



Our plan to reduce greenhouse gas pollution to net zero by 2050

April 2022

City of Melrose

NET ZERO ACTION PLAN



Table of Contents

TABLE OF CONTENTS	1
ACKNOWLEDGEMENTS	2
LETTER FROM THE FUTURE	4
GETTING TO NET ZERO	5
NET ZERO ACTION ROADMAP	17
OUR HOMES AND BUSINESSES	19
GETTING AROUND MELROSE	27
WHERE OUR ENERGY COMES FROM	35
IMPLEMENTATION: WHAT'S NEXT?	41
NET ZERO ACTION ROADMAP SUMMARY	43
APPENDIX A: NET ZERO ROADMAP MILESTONE SUPPORTING DOCUMENTATION	52
END NOTES	55

Acknowledgements

Office of Planning and Community Development, City of Melrose

Denise Gaffey, Director

Martha Grover, Sustainability Manager

Lori Massa, Senior Planner

Volunteers representing the Melrose Energy Commission, Melrose Climate Action, Melrose Pedestrian & Bicyclist Committee and others

Tyler Ballew

Susan Gitelle Baron

Dave Bliss

Ben Butterworth

Jonah Chiarenza

Doug Dick

Rodney Dowell

Jim Garrett

Charlie Harak

Doug Harriott

Ellen Katz

Cassandra Koutalidis

Gary Lamothe

Finn McSweeney

Lisa Montouri Trimble

Ian Moriarty

Susan Murphy

Sunil Sainis

Lori Timmermann

Gabrielle Watson

Ryan Williams

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MAPC Staff

Megan Aki, Clean Energy and Climate Systems Manager

Brooks Winner, Senior Clean Energy Specialist

Nicole Sanches, Former Clean Energy and Equity Specialist I

Cover photo credit: Jim Harrington

Letter from THE FUTURE

Dear Melrose Residents of 2022,

We know that the last few years have been tough in so many ways but please be reassured that you will soon emerge to a brighter future. You may ask yourself, how do we know this? Because we are here, decades in the future, already.

Chastened by the unmitigated disaster of Covid-19, and the imminent existential threat of climate change, America signaled a new era of possibilities had arrived. Eventually, legislation at the local, state and national levels was enacted to revitalize and drive economic and social equality, together with programs for substantially greater environmental quality.

With new momentum spreading across the globe by the 2030's, the dawning of the Sustainable Age arrived as an era of regenerative economic growth driven by the benefits of emerging new technologies and fostering prosperity even as fossil fuel use dramatically declined.

The technological innovations of developing both industrial scale and decentralized sustainable energy sources using wind, waves, tides, solar, biological, terrestrial and hydraulic forces led to vast changes in standards of living across the globe. Self-sustaining redevelopment alleviated many local and global climate threats.

On the local level, communities across the metropolitan Boston area implemented climate action plans in the 2020s to meet the 2050 net zero emissions goal adopted by Boston, Melrose and 12 other surrounding community leaders back in 2016. By 2022, all of the original 14 had begun implementation of the plans and their early success at laying the groundwork began to pay off in the mid '20's as the Sustainable Age gained widespread momentum across New England and other areas of the country.

Energy-efficient heat pump technology to condition our homes and buildings and demand for electric vehicles (EVs) became widespread. Even automobile manufacturers pivoted rapidly away from fossil fuels with most switching to all EVs by 2035. Electric utilities accelerated procurement of renewable energy to meet consumer demand. These and other societal changes led to dramatic improvements in air and water quality.

We extend our heartfelt thanks to the many Melrose citizens whose shoulders we stand on. For it was all of you, who turned your concern for the environment to action, nourished by the small successes, in order to make meaningful change to our community and the larger world. We wish for you all the good fortitude, strength, and continuing love for our Earth needed to make the promise real.

Sincerely,
The 2050 Melrose Energy Commission

Getting to Net Zero

Melrose has committed to reaching net zero greenhouse gas (GHG) pollution 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 Net Zero Action Plan aims to answer these questions and to create a roadmap for our city to reach net zero by 2050.

IN 2017, OUR CITY WAS RESPONSIBLE FOR EMITTING

187,642

METRIC TONS OF CO₂e

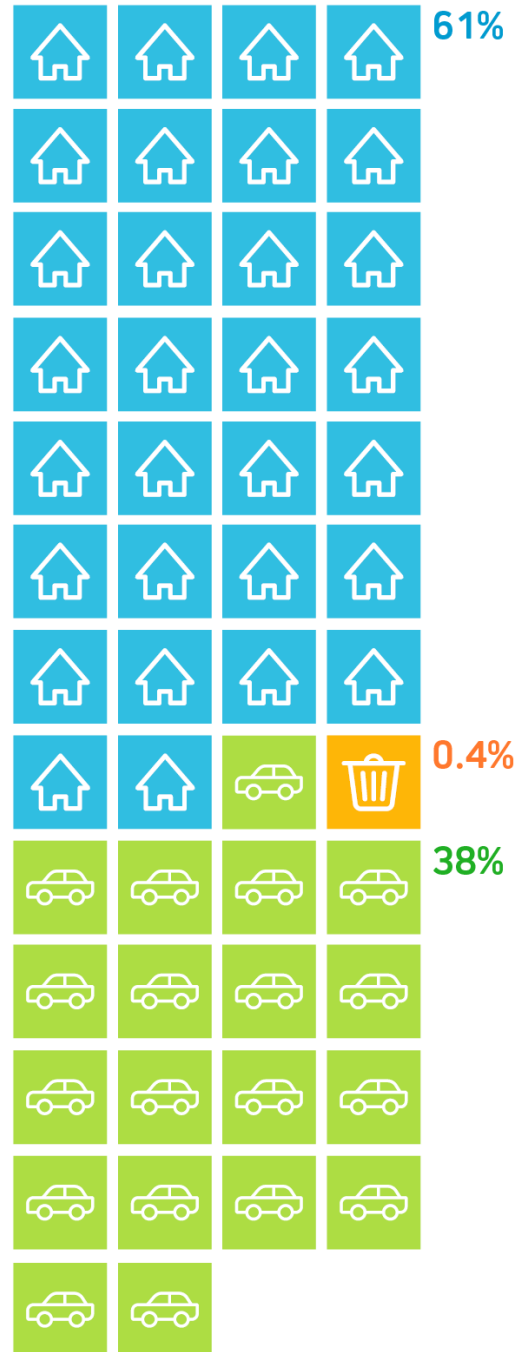
in MELROSE THAT WORKS OUT TO

7

METRIC TONS OF CO₂e per resident



OUR EMISSIONS BREAKDOWN



WHERE ARE WE STARTING?

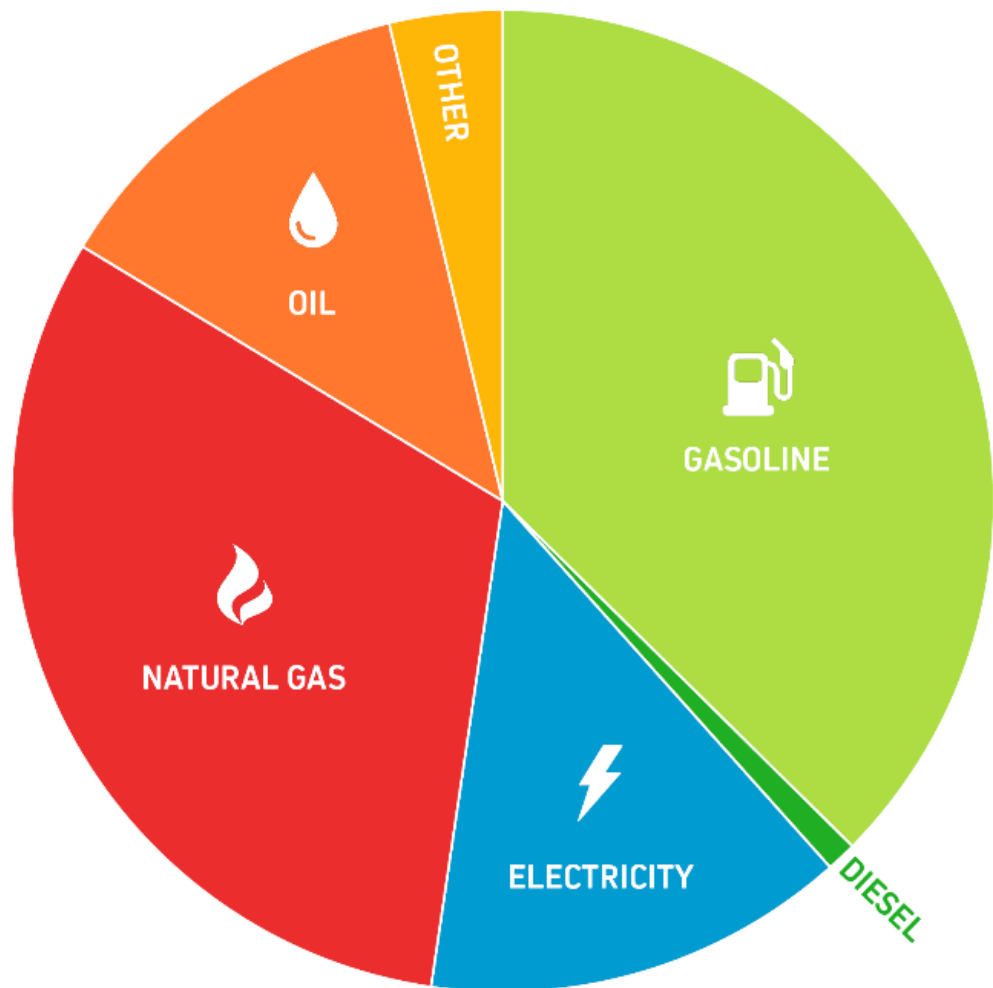
Every day, Melrose residents and businesses rely on fossil fuels to heat and cool our homes, keep the lights on, power our electronics and drive our cars. In doing so, we release **greenhouse gas emissions**.

In 2020, City staff and volunteers worked with MAPC to identify the primary sources of emissions across our community for 2017, the most recent year for which complete data were available, to calculate a baseline for future emission reductions (see Appendix A for the methodology).

In Melrose, buildings are the largest source of emissions (61%). On-road transportation is another major source of emissions, more than 38%.

Which fuels generated the most emissions in Melrose?

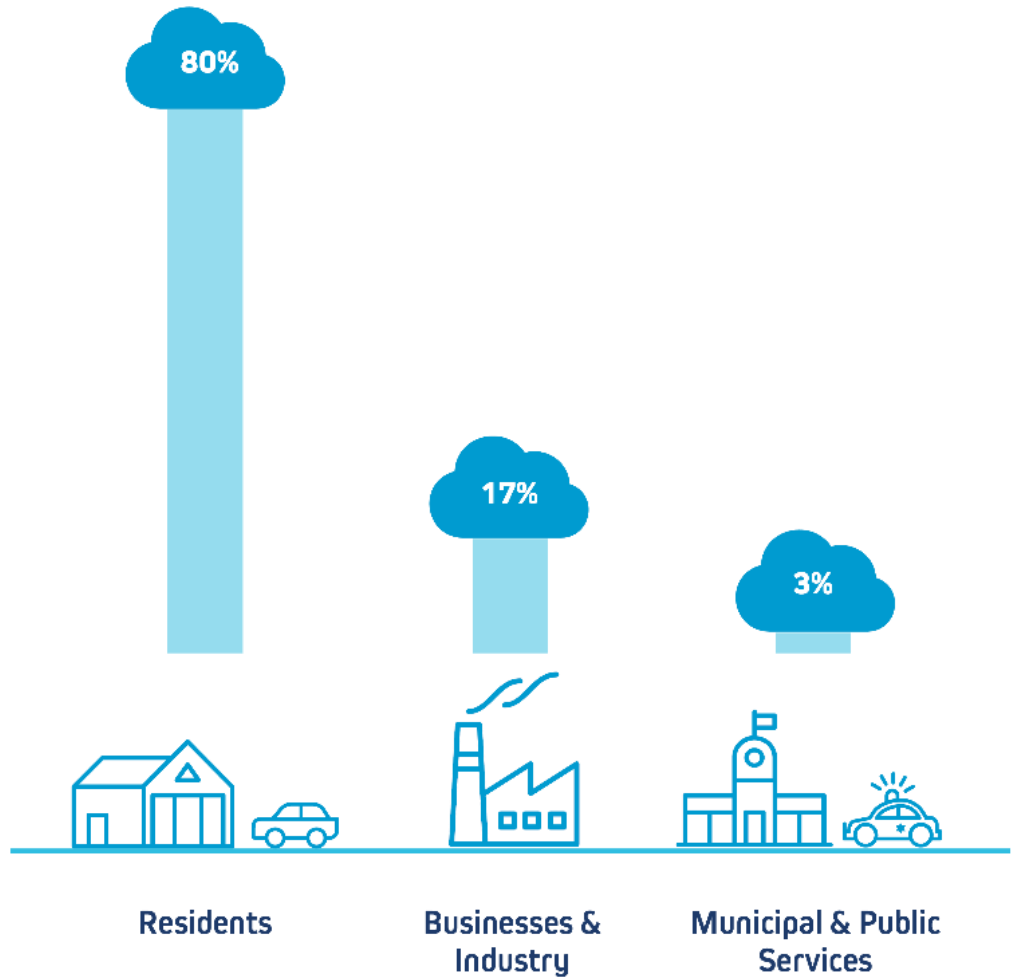
The types of fuel sources our homes, businesses, and vehicles rely on every day generate different amounts of emissions in our community. Our 2017 inventory of greenhouse gas emissions shows that the combustion of fossil fuels, such as oil, natural gas, diesel, and gasoline, was responsible for over 82 percent of our community-wide emissions.



