

# **Chelmsford Climate Action Plan**

Chelmsford Clean Energy and Sustainability Committee

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## Section 1: Executive Summary

Chelmsford has been taking actions over the course of the last 15 years to address sustainability goals. Globally, we need more urgent action to address climate change at the policy, community, and individual level.

With this **draft** report, the community can engage in a robust discussion on viable pathways to achieve the target of Net-Zero by 2050. CEAS will be making and communicating plans for outreach and public input sessions on the analyses and recommendations made below.

Every policy, community or individual action will likely be seen as having an increased cost relative to the status quo, even when that is not actually the case. These must be understood in the larger context of the “external costs” of a fossil-fuel-reliant lifestyle.

The CEAS committee advocates for 3 immediate sets of actions - a combination of policy, community, and individual actions that will be supported by programs and events to assist, inform and motivate town residents and businesses to begin the transformative journey as one family. These actions have the highest returns in terms of reducing the carbon footprint and moving to a sustainable model.

1. CEAS recommends exploring **procuring 100% clean energy** as the default option for Chelmsford Choice.

Estimated Impact: Reduction of approximately **5-6%** of GHG emissions within 1.5-3 years, if adopted for residential only. We could achieve nearly ~15% if adopted by Commercial and Industrial customers also.

2. CEAS recommends **improving the efficiency and electrification of its housing stock**

Estimated Impact: Annual reduction of about **2-4%** over the course of next 10-15 years.

3. CEAS recommends **creating policies and adopting standards** that drive adoption of clean energy production stock, low impact heating and cooling solutions, electric transportation charging and adoption; as well as adopting the highest building efficiency standards for new residential, commercial buildings, and to plan on improving baseline efficiency for incumbent stock in a planned and phased manner. A collaboration with the Planning Board, Select Board and other critical committees with inputs will be critical in achieving this long term action plan.

Estimated Impact: Supports a culture of planning, investment and growth commensurate with the need to achieve Climate Resilience, adaptation and Chelmsford Vision and Values. Impact of 2-4% annually.

The above actions coupled with town departments and personnel transforming the operations will get us on a pathway to reducing nearly 50% of GHG emissions by 2030 and onto Net-Zero by 2050.

**Executive Summary: Clean Energy Strategies and Actions.**

**Strategy CE1. Increase renewable energy generation, use, and access**

1. Strengthen Chelmsford's current municipal energy aggregation program (Start 2022-23)
2. Maximize renewable energy generation on municipal property and encourage residential and commercial renewable energy generation (Start 2023-24)
3. Develop a community shared solar program (Start 2023-2024)
4. Clean Energy Education and Outreach Program

**Strategy CE2. Build smart, resilient energy infrastructure (Start 2024-2025)**

1. Pilot microgrids powered by renewable energy. (Start 2024-2025)
2. Deploy energy storage at critical facilities. (Start 2023-2025).

**Strategy CE3. Reduce the carbon impact of the natural gas pipeline system.**

1. Coordinate with National Grid to address major gas leaks. (Start 2023-2025).

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**Executive Summary: Strategies and Actions to Reduce Building Emissions**

**STRATEGY B1: Support residents and businesses to improve the energy efficiency of their homes and buildings and transition to clean heating and cooling.**

1. Educate and promote to all residents and building owners to improve their homes' energy efficiency.
2. Promote residential building electrification and provide consulting support
3. Adopt the Property Assessed Clean Energy (PACE) program to help commercial building owners finance clean energy improvements.

**STRATEGY B2: Align Chelmsford's zoning and planning with clean energy and sustainability standards.**

1. Promote and encourage full electrification in new- construction buildings.
2. Adopt Massachusetts Specialized Stretch Energy code to minimize fossil fuel use in new- construction building projects.

**STRATEGY B3: Lead by example: The town's municipal buildings and schools will improve energy efficiency and transition to net-zero emissions.**

1. Adopt a net zero carbon standard for new municipal buildings and town-funded affordable housing.
2. Work toward de-carbonizing existing municipal buildings and town-funded affordable housing.

**STRATEGY B4: Advocate for policy changes and resources to enable rapid and affordable transition to carbon-free buildings and infrastructure**

1. Advocate at state-level for new building codes and policies that will enforce zero emission building standards.
2. Advocate for broad based incentives from Mass Save to support electrification of existing buildings

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**Executive Summary: Actions to use Zoning to improve sustainable development**

**Strategy Z1. Improve goal of sustainable development in Chelmsford through zoning regulations.**

1. Conduct a thorough audit of existing zoning regulations and bylaws in Chelmsford with a goal of improving implementation of sustainable development.

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**Executive Summary: Strategies and Actions to reduce emissions due to Transportation**

**Strategy T1: Support walking, biking, and public transportation options, and look at ride sharing opportunities.**

1. Adopt a Complete Streets policy and obtain state funding. Start 2023-2025
2. Advocate for community and regional transit needs. Start 2023-2035

**Strategy T2: Encourage use of zero emission EVs- municipal, business, residents.**

1. Adopt a zero- emission municipal fleet policy. Start 2023-24
2. Expand publicly-accessible charging stations.
3. Adopt EV charging site guidance to help expedite approvals of new public and possibly private charging stations.

**Strategy T3: Advocacy & Community Education-**

1. Advocate for utility rate design changes. Start 2025-27
2. Implement an EV car sharing program. Start 2025-2035

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## Section 2: Chelmsford Green Initiatives and Greenhouse Gas Inventory

### Clean Energy and Sustainability Committee

Chelmsford has committed as a Town to achieve a goal of Net-Zero greenhouse gas (GHG) emissions by 2050. This aligns with the Commonwealth's plan for the entire state to reach Net-Zero carbon emissions by 2050.

