March 18, 2022

Department of Energy Resources (DOER)
100 Cambridge Street, Suite 1020
Boston, MA 02114
Attention: Nina Mascarenhas

Re: **Stretch Code Straw Proposal Comments**

Dear Commissioner Woodcock, Director McCarey, Mssrs. Finlayson and Ormond, et al:

To reach the 2030 emissions reduction goal mandated by the Act Creating a Next Generation Roadmap for Massachusetts Climate Policy (the "Act"), the Commonwealth must swiftly enact and implement an ***effective stretch code update*** together with a ***true net zero opt-in code***.

Individually and collectively, signatories of this letter believe ***DOER's straw proposal falls far short of what is crucial for us to meet our goals***. The straw proposal does NOT:

- Conform to any published standard defining ***"net zero,"*** violating the Act;
- Apply to ***major renovations***, disregarding a crucial decarbonization step mandated by the Act;
- Mandate ***electrification*** or ***renewable energy*** despite the MA Decarbonization Roadmap;
- Account for or curb ***embodied carbon emissions*** related to construction, a heightened risk this decade;
- Sufficiently improve ***energy efficiency standards*** to support Passive House or net zero buildings;
- Require and incentivize ***green communities*** to adopt the opt-in stretch code, contravening the Green Communities Act.

Moreover, even according to the DOER's own numbers, the straw proposal neither meets the 2030 emissions reductions goal nor minimizes life cycle costs as required by law. We urge DOER to finalize the stretch code update and opt-in net zero code according to the ***Net Zero Stretch Code Framework*** included in the appendix. This framework aims at carbon neutrality and equity, ensuring no community is left behind.

Massachusetts is ready for net zero.[1] A year ago, elected and appointed officials from 59 towns and cities – ***representing almost 40% of the state's population*** – voiced strenuous support for the net zero stretch code.[2] Additionally, AIA Massachusetts, as well as the Boston Society for Architecture, AIA Central Massachusetts and AIA Western Massachusetts – ***together representing 5,000 architects in the state*** – strongly advocated for a net zero stretch code.[3]

This letter and appendix reflect hundreds of hours of study and discussion by a ***broad coalition of elected and appointed representatives, building professionals, and non-profit organizations***. Just seven months remain until the legislated deadline for these stretch codes. At the same time, our climate crisis is accelerating. ***Please act now.***

Sincerely,
MA Net Zero Buildings Coalition

[1] https://builtenvironmentplus.org/wp-content/uploads/2021/03/MAisReadyforNetZero_03.01.21.pdf
[2] Letter to Gov Baker 2.4.21
[3] AIA MA Letter to Gov Baker 2.3.21

SIGNATORIES

Stretch Code Straw Proposal Comments to DOER by MA Net Zero Buildings Coalition

Letter + Appendix

March 18, 2022

For signatories added on a rolling basis and grouped by the categories below, please see the end of this document starting on Page 15. If you fit one of the categories below and would like to sign this letter, please use this link:

sign on link for DOER March 9, 2022 letter

Elected and Appointed Representatives

Building Professionals

Non-Profit Organizations

APPENDIX

Stretch Code Straw Proposal Comments to DOER by MA Net Zero Buildings Coalition
March 18, 2022

Executive Summary

For more information about each point below, refer to the numbered section on the pages that follow.

1. There is substantial and growing support for a net zero stretch code.
2. Massachusetts is ready for net zero as shown by a surge in completed and planned net zero projects.
3. We face a "perfect storm" of challenges for meeting the 2030 goal to avert the worst climate impacts.
    a) *We are starting with false comfort in thinking Massachusetts surpassed its 2020 emissions goals.*
    b) *Pre-pandemic, building sector emissions were not stagnant but rather climbing at 4% per year.*
    c) *This decade's growth will send emissions soaring unless stretch codes neutralize emissions.*
4. By DOER's numbers, the straw proposal doesn't meet the 2030 emissions reduction goal.
5. DOER's emissions calculations omit embodied carbon and gas leaks, understating future growth impacts.
6. Reducing embodied carbon in building materials and construction this decade is critical.
7. The straw proposal's net zero definition doesn't meet the law or conform to any published net zero standard or regulation.
8. The straw proposal does not "minimize, to the extent feasible, life cycle costs" per the law.
9. The straw proposal fails the next generation in at least ten ways.
10. The Green Communities Act compels green communities to adopt the opt-in net zero stretch code.
11. DOER should incentivize green communities to adopt the opt-in net zero stretch code soon.
12. It is not hyperbole to suggest that this round of stretch codes will largely determine the success or failure of Massachusetts' next generation climate policy.
13. DOER must develop a suite of more stringent building energy codes – base, updated stretch, and opt-in net zero.
14. Timing is everything. The net zero stretch code needs to become widely adopted in 2023.
15. Accelerating the transition off polluting fossil fuels is most critical for low-income ratepayers.
16. DOER should advance its work in accordance with the MA Net Zero Buildings Coalition's Net Zero Stretch Code Framework (February 2022).
17. A true net zero code will deploy a newly trained workforce and stimulate homeowners to utilize residential electrification incentives.
18. Decarbonizing existing buildings is key.
19. Legislators should act now to allocate $250 million to the Zero Carbon Renovation Fund.
20. We have a 2030 goal. Let's do what it takes to meet it.

For questions, contact NEEP Northeast Energy Efficiency Partnerships – Darren Port dport@neep.org or Kai Palmer-Dunning at kpdunning@neep.org.

1. There is substantial and growing support for a net zero stretch code.

A year ago, elected and appointed officials from 59 towns and cities – representing almost 40% of the state's population – voiced strenuous support for a net zero stretch code in a letter to the Governor. Letter to Gov Baker 2.4.21. Additionally, AIA Massachusetts as well as the Boston Society for Architecture, AIA Central Massachusetts and AIA Western Massachusetts – ***together representing 5,000 architects in the state*** – strongly advocated for a net zero stretch code in a letter to the Governor. AIA MA Letter to Gov Baker 2.3.21. This letter, signed by a broad net zero buildings coalition, indicates growing support.

Increasingly, Massachusetts citizens understand that buildings currently account for 27% of the state's greenhouse gas emissions (70% or more in some cities) and recognize the need to decarbonize the built environment through net zero regulations and deep energy retrofits. As shown by these letters, they are committed to seeing that a true net zero stretch code is enacted, widely adopted, and working toward electrifying the state's 2 million existing buildings over the next 30 years.

2. Massachusetts is ready for net zero as shown by a surge in completed and planned net zero projects.

Recent years have seen an exponential growth of net zero, Passive House, and other high-performance buildings across Massachusetts. Net zero buildings totaling 6 million square feet have been completed, and a total of 7+ million square feet are planned or under construction. These projects together with relevant data including energy modeling are compiled in a recent study by Built Environment Plus (BE+), formerly the U.S. Green Building Council's Massachusetts Chapter.

As this study and others show, contrary to the belief by some, net zero development is practical, affordable, and proven across a wide range of project types. By minimizing life cycle costs, they provide financial benefits. By neutralizing or drastically reducing greenhouse gas emissions, they provide public health benefits. By providing better building envelopes and verified performance, they ensure greater occupant comfort and resiliency.

Net zero buildings will enable the Commonwealth to improve public health while growing the economy. Already, leading municipalities have mandated net zero buildings for municipal construction, demonstrating their cost effectiveness and other advantages. Six municipalities – five towns and one city – have also filed home rule petitions to enact zoning by laws requiring building electrification for new construction and major renovations.

3. We face a "perfect storm" of challenges for meeting the 2030 goal to avert the worst climate impacts.

We are starting with false comfort in thinking Massachusetts surpassed its 2020 emissions goals. The 2020 goal was met in part because of the pandemic which imposed drastic building occupancy changes resulting in a 16% drop in building sector emissions between 2019 and 2020, from 25.5 MMTCO2e to 22 MMTCO2e. Energy and Environmental Affairs Secretary Kathleen Theoharides acknowledged this aberration. "This is not necessarily a cause for celebration," she said. "2020 was an abnormal year by any stretch of the imagination."
https://www.bostonglobe.com/2022/02/15/science/massachusetts-surpassed-its-2020-emissions-goals-theres-big-asterisk/ Concerningly, the 2020 goal was not yet met in 2019 according to the last reported value for statewide greenhouse gas emissions. (*See MassDEP Emissions Inventories | Mass.gov "Statewide*

Greenhouse Gas Emissions Level: Proposed 1990 Baseline Update Appendix C", "Building Consumption" tab.) Moreover, the aggregate emissions trendline was upward.