SOURCE: MELROSE'S 2017 GREENHOUSE GAS INVENTORY

Who is responsible for emissions in Melrose?

As a community, the actions and choices we make each day contribute to the amount of emissions we are responsible for. In Melrose, over 80 percent of emissions come from residents' homes and vehicles and another 17 percent comes from businesses and industry in Melrose.



SOURCE: MELROSE'S 2017 GREENHOUSE GAS INVENTORY

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.

We know that the planet has already warmed by about 1° Celsius since we started burning fossil fuels like coal, oil, and gas in the mid-1800s.ⁱ We also know that if we can keep warming below 1.5° Celsius we can avoid the worst impacts of climate change like extreme floods, wildfires, and droughts.ⁱⁱ The Intergovernmental Panel on Climate Change's 2019 special report, [Global Warming of 1.5°C](#), says that in order to give ourselves a chance to limit global warming to 1.5° Celsius we will need to reduce GHG pollution 45% by 2030 and to net zero by 2050. This means that we have a limited "carbon budget," or amount of GHG pollution that we can afford to put into the air without exceeding 1.5° Celsius of warming.

The longer we wait to start reducing our GHG pollution, the faster we use up our carbon budget and the less time we give ourselves to meet our goal. That is why getting to net zero matters and why we have chosen 2050 as our target date.

We recognize climate change is a global problem and that many of the solutions are beyond our control. To reach our net zero goal, we will need help from global, federal, state, and regional policies that support our transition to clean energy, but we can lead at the local level. During the spring of 2021, the Commonwealth enacted Senate Bill 9, An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy, which set the interim GHG reduction targets of no less than 50% by 2030 and 75% by 2040.ⁱⁱⁱ Our net zero roadmap highlights the strategies that we can deploy locally to accelerate this transition over the next several years.



Source: [Architecture2030.org](https://www.architecture2030.org)

WHAT DOES “NET ZERO” MEAN?

Reaching “net zero” means that our community 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 major shift in the way we heat and cool our homes, how we get around, and where our energy comes from. It also presents a huge opportunity to change our community for the better. By achieving net zero GHG emissions, we can also have cleaner air, healthier people, and a more equitable and prosperous community for everyone. **Sounds pretty good, doesn't it?**

From this...



...to this!



GETTING THERE EQUITABLY

Climate change is an existential challenge, but it is also an opportunity to re-imagine Melrose's future, and to make that future safe, affordable, and equitable for all who live and work in our community. Massachusetts municipalities are increasingly undertaking climate mitigation and adaptation strategies and are starting to seek out ways to advance equity within those measures. By centering equity in this plan, we can build a future that not only is safer and affordable for all, but also allows each individual in Melrose to thrive. An equitable net zero carbon future must be our goal.

In equitable planning, we must be conscientious of the history of our region, the differences in how populations are able to respond to a changing climate, and the needs of residents. We recognize that the effects of climate change systemically impact Environmental Justice communities and other vulnerable populations inequitably. The comparatively negative health outcomes that people of color experience are one example. The inequities we see today will persist in the future if we do not act.

In addition, as more households switch from natural gas to electricity for heating, it is expected that gas rates will rise for those still dependent on gas heating systems. Careful planning at the state level is needed in order to avoid the cost burden falling disproportionately on low-income households.

The state of Massachusetts considers income, race, and English language proficiency within its definition of an Environmental Justice neighborhood.^{iv} The Environmental Justice neighborhoods in Melrose meet either the state's income or minority population Environmental Justice criteria, or both.

Accordingly, it is essential to assess the potential social equity impacts of climate mitigation strategies. For our plan to be actionable and for our vision of the future to be equitable, we must prioritize equity throughout the planning and implementation of our net zero strategies. An equitable Net Zero Plan investigates the anticipated outcomes of its proposed actions on environmental justice communities and other vulnerable populations.

HOW DO WE GET THERE?

A lot can change in 30 years and this plan is a starting point on our path to net zero that we will revisit and adjust as we continue to move forward in the coming years. We know that we need to make our buildings and vehicles, the two major sources of emissions in our community, much cleaner and more efficient. To reach our net zero goal, our community will need to work towards five core transitions.



Make our homes and businesses super-efficient.

Making existing buildings super-efficient and constructing new buildings to high efficiency standards will reduce emissions and make energy bills more affordable for everyone because the cheapest energy is the energy you don't use.



Electrify heating and cooking equipment.

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



Electrify cars, trucks, buses, trains, and other ways we get around.

Electric vehicles are cleaner, cheaper to run over time, and require less maintenance. Providing access to charging stations and creating electric transportation options for those who do not own vehicles are essential to this transition.



Make walking, biking, and public transit the best way to get around.

By designing greener and people-centered streets and sidewalks, we can reduce emissions and air pollution while also making residents healthier and more connected to their community.



Green the grid and produce more renewable energy locally.

Renewable energy comes from endlessly sustainable sources such as wind, the sun's heat or light, or the earth beneath our feet. Our electricity is getting greener all the time thanks to state and local policies, but natural gas still provides most of our electricity in Massachusetts and it has to be imported from out of state. Locally produced renewable energy makes the air we breathe cleaner and benefits the local economy in multiple ways.

WHAT HAVE WE ALREADY DONE?

As a member of the Metropolitan Mayors Coalition, the City of Melrose signed a commitment in 2016 to achieve net zero emissions as a region by 2050. The Melrose Sustainability Manager and the Melrose Energy Commission have worked together on behalf of the City over the last decade to reduce greenhouse gas emissions.

LEADING BY EXAMPLE



Green Community since 2010. Designated a Green Community in 2010, Melrose has since received more than \$2 million in grants and utility incentives for dozens of energy efficiency projects in city and school buildings and LED streetlight upgrades. Melrose currently hosts 11 public EV charging stations and includes three battery EVs in its municipal fleet as well as a water meter van with a hybrid retrofit system. The roofs of the high school, middle school, and DPW Operations Facility are covered with solar arrays.

BUILDINGS



Melrose Energy Challenge. Two community outreach efforts in 2011 and 2016 incentivized homeowners to take advantage of MassSave home energy assessments and weatherization projects. Continued outreach results in about 600 energy assessments and more than 200 insulation projects annually which save homeowners energy and reduces community emissions.



Melrose Heat Smart Campaign. In 2020 Melrose launched a clean heating and cooling outreach program called HeatSmart Melrose with the support of the Massachusetts Clean Energy Center. Heat pumps and solar hot water systems were promoted with much success and over 138 new installations completed. The program laid the groundwork for continued education and awareness efforts to encourage property owners to consider non-fossil fuel options for heating and cooling.

MOBILITY PROGRESS



The Melrose Pedestrian and Bicyclist Committee has worked with the City over the years to increase access and safety for pedestrians and bicycles via Complete Streets projects and infrastructure improvements. Improving public transit and fighting to maintain service levels continue to be top priorities for elected officials and commuters who depend on it daily.

Smart Growth in Melrose. Long before the terms “transit-oriented development” and “smart growth” became commonplace, the City of Melrose created opportunities for dense development near transit through progressive zoning and cooperative relationships with developers. The City has had progressive, growth-oriented zoning in place since the early 1980s and, in recent years, has seized opportunities to promote high-density housing in our transit-rich locations. Two overlay districts established in 2008 and 2014 incentivize dense, mixed-use



PHOTO CREDIT: CITY OF MELROSE

development near public transit on Washington Street and Rail Corridor. In 2021, the Planning Board also approved an incentive program for the zoning districts around the Commuter Rail Stations that is meant to incentivize higher densities in exchange for providing community benefits like green building practices.

EV Charging Infrastructure

In an effort to make electric vehicle charging accessible and easy, Melrose has taken advantage of state grants and utility incentives to install 11 public electric vehicle charging stations (19 total ports) over the last seven years. The most recent chargers are utility pole-mounted chargers – the first of this type of equipment to be installed on the east coast – as a demonstration project with National Grid. Public EV charging is convenient to shopping areas, parks and recreation, as well as to renters and condo owners who may not have the ability to install chargers at home.

CLEAN ENERGY PROGRESS

Solarize Mass Melrose. This 2012 outreach project resulted in 79 homeowners signing up to participate, 425 kW of solar installed, and \$48,000 annual energy savings. The number of rooftop solar installations has grown from nine in 2011 to 526 by the close of 2021 with more permits in process.



PHOTO CREDIT: RESONANT ENERGY



Melrose Community Power Program. The primary goals of the program are to provide competitive choice, longer-term price stability and more renewable energy options to participating consumers. About 90% of Melrose households participate in Melrose Community Power (MCP). Under the new contract that began in November 2021 the program allows residents to choose to support local renewable energy by purchasing 10% more renewable energy than is required by the state. The Massachusetts Renewable Portfolio Standard (RPS) mandates levels increase annually so that in 2022 when the state requirement is at 20% the additional 10% in the MCP program will result in 30% of the supply coming from local Class 1 sources such as wind, solar, and low-impact hydro energy. There is also an option called Melrose 100% Local Green that more than 200 residents have chosen to purchase.

WHAT HAVE WE HEARD FROM THE COMMUNITY?

Melrose's Net Zero Action Plan was developed by the City of Melrose, in a collaborative effort between municipal staff, committee members, residents, and businesses, with support from the Metropolitan Area Planning Council (MAPC).

The Melrose Energy Commission, with key input from the Melrose Pedestrian and Bicyclist Committee, served as the primary advising body in developing the Plan. The committee received training from MAPC on developing a greenhouse gas inventory to inform the plan development and leading focus groups to expand current and future engagement of key stakeholders.

The strategies and actions identified in the Plan were primarily informed by research MAPC completed on other communities' climate action plans and align with MAPC's Municipal Net Zero Playbook, a regional guide for municipalities seeking to reduce emissions. The final priority actions included reflect Melrose's net zero journey, community feedback, and the major sources of GHG emissions in Melrose.

VICTORIAN FAIR KICK-OFF

In 2019, the volunteers engaged residents at the City's annual Victorian Fair and shared information about the net zero planning process commencing in Melrose.



PHOTO ABOVE: SUSTAINABLE MELROSE BOOTHS AT MELROSE'S SEPTEMBER 2019 VICTORIAN FAIR
Melrose's Net Zero Action Plan

COMMUNITY SURVEY AND ONLINE OPEN HOUSE

In September 2020, Melrose residents were invited to participate in an online survey and provide input on the planning process. Participants were asked to share what their concerns were related to climate change and what strategies they believed the City should prioritize in the Plan. More than 500 people completed the survey. It was followed by an Online Open House in December 2020 that solicited still more feedback on the draft.

HOW CAN YOU BE A NET ZERO HERO?

Getting to net zero is a journey that will require Melrose to assemble its own A-Team. There is a place and a way for everyone in our community to contribute to, and benefit from, achieving our net zero goal. While this Net Zero Action Plan highlights the strategies and actions our municipal government will take to support our community-wide goal, we also want all members of our community to envision themselves as Net Zero Heroes on Melrose's A-Team.

Community members of all types – from residents to large employers and everyone in between – are invited to be Net Zero Heroes. Below are some ways you are encouraged to participate in Melrose's net zero journey:

Melrose Resident: Share your voice, get involved, and take action on choices in your control (e.g., complete an energy audit, insulate and air seal your home, go solar, switch to clean heating, make your next car electric) and participate in the local and state programs available to support you.

Melrose Small Business: Share your commitments with customers and staff. For those in a climate-adjacent field – such as electricians, HVAC specialists, plumbers – participate in the green economy and support “green growth” locally.

Larger Employer or Local Institution: Provide programs that assist employees in decarbonizing their homes and commute, and work with other large businesses to share experiences and support community-wide GHG emissions reductions.

Elected and Appointed Officials: Consider how the decisions your Board, Committee, or legislative body will impact Melrose's net zero goal. Advocate and vote to support policy or regulations that advance actions identified in the Net Zero Plan.

