Creating A Clean, Affordable, Equitable and Resilient Energy Future For the Commonwealth



Massachusetts Department of Energy Resources COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENERGY RESOURCES

Patrick Woodcock, Commissioner

Building Energy Code Straw Proposal: MAPC MA Q&A

March 2nd 2022



Starting in 2023 – 3 Energy Code options:

This straw proposal includes an update to the stretch code alongside the new specialized stretch option for Municipalities

Base Code (10th Edition of MA Building Code)

- New Buildings in towns and cities that have not adopted a stretch code
- 52 communities
- BBRS update effective in 2023

Stretch Code (Update)

- New Buildings in towns and cities that adopted, including all green communities
- 299 communities
- DOER update effective in 2023

Specialized Opt-in (New Code Option)

- New Buildings in towns and cities that choose to optinto this code
- Available for adoption Dec 2022

https://www.mass.gov/info-details/stretch-energy-code-development-2022



SUMMARY OF STRAW PROPOSAL



Stretch Code Update – Residential low rise

Proposing 3 Options for Code Compliance:

- **HERS 42** for fossil fuel heating (each unit) or
- **HERS 45** for electric heating (each unit) or
- Passivehouse (whole building)
- Jan-Dec 2023 transition year with HERS 52/55
- Effective December 2023 HERS 42/45





Proposing 3 Options for 'net zero' Code Compliance:

HERS 42 for gas/propane heating (each unit
 + Rooftop solar (where unshaded)
 + pre-wired for electrification

or

- **HERS 45** for electric heating (each unit) or
- Passivehouse (whole building)
 + wired for electrification
 And in all cases
 EV ready wire to parking spaces (20% of space)





Key Changes in Proposed Commercial Stretch Code

- More stringent
 - Envelope and thermal bridging
 - > Air infiltration
 - Energy recovery

The "trifecta"





- New targets
 - Heating and cooling demand limits
- Achieves:
 - Near eliminates space heating
 - Easy building electrification
 - Less stress on grid
 - Improved resiliency
 - Better emissions and LCC











Key Metric – Thermal Energy Demand Intensity (TEDI)

A design approach focused on costeffective emissions reduction led to a key metric of heating Thermal Energy Demand Intensity (TEDI). TEDI was first used in codes for Vancouver and Toronto in Canada

Targeting low heating TEDI means:

- Low emissions
- Easy electrification
- Reduced (or elim) fossil fuel
- Improved resiliency
- Improved comfort



With the proposed code, targeting low heating TEDI results in near elimination of space heating end use. Proposed TEDI code path has space heating end use comparable to Passivehouse at lower cost.

Q&A: 4 Topics to cover

(based on MAPC member submitted questions)

- Timeline and Muni Options 5Qs
- Straw proposal / Public hearings 3Qs
- Scope of Code 5Qs
- Net Zero 1Q
- Next Steps / Other Qs

TIMELINE & OPTIONS FOR MUNICIPALITIES

Q. About timelines, options for municipalities

Q. Please clarify the timelines, adoption options, and number of municipalities affected for the updated stretch code and the specialized code.



Expected Timeline for code adoption

	Winter 2022	Spring 2022	Summer 2022	Fall 2022	Winter/Spring 2023	Summer 2023 and beyond
Updated Base Code	Draft on BBRS 10 th edition code webpage		BBRS Public hearing on 10 th edition	BBRS vote on final 10 th edition	Effective Jan. 2023 as part of 10th edition Code (MA IECC 2021)	
Updated Stretch Code	Outreach, public hearings, and comments on straw proposal	Draft code language available for public comment	Public hearings on draft code	Finalize code proposal & Publish Code	Effective Jan. 2023 to align with 10 th edition	Phase-in HERS requirements in Dec 2023
New Specialized Opt-in Code	Outreach, public hearings, and comments on straw proposal	Draft code language available for public comment	Public hearings on draft code	Finalize code proposal & Publish Code	Finalized Dec. 2022 - Municipal adoption begins	Likely effective dates - July 1, 2023, Jan 1, 2024

Q. About current Stretch Code Communities adopting update

Q. For all communities that have adopted the current stretch code: How many (if any) communities will be required to adopt the updates to the stretch code?

Q. About Green Communities adopting the Specialized opt-in code

Q. Are Green Communities going to be required to adopt the specialized code before it is incorporated into the stretch code?

The 2021 Climate Roadmap Act states in Section 98A:

"A community designated as a green community under subsection (c) of section 10 of said chapter 25A that elects not to adopt the municipal opt-in specialized stretch energy code under said section 6 of said chapter 25A shall not lose its designation as a green community as a result of that election."

Reference: <u>https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8</u>

Q. About current Base Code Communities adoption options

Q. For communities that have not adopted the current stretch code, is their option to adopt the full updated stretch code with or without the specialized code?

Q. About integrating into one energy code for all communities

Q. When will the updated stretch code and the specialized code be rolled into the state building code for all communities?

STRAW PROPOSAL & PUBLIC HEARINGS

Q. About public hearings

Q. The 2021 Climate Act requires five public hearings. Are the five March hearings the only ones they plan to hold or will there be more hearing opportunities for the public to weigh in?

1st round of public hearings: on straw proposal

NEW! Public Hearings for Straw Proposal for Stretch Code update and New Specialized Stretch Code

DOER will hold **five virtual public hearings** to receive comment on its Straw Proposal for Stretch Code update and New Specialized Stretch Code released on February 8th.

Interpretation services will be provided at all hearings in Arabic, Chinese, Haitian Creole, Portuguese, Spanish, and Vietnamese.