Pre-pandemic, building sector emissions were not stagnant but climbing at 4% per year. Reversing this upward trend makes meeting the 2030 goal both more difficult and crucial. The MassDEP Emissions Inventory shows that recent "Building Consumption" emissions are trending upward at the rate of 4% per year over the last four years, 2016 to 2019. (*Again, see MassDEP Emissions Inventories | Mass.gov "Statewide Greenhouse Gas Emissions Level: Proposed 1990 Baseline Update Appendix C", "Building Consumption" tab.*) This is 4X the 1% per year average growth rate since 1990, referenced by DOER, and reflects unprecedented growth of the building sector in recent years. According to the MassDEP data, building sector emissions in MMTCO2e are follows:

2016 – 21.9
2017 – 23.3
2018 – 24.9
2019 – 25.5

This decade's forecast growth will send emissions soaring unless stretch codes neutralize emissions. Development this decade is expected to outpace any rate before or since. According to the Next Generation Roadmap Buildings Sector Report MA Decarbonization Roadmap | Mass.gov, 60% of the growth between 2020 and 2050 is projected to occur over the next decade – driven primarily by demographic trends and small residential buildings. What this means is that 3X more development is forecast to occur this decade than in each of the two following decades. Stretch codes should require proven strategies to minimize life cycle cost and drive toward net zero development on a site emissions basis. These strategies include exemplary energy efficiency, building electrification, and 100% renewable energy.

4. By DOER's numbers, the straw proposal doesn't meet the 2030 emissions reduction goal.

DOER slides from the 2/8/22 webinar Slide 1 (mass.gov) indicate that building sector emissions are currently about 22 MMTCO2e annually. *(Slide 2)* By 2030 MA must achieve 50% reductions in GHG emissions. *(Slide 7)* By DOER's computations, if the straw proposal is enacted, it would yield 500,000 MMTCO2e reductions per year by 2030, and 694,000 MMTCO2e reductions by 2035. *(Slide 4)*

A 500K reduction per year is 2.3% from the current baseline. And DOER forecasts that this rate of reduction will not be achieved until 2030. Before the pandemic, building sector emissions were climbing at the rate of 4% per year, as indicated by the last four years reported by the MassDEP Emissions Inventory. After a 16% drop in building sector emission caused by the pandemic in 2020, it seems more likely that building sector emissions will climb back to 2019 levels or 25.5 MMTCO2e, than transition to falling at the rate of 2.3% any time soon. Net cumulative emissions reduction might be about 10%, not 50%, as needed to meet the 2030 goal. Hypothetically, a 2.3% per year reduction effective immediately, would still only reduce building sector emissions annually from 22 MMTCO2e to 18.3 MMTCO2e, a reduction of 17% (compounded) – ***not even close to 50% or 11 MMTCO2e.***

Unless the transportation or power generation sectors are legally bound to close the gap for the building sector, the 2030 goal will be missed by a wide margin, in violation of legal limits set by the Global Warming Solutions Act Session Law – Acts of 2008 Chapter 169 (malegislature.gov) and Next Generation Roadmap for Climate Policy MA Decarbonization Roadmap | Mass.gov.

5. DOER's emissions calculations omit embodied carbon and gas leaks, understating future growth impacts.

DOER's annual emissions reductions presumably account for building operations only, and do not include embodied carbon emissions from sourcing, production, and transportation of building materials. This is a crucial point given that the Next Generation Roadmap Buildings Sector Report forecasts 60% of the building sector growth will occur during this decade. A true accounting would include embodied carbon emissions and illustrate that aggregate building sector emissions by 2030 are ***WAY off the mark.***

Gas leaks are not accounted for in DOER's emissions forecast. A true accounting would assume continued gas leaks at an accelerated rate as aging infrastructure deteriorates and the business case no longer supports replacement infrastructure which will soon become a stranded asset.

6. Reducing embodied carbon in building materials and construction this decade is critical.

The Global Alliance for Building and Construction and Architecture 2030 calculates that global embodied carbon emissions related to all buildings and infrastructure materials to be 23% of global CO2 emissions each year. For all buildings built between 2021 and 2030, embodied carbon will be responsible for 72 percent of their total emissions.

Operational energy or operational carbon is the energy and corresponding carbon emissions necessary to run a building. Embodied carbon is the energy and corresponding carbon emissions necessary to construct a building and includes the sourcing, production, transportation, and installation of building materials.

Architecture 2030 estimates that the total carbon emissions of new construction between 2020 and 2040 will be 57% from embodied carbon and 43% from operating carbon. As net zero buildings proliferate, the relative impact of embodied carbon will increase. Embodied carbon accounts for greenhouse gas emissions at the start of a building's lifespan and will remain in the atmosphere and affect climate for decades before operational carbon reaches and surpasses the same levels.

This is the most critical decade for reducing emissions, and DOER should ensure that both the updated stretch code and opt-in net zero stretch code regulate embodied carbon. DOER should consider prescriptive paths such as low-carbon concrete specifications. DOER should also consider performance paths such as whole building life cycle assessment for operating carbon and embodied carbon, propelling greater knowledge and modeling capabilities.

7. The straw proposal's net zero definition doesn't meet the law or conform to any published net zero standard or regulation.

The net zero definition appearing on Slide 31 of DOER's webinar slideshow is inadequate and flawed judged against any published standard or regulation. Further, it seems a thinly veiled attempt to circumvent the Next Generation Roadmap statute. The slide says, "Net-Zero new construction is compatible, as built, with the Commonwealth's net-zero emissions economy in 2050." The slide adds three bulleted points:

- Consistent with electrification and deep efficiency approach in EEA's 2050 Roadmap
- Does not necessitate onsite or offsite renewables, nor the assumption that an individual building is net-zero energy
- A building becomes net zero energy when MA electric grid is net zero.

This conforms with no net zero definition in the world today. The common definition of net zero has been honed over the past two decades by 21 studies as referenced by the U.S. Department of Energy (DOE) here. These studies include *Getting to Zero: The Massachusetts Governor's Net Zero Buildings Task Force Report (2008)*, which produced a net zero definition based on site energy and helped spur some of the state's first net zero buildings. Today, fourteen years later, one of the most widely respected building performance standards is Passive House which has advanced an improved net zero definition based on site emissions. ***Not only is DOER's definition aberrant, but it flies in the face of broad net zero support.***

The statute requires the DOER to adopt a definition of a "net zero building." In fact, however, the agency has done nothing of the kind. Translated, the straw proposal's definition means that anything that the agency believes will fulfill the aspirations of the "net zero emissions economy in 2050" qualifies. The agency asserts that this is "consistent with the electrification and deep efficiency approach to EEA's 2050 Roadmap," but that hardly amounts to the definition of a net-zero building. There isn't any assumption that an individual building is net-zero energy, which is the essence of the definition of a net zero building under every net zero study and standard for two decades, as cataloged by the U.S. Department of Energy. The straw proposal's definition does not require a building to use onsite or offsite renewables and doesn't even apply until the MA electric grid is net zero. Apparently, nothing can be a net-zero building until then.

This definition reflects the DOER's refusal to take seriously the municipal opt-in specialized stretch energy code (which it pointedly refuses to call what everyone else calls it, the "net zero stretch code"). The DOER's straw proposal does not authorize municipalities to take the fight against climate change to a new level. It reduces them to adopting modest additions to the DOER's main regulatory effort, the updating of the existing stretch code. ***In effect, the straw proposal is the third veto of the net zero stretch code.***

The statute also requires DOER to adopt net zero performance standards, and DOER hasn't even tried to comply with that requirement. No wonder. Given the definition of a net zero building, in which net zero buildings do not have to be net zero, the very idea of a net zero performance standard is meaningless.