Municipal and School Staff: Lead by example with new public facility construction and renovation projects and when possible, purchase zero emission fleet vehicles. Continue to make municipal buildings and school as energy efficient as possible and add solar to new roofs as they are replaced.

Net Zero Action Roadmap

The City of Melrose developed this Net Zero Action Roadmap to inform our next five years of action to reduce greenhouse gas emissions across all sectors of the City's economy.

Informed by engagement with Melrose's Climate Action Committee members, municipal staff, and the public, the following actions have been prioritized to identify immediate next steps for the City to implement based on potential for impact.

For the five core transitions we know we need to make to achieve net zero, the City has identified **milestones** to work toward by 2030 and 2050. The **strategies** and **actions** identified in the City's Net Zero Action Roadmap all contribute to our efforts to achieve progress towards the key milestones listed below.

Make our homes and businesses super-efficient.



Electrify heating and cooking equipment.



Make walking, biking, and public transit the best way to get around.



	TODAY	2030	2050
Make our homes and businesses super-efficient.	<p>All new buildings built to the state stretch energy code.</p> <p>24% of residents participate in the MassSave Program^v</p>	<p>All new buildings built to net zero standards.</p> <p>20% of homes and businesses have undergone deep energy retrofits.</p>	<p>Nearly all existing homes and businesses in Melrose have had deep energy retrofits.</p>
Electrify heating and cooking equipment.	<p>Approximately 12% of homes rely on electric heating, primarily low efficiency electric baseboard heating.^{vi}</p>	<p>80% of homes previously on fuel oil, propane, or electric baseboard heat have converted to high efficiency electric heat (heat pumps).</p> <p>10% of homes currently on gas heat have converted to high efficiency electric heat.</p>	<p>Nearly all homes and businesses rely on high efficiency electric heating.</p>
Make walking, biking, and public transit the best way to get around.	<p>Approximately 27% of residents walk, bike, or take public transit to work.^{vii}</p> <p>Average number of cars per household is 1.55.</p>	<p>All new developments are accessible by biking, walking, or connected to public transit.</p> <p>Average number of cars per household is below 1.47 (e.g., vehicle miles traveled are reduced by 5%)</p>	<p>All key destinations in Melrose are accessible by biking, walking, or connected to public transit.</p>

Electrify cars, trucks, buses, trains, and other ways we get around.



Less than 0.1% of vehicles registered in Melrose are zero emissions.^{viii}

60% of new vehicle purchases are zero emissions.

37% of registered vehicles are zero emissions.

Nearly all passenger and commercial vehicles registered in Melrose are zero emissions.



Green the grid and produce more renewable energy locally.



Our electricity supply comes from 21% carbon-free sources.^{ix}

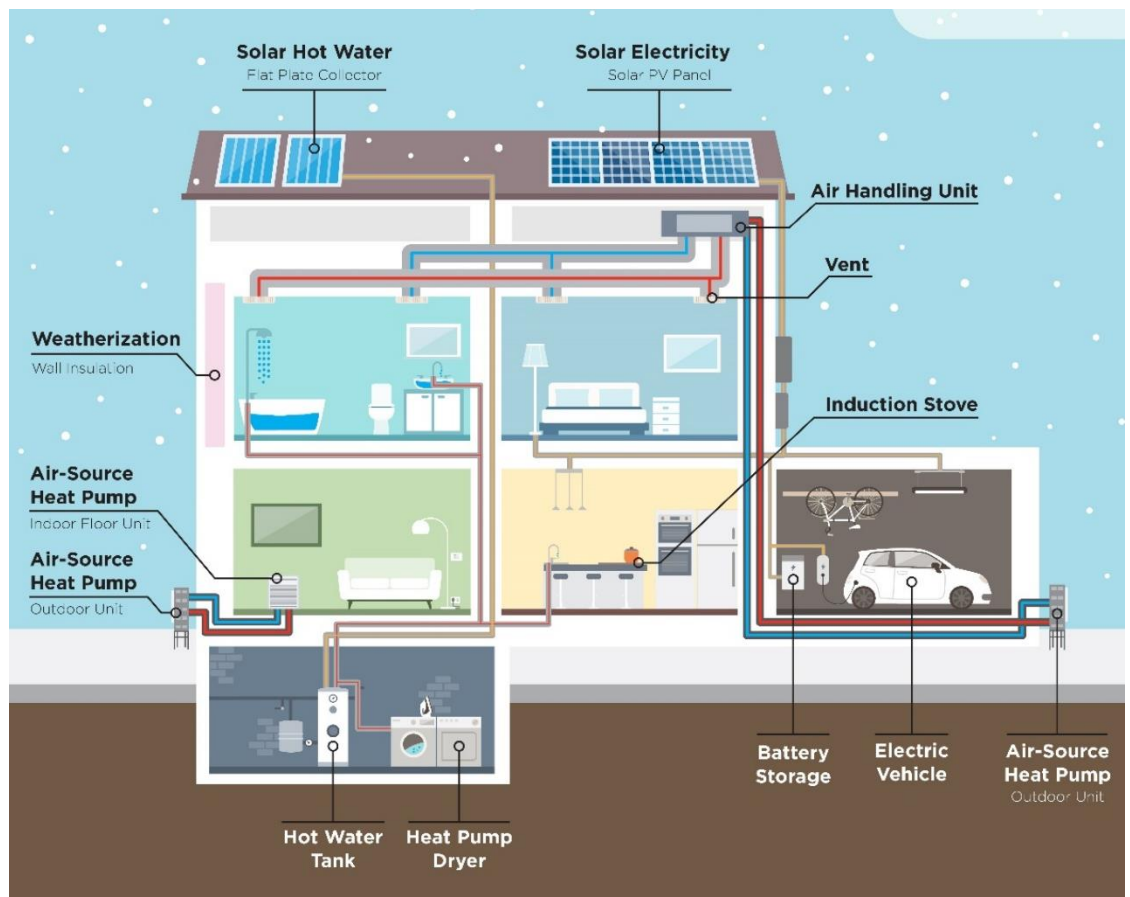
Our electricity supply comes from 100% carbon-free sources.



OUR HOMES AND BUSINESSES

Making our homes and buildings super-efficient and electrifying our space and water heating and cooking are core to Melrose's Net Zero Action Plan. The City of Melrose commits to implementing actions that advance the following strategies:

- Strategy 1. Electrify fossil-fuel end uses.
- Strategy 2. Maximize uptake of residential energy efficiency and deep energy retrofits in existing buildings.
- Strategy 3. Target energy efficiency retrofits of large multi-family buildings.
- Strategy 4. Adopt policies to Incentivize energy efficiency and renewable energy in new construction and major renovations.
- Strategy 5. Lead by example with municipal buildings and advocate for net zero building policies.



INFOGRAPHIC CREDIT: MASSACHUSETTS CLEAN ENERGY CENTER

GROUND SOURCE HEAT PUMPS

An energy-efficient heating system which uses energy from the earth to efficiently heat or cool a building.

AIR SOURCE HEAT PUMPS

An energy-efficient heating system which uses electricity to transfer heat from outside to inside a building, or vice versa. The technology can also be used to heat domestic hot water.

SOLAR HOT WATER

A type of domestic hot water heating system that use sunlight to heat water using a thermal collector.

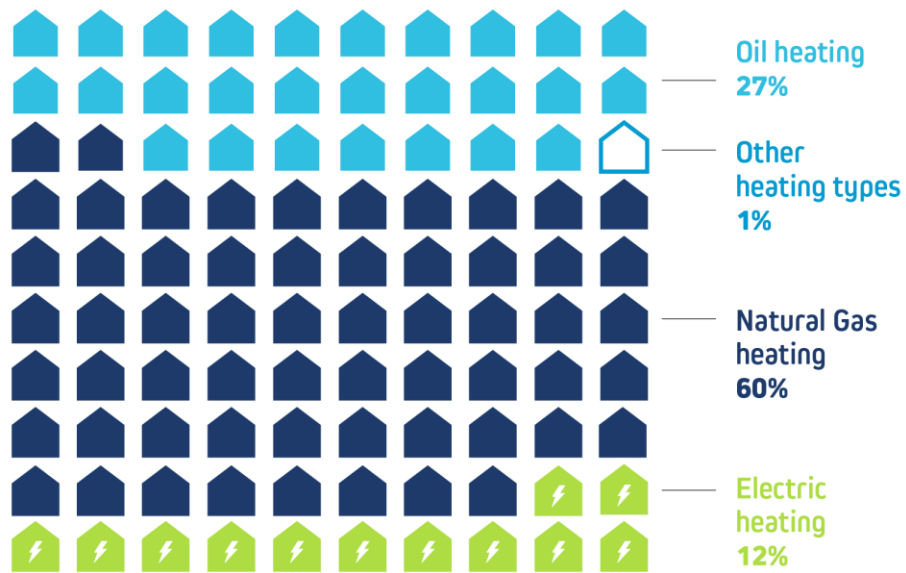
INDUCTION COOKTOPS

A type of electric cooktop with electromagnetic coils beneath a ceramic glass surface that transfers energy

In Melrose, **60 percent of building-related emissions** result from the use of home heating fuels like natural gas and fuel oil. Businesses and industry in Melrose rely less heavily on fuel oil, but the use of natural gas and fuel oil still contribute another 14 percent of building-related emissions. Melrose's older housing stock means the vast majority of homes were built before modern insulation and air sealing practices and can benefit from weatherization and energy retrofits.

Burning oil and natural gas to heat our homes and cook our food creates **66,421 metric tons** of emissions every year in Melrose. It also creates pollution both inside and outdoors. In fact, recent studies have shown that methane leaks from gas-burning stoves is far worse than previously thought.

How are homes heated in Melrose?



SOURCE: AMERICAN COMMUNITY SURVEY 2013-2017 ESTIMATES

Switching to highly efficient electric heating and cooking appliances like **ground-source** and **air-source heat pumps, solar hot water, heat pump hot water, and induction cooktops** immediately reduces carbon emissions and improves indoor air quality, and these benefits only get better as our electric grid gets cleaner. The long life of home heating systems and other appliances means it is important to electrify these systems as they are replaced, to avoid locking new fossil fuel systems that may last for ten, twenty or thirty years.

Strategy 1: Electrify fossil-fuel end uses.

ACTION 1. Create an ongoing “Electrify Melrose” program and campaign.

The City of Melrose will create an on-going “Electrify Melrose” program to help home and business owners transition from fossil fuels to lower emissions alternatives. Melrose’s previous successful Solarize, HeatSmart and Energy Challenge campaigns have shown the potential for community-based outreach campaigns to increase uptake and leverage state funding and incentives.

The new “Electrify Melrose” program would combine the following into a sustained ongoing campaign:

- Support for a range of technologies (see sidebar on previous page);
- Community “electrification coach” advisory services relying on a combination of city staff and volunteer coaches;
- Community-based marketing (outreach using local channels, website, certification program, assisting access to financial incentives);
- Partnerships with installers/manufacturers with discounted and transparent prices;
- Target high-cost oil, propane and electric baseboard heat and systems at the end of their useful life;
- Promote decarbonization planning for future electrification for homes with newer systems.

“Electrify Melrose” should operate in conjunction with home energy efficiency coaching (see Action 3) to provide one-stop shopping for energy saving measures.

Equity Considerations: Target outreach to renters, landlords, residents who speak languages other than English, and low- and moderate-income residents with electrification subsidy programs and income-based MassSave incentives.

ACTION 2. Develop and implement a mechanism for tracking home heating type in Melrose.

The City of Melrose will assess opportunities within existing City reporting mechanisms, such as the Annual City Census form, to reliably and simply collect information on residents’ home heating fuel type. Current local, state, and national datasets on home heating fuel type are limited in the level of granularity and frequency of updates. This provides a challenge to the City’s climate efforts to target and track rapid electrification of homes in Melrose.

Equity Considerations: Provide educational materials regarding different types of home heating systems and how to identify them for both homeowners and renters.

Strategy 2: Maximize uptake of residential energy efficiency and deep energy retrofits in existing buildings.

ACTION 3. Create home efficiency coaching program to assist residents with energy efficiency and deep energy retrofits.

Melrose's historic housing stock presents ample opportunities for weatherization, energy efficiency and deep energy retrofits to reduce both energy costs and greenhouse gas emissions. Home energy efficiency is in many cases the most cost-effective means to reduce emissions from the building sector and residents have indicated the need for better information and guidance in implementing energy efficiency improvements, particularly those that may go beyond MassSave's standard recommendations. Melrose's previous successful Solarize, HeatSmart and Energy Challenge programs have shown the potential for community-based programs to overcome information and cost barriers and increase uptake of energy saving and clean energy improvements.

The Melrose home efficiency coaching program will rely on a City staffperson with residential construction and energy efficiency experience as an initial point of contact to answer resident's questions, direct residents to appropriate resources and provide information on incentives and funding. A combination of City staff and volunteers can provide more in-depth coaching, working in conjunction with MassSave's evolving home energy assessments and incentives as well as the Electrify Melrose program (see Action 1).