The Town of Chelmsford Select Board established the Clean Energy and Sustainability Committee to make recommendations for an action plan for the Town to reach the Net-Zero carbon goal. This chapter presents the GHG emissions inventory which is the first step toward creating a climate action plan to help the Town reach the goal.

### LEGACY OF SUSTAINABILITY

Chelmsford has a long history of taking actions for sustainability which has led to this current Net-Zero commitment.

**2009 Greener Chelmsford Initiative** established to provide awards and recognition to local businesses which achieve specific milestones to save energy, helping to save money and reduce our carbon footprint



**2010 First Solar Panels** on town properties.

**Stretch Energy Building Code**, unanimously approved by Town Meeting.

**Chelmsford designated a Green Community.** Chelmsford received \$1.3 Million in grants to support energy efficiency projects.



**2011-2012 First hybrid vehicles purchased.** Town meeting approves first hybrid vehicles for School Department and the town motor pool.



**First EV charging stations** installed at Adams Library and Vinal Square.

**2013 Energy Savings Performance Contract.** Town Meeting approves \$18.1 Million contract for town building energy conservation and to install nine solar arrays producing an estimated annual output of 2.4 million kWh, about 130 tons of CO2/yr.



**Solarize Chelmsford** campaign begins

**2014 Energy manager** position created.

**Energy Savings Measures.** Completed on 26 town buildings.

**LED Street Lighting.** 2,126 lights replaced saving 350,102 kWh per year.



**2015 Nine Town Solar Arrays** commissioned. **80% of electricity** for municipal buildings now drawn from Solar.

**Chelmsford Saves Campaign** helps more than 700 homes save energy.

**2016 Chelmsford Choice** municipal aggregation program starts with two offerings- a low cost offering and an optional “Choice Plus” 100% green (renewable) option.

**Town energy costs reduced** by \$731,970 for FY2016. Six buildings receive Energy Star certification.

**2017-20 Additional energy conservation projects** at Chelmsford High School, McCarthy Middle School, Senior Center, Police Station, CPS Administration, North Town Hall, Town Offices.

**2021 Clean Energy and Sustainability Committee** established by Select Board after climate resolution Town Meeting vote. Energy Conservation Committee that was active in helping Chelmsford complete the projects noted above was dissolved and its duties assumed by a new committee.



## GREENHOUSE GAS EMISSIONS IN CHELMSFORD

Every day, Chelmsford residents and businesses rely on fossil fuels to heat and cool our homes, keep the lights on, power our electronics and drive our cars. In doing so, we release greenhouse gas emissions. At Spring Town Meeting 2021, a climate resolution was approved which committed Chelmsford to a goal of Net-Zero Carbon Emissions by 2050 (1).

Chelmsford’s Net-Zero goal reflects the Massachusetts’ state goal (2). We recognize that Chelmsford- together with all Commonwealth cities and towns- must curb our emissions in order for Massachusetts to succeed.

This GHG Emissions Report was created using data generated by David Righter of the Northern Middlesex Council of Governments (3). It will be a foundation of Chelmsford’s Climate Action Plan which will contain specific strategies which the Town can implement locally to accelerate our transition to lower emissions and help meet the state targets for Net-Zero by 2050.

This report identifies the primary sources of emissions across our community and was based on data from 2017, the most recent year for which complete data were available. It represents a baseline to help measure future GHG emission reductions.

The analysis followed the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (4), an internationally recognized GHG accounting and reporting standard (see the methodology report

**IN 2017, OUR TOWN  
WAS RESPONSIBLE  
FOR EMITTING**

**356,126**

**METRIC TONS OF CO<sub>2</sub>e**

**in CHELMSFORD  
THAT WORKS OUT TO**

**10.6**  
**METRIC  
TONS  
OF CO<sub>2</sub>e  
per resident**

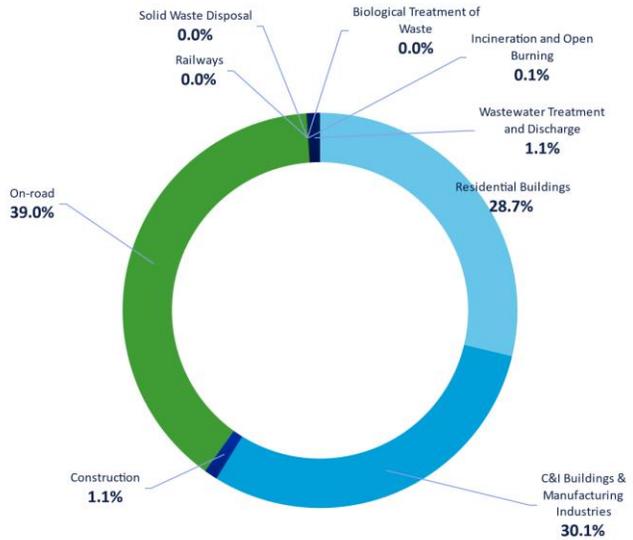


for details on the data sources and methods). Neighboring communities, including Acton and Westford, have completed GHG inventories using the same tool and methodology. (5) (6)

**WHAT ARE THE SOURCES OF EMISSIONS IN CHELMSFORD?**

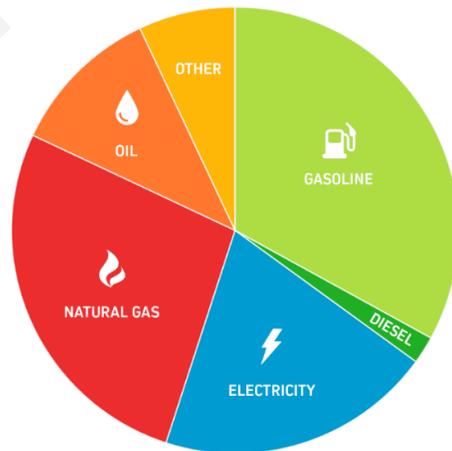
In Chelmsford, buildings are the largest source of GHG emissions (60%). On-road transportation is another major source of emissions (39%). Chelmsford’s solid waste and wastewater account for about 1% of our community’s total emissions.