In short, the basic regulatory approach of the straw proposal is flatly inconsistent with the agency's statutory mandate. Instead of proposing a stretch code update and true net zero stretch code that ensure the Commonwealth meets legally mandated emissions limits in 2030, the agency has reduced the net zero stretch code to a ***minor improvement of an updated stretch code which is also insufficient to meeting the 2030 goal. This is, of course, not in accordance with the applicable law.***

8. The straw proposal does not "minimize, to the extent feasible, life cycle costs" per the law.

The Global Warming Solutions Act requires the stretch code to "minimize, to the extent feasible, the life-cycle cost of the facility by using energy efficiency, water conservation or other renewable or alternative energy technologies."

According to DOER's webinar commentary, all-electric buildings yielded a life cycle cost reduction – up to 9% better – across all project types when compared with gas. Although no analysis or data was shared, this statement alone suggests that DOER is compelled to require building electrification because it minimizes life-cycle costs. The updated stretch code will become effective in 299 communities in January 2023, without requiring additional and onerous municipal action to adopt the opt-in net zero code. ***By law, building electrification must be a requirement of both the updated stretch code and opt-in net zero stretch code.***

9. The straw proposal fails the next generation in at least ten ways.

1. ***It allows fossil fueled buildings.*** Under all three codes – Base, Updated Stretch, and Opt-In Net Zero Stretch – the Stretch Code Straw Proposal is missing the opportunity to slash building sector emissions by 64%, as can be delivered today by heating electrification, according to DOER's slides. This perpetuates climate risks to public health, along with significant associated costs, while creating another generation of existing buildings that will soon need to be retrofitted with electrified heating at significantly greater capital expense, burdening our workforce and taxpayers and creating a drag on the economy.

2. ***It allows unlimited curtainwall (R8) which yields significantly less energy efficient buildings than optimally (+/-35%) glazed building enclosures (R27+).*** Aesthetics and flexibility can be met with a variety of design elements and strategies other than curtainwall. The era of unlimited curtainwalls must end.

3. ***The Stretch Code Straw Proposal does not sufficiently "stretch."*** The updated residential stretch code (HERS 42/45) requires only a 23%/18% improvement as compared to the base code, while the updated commercial stretch code (ASHRAE 90.1 2019) requires only a 5% improvement as compared to the base code (ASHRAE 90.1 2016). Best practice suggests that significantly greater energy efficiency is readily achievable and yields life cycle cost savings. The MA Ready for Net Zero study (March 2021) showed millions of square feet of existing net zero buildings which achieved 40%, 50%, 60% or greater energy efficiency improvement compared to a baseline building.

4. ***It does not require renewable energy to offset 100% of the annual site emissions.*** As a result, projected growth this decade will take us further from the 2030 goal. A true net zero stretch code requiring renewable energy to offset 100% annual site emissions is needed to level emissions. See pictogram in Appendix Section 20 (page 14). This tells the story in a nutshell.

5. ***It does not address major renovations, which are a significant driver of building activity, as well as a significant opportunity to decarbonize.*** From the 2050 Decarbonization Roadmap: The most cost-effective time for an existing building to transition to a heat pump system is during routine home improvements or when an older HVAC system must be replaced." (page 45) "Electrification of space and water heating is a low-risk, cost effective strategy for decarbonizing the majority of the Commonwealth's building stock." (page 44)

6. ***It does not incentivize municipalities to adopt the municipal opt-in net zero stretch code.*** Green Communities grants totaling up to $10 million annually are ideally suited to this purpose. See Appendix Section 11 (page 10).

7. ***It mentions Embodied Carbon only in the most superficial way in connection with curtainwall buildings.*** As discussed in Appendix Section 6 (page 6), this disregards a major contributor to building sector emissions which is even more important to regulate than operating carbon, especially this decade.

8. ***It requires air tightness testing but not commissioning and performance verification.*** The MA Net Zero Buildings Coalition recommends otherwise. See the Net Zero Stretch Code Framework in Appendix Section 16 (page 11).

9. ***It is silent on refrigerants, and yet additional climate risks are posed by driving toward electrified heating (heat pumps) without specifying low-impact refrigerants and refrigerant handling.*** The MA Net Zero Buildings Coalition is cognizant of these risks and recommends stretch code provisions to address them. See the Net Zero Stretch Code Framework in Appendix Section 16 (page 11).

10. ***Exemptions and waivers are unclear. Without code language, even the building area thresholds for these codes is unclear.*** The MA Net Zero Buildings Coalition recognizes that even the best stretch codes can be weakened by exemptions and waivers. See the Net Zero Stretch Code Framework for a suggested approach in Appendix Section 16 (page 11).

10. The Green Communities Act compels green communities to adopt the opt-in stretch code.

DOER's straw stretch code proposal violates the statute by allowing green communities to retain their designation without adopting the opt-in stretch code which is more beneficial.

In 2008, the Green Communities Act https://malegislature.gov/laws/sessionlaws/acts/2008/chapter169 established the criteria for municipalities to qualify as "green communities" which includes requiring all new residential construction over 3,000 square feet and all new commercial and industrial real estate construction to "minimize, to the extent feasible, the life-cycle cost of the facility to the using energy efficiency, water conservation and other renewable or alternative energy technologies." This precise language also defines the stretch code and effectively mandates green communities to adopt it.

Nothing in the statute anticipates two stretch codes. However, the law requires green communities to "minimize, to the extent feasible, life-cycle cost." This requires net present value computations (standard calculations in life cycle cost assessment) to determine and compare the cost effectiveness of the two stretch codes as applied to various building types. The opt-in net zero stretch code minimizes life-cycle cost to a greater degree than the updated stretch code. Why? Because as shown by many studies, net zero buildings can be built for little if any cost premium and produce annual energy cost savings over the lifespan of a building, typically 50+ years, thus lowering the life-cycle cost. ***Therefore, green communities are compelled by law to adopt the opt-in net zero stretch code.***

11. DOER should incentivize green communities to adopt the opt-in net zero stretch code soon.

DOER should incentivize green communities to adopt the opt-in net zero stretch code using the state-funded green communities grant pool, up to $10 million per year, as provided for in the Green Communities Act. Only green communities adopting net zero standard should be eligible to compete for the entire pool up to $10 million in the first round of grant applications. Any balance remaining after these net zero green communities receive their awards could be the basis for a second round of grant applications by green communities still using the updated stretch code.

DOER should consider allowing green communities a three-year "concurrency period" during which individual municipalities could decide, by vote of Town Meeting or Town Council, whether and when to transition from the updated stretch code to the opt-in net zero stretch code. Green communities adopting the opt-in net zero stretch code would become known as "net zero green communities." At the end of the concurrency period, green communities that have not yet adopted the opt-in net zero stretch code should be encouraged to do so through a possible DOER "leading by example" municipal training program.

12. It is not hyperbole to suggest that this round of stretch codes will determine the success or failure of Massachusetts' next generation climate policy.

At the beginning of the next three-year code cycle, the updated Stretch Code will become the operative building energy code for 299 Massachusetts communities representing nearly 90% of our population. Updating will happen in an instant, no municipal action necessary, taking effect in January 2023. This is the decade that matters most, according to climate scientists. DOER must produce building energy codes and advance integrated state incentive programs that together drive down emissions in accordance with the state's emissions targets. Building energy codes are not up for political persuasion but must use a science-based approach to address climate data and meet state laws.

If this updated Stretch Code fails us and we do not meet the 2030 goal, building sector emissions which account for 27% of aggregate emissions will likely continue to rise in connection with expanded development, contributing to the intensification of global feedback loops (atmosphere, ice, forest, ocean) over which we have no control. Considering the seriousness of this potential risk, leading communities, some of which have more aggressive climate goals than the state's, are already moving to pursue other governance options. And with good reason.