Equity Considerations: Target outreach to renters, landlords, residents who speak languages other than English, and low- and moderate-income residents with electrification subsidy programs and income-based MassSave incentives.

ACTION 4. Opt into the state's Commercial Property Assessed Clean Energy (CPACE) law.

Melrose will explore opting into Commercial Property Assessed Clean Energy (CPACE), a financing structure that allows businesses to borrow money for clean energy projects and make repayments through an assessment on their property tax bill. CPACE allows commercial property owners to make more comprehensive clean energy upgrades and finance them with longer payback periods. CPACE financing is available in Massachusetts as of July 2020. Melrose will also advocate with state legislators to sponsor or support legislation that increases funding for incentives and financing that encourage deep energy retrofits, renewable energy, energy storage, and clean heating and cooling for businesses and residents of all income levels that prioritize expanding access to historically underserved populations (e.g., low- and moderate-income, renters, low-English-proficiency households) such as Residential PACE (RPACE) or a Green Bank similar to that of Connecticut.

Equity Considerations: Conduct outreach and education to small businesses that own commercial property in Melrose.

Strategy 3: Target energy efficiency retrofits of large multi-family buildings.

ACTION 5. Consider requiring licensing for rental units to include energy efficiency requirements for ongoing compliance.

One of the largest barriers to implementation of energy efficiency in rental units is that it requires those who own and manage the property, such as landlords and building managers, to invest in efficiency upgrades while those occupying the building units – assuming they are responsible for the utility payments – experience the benefits, including economic, quality of life, resilience, and health benefits. This is known as a “split incentive.” Rental licensing helps to address this challenge and promote energy efficiency in existing buildings by requiring that certain actions, such as energy audits and weatherization, be implemented in rental properties and pass a regular inspection during the point of leasing.

For the 30% of residents who are renters, the City will explore options to establish requirements within the rental licensing process for landlords and building managers to improve their health, safety, and welfare. This could include requirements to provide a minimum level of energy efficiency upgrades to their units. Formalize the timeline of energy efficiency measures so that landlords and building managers can implement appropriate measures strategically. Consider starting with a voluntary program with recognition for joining the program, and ramping up to required rental licensing over time.

The program should provide landlords with flexibility in how to comply, such as the ability to choose which technology, from among a prioritized list or degree of efficiency, is most appropriate. Inspections of rental unit should happen at minimum when the leaser changes, however, more regular inspections could be enforced at a standard interval of time. Results of the inspection should be publicly available for renters.

Equity Considerations: Pair implementation with protection for renters so that they are not displaced by resulting improvements to the property. Enact complementary policies and programs, such as renter protections, free renter legal aid, and renter support phone-lines.

ACTION 6. Target existing multi-family dwellings with electric baseboard or oil heat for conversion to heat pumps.

Melrose’s previous outreach campaigns have demonstrated the need for targeted programs to reach residents of multi-family buildings. Many of the largest multi-family properties in the City rely on high-cost, high-emissions heating systems such as electric baseboard (Melrose Towers and Melrose Housing Authority properties) and oil (Towne Estates, Levi-Gould and Fuller House). Targeted outreach to the management of these properties can be incorporated into the Electrify Melrose program (see Action 1) but will require a specialized approach.

Equity Considerations: This action item supports equity, as many of the targeted property residents include lower- and middle-income or fixed income households.

Strategy 4: Adopt policies to mandate energy efficiency and renewable energy in new construction and major renovations.

ACTION 7. Adopt net zero stretch building energy code.

Following state action to establish a net zero stretch building energy code in 2022, as mandated under the March 2021 Next Generation Roadmap legislation, the City of Melrose will adopt a net zero stretch building energy code. Melrose will pair adoption of a net zero stretch energy code with outreach and education for developers, builders, and residents (see Action 10). The building code presents an opportunity to make buildings healthier and safer, and to transition away from onsite combustion. Today, the upfront cost differentials of building to a net zero standard are minimal, and will continue to reduce over time. It is far more cost-effective to build to a net zero standard than to retroactively retrofit the same building. Subsequently, the annual energy costs can be reduced when buildings are built to a highly efficient standard and renewables are leveraged. A net zero stretch code allows communities to ensure that new construction and major renovations will be built to net zero standards and helps ensure that buildings are not locked into high emissions for years into the future.

Equity Considerations: Engage in discussions with Environmental Justice populations in Melrose and empower community organizations to weigh-in on the code development process.

ACTION 8. Incentivize energy efficiency, electrification, and renewable energy within special permit processes.

The City of Melrose will seek to adopt and gradually strengthen requirements over time for special permits that incentivize and facilitate the implementation of net zero measures in buildings undergoing significant renovation and new construction. Over the next 30 years, a subset of buildings will undergo a significant renovation or be replaced with a new building. For these buildings, it is important to ensure that they will be both allowed and encouraged to achieve the highest possible energy and emissions reductions because those buildings may not undergo significant rebuilding for another 50 to 100 years.

Until a net zero stretch building code is adopted (Action 7), the best zoning tools for Melrose to enact are special permits that incentivize these net zero measures. Special permit processes will also be important in establishing standards beyond what may be included in the net zero stretch code (under development by the Department of Energy Resources).^x

In June 2021, the City of Melrose adopted an incentive zoning special permit that allows for appropriate increases in density in the downtown and Commuter Rail station areas for projects that provide community benefits, such as green building practices that result in energy efficiency levels exceeding building code and/or clean energy generation, which go beyond what is otherwise required in the Zoning Ordinance. This special permit can be updated as necessary over time to gradually strengthen requirements around energy efficiency, electrification, and

renewable energy in a way that does not impede the creation of new housing units in smart growth locations.

Melrose also has a special permit review process for multi-family residential uses in non-residentially zoned areas that could be updated to include standards for energy efficiency, electrification, and renewable energy to support the City's net zero goals.

Equity Considerations: Develop requirements in consultation with developers and building owners to avoid unintended impacts on energy bills.

ACTION 9. Require energy reporting for all new commercial construction one year after certificate of occupancy, or on an ongoing basis.

To support implementation of Action 8, the City of Melrose will explore options for implementing energy reporting for all new commercial, mixed use, and multifamily construction one year after certificate of occupancy. The reporting requirements for new construction in Action 8 will require Melrose to establish a structure for processing reporting as well as increased staff capacity, but it is the best way to analyze whether permitting and zoning measures are working. This policy is an important enabling action that many communities are already using to drive emissions reductions in the building sector across New England and throughout the United States.

Equity Considerations: Work with affordable housing owners and developers to ensure that the reporting requirements are structured in a way that allows them to participate.

ACTION 10. Provide training opportunities for City departments, boards and committees, realtors, and developers on Net Zero.

Since the development of a Net Zero building utilizes different building standards, calculations, and codes than are typically used in construction, building inspectors and plan reviewers may not have a familiarity with best practices. The goals of these trainings would be to familiarize inspectional services and other staff and members of boards and committees with high-performance building practices, to empower them to conduct relevant energy and performance calculations during plan review, and to enable inspectors to identify common construction mistakes and code violations in order to conduct efficient and effective inspections. A thorough curriculum will cover topics such as: LEED, Net Zero, Passive House and other high-performance standards, HERS ratings, life safety benefits of Net Zero buildings, and energy modeling. Additionally, Melrose will provide guidance to developers on permitting for Net Zero buildings.

Equity Considerations: Include focused training on net zero and net positive practices for multi-family buildings to increase the likelihood that benefits are realized by renters.

Strategy 5: Lead by example within municipal buildings and advocate for net zero building policies.

ACTION 11. Adopt net zero standards for new public buildings and major renovations.

The City of Melrose will lead by example by constructing, retrofitting and maintaining City-owned buildings to reduce energy use and maximize clean energy technology as much as feasible. Municipal buildings are the largest source of GHG emissions from municipal operations (municipal emissions overall only represents 3% of total community-wide emissions), and they also present a highly visible opportunity for the City to demonstrate the feasibility and appeal of net zero buildings.

In existing City-owned buildings (including school and municipal buildings), Melrose will complete energy audits and retro-commissioning projects that ensure that existing energy systems are operating efficiently, perform deep energy retrofits that maximize energy efficiency, and deploy renewable energy projects that provide as much on-site energy as possible. We will use the audits to identify buildings with high energy consumption and plan for deep energy efficiency retrofits. We will also evaluate buildings for on-site renewable energy suitability and build renewable energy projects at municipal properties with sufficient resource potential.

Equity Considerations: Prioritize improvements to public buildings that are utilized by residents in the community such as schools, library, and the senior center.

ACTION 12. Implement a suite of strategies to protect and plant trees.

The City of Melrose will implement a variety of strategies to protect the health of existing trees, reduce the removal of viable trees and increase the planting of new trees. Increasing the tree canopy in Melrose reduces heat islands and hot spots in the city and sequesters carbon that would otherwise go into the atmosphere. Require that every tree removed is replaced on site with a dedicated number of trees (2x or 3x). If the trees cannot be planted on site, they must be planted off-site at a location designated by the Department of Public Works with priority given to neighborhoods and streets with little tree canopy and heat islands.

In addition, adopting enhanced sustainable landscape plans for new construction in its zoning ordinances should be encouraged (see, e.g., Somerville's Green Score, which replaces inflexible "minimum landscaped areas" requirements with a point-based system that encourages higher value landscaping elements such as large trees).

Equity Considerations: Engage residents from vulnerable communities in the planning and development of the Green Score to improve the likelihood for a more equitable and impactful outcome.

GETTING AROUND MELROSE

Electrifying our transportation system and giving people choices about how they get around are core to Melrose's Net Zero Action Plan. The City of Melrose commits to implementing actions that advance the following strategies:

- Strategy 1. Encourage low-carbon modes of transportation.
- Strategy 2. Encourage uses of zero emission vehicles.
- Strategy 3. Develop zero emission vehicle infrastructure for residents, workers, and visitors.
- Strategy 4. Adopt zero emission mobility zoning measures.
- Strategy 5. Lead by example through municipal fleet electrification and advocate for community transit needs.

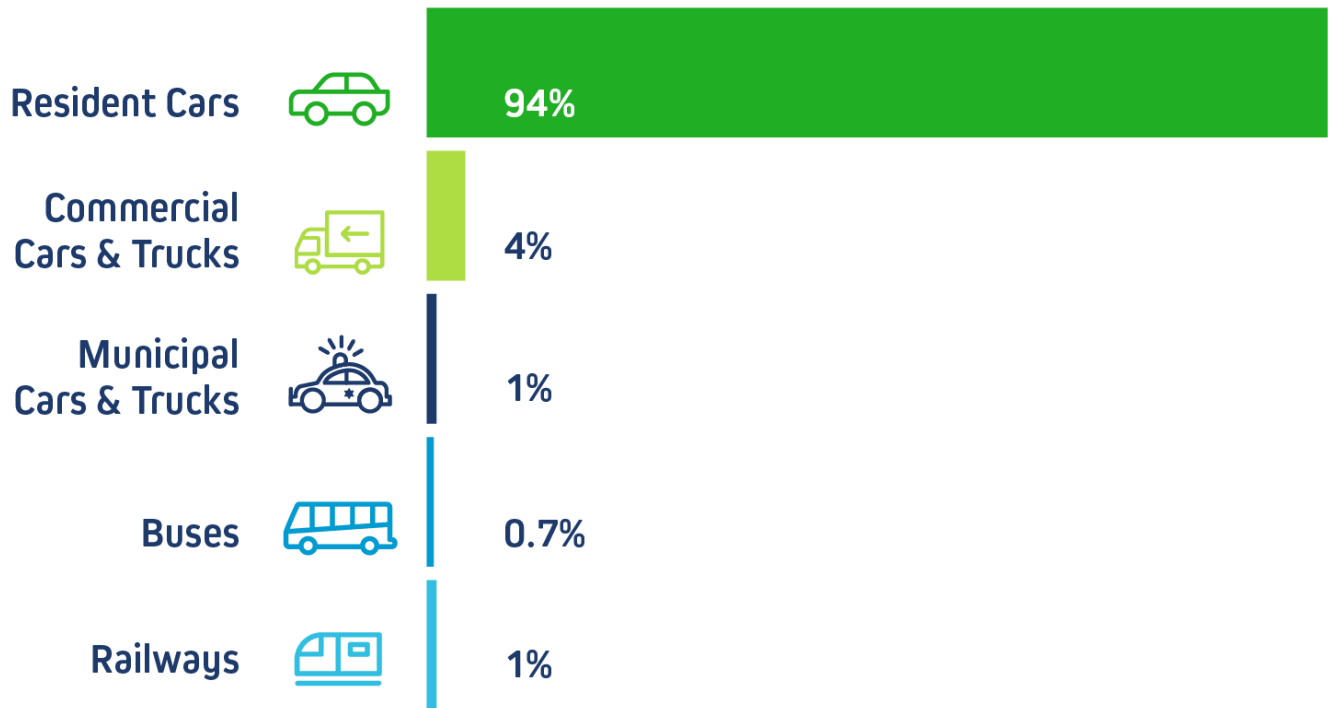


PHOTO ABOVE: MELROSE ELECTRIC VEHICLE SHOWCASE

Gasoline- and diesel-powered cars, trucks, buses, trains, and other forms of transportation accounted for **more than a third** of our community's emissions in 2017.