**Percent of Total Community-wide Emissions by Subsector**



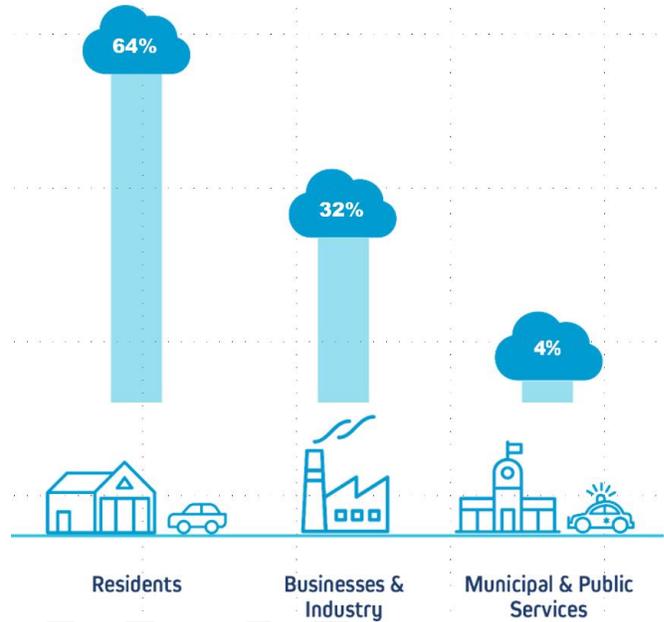
**WHICH FUELS GENERATED THE MOST EMISSIONS IN CHELMSFORD?**

Our 2017 inventory of greenhouse gas emissions shows that the combustion of fossil fuels, such as oil, natural gas, diesel, and gasoline, was responsible for 73 percent of our community-wide emissions. The additional emissions are from gas-fired power plants located outside our town that provide our electricity.



### WHO IS RESPONSIBLE FOR EMISSIONS IN CHELMSFORD?

In Chelmsford, nearly two-thirds of emissions come from residents' homes and vehicles and another third comes from businesses and industry in Chelmsford.



### WHAT EMISSIONS ARE NOT INCLUDED IN THE 2017 GHG INVENTORY?

While the 2017 GHG inventory covers a majority of the largest sources of emissions in Chelmsford, there are a few gaps not covered by the analysis. One area not addressed is the carbon capture and storage benefits of enhancing the Town's natural assets (e.g., trees, wetlands, and soils). Chelmsford will be working to address this side of the emissions equation as the plan develops.

### GETTING TO NET-ZERO

Chelmsford has committed to reaching Net-Zero GHG emissions by 2050. What exactly does this mean for our community? Why does our local goal matter? How will we get there and what do we need to do to reach that goal? This initial Climate Action Plan provides specific strategies and creates a roadmap for our town to reach Net-Zero by 2050.

### WHAT DOES "NET-ZERO" MEAN?

Reaching "Net-Zero" means that Chelmsford will reduce its GHG emissions as much as possible and remove or offset any remaining emissions by 2050 and ideally sooner. This will require a behavioral shift in thinking and actions in a number of areas, including how we heat and cool our homes, how we get around, and where our energy comes from, and how we value our natural resources. It also presents a huge opportunity to change our community for the better.

Net-Zero GHG emissions also creates cleaner air, healthier people, and a more equitable and prosperous community for everyone.

### WHY NET-ZERO?

Climate scientists have made it clear that we need to reduce global GHG emissions to Net-Zero by 2050, or sooner, to avoid catastrophic climate change (7). The planet has already warmed by about 2° F (1° Celsius) since we started burning fossil fuels like coal, oil, and gas in the mid-1800s. The United Nations Intergovernmental Panel on Climate Change has determined that if we can keep warming below 2.8°F

(1.5° Celsius), we can avoid the worst impacts of climate change like extreme floods, wildfires, and droughts (8).

We have a limited “carbon budget,” or amount of GHG pollution that we can afford to put into the air without passing this limit. **The longer we wait to start reducing our GHG pollution, the faster we use up our carbon budget and the less time we have to meet our goal.**

To reach our Net-Zero goal, we will need help from global, federal, state, and regional policies that support our transition to clean energy and reduction of emissions. Both the Commonwealth and the Federal government have implemented many planning and funding programs to help citizens and communities reach the goal.

### **GETTING THERE EQUITABLY**

Climate change is likely a challenge to life on the planet, but also an opportunity to make our community and the world safer, healthier, and more equitable for all. Massachusetts municipalities are increasingly undertaking climate mitigation and adaptation strategies in ways which seek to advance equal sharing of societal benefits among all residents. Making equity considerations central in our plans will help mitigate past inequities which will become even more severe in the future due to climate change degradation.

### **HOW DO WE GET THERE?**

The basic principles of achieving Net-Zero are clear and are outlined in the Massachusetts 2050 De-carbonization Roadmap (9): we must change where our energy comes from and make our buildings and vehicles able to operate without use of fossil fuels.