13. DOER must develop a suite of more stringent building energy codes – base, updated stretch, and opt-in net zero.

Building energy codes need to meet the 2030 goals and support forecast development activity this decade. Unless they do so, building sector emissions will rise. Three building energy codes – Base, Updated Stretch, and Opt-In Net Zero Stretch – should be well coordinated and promulgated by January 2023, providing benefit as soon as possible. The opt-in net zero code should be available for adoption as of January 2023, effective immediately or within six months. All three should ***pertain to both new construction and major renovations, the latter defined as significantly affecting 50% or more of the building space.*** To meet the 2030 goal, the following important provisions are crucial:

1. ***Base Energy Code*** – require good energy-efficient, all-electric, EV Electric Vehicle-ready, and PV Photovoltaic-ready buildings. DOER notes that 2020 Massachusetts new homes average HERS 51.

2. ***Updated Stretch Code*** – require better energy-efficient, all-electric, PV Photovoltaic-ready, low embodied carbon, EV Electric Vehicle-charging. A 20% improvement from HERS 51 is HERS 41.

3. ***Opt-in Net Zero Stretch Code*** – require best energy-efficient, all-electric, net zero (on-site emissions), low embodied carbon, EV Electric Vehicle charging + 100% renewable power generated on-site or off-site or purchased from approved sources, validated by Passive House or other third-party certification. DOER notes that Passive House standards are comparable to HERS 34.

14. Timing is everything. The net zero stretch code needs to become widely adopted in 2023.

According to the Next Generation Roadmap Buildings Sector Report, a high performance, net zero on-site emission stretch code adopted in 2023 could reduce annual 2050 emissions from residential and new commercial construction by 1.30 MMT CO2 (87% reduction), whereas adoption by 2030 could reduce annual 2050 emissions from residential and commercial new construction by 0.8 MMT CO2 (54% reduction). ***Stepping up adoption by seven years could realize a savings of 0.7 MMT CO2 or 61% more emissions. A true net zero stretch code needs to become widely adopted and effective in 2023.***

Stretch codes offer advantages of uniformity, enforceability, and adaptability through periodic updates. Unless DOER delivers stretch codes aimed at meeting state emissions reduction goals, leading communities have shown readiness to pursue other potential fossil fuel free governance solutions to meet the 2030 goal which is imminent. These include home rule petitions, local zoning incentives, and special permits.

15. Accelerating the transition off polluting fossil fuels is most critical for low-income ratepayers.

Local and state policies will work in coordination with a net zero stretch code to ensure that low-income ratepayers are not burdened with rising fossil fuel prices during the clean energy transition. By expanding workforce training and incentivizing heat pump retrofits for low- and moderate-income ratepayers, these ratepayers will not be burdened with expensive utility bills but rather benefit from 50% more energy efficient home heating systems. Net zero code adoption isn't just for wealthy towns. Energy-burdened communities benefit most from energy-efficient affordable housing and declining emissions.

16. DOER should advance its work in accordance with the MA Net Zero Buildings Coalition's Net Zero Stretch Code Framework (February 2022).

Through a collaborative effort, representatives of the MA Net Zero Buildings Coalition developed a consensus one-pager that suggests a ***net zero definition*** and ***seven important new code provisions –*** energy efficiency, electrification, renewable energy, embodied carbon, building energy reporting & commissioning, refrigerants, exemptions & waivers. These provisions apply to both commercial and residential projects, and to major renovations as well as new construction. See the following page.

NET ZERO *DEFINITION*

An energy-efficient, all-electric, low embodied carbon building that achieves carbon neutral building operations through the production and/or procurement of renewable energy.

CARBON NEUTRALITY *GOAL*

Achieve statewide carbon neutrality per the Global Warming Solutions Act which calls for emissions reductions from 1990 levels of at least 50% by 2030 and at least 75% by 2040, leading to "net zero" by 2050. Support municipalities in meeting or exceeding these emission reduction goals.

EQUITY *GOAL*

Prioritize net zero stretch code adoption and energy-efficient affordable housing in energy-burdened communities. Ensure "No community left behind."

COMMERCIAL & RESIDENTIAL

PRINCIPLE

Transition all building types to 100% renewable energy. Ensure "No square foot left behind."

NEW CONSTRUCTION & RENOVATION

PRINCIPLE

Electrify all buildings starting with new construction and major renovations.

ENERGY EFFICIENCY

IMPORTANT NEW CODE PROVISION

Set energy efficiency standards consistent with leading benchmarks to reduce greenhouse gas emissions, operational expenses, and grid load.

ELECTRIFICATION

IMPORTANT NEW CODE PROVISION

Require primary heating/cooling systems, appliances and other systems to be 100% electric to take full advantage of renewable energy and provide cost-effective heat and air-conditioning.

RENEWABLE ENERGY

IMPORTANT NEW CODE PROVISION

Require buildings to be powered by 100% renewable energy which can be on-site or off-site, generated and/or purchased from approved sources, so that building operations are carbon neutral.

EMBODIED CARBON

IMPORTANT NEW CODE PROVISION

Require Whole Building Life Cycle Assessment (WBLCA) to account for and minimize embodied carbon in the sourcing, production, and transportation of building materials.

BUILDING ENERGY REPORTING & COMMISSIONING

IMPORTANT NEW CODE PROVISION

Require building energy reporting and disclosure, together with initial and periodic commissioning, to ensure that building systems operate as designed.

REFRIGERANTS

IMPORTANT NEW CODE PROVISION

Require the selection of low-impact refrigerants and refrigerant recycling (prohibiting disposal) to limit ozone depletion and carbon emissions.

EXEMPTIONS & WAIVERS

IMPORTANT NEW CODE PROVISION

Exemptions should be narrowly defined, fully justified, and subject to review as technology changes. Waivers should only be available in limited instances through a clearly defined process. These might include emergency generation and process gases or other instances of technological infeasibility.

For more information contact Northeast Energy Efficiency Partnerships - Darren Port dport@neep.org Kai Palmer-Dunning at kpdunning@neep.org

17. A true net zero code will deploy a newly trained workforce and stimulate homeowners to utilize residential electrification incentives.

The surest way to create strong market demand for the state's jobs initiative and residential electrification program is to promulgate a true net zero stretch code and incentivize its adoption. The net zero code will work in tandem with the state's residential electrification and workforce development efforts. At a recent Northeast Sustainable Energy Association (NESEA) program, MassCEC representatives proposed a pilot that would be akin to MassSAVE "on steroids," with a focus on providing homeowners with a pathway to decarbonization. Other speakers focused on state-supported workforce training for heat pump retrofits, as mandated by the Next Generation Roadmap Act. A net zero stretch code will leverage state investment in jobs training and electrification incentives, ensuring good jobs and a strong economy.

18. Decarbonizing existing buildings is key.

Most of the projected 2050 building space – 81% according to the Next Generation Roadmap Buildings Sector Report, or 73% according to the DOER straw proposal webinar – already exists today. Reducing emissions to meet statutory goals requires decarbonizing existing buildings, 74% of which are by square footage residential buildings, according to the Next Generation Roadmap Buildings Sector Report.

This report envisions a straight-line approach to emissions reductions, starting this decade, stating, "In order to achieve required emissions reductions in and before 2050 in the Buildings Sector, significant growth in the pace and scale of heating system retrofits is required. For the residential sector, that translates to an average of nearly 100,000 homes installing heat pumps or other renewable thermal systems each year for the next 25-30 years. The commercial sector requires a comparable level of effort."

The legislature recently voted approval of $100 million in ARPA funding to incentivize heating system retrofits and energy efficiency improvements of existing buildings. But $100 million will be depleted in a year and "stretched thin" over 100,000 homes, providing only $1,000 per structure, barely enough for air infiltration sealing. A new proposal seeks an additional $250 million in anticipated ARPA funding to boost this existing building retrofit incentive. This would provide another $2,500 per structure. A residential heat pump retrofit with modest energy efficiency improvements could easily cost 10-20X this amount or $25,000-$50,000.