Electric cars and buses are cleaner, cheaper to run over time, and require less maintenance. Electric vehicles are becoming more common and more affordable every year, and the range of makes and models available at comparable price points to gasoline- and diesel-powered vehicles is set to increase immensely in the next five years.

Expanding low-carbon mobility options like walking, biking, and transit are some of the best ways to reduce transportation emissions. By designing greener and people-centered streets and sidewalks, we can make walking, biking, and public transit as easy as taking a solo trip in a personal vehicle – and reduce traffic too! These alternatives to driving will help reduce emissions and air pollution while also making residents healthier and more connected to their community.



SOURCE: MELROSE'S 2017 GREENHOUSE GAS INVENTORY

Strategy 1: Encourage low-carbon modes of transportation

ACTION 13. Develop and implement a Safe Streets Plan and pilot projects.

The City of Melrose will develop a Safe Streets Plan to identify gaps in the transportation network and inform how best to prioritize near- and longer-term projects. This effort will build on the work of the Pedestrian and Bicycle Advisory Committee and prioritize the needs of children, older adults, and people with disabilities.

The Safe Streets Plan should analyze mode share patterns, evaluate bicycle and pedestrian infrastructure needs, and make recommendations on best practices to improve bicycle and pedestrian safety and connectivity on major regional corridors and local routes with high access to important destinations (workplaces, retail, recreation, public services, etc.). This plan will also aim to connect Melrose to existing and proposed regional trails and paths, such as the Northern Strand Trail in Malden, Malden River Greenway, Tri-Community Greenway in Stoneham and the Wakefield-Lynnfield Rail Trail.

Melrose will also explore options for off-road community paths. Off-road paths that prohibit motorized vehicles are an important option to encourage residents and commuters to leave their cars. One potential area to explore is the use of the Orange Line MBTA/DCR right of way, which was first recommended in MAPC's Main Street Corridor report published in 2013.

Equity Considerations: Ensure robust engagement of vulnerable populations in the planning processes. Plan for the provision of equitable access to infrastructure investments.

ACTION 14. Expand Safe Routes to School programming.

Safe Routes to School (SRTS) a federally funded initiative of MassDOT, works with schools, communities, students, and families to increase walking and biking among elementary and middle school students in the Commonwealth. SRTS works with a variety of stakeholders to advocate for better bicycling and pedestrian infrastructure, educate students and their families about walking and biking to school safely, and provides other related technical assistance to schools. The City should adopt recommendations made by SRTS studies to make known hot spots safer.

Equity Considerations: Ensure robust engagement of vulnerable populations in the planning processes. Advocate for the provision of equitable access to infrastructure investments

ACTION 15. Support expansion of the Landline Trail and Greenway Network.

As a part of the safe streets plan in Action 13, the City will support expansion of the Landline Trail and Greenway Network and Safe Routes to School (SRTS) programming.

MAPC's Landline Trail and Greenway Plan envisions a 1,400 mile regional network of trails and greenways across the region. These trails and greenways will provide critical infrastructure and connectivity to facilitate more walking and biking throughout the region. The City will help implement the Landline vision by working with local trail groups to identify priority trail construction areas and advocating for funds at the state level for trail construction and maintenance.

Equity Considerations: Ensure robust engagement of vulnerable populations in the planning processes. Advocate for the provision of equitable access to infrastructure investments.

Strategy 2: Encourages uses of zero emission vehicles.

ACTION 16. Create an education and community engagement program to promote electric vehicle adoption

The City of Melrose will provide a suite of education and outreach services, EV ride and drives, and incentives to promote electric vehicle adoption with a focus on financing and purchase opportunities to make zero emission vehicles more affordable.

At first glance, the transition to zero emission vehicles may seem to rest squarely on consumer choices and behavioral changes of a community's residents. However, there is an important role for larger market forces, federal and state incentives, and local education and awareness building to nudge residents toward the choice that aligns with getting to net zero. The City will develop a suite of municipal outreach services that may include partnerships with nonprofits such as the Green Energy Consumers Alliance Drive Green discount program, utility EV charging and program offerings, and national programs such as National Drive Electric Week to educate Melrose residents about the benefits of EVs.

Local EV showcases at Healthy Melrose and the Victorian Fair have proven to be very effective at increasing EV purchases by residents and those should continue and expand to provide ride and drive opportunities. Giving people direct and extended experience driving an electric vehicle can reduce perceived barriers individuals may have about switching to an electric vehicle. The Portland Greater Council of Governments took this a step further with their Electric Vehicle Lending Program, which provides individuals with the opportunity to borrow an EV for up to a week. This extended exposure allows individuals to see how an EV fits into their day-to-day lifestyle.

Equity Considerations: Identify opportunities to increase the subsidies and incentives for low-income drivers and provide opportunities to access electrified transportation for people who do not own a car. Incorporate translation and accessibility into the program planning.

Strategy 3: Develop zero emission vehicle infrastructure for residents, workers, and visitors.

ACTION 17. Support awareness of on-street EV charging to provide access to infrastructure for renters and homeowners that lack access to off-street parking.

In 2021, the City partnered with National Grid on a demonstration project to test the concept of pole-mounted EV chargers. Nine locations near multifamily housing, recreation areas, and in business districts with limited off-street parking were selected in order to make EV charging more accessible to more people. Other benefits include lower installation costs and easier installation at the power source. Following the installation of 15 new utility pole-mounted EV chargers through the National Grid demonstration project in July 2021, the City will promote them widely through signage, lighting, outreach and other awareness efforts.

Equity Considerations: Perform regular and ongoing outreach to neighborhoods with high concentrations of renters where resident turnover will be more frequent.

ACTION 18. Conduct outreach and education efforts targeting businesses to encourage charging infrastructure deployment.

To support the expansion of charging stations beyond publicly owned lots and right of ways, the City will approach large employers, institutions, and retailers to connect them with funding opportunities (e.g. Volkswagen Settlement, MassDEP Electric Vehicle Incentive Program - EVIP, and National Grid's Make Ready Program) to install electric vehicle charging stations on their sites. The City will leverage connections through the Chamber of Commerce and National Grid to work with large private sector actors interested in installing electric vehicle charging stations. The City will coordinate with National Grid to ensure there is a plan for increased electric demand from the charging stations installed.

Equity Considerations: Ensure robust engagement of vulnerable populations in the planning processes to ensure equitable distribution of charging infrastructure.

ACTION 19. Expand public charging and more municipal parking lots near municipal services and facilities such as the library, schools, and additional business districts.

The City of Melrose will expand public charging at more municipal parking lots near municipal services and facilities such as the library, schools, and additional business districts.

Melrose installed an EV charger in the City Hall parking lot in 2014 and a second one at the Cedar Park commuter lot in 2017 which serve a variety of users and needs. The City will invest in additional electric vehicle charging stations in more locations to help provide the infrastructure needed to support continued EV adoption for residents, workers, and visitors. As a part of this action, the City will assess options and put in place sustainable pricing and parking policies to support management of the charging stations as utilization increases over time. Consider allowing renters and those without at-home access to charging to use the public chargers overnight with special parking permits.

Equity Considerations: Plan for equitable geographic distribution of charging stations across the community and pair with programs to reduce economic barriers to EV adoption (Action 13).

ACTION 20. Specify or adopt design guidelines for EV and PEV charging stations, signage, and wayfinding for both on- and off-street parking. Adopt regulations and enforcement policies for EV and PEV parking spaces.

Consistent wayfinding and visible signage provides the needed support for existing EV drivers to locate charging infrastructure and sends a signal to other drivers that an EV may be viable alternative by reducing range anxiety. The City will pair signage with EV specific parking regulations and incorporate these regulations into existing parking enforcement structures. The City's signage guidelines will adhere to the standards published by the Federal Highway Administration in the Manual on Uniform Traffic Control Devices. Signage requirements will include consistent guidance on parking space stencils and signage that communicates any restrictions to the use of the EV parking space. Regulations will limit use of the spot to EV drivers and impose a time limitation to increase utilization of the charging station.

Equity Considerations: Plans for and requirements around EV charging station installation should include provisions for ADA compliant spaces with access to charging stations.

Strategy 4: Adopt zero emissions mobility zoning measures.

ACTION 21. Continue to support transit-oriented development in existing overlay districts.

Recognizing its strong transportation assets, the City is committed to advancing smart growth and transit-oriented development. That is, high-density, mixed-used development near the Oak Grove Rapid Transit Station, as well as around our three MBTA Commuter Rail Stations and in our downtown. As the City of Melrose has increased its housing supply over the years, it has also remained dedicated to increasing the supply of affordable housing. While Melrose has not yet met the 10% threshold set by the Commonwealth for the percentage of housing units designated as affordable, it has reached 8% by making steady progress over the years. Melrose will continue to make progress and increase redevelopment near public transit through progressive zoning and the flexibility of the Planning Board to ease or waive parking requirements.

Equity Considerations: Include requirements for affordability and community amenities within existing overlays. This recommendation should also be paired with strategies that preserve affordable housing and protect against displacement.

ACTION 22. Adopt comprehensive parking policies to maximize efficient use of spaces, reduce use of single occupancy vehicles, and incentivize electric vehicle charging infrastructure.

Parking plays an integral role in influencing vehicle congestion, determining travel behavior, and shaping land use patterns. Not only is parking very expensive to construct, but also in many circumstances, more parking actually contributes to increased vehicular congestion. Under this policy, the City will consider the elimination of minimum parking requirements for all new residential units, establishment of parking maximums within half a mile of high-quality transit stops, creation and expansion of parking benefit districts, and incentives for developers to provide less than maximum allowable parking. There are a wide range of data-driven strategies that cities and towns can employ to encourage more efficient allocation of parking resources. Parking studies provide valuable insight as to how parking is currently utilized and can help inform how parking policies can best meet demand, often reducing the perceived need for more parking.

As a part of the incentive zoning special permit in Action 2, the City will also aim to incentivize electric vehicle charging infrastructure and on or off-site bicycle and pedestrian infrastructure in exchange for allowing increases in density.

Equity Considerations: Incorporate considerations that prioritize creation of housing units and other community amenities within parking policies.

Strategy 5: Lead by example in the municipal fleet and advocate for community transit needs.

ACTION 23. Adopt zero emission standards for the municipal fleet.

The City of Melrose will adopt a zero emission municipal fleet policy that commits to complete transition to zero emission vehicles and equipment by no later than 2035 for all vehicles with viable zero emission makes and models. This policy should also address how the vehicle purchase approval process will be managed within the municipality to ensure that all departments are adhering to the new emissions standards. The policy should include maintenance equipment such as landscaping tools and machines.

Building on the City's participation in National Grid's Fleet Advisory Services Program (FASP) begun in June 2021, municipal staff involved in fleet purchase decisions will be actively involved in the ongoing analysis. The FASP assessment will provide recommendations on electric fleet replacements, idle reduction technologies, fleet right sizing (i.e., consolidating vehicles with similar use cases and low rates of utilization), and placement of charging stations to support fleet electrification. The FASP process commits the City to revisiting and regularly updating it to account for rapid improvements in vehicle technology.

Equity Considerations: Provide opportunities for community feedback on the policy to promote greater transparency and community involvement in lead by example efforts.

ACTION 24. Advocate for community transit service needs, bus stop upgrades, and increased efficiency and electrification of the regional transit system.

The City of Melrose will continue to advocate for measures within transit planning processes at the MBTA and MassDOT that align with the City's net zero goals. Recent examples include successfully fighting MBTA service reductions on the Reading/Haverhill line with elimination of the Cedar Park station stop and the 136/137 bus routes in 2020.