### Section 3: SIX TRANSITIONS TO REACH OUR NET-ZERO GOAL

**Convert to 100% renewable energy.** Renewable energy comes from sustainable sources such as wind, the sun's heat or light, and heat from the earth beneath our feet. Our electricity is getting greener all the time thanks to state and local policies. Presently about 20% of Chelmsford's residential electricity comes from renewable sources, although natural gas, a key fossil fuel, still powers most electricity generation in New England.

We in Chelmsford have the option to choose to purchase entirely renewable electricity now, and doing so will help drive the market to produce more renewable energy sooner.

**Local production of renewable energy.** Generating more renewable energy locally avoids the expensive and inefficient long-distance transmission of power, and small-scale clean energy projects, such as rooftop solar Photovoltaic (PV), can provide new power sources more quickly than large developments.

**Building Energy Efficiency.** Making existing buildings very energy-efficient and constructing new buildings to new high efficiency standards will reduce emissions and make energy bills more affordable for everyone.

**Electrification of our residential and commercial buildings.** Switching to modern technology including heat pumps, air source geothermal, and induction cooking immediately reduces carbon emissions, improves indoor air quality and makes buildings safer by removing combustible and explosive fossil fuels.

**Electrify transportation.** Cars, trucks, buses, trains. Electric vehicles are cleaner, cheaper to run over time, and require less maintenance. Provide access to charging stations. Create electric transportation options for those who do not own vehicles.

**Improve our infrastructure.** Promote and support walking, biking, and public transit as practical ways to move around our town. This not only reduces emissions and air pollution but also provides opportunities for residents to be healthier and more connected to their community. While upgrading infrastructure, take the opportunity to improve our local natural environment, with special attention to trees and plants which draw carbon out of the atmosphere and provide a local cooling effect. (Although the physical area of Chelmsford is too small for this to be a principal strategy of achieving Net-Zero, it is still important because how we treat our environment is a proxy for our overall ambitions for a truly viable and sustainable world. This, after all, is our overarching goal in achieving Net-Zero).

### TAILORING THE PLAN WITH PUBLIC INPUT

The Clean Energy and Sustainability Committee is seeking feedback from the Town departments and committees and also residents and businesses. In particular --

1. Do you support the general goals outlined in this emissions report?
2. Are there particular suggestions that you have which you believe can help our town reach Net-Zero by mid-century?
3. Would you like to be involved in this process?

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## Section 4: Chelmsford Clean Energy Supply – Path to 2050

To help Chelmsford reach Net-Zero greenhouse gas (GHG) emissions by 2050, the Town will need to meet the energy needs of our homes, businesses, and vehicles with 100 percent renewable sources of energy.

The following three strategies will help achieve the 2050 Net-Zero goal:

**Increase renewable energy generation, use, and access**

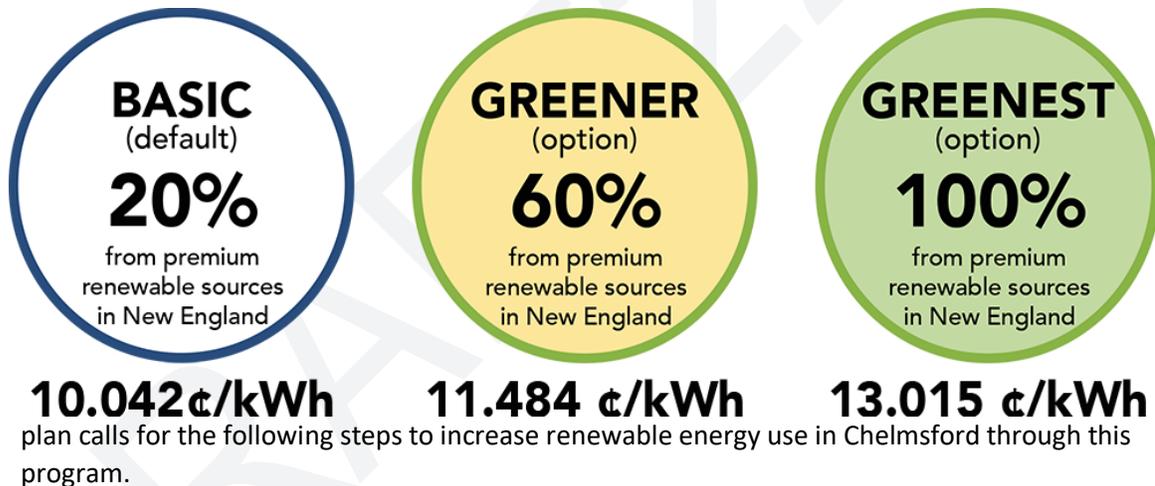
**Build smart, resilient energy infrastructure, and**

**Reduce the carbon impact of the natural gas pipeline system.**

### Strategy CE1. Increase renewable energy generation, use, and access

#### 1. Strengthen Chelmsford’s current municipal energy aggregation program (Start 2022-23)

About 20% of Chelmsford’s residential electricity use is from renewable sources through the electric grid. Chelmsford Choice- the Town’s electricity aggregation program- gives Chelmsford residents and businesses a clean energy alternative. Chelmsford residents and businesses can enroll in one of three programs with different clean energy portfolios and different costs: This



