, and transit.	Short	PD	Bike Ped Committee
Implement climate impact fees on new or redevelopment to encourage resilient and sustainable development and support future municipal projects.	Long	EC	P, PB, TCC

Strategy Area B: Modernize Topsham's Buildings			
Transition to Cleaner Heating and Cooling, and Efficient Appliances in Municipal/Tribal Buildings			
Adopt and execute a plan for energy efficiency and building envelope weatherization improvements for municipal buildings. Collaborate with local school district for school building improvements.	Mid	TM	EC
Consider the Municipal Complex as a demonstration area for low-cost, high-impact techniques that residents could implement at home	Ongoing	EC	TM, TCC
Upgrade to energy efficient interior lighting in municipal buildings.	Ongoing	TM	
Upgrade to energy efficient appliances in municipal buildings.	Ongoing	TM	EC
Install heat pump system or VRF system for heating/cooling and heat pump water heating in municipal buildings.	Long	TM	EC
Upgrade streetlights and exterior lighting for municipally-owned facilities with energy efficient LED lighting (and minimize light pollution with downlighting where possible).	Ongoing	TM	EC
Support and ecourage window insulation upgrades for town residents	short	EC	TM
Advance the Design and Construction of New Buildings			
Publicize green building techniques and developers using them.	Ongoing	EC	
Strategy Area C: Reduce Emissions through Clean Energy Innovation			
Reduce Greenhouse Gas (GHG) Emissions			
Long-term planning/capital improvement planning Provide input to town's long-term budget planning for facilities, vehicles, and equipment	Mid	TM	EC
Advance Clean Energy Adoption			
Continue to support and advance renewable energy ordinance(s) that allows, enables, or encourages community-appropriate renewable energy and energy storage installations and a streamlined permitting process for small-scale renewable energy installations.	Ongoing	P	EC
Add website examples of clean energy upgrades and attributed cost savings on the Towns's webpage.	Ongoing	EC	P
Maintain a streamlined permitting process for small-scale renewable energy installations.	Ongoing	CEO	
Transition to Clean Energy			
Maintain a long-term service contract or power purchase agreement (PPA) and where possible supply our own renewable power ensuring a majority of the municipality's electricity is from local renewable energy sources.	Ongoing	TM	EC
Fund a feasibility study to lease land to a solar installer to create a revenue stream for the town.	Short	EC	TM
Install renewable energy projects on municipal property (i.e. rooftop, parking lot, landfill, wellhead protection area, recreation fields).	Ongoing	EC	TM

Strategy Area D: Grow Jobs and Protect Natural Resource Industries			
Support Maine's Natural Resource Economy			
Adopt policies that enable, support, or incentivize local food production and consumption, including community gardens.	Long	P	TCC
Strategy Area E: Protect the Environment & Promote Natural Climate Solutions			
Protect Natural and Working Lands and Waters			
Incorporate a goal into conservation plans of conserving land with a priority on addressing conservation gaps related to high biodiversity areas, undeveloped blocks, and land and water connectivity.	Ongoing	TCC	P
Create or update a watershed plan to identify flooding and water quality priorities and adaptation options.	Med	TCC	P
Continue working with the Brunswick Topsham Land Trust and State of Maine to expand existing conservation high-value and flood prone areas such as around the Muddy and Cathance Rivers.	Ongoing	TCC, PB, P	
Develop an invasive species management plan for public lands.	Long	DPW, Rec	TCC
Inventory waste practices in municipal operations to identify opportunities to reduce waste and implement waste reduction programs for municipal operations.	Long	TM	All Depts
Evaluate feasibility of a "Swap Shop" at the transfer station and formalize existing educational practices by staff to expand sustainable waste management and re-use practices.	Long	SWF	
Strategy Area F: Build Healthy & Resilient Communities			
Strengthen Public Health			
Identify and plan to reduce public health threats in the community that are exacerbated by climate change.	Ongoing	EMS	
Strategy Area G: Invest in Climate-Ready Infrastructure			
Assess climate vulnerability of infrastructure			
Encourage new development to consider underground powerlines to reduce outage impacts.	Ongoing	P, TM	PB
Insure the Capital Investment Plan a) identifies vulnerable municipal facilities and assets, and b) prioritizes resilience in improvements and/or new construction.	Ongoing	DPW, TM	
Utilize climate-ready standards, designs, and practices to	improve infrastruct	DPW ongoing	
Adopt DEP's Stream Smart Crossing Guidelines as standard practice for culvert and bridge improvements. Identify vulnerable crossings and apply for DEP improvement funds.	Ongoing	DPW	TM

Strategy Area H: Engage Maine People			
Increase public awareness of climate change impacts and opportunities to take action			
Continue to support groups of community stakeholders to assist in the implementation of this plan.	Ongoing	P, PD	EC, TCC, Bike/Ped, PB
Create an outreach program focusing a climate change mitigation and adaptation and energy efficiency programs for residents and businesses.	Ongoing	EC	
Amplify public health advisories for climate-related health and weather events, such as air quality advisories, extreme heat or cold events, extreme storms, power outages, waterborne disease outbreaks, harmful algal blooms, vectorborne disease trends, etc.	Ongoing	PD/EMS	
Pursue grant funding to develop and support an annual outreach plan to educate residents about the risks of brown tail moths, ticks and mosquitos, and methods to prevent illness.	Long	TCC	Rec
Engage youth in resilience, clean energy, and energy use reduction.	Ongoing	EC	
Collaborate with local schools to incorporate climate change, resilience, and sustainability into school curricula and operations (fleet vehicles, buildings, etc.)	Ongoing	EC	

Acronyms			
Bike/Ped	Bicycle and Pedestrian Committee	PB	Planning Board
CEO	Code Enforcement Officer	Rec	Parks and Recreation Dept.
DPW	Department of Public Works	SB	Select Board
EC	Energy Committee	SWF	Solid Waste Facility
EMS	Emergency Services	TCC	Topsham Conservation Commission
P	Planning Department	TM	Town Manager
PD	Police Department		

Timeframes	
Short	2 years or less
Mid	2-5 years
Long	5+ years
Ongoing	Already in progress and continuing

LOOKING AHEAD

Looking ahead, the Climate Action Plan is meant to be flexible and able to change over time. As our community grows, so do the challenges and opportunities we face. New technology, scientific discoveries, changes in population, and past experiences may lead us to update our strategies. We can adjust our goals and timelines as needed to stay on track. Since both technology and our climate are changing quickly, we should regularly review and prioritize action items based on available resources. This includes staff and community capacity, funding opportunities, and the complexity of each action. The Town will update the community on progress each year. By staying flexible, we can keep making real progress toward a more sustainable and resilient future.

HOW TO STAY INVOLVED

The Energy Committee meets on the 4th Tuesday of each month at 4:30pm at the Town Office. Meeting agendas and connection links are posted on the Topsham website under the Committee's webpage **topshammaine.com/energy** along with links to webinars, and information about current projects.

APPENDIX A
TOPSHAM CAP SURVEY RESULTS

APPENDIX B
BASELINE CLIMATE CHANGE VULNERABILITY ASSESSMENT

APPENDIX C
SOCIAL VULNERABILITY ASSESSMENT

APPENDIX D
GREENHOUSE GAS INVENTORY REPORT