The DOER presentation included MassSave subsidies of $15,000 per dwelling unit for HERS 45 and $25,000 per dwelling unit for HERS 35 (reflecting Passive House performance). Valuable as these incentives are, they must be accompanied by explicit MassSave promotion (not discouragement) of heat pumps. MassSave incentives are not currently available in 31 municipal light plant communities. A comparable publicly funded incentive program should be required in and developed for these communities.

19. Legislators should act now to allocate $250 million to the Zero Carbon Renovation Fund.

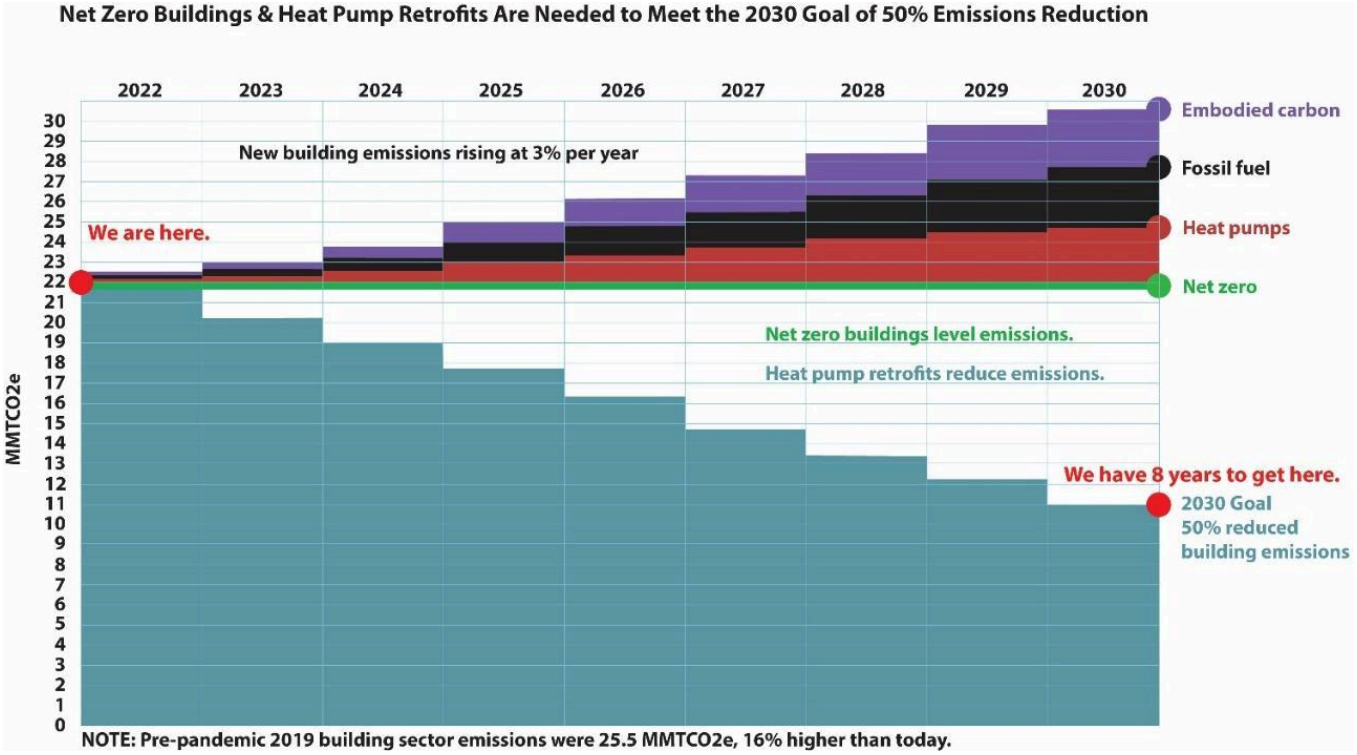
A Zero Carbon Renovation Fund of $250 million, allocated from the remaining ARPA funds, will respond to the climate crisis and improve the health and well-being of Massachusetts residents by renovating existing buildings to zero carbon. Administered through MassCEC, this fund will result in deep carbon savings by transforming existing MA buildings to be energy efficient, all electric, renewably powered, and renovated with low-embodied carbon materials. This is especially important today, before the grid is decarbonized.

The proposed Zero Carbon Renovation Fund will promote affordability. This fund would assist affordable housing, public housing, low- and moderate-income homes, municipal buildings including but not limited to schools, and small businesses with Massachusetts State Supplier Diversity Office Certifications.

This is a bold proposal to address the urgent need for zero carbon retrofits. **"**Nearly one third of Massachusetts' emissions come from its more than 2 million ***existing*** buildings." However, as stated in the Massachusetts 2050 Decarbonization Roadmap Study, "Electrification and efficiency in existing buildings presents a larger challenge, as this stock represents the bulk of emissions reductions needed by 2050." By reference to this study, the Act Creating a Next Generation Roadmap for Massachusetts Climate Policy hinges on retrofitting over 1 million existing homes by 2030 and 350 million square feet of commercial retrofits, "with at least two-thirds [of existing buildings] receiving deep energy efficiency improvements."

20. We have a 2030 goal. Let's do what it takes to meet it.

As illustrated by the pictogram below, we have eight years to meet the 2030 goal. Building sector emissions climbing at rate of 3% per year (less than the pre-pandemic rate of 4% per year), will take us further from the 2030 goal. If fossil fuel buildings are allowed and only moderate energy efficiency is required, the rise will be steeper, as shown in black. If all-electric buildings and higher energy efficiency are required, the rise will be less steep, as shown in red. A widely adopted net zero stretch code will level building sector emissions this decade, as shown by the horizontal green line. Embodied carbon emissions associated with construction are expected to rise significantly this decade, as shown in purple.



To meet the 2030 goal, we need net zero new construction to level emissions, as shown in green, AND electrification of existing buildings to reduce emissions, as shown in blue. It's that simple. DOER must develop an effective stretch code update and a true net zero opt-in code that neutralize building sector emissions and ensure no community is left out of the clean energy transition.

SIGNATORIES

Stretch Code Straw Proposal Comments to DOER by MA Net Zero Buildings Coalition

Letter + Appendix

March 18, 2022

Signatories will be added on a rolling basis and grouped by the categories below through March 18, 2022.

Elected and Appointed Representatives

Acton

David D. Martin, Select Board Chair
Jim Snyder-Grant, Select Board
Fran Arsenault, Select Board
Himaja Nagireddy, Select Board
The Acton Climate Coalition Steering Committee

Amherst

Dorothy Pam, Town Councilor
Pam Rooney, Town Councilor
Cathy Schoen, Town Councilor
Jennifer Taub, Town Councilor - District 3
Stephanie Ciccarello, Sustainability Coordinator
Andra Rose, Energy and Climate Action Committee, Vice-Chair

Andover

Harry Voorhees, Chair, Green Advisory Board (appointed Town Board)
Melanie Cutler, Andover Green Advisory Board member
Willow Cheeley, Andover Green Advisory Board Member
Maria Bartlett, Andover Green Advisory Board Member

Arlington

Adam Chapdelaine, Town Manager
Kristen Fritsch, Sustainability Coordinator, Architect
Patrick M. Hanlon, Vice Chair Zoning Board of Appeals, Town Meeting Member
Eric Helmuth, Select Board member
Lenard Diggins, Select Board member
Coralie Cooper, Chair, Clean Energy Future Committee
Marc Breslow, Clean Energy Future Committee
Pasi Miettinen, Clean Energy Future Committee
Amos Meeks, Town Meeting Member

Ashland

Kevin McClean, Planning Board
Anna Tesmenitsky, Planning Board

Robert Scherer, Select Board Member
Ashwin Ratanchandani., Sustainability Committee Chair
Charles W. Lidz Ph.D., Sustainability Committee Co-chair
Matthew Marshquist, Sustainability Committee Member
Cara Hulme, Sustainability Committee Member
Margy Gassel, Ph.D., Sustainability Committee Member

Belmont

Adam Dash, Select Board Member
Mark A. Paolillo, Select Board Member
James Booth, Belmont Energy Committee Co-Chair
Marty Bitner, Belmont Energy Committee Co-Chair, Town Meeting Member
Roger Wrubel, Belmont Energy Committee member, Town Meeting Member
Brian Kopperl, Belmont Energy Committee Member
Reverend Cindy Davidson, Executive Director, Massachusetts Interfaith Power & Light