- Recruit additional Chelmsford residents to join the Chelmsford Choice program.
- Encourage residents currently enrolled to step up to the “greenest” option.
- Increase the amount of renewable energy in the “basic” portfolio from 20% to 50% at next contract renewal.
- Increase the amount of renewable energy in the “greener” portfolio from 60% to 75% at next contract renewal.
- Change the default option from the “basic” option to the “greener” option at next contract renewal.
- Connect Chelmsford Choice to a solar installation in Massachusetts that provides a discount to low-income customers via the Solar Massachusetts Renewable Target (SMART) program. (at next contract renewal) <https://www.mass.gov/doc/alternative-licss-and-css-programs-guideline-october-2020/download>

2. **Maximize renewable energy generation on municipal property and encourage residential and commercial renewable energy generation** (Start 2023-24) Municipalities are installing solar PV in multiple configurations – municipal rooftops, parking canopies, and ground-mounted installations. Some communities are working on installing other types of renewables, such as wind turbines, solar thermal systems for hot water heating in municipal buildings, and geothermal generation via ground source heat pumps. An important benefit of the Town installing renewable generation is to lead by example, showing residents and businesses what is possible.

Chelmsford has already done a tremendous job installing solar PV on municipal properties. It is believed that existing Town solar installations provide 70-80% of the Town's current municipal electrical needs. Additional installations will help power future heat pumps in Town buildings, and also support new CSS programs described below.

Specific goals include:

- Assess possible locations for installation of additional renewable energy generation.
- If feasible projects are identified, obtain necessary approvals and funding to proceed.

3. **Develop a community shared solar program** (Start 2023-2024) A community shared solar (CSS) project allows all electricity users to benefit from a specific solar generation project. CSS projects use virtual net metering to allow participants to subscribe to a specific project and receive credits for a portion of the energy generated on their utility bill.

CSS is well-suited to help low-income and renter residents participate in solar PV since participation does not depend on owning a home. CSS is also useful for homeowners who do not have a roof in good condition and/or suitable location for installing solar.

Specific goals include:

- Identify additional opportunities to lease municipal land or rooftop space to set up a program that benefits low-income residents. (Start 2022-23)
- Obtain input from Chelmsford residents who might be interested in program development.
- Seek contract terms from vendors that will eliminate barriers to participation and provide consumer protection (e.g., clear contract terms and easy opt-out options or support if unable to pay utility bills).

4. **Clean Energy Outreach Program:** Community education and outreach will become an important part of this Plan. We will develop an outreach plan to help residents and building owners understand the Net-Zero commitment and how it will be achieved. The outreach will include education on the new technologies that will help achieve the plan, including solar PV, heat pumps, electric vehicles (EVs), and building weatherization programs. The outreach will emphasize and follow incentives provided through the Mass Save program, and if possible, give examples of cost savings from using the upgrades and new technologies.

Specific goals include:

- Meet with the Town Manager and Select Board to discuss roles and responsibilities for a community outreach program.
- Research methods used by other organizations to educate residents and business, and select best practices for Chelmsford.
- Partner with other Chelmsford organizations who have a vested interest to seek their input, including the DPW (Complete Streets program), CCAT citizens team already doing outreach, the Bike and Pedestrian and Tree committees, and others as appropriate.
- Meet with potential partners, including All-In Energy and the 5 major energy efficiency service providers active in Town to seek their advice and consider whether Chelmsford should partner with one or more entities as other Towns are doing. Often called Solarize, HeatSmart, or Solarize Plus, these programs identify and vet qualified vendors, typically via an RFP process.
- Develop a draft community outreach plan and seek public comment.
- Continue existing outreach effort underway by the CCAT Team while plan develops.

**Strategy CE2. Build smart, resilient energy infrastructure** (Start 2024-2025) Municipalities can plan and support centralized clean energy systems, such as district energy and microgrids, which serve multiple buildings via zoning and permitting policies. District energy uses networks of insulated pipes that carry steam or water to heat and cool buildings. Microgrids are localized electrical grids powered by renewables, usually solar PV, and have capability to operate autonomously from the main electrical grid.

1. **Pilot microgrids powered by renewable energy.** (Start 2024-2025) Microgrids can operate independently from the larger electrical grid and serve a specified area, usually at several buildings with proximate energy loads. Microgrids include battery storage and controls and are powered by renewable sources, usually solar PV. Microgrids with energy storage build resiliency into the local clean energy supply- the storage system levels out peak demands that occur at different times of day, and also provides power to the grid during a power outage.

Specific goals include:

- Identify potential sites in Chelmsford suitable to host a microgrid. Microgrids are well-suited to support essential services, such as a fire department, health center, assisted living facility, community shelter, and schools. They can be used in any grouping of buildings such as large apartment complexes, office parks, and shopping districts.
  - Begin discussions early with National Grid about project feasibility and discuss any written approvals needed if the microgrid will cross multiple property owners' boundaries.
  - Engage partners and facility owners/managers who might benefit from the project early on to get input.
  - Pursue funding to commission a feasibility study for a project.
2. **Deploy energy storage at critical facilities.** (Start 2023-2025). Energy storage allows a building to scale back its use of energy from the electric grid at peak times and supply energy back into

the grid when the grid needs more power. Energy storage also increases resiliency by providing power during outages and makes onsite renewable energy more efficient when paired together. Most building-level storage solutions use batteries; lithium ion, lead acid, and electrical chemical (flow) are the most common, with new types such as highly efficient iron-air batteries nearing market viability. There are many battery storage projects coming on line across the U.S. and also in Massachusetts for both individual buildings and the electric grid.