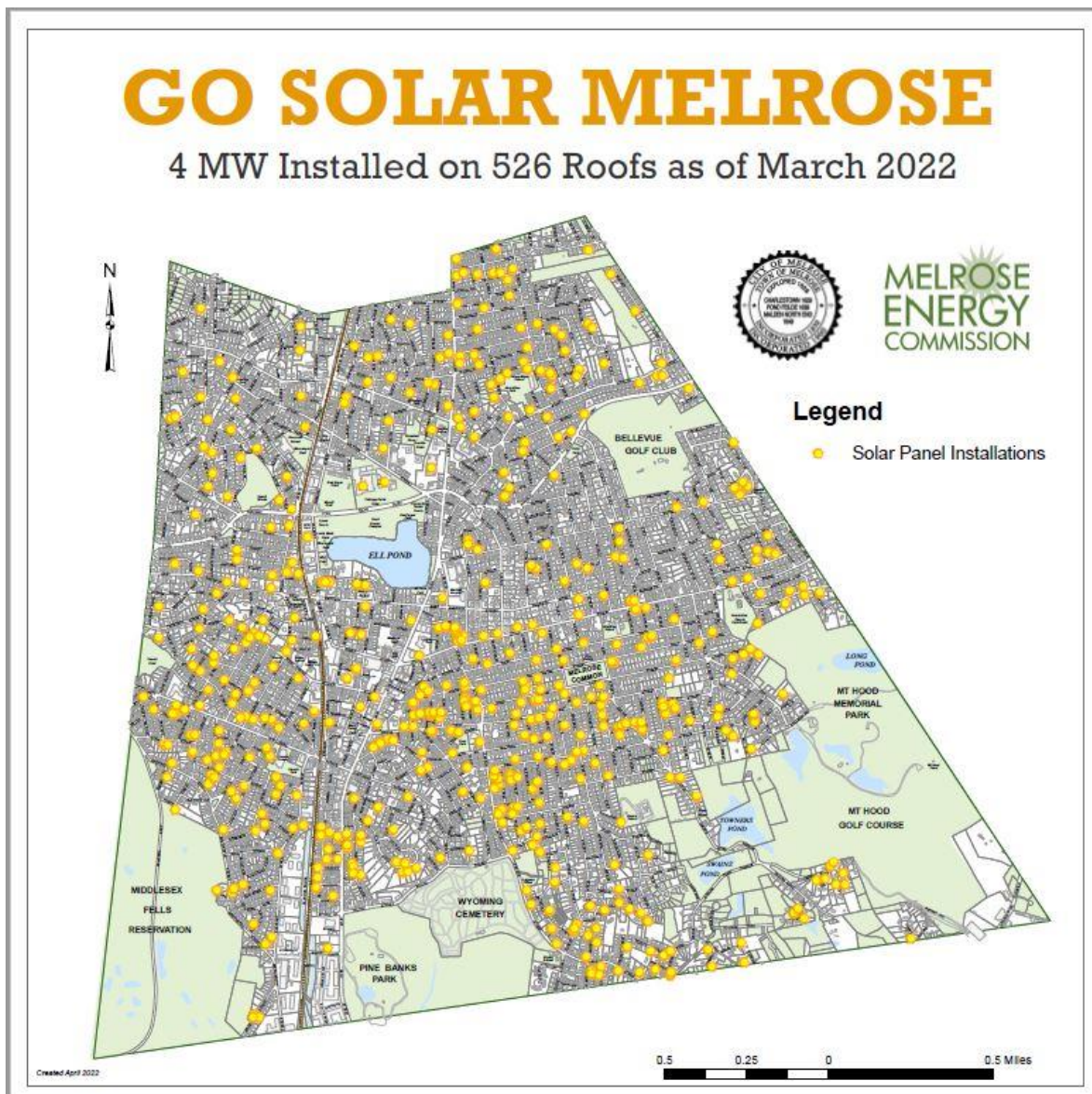
Melrose will work with the community to identify priority areas to increase access and community transit ridership. The City will also advocate during upcoming planning processes with the MBTA and MassDOT and push for improved energy efficiency and reduced carbon intensity of mass transit vehicles.

Equity Considerations: Ensure robust engagement of vulnerable populations in the planning processes. Plan for the provision of equitable access to infrastructure investments.

WHERE OUR ENERGY COMES FROM

The City of Melrose commits to implementing actions that advance the following clean energy supply strategies:

- Strategy 1. Maximize on-site renewables for property owners.
- Strategy 2. Maximize off-site community shared solar
- Strategy 3. Procure renewable energy for all remaining energy needs
- Strategy 4. Lead by example and advocate for smart electricity use.

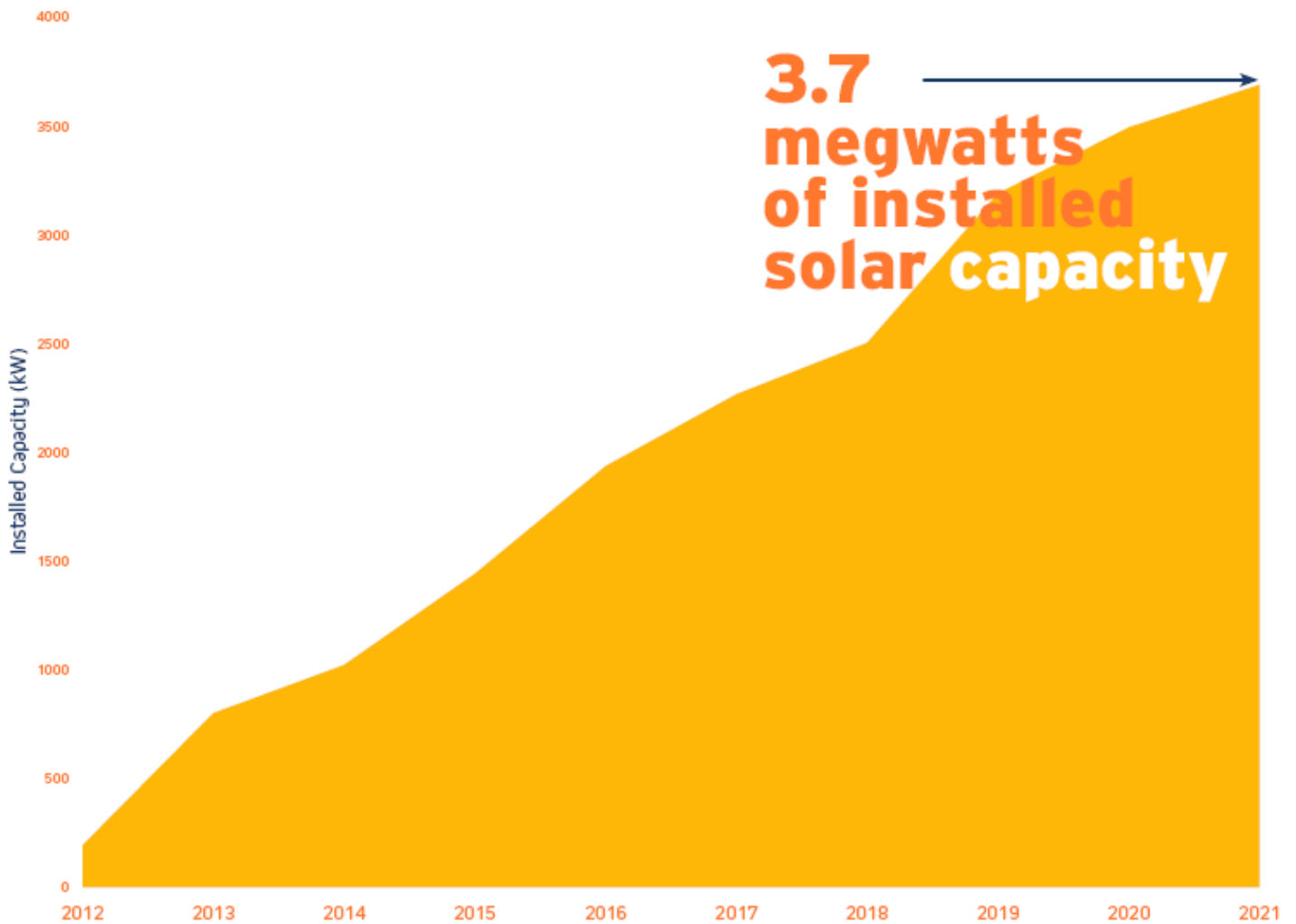


GRAPHIC ABOVE: MELROSE ROOFTOP SOLAR INSTALLATIONS THROUGH MARCH 2022. SOURCE: PERMITS

Electrification of systems that currently rely on fossil fuels (like our home heating systems, our cars, etc.) is essential to achieving our net zero goal in Melrose. However, the success of this strategy depends on fully transitioning our electric grid to renewable sources of energy.

Renewable energy comes from endlessly sustainable sources such as wind, the sun's heat or light (i.e., solar), or the earth beneath our feet (i.e., geothermal). Our electricity is getting cleaner and greener all the time thanks to state and local policies, like Melrose's electricity aggregation, but natural gas still provides most of our electricity in New England. Developing local renewable energy projects and supporting renewable energy projects through electricity aggregation and policy advocacy will help our community speed up the process of switching to clean energy.

In Melrose, more than 526 properties already have solar on their rooftops, and the production of local, renewable energy sources is growing. As of the end of 2021, Melrose's installed solar capacity was more than **3.7 megawatts**.



SOURCE: MASSACHUSETTS DEPARTMENT OF ENERGY RESOURCES, SREC I, SREC II, AND SMART QUALIFIED PROJECT DATA IN MELROSE

Strategy 1: Maximize on-site renewables for property owners.

ACTION 25. Continue to promote the EnergySage.com platform for residents who want to install solar and for renters who want to participate in community solar.

The City of Melrose will continue to promote the EnergySage.com platform for residents who want to install solar and for renters who want to participate in community solar. The City will also explore mechanisms to support access to community solar for low-income residents.

Building on the success and lessons learned from the City's implementation of Solarize Melrose in 2012 and the partnership with EnergySage that began in 2014, Melrose will continue to promote the EnergySage.com online platform for property owners who want to go solar as a shopping and education tool. The City will also promote EnergySage's community solar platform for renters and other homeowners who are unable to install rooftop solar. The City will consider the potential for additional partnerships with specific installers chosen through a competitive procurement process (see Action 1).

Equity Considerations: Identify and mitigate potential barriers to participation in community solar including long term contracts and credit score requirements.

Strategy 2: Maximize off-site community shared solar.

ACTION 26. Develop a low-income community shared solar program under the state's SMART incentives.

Melrose will explore options available to develop a low-income community shared solar program through the municipal aggregation program Melrose Community Power as authorized in the updated SMART incentives. This will include a review of near-term opportunities under the state's SMART program incentives. The City will work to ensure through project outreach and incentives that low-income residents are involved in the development of the program.

Equity Considerations: Identify and mitigate potential barriers to participation in community solar including long term contracts and credit score requirements.

Strategy 3: Procure renewable energy for all remaining needs.

ACTION 27. Pursue 100% carbon-free electricity in the Melrose Community Power by 2030.

The City of Melrose will gradually increase the amount of renewable energy in the Melrose Community Power program so the default level is 100% carbon-free by 2030, and then maintain that outcome permanently.

Melrose launched what is now called Melrose Community Power in 2015. The 2019-2021 contract set the baseline for electricity supply at 5% more local

renewables than the state's Renewable Portfolio Standard (RPS) The new 2021 – 2024 contract will increase the amount to 10%. There is also an option for 100% renewable energy. The program ensures that all additional renewables are from MA Class I RECs (Renewable Energy Credits). MA Class I RECs help to support local renewable energy since projects meeting the criteria for these credits are required by the state RPS.

The City will continue to implement this program into the future with the goal of increasing the percent of Class I RECs in the default rate to 100% renewables by 2030 as well as exploring direct off-taker opportunities in renewable energy developments. This effort will involve active monitoring of rates and the local impact on low-income ratepayers. The City will also continue the successful outreach campaign to encourage residents and businesses to opt-up to 100% Local Green.

Equity Considerations: Pay particular attention to the costs of participating compared to utility electricity costs and provide a default rate that is competitive with these prices.

Strategy 4: Lead by example and advocate for smart electricity use.

ACTION 28. Maximize the installation of clean energy resources on municipal property and purchase 100% renewable municipal electricity supply by 2030.

The City will seek to maximize the installation of clean energy resources on municipal property, including exploration of opportunities to pair solar with storage and retrofit buildings with clean heating and cooling systems.

The City has already installed rooftop solar on every available municipal building roof where there is space and the roof condition makes it feasible including on the high school, middle school and the Public Works Operations Facility. Melrose will demonstrate leadership in this sector by maximizing the installation of solar PV on municipal buildings as more roofs are replaced, such as Memorial Hall and several elementary schools. Solar canopies should be considered again for parking lots such as at the high school and the City Hall parking lot among others. After assessing the feasibility of municipal sites for renewable energy, the City will consider a plan for installation and procure these systems where they are feasible.

In addition, Melrose should progressively increase the amount of renewable electricity in its municipal supply contracts until reaching 100% for municipal operations by 2030. Melrose has already started this transition by contracting for an additional 10% MA Class 1 RECs in the last year of the current contract for 2023. At all points of implementing this action, the City will consider cost impacts to taxpayers in Melrose.

Equity Considerations: Provide opportunities for community feedback on the policy to promote greater transparency and community involvement in lead by example efforts.

ACTION 29. Support state legislation and policies to de-carbonize the region's energy supply.

The City of Melrose will advocate for state policies that increase the Renewable Portfolio Standard (RPS) and promote incentives specifically for low to moderate income (LMI) residents such as LMI solar incentives, and programs and procurements that further decarbonize the region's energy supply, such as offshore wind development.