Becket

Al Blake, 350 Massachusetts

Beverly

Mayor Michael P. Cahill
Julie Flowers, City Council President, City Councilor at Large
Hannah Bowen, City Councilor at Large

Bolton

Anthony Jagodnik, Heat Smart Alliance

Boston

Ruthzee Louijeune, Boston City Councilor At-Large
Julia Mejia, Boston City Councilor At-Large
Brian Worrell, City Councilor, District 4
RIcardo Arroyo, City Councilor, District 5
Kendra Lara, Boston City Councilor, District 6, Chair of the Committee on Environmental Justice, Resiliency, and Parks
Tania Anderson, Boston City Councilor District 7
Kenzie Bok, Boston City Councilor, District 8
Liz Breadon, Boston City Councilor, District 9

Boxford

Barbara Jessel, Select Board Chair
Holly Langer, Planning Board and Sustainability Committee
Gary Martin, Chair, Boxford Sustainability Committee
Patrick Canonica, Boxford Sustainability Committee

Braintree

Elizabeth Maglio, Town Councilor

Brookline

Heather Hamilton, Select Board Chair
Raul Fernandez, Select Board Vice Chair

John VanScoyoc, Select Board
Miriam Aschkenasy, Select Board
Steven A. Heikin, FAIA, Brookline Planning Board Chair
Paul Saner, Economic Development Advisory Board Co-Chair, Town Meeting Member
Jesse Gray, Chair, Zero Emissions Advisory Board to the Select Board, Town Meeting Member
Werner Lohe, Zero Emissions Advisory Board to the Select Board, Town Meeting Member
Kathleen Scanlon, Zero Emissions Advisory Board to the Select Board, Town Meeting Member
Lisa Cunningham, Town Meeting Member, MA Building Electrification Accelerator

Cambridge

Mayor Sumbul Siddiqui
Dennis J. Carlone, City Councillor, Co-Chair Finance Committee
Patricia Nolan, City Councillor
Quinton Y. Zondervan, City Councillor
Jan Devereux, Former City Councillor

Canton

Christine Smith, Chair, Canton Sustainability Committee

Concord

Amanda Kohn, Sustainability Director
Kerry Lafleur, Town Manager
Susan Mlodozeniec, West Concord Advisory Committee member, HeatSmart Alliance member

Cummington

Kathryn Eiseman, Chair, Cummington Planning Board

Dedham

Jessica L. Porter, Planning Board Member
Emily Walton, Appointed Sustainability Advisory Committee Member

Framingham

Adam Steiner, City Councilor
Aimee M. Powelka, Ph.D., Framingham Sustainability Committee Vice Chair
Jaime S. Haber, Secretary, Framingham Sustainability Committee
Donna Kramer Merritt, Framingham Sustainability Committee
Sean Bilodeau, Framingham Sustainability Committee

Franklin

Cobi Frongillo, Town Council
Patrick Carl Sheridan, Town Council
Ted Cormier-Leger, Town Council
Melanie Hamblen, Town Council
Sam Gifford, Heat Smart Alliance

Gloucester

Candace P. Wheeler, Chairman, Gloucester Clean Energy Commission
Susan Hoague, Cape Ann Climate Coalition
Douglas Smith, Cape Ann Climate Coalition
Karin Peterson, Cape Ann Climate Coalition

Lisa Jean Smith, Cape Ann Climate Coalition
Mark Nelson, Cape Ann Climate Coalition
Gail S. Seavey, Cape Ann Climate Coalition
Rebecca Reynolds, Cape Ann Climate Coalition
Lynn Levreault, Cape Ann Climate Coalition
Karen N. Bell, Cape Ann Climate Coalition
Robert Myers, Cape Ann Climate Coalition
Cynthia Smith, Cape Ann Climate Coalition
Dick Prouty, TownGreen Board Chair
Susanna Natti, TownGreen
Ted Hoague, TownGreen
Valerie I. Nelson, Water Alliance

Groton

Becky Pine, Select Board Chair
Ginger Vollmar, Groton Sustainability Commission, Appointed Member

Hopkinton

Linda Chuss, Sustainable Green Committee member

Ipswich

Carolyn Britt, Planning Board Chair, Ipswich Climate Resiliency Committee member
James Donovan, Ipswich Climate Resiliency Committee member
Michael Schaaf, Town Finance Committee member, Municipal Light Department Committee
Michael Johnson, Chair of the Ipswich Climate Resiliency Committee
Charles Whitten, Member of the Ipswich School Committee and Climate Resiliency Committee

Lancaster

David Spanagel, Nashoba Valley Climate Coalition member, Thayer Memorial Library Trustee

Lexington

Joseph Pato, Select Board Member
Mark Sandeen, Select Board Member
Cynthia Arens, Town Meeting Member, Sustainable Lexington Committee member
Len Jensen, Town Meeting Member, Sustainable Lexington Committee member
Paul Chernick, Town Meeting Member, Sustainable Lexington Committee member
Ricki Pappo, Town Meeting Member, Chair, Lexington Climate Action Network (LexCAN)
Jeanne K Krieger, Town Meeting Member
Tina McBride, Town Meeting Member

Lincoln

Jennifer Glass, Select Board Member
Audrey Kalmus, Chair, Capital Planning Committee
Susan Klem, Green Energy Committee

Marblehead

Eileen Mathieu, Green Marblehead Committee, Appointed Member
Louise B. Yarmoff, Sustainable Marblehead Executive Director
Judith Back, Sustainable Marblehead Founder
Lynn Bryant, Sustainable Marblehead Board Member

Jean-Jacques Yarmoff, Sustainable Marblehead Board Member
Peter Langer, Sustainable Marblehead Board Member
Marybelle Hollister, Sustainable Marblehead

Marlborough

Samantha Perlman, City Councilor

Maynard

Kate Wheeler, Maynard Sustainability Committee
Kate Wheeler, Member, Maynard Sustainability Committee and Maynard Tree Corps
Leslie Bryant, Green Maynard

Medfield

Osler L. Peterson, Select Board Member
Megan Sullivan, Medfield Environment Action

Medford

Breanna Lungo-Koehn, Mayor
Zac Bears, City Council Vice President
Nicole Morell, City Council
Kit Collins, City Council
Alicia L. Hunt, Director of Planning, Development & Sustainability
Robert Paine, Chair, Medford Energy and Environment Committee
Barry Ingber, Medford Energy and Environment Committee member
Lauretta James, Medford Energy and Environment Committee member
Luke McKneally, Medford Energy and Environment Committee member
Jenny Graham, Vice Chair, Medford School Committee
Paul Ruseau, School Committee Member

Melrose

Paul Brodeur, Mayor
Martha Grover, Sustainability Manager
Ryan Williams, City Councilor
David Bliss, Melrose Energy Commission

Mendon

Carolyn C. Barthel, Land/Energy Use Committee

Milton

Meredith Hall, Planning Board Member
Sustainable Milton, as a unanimous vote, L. Tucker Smith, President

Natick

David Mogolov, Natick Sustainability Committee
Roger Luckmann, Elders Climate Action

Needham

Donna Vello, Green Needham
Maureen Commane, Green Needham
Stephen Frail, Green Needham

Eleanor Rosellini, Green Needham
James Glickman, Green Needham Collaborative (Steering Committee)

Newburyport

Michael Strauss, Chair, Energy Advisory Committee

Newton

Mayor Ruthanne Fuller
Alicia Bowman, City Councilor
Deb Crossley, City Councilor, at-large
Andreae Downs, City Councilor
Emily Norton, City Councilor
Bill Humphrey, City Councilor
Vicki Danberg, City Councilor
Maria S. Greenberg, City Councilor Ward 1
Halina Brown, Chair, Newton Citizens Commission on Energy
James Purdy, Vice chair, Newton Citizens Commission on Energy
Jane Hanser, Transportation Advisory Group
Marcia Cooper, President, Green Newton
Dan Rubin, Chair, Green Newton
Cory Alperstein, Board Member, Green Newton
Craig Forman, Board Member, Green Newton
Peter Barrer, Green Newton