Specific goals include:

- Identify opportunities and priorities for energy storage for both municipal and privately-owned facilities. Questions to address include how much storage would be needed on an emergency or regular basis; facilities in the community that might benefit from storage; and adequate space to locate a battery system.
- Reach out to staff who own and operate a prioritized building to discuss the potential for energy
- Coordinate with the Fire Chief and Inspections Department.
- Develop an RFP for a vendor to conduct a formal feasibility study for potential projects. A good feasibility study will identify goals/metrics for the system, and review energy load and variation, logistics of interconnection to the electric grid, system size, design, lifespan, approximate cost, past energy usage, safety, and government/private funding opportunities.
- Seek funding and financing.
- With funding secured, release an RFP for engineering and construction for a municipal project, or work with a private owner to help move the project ahead.

### **Strategy CE3. Reduce the carbon impact of the natural gas pipeline system.**

1. **Coordinate with National Grid to address major gas leaks.** (Start 2023-2025). Repairing gas leaks helps to eliminate difficult-to-account-for GHG emissions which are considered an important part of the GHG emissions in every community that has gas pipelines- both the large gas transmission lines, and also the local delivery system under our streets. Repairing leaks also improves residents' health and makes the gas network more efficient and safe. National Grid has an ongoing program to identify and repair gas leaks, and Chelmsford has a significant number of identified leaks waiting for repair. Municipalities can advocate for faster repair of super-emitter gas leaks with National Grid and also coordinate and prioritize DPW street projects to reduce the biggest leaks faster.

Specific goals include:

- Establish an internal policy to coordinate municipal paving, water, and sewer
- infrastructure planning efforts with National Grid's plan to repair leaks.
- Ahead of each construction season, hold a coordination meeting with National Grid to align infrastructure repair schedules and establish communications, restoration, paving, and inspection procedures. Use this meeting to check-in on the repair status of gas

leaks, including Grade 3 super-emitters, those that are larger than 2,000 square feet and have Significant Environmental Impact (SEI).

- Where possible, consider expediting Town projects that will involve gas leak repair.
- Check progress internally and with National Grid regularly during the construction season.

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## **Section 5: Strategies and Actions to Reduce Building Emissions**

Almost 60% of the greenhouse gas emissions in Chelmsford are due to buildings, split relatively evenly between residential and commercial/industrial buildings. To become net zero by 2050 Chelmsford must convert almost all buildings to being powered solely by renewable electricity before that date. To accomplish this will involve attention to retrofitting existing buildings with improved insulation and heat pumps. Massachusetts codes will require buildings to be insulated to increasingly higher standards. In the near-term Massachusetts codes will strongly encourage, but not require, exclusive use of electricity to power all new buildings. In progressing toward its commitment of net zero emissions Chelmsford should adopt building code options which best advance decarbonization and also advocate for a Massachusetts code which prohibits fossil fuel use in new construction or extensive renovation projects.

Massachusetts is increasing a number of financial incentives to aid in this transition. Chelmsford will take additional actions to inform our residents and businesses of existing programs and encourage that residents and businesses plan for and use these programs to improve building efficiency. Beyond existing general education potential users want to understand how these unfamiliar all-electric systems can be effective and reliable in their own homes.

A Summary of Strategies and Actions to address Chelmsford's net-zero-emissions goal in the building sector are given in the next page and discussed more fully following this.

### **STRATEGY B1: Support residents and businesses to improve the energy efficiency of their homes and buildings and transition to clean heating and cooling.**

- 1. Educate and promote to all residents and building owners to improve their homes' energy efficiency.** The first step toward removing fossil fuels systems from buildings is to assure good energy efficiency. Mass Save home energy audits are free to town residents, but is still been used by a minority of households. Chelmsford Clean Energy Committee (CEAS) will initiate a multi-year promotion effort to encourage all residents and businesses to take part in these free energy assessment program, with special attention to income-eligible residents. Start Fall 2022, continue for three years.
- 2. Promote residential building electrification and provide consulting support.** The Massachusetts Clean Energy Climate Plan 2050 requires conversion of all buildings in the state away from fossil fuel heating and toward heat pumps (Ref 10). In spite of recently increased incentives residents are still unsure about the adoption of this technology. CEAS will create a program to provide counselling support to help owners understand how heat pumps could work in their buildings. This program will provide guidance for Chelmsford residents on general issues surrounding heat pump adoption and also professional consultation to compare bids for those who actively are planning to install them. Start Spring 2023, continue for three years.
- 3. Adopt the Massachusetts Property Assessed Clean Energy (PACE) program.** Commercial PACE is a financing mechanism to allow commercial property owners to finance clean energy improvements for existing buildings over a long term, thereby encouraging owners of commercial and industrial property to invest. The program lets owners agree to a betterment assessment and lien on their property, sufficient to repay the financing extended by a private

capital provider. (Ref 11). Applications are made directly to MassDevelopment who approves the application and arranges for a betterment fee to be imposed by the town where the building is located. Chelmsford must opt-in to PACE by a majority vote of the board of selectmen. CEAS will advocate and begin the process for PACE to be adopted by Chelmsford by interacting with relevant town agencies. Start adoption process 2023.

**STRATEGY B2: Align Chelmsford's zoning and planning with clean energy and sustainability standards.**

- 1. Promote and encourage full electrification for new- construction buildings.** Planning and building departments will provide developers and owners requesting permits an information packet on the economics and other benefits of electrification for new construction and how this is consistent with Chelmsford goals. Permit applicants will also be required to fill out and file a questionnaire detailing intended building practices and whether these are sustainable. This action fills the gap before Chelmsford's Energy Codes prohibit fossil fuel use in new construction buildings.
- 2. Adopt Massachusetts Specialized Stretch Energy code to minimize fossil fuel use in new- construction building projects.** The Massachusetts Department of Energy Resources (DOER) has produced a Specialized Stretch Energy Code that contains advanced requirements to discourage fuel use in new building construction or extensive renovations. Towns will need to explicitly opt-in to the Specialized Stretch Energy Code by town meeting vote. (Ref 12) CEAS will work toward adoption of the Specialized Stretch Energy Code which is expected to be available December 24 2022. Expected start Jan 2023.