The current RPS puts the state on track to reach 67% renewable energy by 2030. The Next Generation Roadmap for Massachusetts Climate Policy, enacted in 2021, raised the rate of increase to 3% from 2025 through 2029 at which point the rate of increase returns to 2% and puts the state on a pathway to achieve approximately 80% renewable generation by 2050.^{xi}

An increase in the renewable portfolio standard helps to advance the installation of new renewable energy systems across the state. Since many utility programs are driven by the requirements of the RPS, an increase in renewables also improves the financial incentives for renewables and helps to lower soft costs for renewable energy by the increase in competition.

Equity Considerations: Ensure that policies include measures to directly benefit Environmental Justice communities across Massachusetts and increase access to clean energy for all.

ACTION 30. Advocate for expansion of demand response programs and creation of distinct time of use rates.

The City of Melrose has participated in a variety of demand response programs since 2012 with much success. The City should continue these initiatives and also advocate for expansion of demand management programs and the creation of distinct time of use rates for different types of buildings and electric vehicle charging. This will include support for smart metering infrastructure, demand response programs, energy storage infrastructure and advocacy for additional incentives for energy storage.

Equity Considerations: Ensure that policies include measures to directly benefit Environmental Justice communities across Massachusetts with a focus on affordability.

ACTION 31. Advocate to regulators and utilities to greatly accelerate the repair of gas leaks and support the phase-out of the natural gas distribution supply network.

Melrose will advocate for the repair of super-emitter gas leaks and coordinate information and data sharing with National Grid. Repairing gas leaks improves residents' health, makes the gas network more efficient and helps to eliminate difficult to account for GHG emissions. The City will advocate for additional efforts for detection and mitigation of gas leaks and work to expedite the repair of local leaks.

Melrose will also advocate for regulatory changes that help accelerate the phasing-out of the gas distribution network as is being investigated by the MA Department of Public Utilities at the request of the MA Attorney General's Office. We await the outcome of the investigation that was launched in October 2020.

Since the repair of gas leaks and replacement of pipes involves digging up and repairing streets, they can be costly and require multiple permits. Melrose will continue to work with National Grid to see where priorities for gas leak repair and street repair overlap and explore opportunities to develop a shared schedule to complete multiple repairs in the same street opening and re-pavement. This action could also include consideration of ways to expedite permitting for these repairs, including an online permitting system such as Roadworks. Melrose will continue its participation in the Multi-Town Gas Leaks Initiative, working with communities throughout the region to accelerate leak repair by improving data sharing, communication, and coordination between municipalities and National Grid.

Equity Considerations: Ensure equity in setting street repair and gas leak repair priorities throughout Melrose.

Implementation: What's Next?

This Net Zero Action Plan is just the beginning for the City of Melrose. The transitions required to achieve net zero in Melrose necessitates an all-hands-on-deck approach – both internally, with City staff and elected bodies, and externally, with local community partners and municipal peers. The following initiatives will be spearheaded by the City's Sustainability Manager which will facilitate implementation of the actions prioritized in this plan.

GOVERNANCE

Develop internal practices and structures for multi-departmental coordination on climate action.

The Mayor will appoint key members of City boards, commissions, and departments to join a Net Zero Action Task Force. Task Force members will support the Sustainability Manager in implementing and reporting on the progress of priority actions identified in the plan. The Task Force will also be structured to be a two-way exchange of information – providing opportunities to increase climate literacy and technical capacity across city government.

One of the first objectives of the Net Zero Action Task Force will be to align municipal department responsibilities with the goals of the Net Zero Action Plan and identify any areas where municipal activities may be acting in opposition to the goals of the plan.

This process will result in the incorporation of a climate framework into the goals of every municipal department.

Report on metrics of success and update greenhouse gas inventory on a semi-annual basis.

The City's GHG inventory will be the core tool for benchmarking progress toward its net zero goal. The City will update its GHG inventory as new data sets are made available, using MAPC's Community Greenhouse Gas Inventory Tool. The expectation is that this will occur every two years. The 2017 GHG inventory will be used as the baseline to measure progress against.

Revisit and update the plan every five years.

The Net Zero Action Plan is intended to serve as a living document that will be revisited and revised regularly by the Sustainability Manager and the Net Zero Action Task Force to ensure our community is always pushing ahead and successfully working toward its goals.

PUBLIC ENGAGEMENT AND EDUCATION

Building community capacity to make the electrification transition

A core component of the community engagement plans to convene focus groups during the planning process had to be put on hold due to the COVID-19 pandemic. As such, the City will prioritize building and strengthening relationships with vulnerable populations that are not currently reached by the City's communication and engagement channels. In addition, broad and continued outreach to stakeholders both in city government and in the wider community is necessary in order to increase understanding of what the transition to net zero entails. There is a role for everyone in this challenge and more education on how to get there is needed.

PARTNERSHIP AND COLLABORATION

Coordinate climate action regionally with the Metro Mayors Coalition municipalities

Coordinated action with surrounding municipalities will be a component to the success of Melrose's Plan. The City will continue to connect and share best practices with staff in nearby Metro Boston municipalities, utilizing existing regional networks like the Metropolitan Mayors Coalition Climate Preparedness Task Force to identify regional priorities and programs for implementation.

Net Zero Action Roadmap Summary

NAVIGATING THE ROADMAP

Timeframe

Specifies the anticipated timeframe needed for full implementation of the action.

IN PROCESS Currently underway by City staff

SHORT TERM Less than one year (<1 yr)

INTERMEDIATE TERM Two to three years (2-3 yrs)

LONG TERM Four to five years (4-5 yrs)

Potential Co-Benefits

This section identifies the high-level potential for the types of benefits, in addition to greenhouse gas emissions reductions, the City may experience through effective implementation of the action.



PUBLIC HEALTH BENEFITS



ECONOMIC BENEFITS



ENERGY SYSTEM BENEFITS



ENVIRONMENTAL BENEFITS

Internal Partners

Although the Sustainability Manager is primarily responsible for spearheading implementation, Internal Partners are identified to assist with implementation. Acronyms used refer to Office of Planning and Community Development (OPCD) and Department of Public Works (DPW).

Other Partners

Other partners are identified within municipal operations and the broader community-at-large that will be critical to successful implementation of the action. Acronyms used refer to Melrose Energy Commission (MEC), Massachusetts Clean Energy Center (MassCEC), Massachusetts Department of Energy Resources (DOER).

Funding Needs

This category specifies whether the type of funding need is capital, operations, staff or volunteer time. Particularly intensive actions call out where the City may need additional dedicated staff for successful implementation.

OUR HOMES AND BUSINESSES:





2030 MILESTONES

- All new buildings built to net zero standards.
- 20% of homes and businesses have undergone deep energy retrofits.
- 80% of homes previously on fuel oil, propane, or electric baseboard heat have converted to high efficiency electric heat (heat pumps).
- 10% of homes currently on gas heat have converted to high efficiency electric heat.





2050 MILESTONES

- Nearly all existing homes and businesses in Melrose have had deep energy retrofits.
- Nearly all homes and businesses rely on high efficiency electric heating.

STRATEGY 1: Electrify fossil-fuel end uses

	ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 1.	Create an ongoing "Electrify Melrose" program and campaign.	<1 yr	Energy Coach	MEC, MassSave, DOER, National Grid, MassCEC, MassEnergize	Dedicated staff person Operating expenses	●	●		
ACTION 2.	Develop and implement a mechanism for tracking home heating type in Melrose.	<1 yr	GIS Specialist	City Clerk, Assessors, Inspectional Services	Staff time				

STRATEGY 2: Maximize uptake of residential energy efficiency and deep energy retrofits in existing buildings





	ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 3.	Create a home efficiency coach program to assist residents with energy efficiency and deep energy retrofits.	<1 yr	Existing volunteer coaches	MEC, MassSave, DOER, National Grid, MassCEC, Abode Energy	Dedicated staff person Operating expenses	●	●	●	

ACTION 4.	Opt into the state's Commercial Property Assessed Clean Energy (CPACE) law.	2-3 yrs	Chief Assessor	Chamber of Commerce, commercial property owners	Operating expenses				
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STRATEGY 3: Target energy efficiency retrofits of large multi-family buildings





ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS					
ACTION 5.	Consider requiring licensing for rental units to include energy efficiency requirements for ongoing compliance.	4-5 yrs	Building Commissioner	Renters, property owners and managers, Board of Health	Dedicated staff person Operating expenses	●		●	
ACTION 6.	Target existing multi-family dwellings with electric baseboard or oil heat for conversion to heat pumps.	2-3 yrs	Energy Coach	MassSave, National Grid, DOER, MassCEC, MassEnergize	Staff time	●	●		

STRATEGY 4: Adopt policies to mandate energy efficiency and renewable energy in new construction and major renovations

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 7.	Adopt net zero stretch building energy code.	<1 yr	Director Strategic Initiatives	OPCD, Planning Board, MEC, building developers, Inspectional Services, City Council	Staff time	●	●	●
ACTION 8.	Incentivize energy efficiency, electrification, and renewable energy within special permit processes.	2-3 yrs	Planning Director	OPCD, Inspectional Services, Planning Board, Zoning Board, building developers	Staff time	●	●	
ACTION 9.	Require energy reporting for all new commercial	2-3 yrs	Building Commissioner	OPCD, Planning Board, Zoning Board	Staff time		●	●

	construction one year after certificate of occupancy, or on an ongoing basis.						
ACTION 10.	Provide training opportunities for City departments, boards and committees, and developers to support Net Zero.	<1 yr	Director Strategic Initiatives	Certified trainers, MEC, DOER, National Grid, MassCEC	Operating expenses Staff time		●

STRATEGY 5: Lead by example within municipal buildings and advocate for net zero building policies

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS					
ACTION 11.	Adopt net zero standards for new public buildings and major renovations.	<1 yr	Planning Director	Mayor's Office, DPW, Inspectional Services, MEC, City Council	Staff time	●	●	●	●
ACTION 12.	Implement a suite of strategies to protect and plant trees.	2-3 yrs	City Engineer	DPW Green Team	Capital expenses	●			●

GETTING AROUND MELROSE





2030 MILESTONES

- All new developments are accessible by biking, walking, or connected to public transit.
- Average number of cars per household is below 1.47 (e.g., vehicle miles traveled are reduced by 5%)
- 60% of new vehicle purchases are zero emissions.
- 37% of registered vehicles are zero emissions.





2050 MILESTONES

- All key destinations in Melrose are accessible by biking, walking, or connected to public transit.
- Nearly all passenger and commercial vehicles registered in Melrose are zero emissions.

STRATEGY 1: Encourage low-carbon modes of transportation

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 13. Develop and implement a Safe Streets Plan and pilot projects.	2-3 yrs	Planning Director	DPW, OPCD, Pedestrian and Bicyclist Committee	Capital funding Staff time	●			●
ACTION 14. Expand Safe Routes to School programming.	2-3 yrs	School Department	DPW, OPCD, Pedestrian and Bicyclist Committee	Grant funding	●			●
ACTION 15. Support expansion of the Landline Trail and Greenway Network.	4-5 yrs	Planning Director	DPW, OPCD, Pedestrian and Bicyclist Committee	Capital funding	●			●


STRATEGY 2: Encourage use of zero emission vehicles

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 16. Create an education and community engagement	In process	Energy Coach	Green Energy Consumers Alliance, MEC, EV Taskforce	Dedicated staff person	●	●		●



program to promote electric vehicle adoption.

Operating expenses





STRATEGY 3: Develop zero emission vehicle infrastructure for residents, workers, and visitors

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS		
ACTION 17.	Support awareness of on-street EV charging to provide access to infrastructure for renters and homeowners that lack access to off-street parking.	In process	Communi-cations Coordinator	MEC, DPW, National Grid	Volunteer time Staff time	● ●
ACTION 18.	Conduct outreach and education efforts targeting businesses to encourage charging infrastructure deployment.	<1 yr	Energy Coach	MEC, OPCD, Chamber of Commerce	Volunteer time Staff time	●
ACTION 19.	Expand public charging in more municipal parking lots near services and facilities such as the library, schools, and additional business districts	2-3 yrs	DPW	National Grid, EV charging station vendors, MassEVIP	Capital funding Operating expenses Grant funding	● ●
ACTION 20.	Specify or adopt design guidelines for EV and PEV charging stations, signage, and wayfinding for both on- and off-street parking. Adopt regulations and enforcement policies for EV and PEV parking spaces.	<1 yr	Planning Director	OPCD, Planning Board	Staff time	●

STRATEGY 4: Adopt zero emissions mobility zoning measures

	ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 21.	Continue to support transit-oriented development in existing overlay districts.	In process	Planning Director	OPCD, Planning Board	Staff time	●	●		●
ACTION 22.	Adopt comprehensive parking policies to maximize efficient use of spaces, reduce use of single occupancy vehicles, and incentivize electric vehicle charging infrastructure.	2-3 yrs	Planning Director	OPCD, Planning Board	Staff time	●			●

STRATEGY 5: Lead by example in the municipal fleet and advocate for community transit needs





	ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 23.	Adopt zero emission standards for the municipal fleet.	<1 yr	Strategic Initiatives Director	DPW Director, City Department Heads, National Grid Fleet Advisory Services Program	Staff time	●	●	●	
ACTION 24.	Advocate for community transit service needs, bus stop upgrades, bus rapid transit, and increased efficiency and electrification of the regional transit system.	In process	Mayor's Office	OPCD, MBTA, MassDOT, and Pedestrian and Bicyclist Committee	Staff time	●	●	●	●

OUR ENERGY SUPPLY

2030 MILESTONES

- Our electricity supply comes from 100% carbon-free sources.