Northampton

Alex Jarrett, City Councilor, Ward 5
Rachel Maiore, City Councilor, Ward 7
Denise Lello, Mothers Out Front Northampton Chair
Chris Mason, on behalf of the Northampton Energy and Sustainability Commission

Northborough

Jeanne Cahill, Master Plan Implementation Committee and Sustainable Northborough Citizen's Group
Deirdre Watkins, Sustainable Northborough Citizen's Group

Pepperell

Renee D'Argento, Pepperell Climate Change Committee

Pittsfield

Jane Wynn, Berkshire Environmental Action Team

Quincy

Shelly Dein, Energy & Sustainability Director
Gina Favata, Quincy Climate Action Network (QCAN)

Rockport

Dianne Finch, Rockport Conservation Commissioner
Peter Kuttner, FAIA, Rockport Planning Board member
Steve Wood, Green Community Task Force
Christine Downing, Chair, Rockport Cultural Council
Mary Devaney, Rockport Rights of Way Committee and Cape Ann Climate Coalition

Diane Cartwright, Cape Ann Climate Coalition
Susan Britt, Cape Ann Climate Coalition
Sharon B. Kishida, Cape Ann Climate Coalition

Salem

Mayor Kimberly Driscoll
Domingo Dominguez, Councillor at Large
Conrad Prosniewski, Councillor at Large
Alice Merkl, Councillor at Large
Caroline Watson-Felt, City Councillor Ward 2
Patricia Morsillo, City Councillor Ward 3
Leveille McClain, City Councillor Ward 4
Jeff Cohen, City Councillor Ward 5
Megan Riccardi, City Councillor Ward 6
Andy W. Varela, City Councillor Ward 7
John Hayes, Chair, Sustainability Energy, and Resiliency Committee
Manny Cruz, Vice-Chair, School Committee
Salem Alliance for the Environment Board, Pat Gozemba and Cindy Keegan, Co-chairs

Sharon

Hanna Switlekowski, Select Board Member

Somerville

Mayor Katjana Ballantyne
Willie Burnley, Jr., City Councilor At-Large
Kristen Strezo, City Councilor At-Large
Jake Wilson, City Councilor At-Large
Ben Ewen-Campen, City Councilor, Ward 3
Judy Pineda Neufield, City Councilor, Ward 7
Will Mbah, Former City Councilor
Elizabeth Galloway, Senior Building Scientist, Somerville

Topsfield

Joel Hariton, Ipswich River Watershed Association Outreach Committee

Truro

Bob Higgins-Steele, Truro Energy Committee, Truro Climate Action

Upton

Christine Lazar, Sustainable Upton
Laurie Wodin, Sustainable Upton Co-Administrator

Wakefield

Julie Smith-Galvin, Chair, Town Council
Jennifer Kallay, Wakefield Municipal Gas and Light Department Commissioner
Melissa Eusden, Wakefield Environmental Sustainability board member

Waltham

Colleen Bradley-MacArthur, City Councilor At-Large
Jonathan Paz, City Councilor Ward 9

Watertown

Mark S. Sideris, City Council President
Tony Palomba, City Councilor At-Large
Caroline Bays, City Councilor At-Large
John Gannon, City Councilor At-Large
John Michael Airasian, City Councilor At-Large
Nicole Gardner, District A City Councilor
Lisa Feltner, District B City Councilor
Vincent Piccirilli, District C City Councilor
Emily C. Izzo, District D City Councilor
Edward Lewis, Watertown Energy Manager
Jeanne Trubek, Chair, Watertown Environment and Energy Efficiency Committee
Pat Rathbone, Appointed member Watertown Environment and Energy Efficiency Committee
Watertown Environment and Energy Efficiency Committee (as an entire appointed committee)
Laurel Schwab, Senior Environmental Planner

Wayland

Anne Richards Harris, Co-Chair, Wayland Energy and Climate Committee
Stephen R. Breit, Energize Wayland

Wellesley

Wellesley Select Board (unanimous vote): Thomas H. Ulfelder, Chair; Lise M. Olney, Vice Chair; Elizabeth Sullivan Woods, Secretary; Colette E. Aufranc; Ann-Mara S. Lanza
Laura Olton, Chair, Wellesley Climate Action Committee
Susan Morris, Vice Chair, Wellesley Climate Action Committee
Fred Bunger, Town Meeting Member, Wellesley Climate Action Committee
Martha Collins, Wellesley Climate Action Committee
Ellen Korpi, Wellesley Climate Action Committee
Marybeth Martello, Wellesley Sustainability Director
Mary Gard, Sustainable Wellesley Member

Williamsburg

Adin Maynard, Williamsburg Energy Committee

Williamstown

Wendy Penner, Williamstown COOL Committee Chair

Winchester

Susan Verdicchio, Select Board Chair
Michael Bettencourt, Select Board
Mariano Goluboff, Select Board
Ken Pruitt, Sustainability Director
Ruth Trimachi, Winchester Climate Action Advisory Committee
Christine Martin Barraford, Climate Action Advisory Committee
Joshua Bers, Climate Action Advisory Committee appointee
Dave Judelson, Town Meeting Member, Sustainable Winchester Member
John Brown, Town Meeting Member

Worcester

Mayor Joseph Petty
Edward M. Augustus, Jr., City Manager
Etel Haxhiaj, City Councilor
Sean Rose, District 1 City Councilor
John Odell, Chief, Department of Sustainability and Resilience
Luba Zhaurova, Director of Projects, Department of Sustainability and Resilience

Non-Profit Organizations

BSA/AIA Boston Society for Architecture, Anda French, AIA, BSA President
Eastie Farms, Kannan Thiruvengadam
LISC, Emily Jones, Senior Program Officer for LISC Boston's Green Homes + Green Jobs Initiative
Greater Boston Physicians for Social Responsibility, Andee Krasner, Program Manager, Climate and Health
Climate Code Blue, Caren Solomon
Northeast Sustainable Energy Association, Miriam Aylward, Executive Director, Rachel White, Board Chair
Mass Climate Action Network, Sarah Dooling, Executive Director
Clean Water Action, Laura Spark, Senior Policy Advocate
Charles River Neighborhood Foundation, Amy Mah Sangiolo
Mystic River Watershed Association, Patrick Herron, Executive Director
Boston Clean Energy Coalition, Rickie Harvey
Passive House Massachusetts, Hank Keating
Zero Carbon MA, Jesse Gray and Lisa Cunningham, Co-founders
Jewish Climate Action Network, David Schreiber
Fore River Residents Against the Compressor Station, Alice Arena, President
350Mass, Mark Dyen
350Mass Newton Node, Leslie Zebrowitz
350 North Shore Node, Kate Enderlin and Jim Mulloy
350 Mass MetroWest Node, Paul Shorb
350MA Mystic Valley Node, Christine Foot
Mothers Out Front Massachusetts, Anne Wright, Coordinator
Mothers Out Front Worcester, Gaylen Moore
Mothers Out Front Brookline, Tracie Burns and Anne Sudduth, Co-chairs
Mothers Out Front Acton, Judith A. Aronstein, Coordinator
Mothers Out Front, Lexington
Lexington Climate Action Network (LexCAN)
Climate Action Now, Western Mass (CAN), Adele Franks, Northampton
No Fracked Gas in MA, Rosemary Wessel, Program Director
Global Urban Solutions, Peter H. Smith
Berkshire Environmental Action Team, Jane Winn, Executive Director
Watertown Faces Climate Change, including Watertown 350 Mass node and Watertown Citizens for Peace, Justice, and the Environment, Barbara Rose and Pat Rathbone
Quincy Climate Action Network, Gina Favata
Hamilton Wenham Climate Action Team, Robert Knowles
Green Newton Building Standards Committee, Dan Rubin, Chair, Newton
Sustainable Arlington, Tom Ehbrecht and Brucie Moulton, Co-Chairs, Arlington