**STRATEGY B3: Lead by example: The town's municipal buildings and schools will improve energy efficiency and transition to net-zero emissions.**

- 1. Adopt a net zero carbon standard for new municipal buildings and town-funded affordable housing.** CEAS will advocate that Chelmsford adopt a zero- carbon standard for future new- construction municipal buildings and affordable housing. Adopting this principle is not only consistent with Chelmsford's net-zero emission goals, but is also cost effective. There is evidence that electrification of new buildings in the Northeast has lower cost of ownership with up- front costs compensated by lower future power costs. Start study and adoption process 2023
- 2. Work toward de-carbonizing existing municipal buildings and town-funded affordable housing.** CEAS will seek resources and conduct a study to determine the cost of electrification of its existing building stock and plan for implementation. This information will be used to develop a building electrification retrofit plan. Start 2025

**STRATEGY B4: Advocate for policy changes and resources to enable rapid and affordable transition to carbon-free buildings and infrastructure.**

- 1. Advocate at state-level for new building codes and policies that will enforce zero emission building standards.** It is clearly incompatible with Chelmsford's goal of reaching zero carbon emissions to continue to construct new buildings which use fossil fuels. However, the Massachusetts Department of Energy Resources (DOER) has not yet prohibited use of fossil fuel

in new buildings in its 2023 proposed Specialized Stretch Energy building code (Ref 2). CEAS will advocate to the Chelmsford Massachusetts State Representatives and Senator and DOER to enable and create a future building code which does prohibit use of fossil fuels in new-construction buildings or extensive renovations. Start 2024 with the next code update cycle and continuing until fossil fuel prohibition is codified.

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**Section 6: Strategies to use Zoning to improve sustainable development.**

The Town has contracted Weston & Sampson (W&S) to conduct a thorough audit of existing zoning regulations and bylaws in Chelmsford with a goal of improving implementation of sustainable development. W&S finished the audit in June 2022, and are working to develop a first draft of actionable recommendations. We expect more details and plans by early 2023.

Meanwhile the CEAS committee is working with the Planning Board to begin integrating sustainability into the permitting process. This will take the form of a questionnaire that applicants will be required to submit along with their permit application. The questionnaire is designed to help the applicant become aware of Chelmsford's climate related goals, and will help them articulate how they plan on minimizing the impacts of their project, if any. The questions will also help expose applicants to sustainable approaches that they may not have considered previously, which itself may help guide their (re) development decisions.

W&S plans to deliver its final set of recommendations in September. This list will be reviewed and prioritized by the CEAS committee and Town government. The finalized list of recommendations actions (some of which may require Town Meeting approval) will be presented to affected Chelmsford departments and Boards later this year.

###

## Section 7: Transportation

Reducing carbon from transportation will be achieved primarily by electrification of the entire vehicle fleet and reducing the vehicle miles traveled.

The Commonwealth has an active planning process to help reduce transportation carbon emissions. In addition, all vehicle manufacturers have solid plans to increase the number of electric vehicles (EVs) produced and increase the range of batteries. Chelmsford will tie into and augment these programs.

There are a number of steps the Town can take to accelerate and enhance the transition to EVs and reduce the total vehicle miles traveled, as described in this chapter.

### Overarching strategies

Chelmsford residents annually generate over 138,000 metric tons of CO<sub>2</sub> from transportation - 39% of our emissions. Emissions from non-residents traveling through the town (on the highway, for example) are not included in this figure. Four overarching strategies will help to bring these numbers to net zero by 2050.

#### **Strategy T1: Support walking, biking, and public transportation options, and look at ride sharing opportunities.**

**1. Adopt a Complete Streets policy and obtain state funding.** Start 2023-2025

The Chelmsford DPW is leading the Town effort for the state program called "Complete Streets" which was established to improve safety and convenience for residents who bike, walk, or take public transportation. This state program includes funding and has an added benefit to our community of prioritizing children, older adults, and people with disabilities. Chelmsford published a complete streets report in 2017 and there appears to be grant funding opportunities to implement the recommendations

**2. Advocate for community and regional transit needs.** Start 2023-2035 Working with the Lowell Regional Transit Authority should be an on-going process to provide Chelmsford residents and businesses with effective service to reduce individual vehicle traffic. Strategies and opportunities will change over time, but prioritizing bus improvements and electrification of the regional transit system are a good place to start.

#### **Strategy T2: Encourage use of zero emission EVs- municipal, business, residents.**

**1. Adopt a zero- emission municipal fleet policy.** Start 2023-24 Adopt a policy of giving strong preference to zero emission vehicles whenever a vehicle serving the municipal fleet needs replacement (including school buses and shuttles). Consider the impacts of the maintenance needs to keep this fleet operational, including maintenance facilities and workforce training

**2. Expand publicly-accessible charging stations.** Conduct planning and seek funding for public charging stations such as the first fast charging station scheduled to be on line at the Chelmsford Forum (ice rink) in the near future. The Town will consider siting additional charging stations- perhaps at libraries, multiservice centers, garages, parking lots, fire/police stations, and other

publicly accessible facilities. Focus on fast-charge stations, and seeking federal/state grant funding.