STRATEGY 1: Maximize on-site renewables for property owners

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 25. Continue to promote the EnergySage platform for residents who want to install solar; renters who want to participate in community solar	In process	Energy Coach	MEC, EnergySage.com	Volunteer time Staff time		●	●	




STRATEGY 2: Maximize off-site community shared solar

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 26. Develop a low-income community shared solar program under the state's SMART incentives	2-3 yrs	Strategic Initiatives Director	DOER, solar developers, electric supplier, PowerOptions, Good Energy	Staff time Grant funding		●	●	

STRATEGY 3: Procure renewable energy for all remaining needs

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 27. Pursue 100% carbon-free electricity in the Melrose Community Power by 2030.	In process	Strategic Initiatives Director	Good Energy, electricity supplier, MEC, DPU, DOER	Staff time		●	●	●

STRATEGY 4: Lead by example and advocate for smart electricity use

ACTION	TIMEFRAME	INTERNAL PARTNER	OTHER PARTNERS	FUNDING NEEDS				
ACTION 28. Maximize the installation of clean energy resources on municipal property and purchase 100% renewable municipal electricity supply by 2030	4-5 yrs	City Engineer	DPW, OPCD, PowerOptions, National Grid, solar developers	Capital expense Grant funding	●	●		
ACTION 29. Support state legislation and policies to de-carbonize the region's energy supply	In process	Mayor's Office	State Legislature, City Council	Staff time	●	●	●	
ACTION 30. Advocate for expansion of demand response programs and creation of distinct time of use rates.	4-5 yrs	Mayor's Office	State Legislature, City Council, DPU	Staff time		●	●	●
ACTION 31. Advocate to regulators and utilities to greatly accelerate the repair of gas leaks and support the phase-out of the natural gas distribution supply network	4-5 yrs	Mayor's Office	DPW, State Legislature, City Council, DPU	Staff time	●	●		●

Appendix A: Net Zero Roadmap Milestone Supporting Documentation

The targets set forth in the Net Zero Roadmap for the year 2030 are designed to provide concrete, measurable milestones that will allow the City to assess whether it is on track to meet the Net Zero by 2050 goal. These targets are calculated to be consistent with Massachusetts' climate goals as set forth in "An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy" adopted in 2021, which establishes an emissions limit of not less than 50% reduction from 1990 levels by 2030 (and 75% reduction by 2040), and are tailored to Massachusetts' specific challenges as a largely residential community with an older historic housing stock.

Baseline

The Massachusetts statewide target is assessed based on a 1990 emissions baseline; due to progress made since 1990 (primarily due to reductions in emissions intensity of the electric grid) the state has achieved approximately a 23% reduction in statewide emissions since 1990, so the target equates to a 35% reduction from current emissions levels.

Melrose does not have data on city emissions from 1990 and is using its 2017 Greenhouse Gas Inventory as the baseline for assessing progress on mitigation goals. For the purpose of setting 2030 targets this plan assumes that Melrose is in a similar position to the state as a whole in terms of the progress made between 1990 and 2017, so the targets are calculated to achieve a 35% reduction from the 2017 baseline. This seems to be a reasonable assumption since Melrose's population in 2017 (28,367) is very similar to that in 1990 (28,112); note Melrose's population declined significantly and then rebounded during that time, so the pattern of emissions trends between 1990 and 2017 may be quite different from that of the state as a whole.

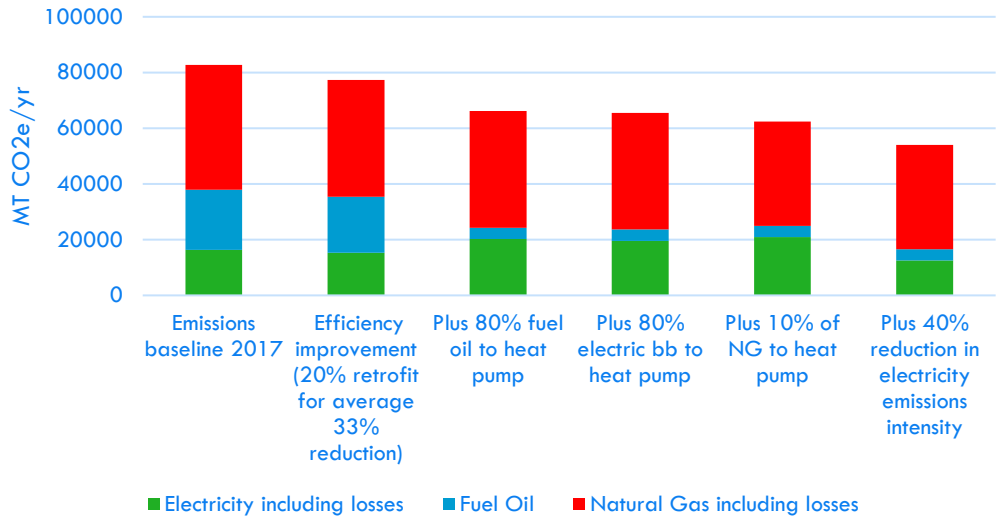
Building sector targets

Reducing emissions from the building sector involves a combination of reducing energy usage through improving building envelopes, improving the energy efficiency of building heating and cooling systems, and electrifying those systems so that they can be run on clean renewable electricity. These changes build on one another; for example, switching from oil heat to electric heat pump reduces emissions through the greater efficiency of the heat pump system and also due to the lower emissions intensity of electricity as a power source, and there will be further emissions reductions from those systems over time as the electric grid becomes cleaner.

The chart below illustrates the cumulative impact of the energy efficiency, heat pump conversion and electric grid clean energy targets to achieve the 2030

emissions reduction target. Note that these targets represent one pathway to achieving the goal; shortfalls in one area can be made up by improved progress in other areas, and it is important to keep track of all of the measures to ensure that overall progress is on track.

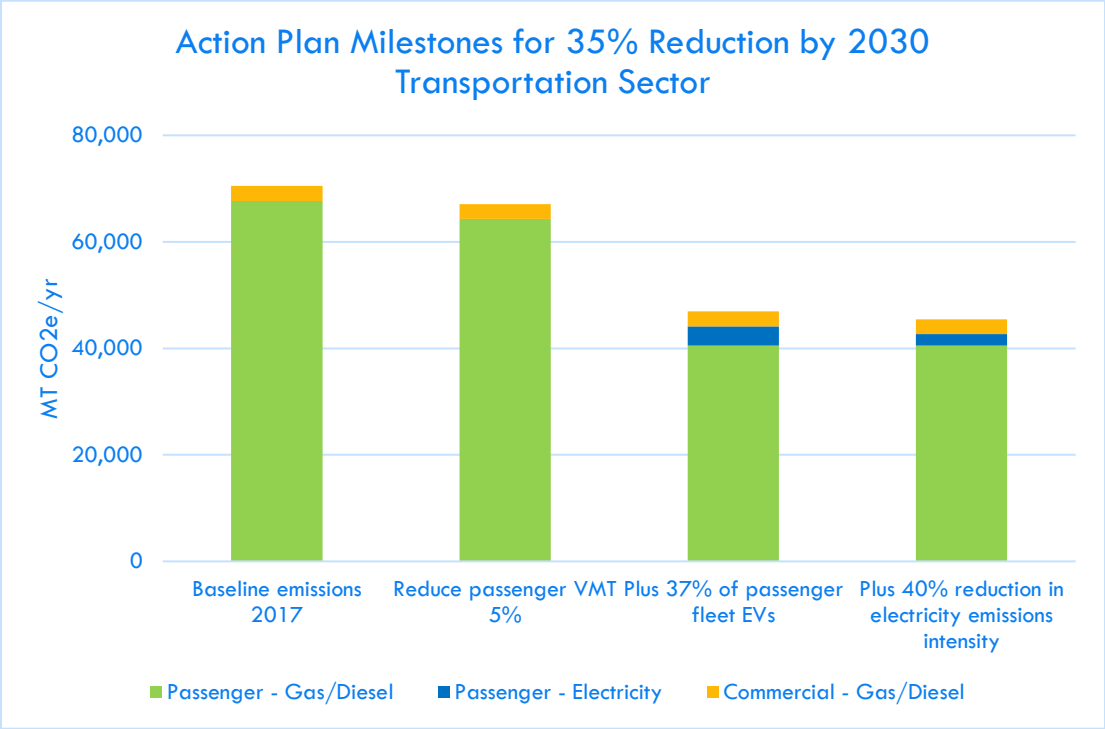
Action Plan Milestones for 35% Reduction by 2030 Building Sector



Transportation

Reducing emissions from the transportation sector involves a combination of reducing vehicle miles, improving the energy efficiency of vehicles, and electrifying vehicles so that they can be run on clean renewable electricity. These changes build on one another; for example, modern electric vehicles use less energy to run and also reduce emissions due to the lower emissions intensity of electricity as a power source, and there will be further emissions reductions from those systems over time as the electric grid becomes cleaner.

The chart below illustrates the cumulative impact of reducing vehicle miles and transitioning to electric vehicles to achieve the 2030 emissions reduction target. Currently approximately 12% of passenger vehicles in Melrose are replaced by new vehicles each year; assuming linear progress towards a goal of 60% of new cars electric in 2030, the percent of registered vehicles that would be EV in 2030 should be about 37%.



Clean electricity

The transition to clean renewable sources of electricity is essential to achieving Melrose's net zero goals, and reduction in the emissions intensity of the electric grid is incorporated into the target calculations for the building and transportation sector. The overall intensity of the electric grid is largely dependent on state policy, but Melrose has committed to targeting 100% of electricity from renewable resources through increasing local renewable generation and through power purchasing programs.

End Notes

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- ⁱ [https://earthobservatory.nasa.gov/world-of-change/global-temperatures#:~:text=According%20to%20an%20ongoing%20temperature,2%C2%B0%20Fahrenheit\)%20since%201880.](https://earthobservatory.nasa.gov/world-of-change/global-temperatures#:~:text=According%20to%20an%20ongoing%20temperature,2%C2%B0%20Fahrenheit)%20since%201880.)
- ⁱⁱ <https://climate.nasa.gov/news/2865/a-degree-of-concern-why-global-temperatures-matter/>
- ⁱⁱⁱ "Governor Baker Signs Climate Legislation to Reduce Greenhouse Gas Emissions, Protect Environmental Justice Communities," Governor's Press Office, March 21, 2021, <https://www.mass.gov/news/governor-baker-signs-climate-legislation-to-reduce-greenhouse-gas-emissions-protect-environmental-justice-communities>
- ^{iv} "Environmental Justice Populations in Massachusetts," MA Executive Office of Energy and Environmental Affairs, <https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts#interactive-map>
- ^v "Residential Nonparticipant Customer Profile Study," DNV GL, February 6, 2020, Table 7.2. Community outreach metric table: dual fuel, p.94, https://ma-eeac.org/wp-content/uploads/MA19X06-B-RESNONPART_Report_FINAL_v20200228.pdf
- ^{vi} "Housing Tenure by Fuel Type by Municipality," American Community Survey (ACS), 2014-2018, <https://datacommon.mapc.org/browser/datasets/191>
- ^{vii} "Transportation to Work from Residence by Municipality," American Community Survey (ACS), 2014-2018, <https://datacommon.mapc.org/browser/datasets/38>
- ^{viii} "Massachusetts Vehicle Census Summary Statistics for GHG Inventories (Municipal)," Metropolitan Area Planning Council, 2014, <https://datacommon.mapc.org/browser/datasets/412>
- ^{ix} Melrose Community Power Program webpage, <https://mcp.cityofmelrose.org/>
- ^x According to MGL Chapter 40A Section 9, "Zoning ordinances or by-laws may also provide for special permits authorizing increases in the permissible density of population or intensity of a particular use in a proposed development; provided that the petitioner or applicant shall, as a condition for the grant of said permit, provide certain open space, housing for persons of low or moderate income, traffic or pedestrian improvements, installation of solar energy systems, protection for solar access, or other amenities."
- ^{xi} <https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8>