Building and Business Professionals

Marc Sternick, Elected Representative to AIA MA, AIA Western MA
The Green Engineer, Inc., Christopher Schaffner, PE, CEO
ZeroEnergy Design, Stephanie Horowitz, Architect and Principal
Dave Boettcher, Abode Energy Management, Concord
Steveworks LLC, Steve Greenberg, Asher Greenberg, Newton
HIS and HERS Energy Efficiency, Adin Maynard, Haydenville
Energia, LLC, Tom Rossmassler, Holyoke
Decumanus Green Design/Build, Inc., Joseph Carry, Lenox
East Branch Studio (formerly KHCC), Timothy Ballard, Greenfield
South Mountain Company, John Abrams, President and CEO, West Tisbury
Hill Energy Services LLC, Nicholas Hill, CEM, LEED-AP, Needham
Fred Davis Lighting Corporation, Fred Davis, President, Medfield
Bruce Harley Energy Consulting, Bruce Harley, Principal
Entasis Architecture, Jay Walter, AIA, Principal
Ken Thick Construction, Sarah Bartholomew, Operations Manager
Schernecker Property Services (multi-family building envelope contractor), Fred Schernecker, CEO, Brookline
Satoria Sustainability Consulting, Peter A. Crawley, Principal
Byggmeister, Inc., Rachel White and Paul Eldercamp, Maria Washington
Green Logic Design, Darren Port, Northampton
Global Urban Solutions, Peter H Smith
Sage Builders, Jonathan Kantar
Shirine Boulos Anderson, AIA
Adam P. Mitchell, Principal, CambridgeSeven
Peter Kuttner, Principal, CambridgeSeven
Douglas Flandro, Sustainable Design Leader, CambridgeSeven
Danielle McDonough, Senior Associate, CambridgeSeven
Kevin Mowatt, Architect, CambridgeSeven
Jacob Bloom, Designer, CambridgeSeven
Matthew Cox, CambridgeSeven
Berton Bremer, Architect, CambridgeSeven
Scott Waddell, Building Performance Analyst
Martine Dion, FAIA, LEED AP BD+C
Andrea Love, Principal, Payette
Denise Blankenberger, Payette
Caitlin Cashner, Payette
Amber Penman, Architect, Payette
Melanie Silver, Payette
Philippe Genereux, Payette
Calvin Ray Boyd, Payette
Adam Wagner, Payette Architects
Eamonn Meagher, Payette Architects
Thomas Beresford, Payette Architects
Warner + Cunningham, Inc, Architects, George Warner, Principal, Brookline
Mattew Ficket, SGA, Principal, Science and Technology, Boston
Lisa Monahan, Architect, Newton
Arlen Li, Architect, Norfolk
Suni Dillard, Architect, Medford

Lori Ferriss, Goody Clancy
Scott Laidlaw, Architect, Thomas Douglas Architects, Florence
AURORA Architects + Builders Co., Nathaniel May
Julia Nugent Architects, Julia Nugent Principal
Next Phase Studios, Architects, Rick Ames, Principal
Michelle Apigian, ICON Architecture
Danny Veerkamp, LEED AP, Sustainability Expert, Maynard
Diane Sokal, AIA, LEED AP, BD+C, Brookline
Nicole Voss, AIA, isgenuity Director of Sustainability, Boston
Grant Studio, Michael Grant, Architect, Boston
Kim Radochia Studios, Kim Radochia, Gloucester
Michelle Oishi, AIA, Belmont
Keihly Moore, Studio G Architects, Boston
Kevin Tremblay, PCA Architects, Cambridge
Hubert Murray, Principal, HMAP, Cambridge
Judd Galloway, Thornton Tomasetti, Structural Engineer, Somerville
Mike Duclos, Stow
Action, Inc., Andrea Harkness
CLEAResult, Benjamin Todd
Greene Energy Consultants, LLC, Scott Greenbaum, Principal
Elevated Design, Mark Schow
Rare Forms, Inc., Greg Bossie, Northampton
Sustainable Comfort, James Moriarty
Institute for Market Transformation, Benjamin Silverman
Chapman Construction/Design, John Hyde
Abode Energy Management, Tamir Nir, Framingham
Matt Jancek Home Improvements, Matthew Jancek, Owner
Tohn Environmental Strategies, LLC, Ellen Tohn
Steveworks LLC, Steve Greenberg
Bliss Enclosure Consulting + Design, David Bliss Principal
Mikal Malkovich, Thomas Douglas Architects, Northampton
Jennifer Marrapese, Petersen Engineering
Rethinking Power Management, Ilene Mason
Fitch Architecture and Community Design, Laura Fitch
Kevin Collins, New Ecology
Daniel Bonham, Architect, Thomas Douglas Architects, Williamsburg
Birchwood Sustainable Development, Betsy Harper, Newton
Tricia Kendall Architecture + Design, Ashland
A9 Green/Total Green Energy Solution, Bijan K. Hosraviani, Ph.D., Lexington
Net Zero Heating and Air Conditioning LLC, Brian Pelton, Billerica
Designer of Greens, Catherine Rooney, Ashland
Calnan's Energy Systems, Inc., Rob Calnan, Wayland
Bliss Enclosure Consulting + Design, David Bliss, Melrose
Edward Devereux, EcoNatick.org, Natick
John J. Bourneuf, V.P. of Operations, Helix Power Corporation
Lauretta James, Realtor, GREEN, Medford
Melanie Shea, The Center for EcoTechnology, Norfolk
Laura Homich, PCA, Cambridge
Peter Crawley, Satoria Sustainability Consulting, Cambridge
Lindsey Lawson, WSP Built Ecology, Boston

Thomson Macdonald, BCAN, Boston
Alex DeFronzo, Executive Director, Piers Park Sailing Center, East Boston
Heather O'Brien, Eastie Farm, East Boston
Rebecca Olander, Perugia Press, Inc., Florence
Jim Newman, Principal, Linnean Solutions LLC, Cambridge
Matthew Turcotte, Power House Energy Consulting, Northampton
Lynn Nadeau, HealthLink, Marblehead
Amy Seabrook, Adventures with Amy, Rockport
Richard Higgins, Higgins and Hart, Gloucester
Peter W. Parsons, CACC, Gloucester
Holly Samuelson, Associate Professor of Architecture Harvard Graduate School of Design
Eric Grunebaum, Principal, Bequia Securities, Cambridge
Kim L. McCoy, Worcester Earn-A-Bike, Inc.

Other Signatories

Cynthia S Hibbard, Green Cambridge Board member
Reverend Fred Small, Massachusetts Interfaith Power & Light, Cambridge
Paul Popinchalk, MA Building Electrification Accelerator
Elena Fagotta, Mothers Out Front, Cambridge
Curt Newton, 350Mass - Boston Node, Boston
Susan Purser, Coordinator, 350MA-Berkshires
Cindy Callaway, Mothers Out Front Newton
Sam Gifford, Heat Smart Alliance, Framingham
Robert Bonney, Citizens' Climate Lobby Northshore, Salem
Jim Mulloy, 350 Mass, Salem
Mary Klug, 350Mass, Marblehead
Bill Green, 350Mass, Cambridge
Gabrielle McFrane, MOF Boston
Staci Montori, MOF Lincoln, Community Organizer
Cindy Callaway, MOF Newton
Patricia Mary O'Hagan, MOF Lincoln
Marcia Gens, Lexington Green Network
Mary Yardley, Lexington Climate Action Network
Marcia Hart, RN, Gloucester
Christine Downing, Rockport
Kasha Guka, writer, Rockport
Jeanine Burns, RN, Gloucester
Blake Cady, MD, Brookline
Sandra Ronan, LICSW, Gloucester
Emma Thornton, Boston
T. David Marro, Gloucester
Patrick Thomas, Gloucester
Mary Francis, Rockport
Patricia Smirnoudis, Lexington
Richard Luecke, Gloucester
Ellen Leaman, Gloucester
Gail Smith, Gloucester

Marc Theermann, Wellesley
Eric W. Hutchins, Rockport
Michael O'Leary, Gloucester
Mary B. Francis, Rockport
John Gorham, Dedham