- 3. Adopt EV charging site guidance to help expedite approvals of new public and possibly private charging stations.** Specify requirements for stations, signage, and wayfinding for both on- and off-street parking. Update regulations and enforcement policies for EV parking spaces.

**Strategy T3: Advocacy & Community Education-** Work with our state and Federal reps to advocate for policies and funding to help the transition- both infrastructure like charging stations, and also community education and outreach as we all make decisions on what type of vehicle to drive.

- 1. Advocate for utility rate design changes.** Start 2025-27 Work with our state reps and National Grid, Mass Municipal Association, the Department of Energy Resources, and others to advocate for the electric grid to have the ability to draw electricity from EV batteries during peak hours to reduce use of fossil fuel peaker plants. Modify electric rates so customers are incentivized to charge EV's off of peak hours, reducing grid load.
- 2. Implement an EV car sharing program.** Start 2025-2035 Consider developing an income-tiered program in partnership with community organizations and affordable housing developments.

**Section 9: Acknowledgements**

**Clean Energy and Sustainability Committee Members**

David Drayton, Sally T. Johnston, Bern Kosicki, Brendan Marshall, Sean McGuigan, Brittany Nammour (Doherty), Peter Spawn, David Sperry, Caeli Tegan, Badhri Uppiliappan, Bethany Ward,

Christopher Haley, Melissa Joyce

David Righter (NMCOG)

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## REFERENCES

1. Article 28 Climate Resolution Chelmsford Spring Town Meeting June 2021  
<https://chelmsfordma.gov/DocumentCenter/View/12331/2021-Spring-Annual-Town-Meeting-Warrant--Constable-Return>
2. AN ACT CREATING A NEXT-GENERATION ROADMAP FOR MASSACHUSETTS CLIMATE POLICY  
<https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8>
3. David Righter (NMCOG) presentation (“Town of Chelmsford Greenhouse Gas Inventory” – CEAS Committee Meeting – April 12, 2022”)   
[https://www.townofchelmsford.us/AgendaCenter/ViewFile/Minutes/\\_04122022-5723](https://www.townofchelmsford.us/AgendaCenter/ViewFile/Minutes/_04122022-5723)
4. Greenhouse Gas GHG Protocol for Cities -An Accounting and Reporting Standard for Cities  
[https://ghgprotocol.org/sites/default/files/standards/GPC\\_Full\\_MASTER\\_RW\\_v7.pdf](https://ghgprotocol.org/sites/default/files/standards/GPC_Full_MASTER_RW_v7.pdf)
5. Acton Climate Action Plan Blueprint December 2021 <https://www.acton-ma.gov/DocumentCenter/View/7404/CAP-Blueprint>
6. Westford Climate Roadmap November 2021  
<https://westfordma.gov/DocumentCenter/View/10654/Westford-Climate-Roadmap-v1>
7. United Nations News April 2022 <https://news.un.org/en/story/2022/04/1115452>
8. UN IPCC Special Report on Global Warming of 1.5 °C Oct 2018 <https://www.ipcc.ch/sr15/>
9. Massachusetts 2050 Decarbonization Roadmap <https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download>
10. Heat Pump: A heat pump efficiently recovers and transfers thermal energy from the cold outside environment to heat the interior of buildings using the refrigeration cycle. Many heat pumps can also operate in the opposite direction, cooling the building by removing heat from the enclosed space and rejecting it outside.
11. MassDevelopment PACE application site <https://www.massdevelopment.com/what-we-offer/key-initiatives/pace/>
12. 2023 Stretch Energy Code Update and Municipal Opt-in Specialized Code  
<https://www.mass.gov/doc/summary-document-explaining-stretch-energy-code-and-specialized-opt-in-code-language/download>

## APPENDIX

This section is intentionally left blank, and will be updated as we continue to revise the report with public feedback.

## GLOSSARY

This section is intentionally left blank, and will be updated as we continue to revise the report with public feedback

## NOTES ON THIS DRAFT

### DONE

1. Inclusion of updated Building section which addresses DD critical review. No other wording changes to other sections except see 3 below
2. "Acknowledgements" made into a new section with two additions
3. Consistent use of language and paragraph formatting all sections
  - a) Each Section = Start new page.
  - b) Paragraph formatting hierarchy consistent for strategies and actions/goals.
  - c) Uses formatting common to other towns' CAPs, particularly Acton's
4. Executive summary has (optional) Strategies and Action Summaries added.

### IN PROCESS

1. Update Outreach plan (first version is already in CAP) for
  - a. When next release? Post this date
  - b. How to distribute? Create Town website page
  - c. What is the plan for gathering feedback:
    - i. Public presentations? Surveys? Fair/table participation? Other?
    - ii. Try to be specific
    - iii. Main Channels we will use
2. Include intermediate goal for GHG emissions (eg 2030).
  - a. The committee has already talked about this but hasn't done anything yet.
  - b. Gov Baker filed CECP 2030 plan Goal = 45% reduction,
  - c. Next Gen Climate Bill 2021 Goal = 50% reduction.
  - d. What is our goal? What will we do to get there?
3. Updates for any of the four teams since Aug 2022.
  - a. Building section rewritten and inserted after DD critical review.
    - i. Reorganized with new higher level strategies
    - ii. Some new actions added.
    - iii. Text changes reflected DD's comments
4. Should there be a new section on Other Sustainability? Might include
  - a. Importance of Diet in net zero planning (globally livestock = 15-20%, but none in Chelmsford)
  - b. Trees (important globally but less in Chelmsford)
    - i. Chelmsford- policy and practice
  - c. Personal Actions? This is one way to start individuals to pay attention.

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