Hearing Focus	Date		
Western Region	March 2, 6:00 pm – 8:00 pm		
Metro Boston and Northeastern Region	March 3, 9:00 am – 11:00 am		
Environmental Justice Communities	March 4, 6:00 pm – 8:00 pm		
Central Region	March 7, 3:00 pm – 5:00 pm		
Southeastern Region	March 8, 3:00 pm – 5:00 pm		

Q. About straw proposal release

Q. Why did they (DOER) wait until 3:45pm Monday to let us know about the release of the straw proposal at 9:00am Tuesday?

Q. About straw proposal

Q. What changes were made to the specialized opt-in code draft language written by DOER staff last summer between September 2021 and February 2022 when it was finally released?

SCOPE OF STRETCH CODES

Q. About major renovations and stretch codes

Q. Why were major renovations excluded from the specialized opt-in code? It's a significant missed opportunity.

Q. Why doesn't the proposal address major renovations? Reducing emissions from our existing buildings is essential to meet targets, but the absence of a true net-zero stretch code that applies to major renovations as well as new construction fails to shape development appropriately.

Q. About meeting 2030 emissions limits & minimizing life-cycle costs

Q. How does the proposal meet the 2030 emissions reductions goals or minimize life cycle costs as required by the Global Warming Solutions Act?

Q. Do the straw proposal codes meet the 2030 emissions reductions limits as required by the 2021 Climate Act? If not, why not?



Building Energy Code in MA state law

2008 Green Communities Act

• Base Energy Code:

"To adopt and fully integrate the latest International Energy Conservation Code (IECC) and any more stringent amendments thereto as part of the state building code, in consultation with DOER."

MGL CH143, Section 94(o)

• Created DOER Green Communities Program and **Stretch energy code**:

"minimize, to the extent feasible, the lifecycle cost of the facility by utilizing energy efficiency, water conservation and other renewable or alternative energy technologies."

MGL CH25a. Section 10(c)

2021 Climate Act

- 50% emission reduction in 2030 (sublimits to be established for buildings sector)
- DOER to **update the Stretch Code** from time to time, in consultation with BBRS
- DOER to develop: a municipal opt-in specialized stretch energy code that includes:
 - net-zero building performance standards
 - a definition of net-zero building
 - designed to achieve MA GHG emission limits and sub-limits.
 - may by phased in by building type
 Session Laws of 2021 Chapter 8: Section 31

Statutory Timeline

- July 2022: EEA must establish specific 2025 and 2030 emissions reduction targets for the buildings sector
- **December 2022**: DOER must promulgate new specialized opt-in code
- January 2023: New Base Energy Code expected to go into effect
- **2030**: Massachusetts must achieve at least 50% reduction in GHG emissions

Building Energy Code role in reducing emissions

- Building code is the primary policy impacting new buildings.
- New buildings (built after 2023) ~27% of all building space by 2050
- New buildings are easiest and cheapest to make 2050-compliant
- New construction market helps drive cost reductions in building retrofits.







DOER Code Proposal – Economic and Emissions Impact

• DOER is proposing two updates:

of Energy Resources

- Update Stretch Energy Code, align with timing of the base energy code update
- Issue new Specialized Opt-in Code as required by 2021 Climate Roadmap legislation by Dec 2022
- 500,000* tons/year of GHG reductions in 2030,
 - rising to 694,000 tons/year by 2035
 - Other economic, health, resiliency and grid benefits
- **Over \$21 Billion** in life cycle cost savings (combined construction and operating costs)

*Note: Emissions reduction and cost savings forecasts are conservative as they currently do not account for any solar PV additions to new construction or methane leakage from natural gas supply and use.



Q. About fossil fuel option in the Specialized Opt-in code

Q. What are the arguments against taking out the fossil fuel option in the specialized code?



Key Consideration: Electrification in Residential & Commercial

- Electric heating compared to gas heating
 - 64% less emissions current
 - > 98% less emissions in 2050
- Critical that buildings migrate toward electrification



Based on 95% efficient natural gas boiler vs. 320% efficient air source heat pump, 2019 emission rate of 478 lbs/MWh, 2050 emission rate of 27 lbs/MWh https://www.mass.gov/doc/technical-support-document-draft-2019-ghg-emission-factors/download

NET ZERO DEFINITION

Q. About Net Zero definition

Q. How does the proposal satisfy "net-zero" objectives? It appears that the draft allows on-site fossil-fuel combustion for heating, domestic hot water, cooking, and other uses. This continued generation of on-site emissions for normal day-to-day functions appears to create a hard barrier to achieving net-zero operations.



Specialized Code: Proposed Net Zero Definition

- Consistent with EEA's 2050 Roadmap
- Compatible, as-built, with the Commonwealth's net zero emissions economy in 2050
- Does not necessitate onsite or offsite renewables, but means a building becomes net zero energy when MA electric grid is net zero
- Includes enhanced energy efficiency and elimination of on-site emissions from space heating, domestic hot water, cooking and other process uses

Electric Heat: No additional requirements, compliant as built with net-zero in 2050

Fossil Fuel Heat: Require solar on-site to offset emissions and pre-wire for future electric heating and cooking "Net Zero new construction is defined as being consistent with the electrification and deep efficiency benchmarks described in the All Options pathway, discussed in the *Energy Pathways Report* – that is, that the new construction is compatible, as-built, with the Commonwealth's net-zero emissions economy in 2050. Its focus is on-site emissions; it does not necessitate onsite or offsite renewables, nor the assumption that a building is net-zero energy." EEA Buildings Sector Technical Report, p. 39





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Net-zero requirements for homes with fossil fuels

- Solar PV requirement
 - Required solar PV installation on all unshaded roof with good solar access
 - Solar PV production may not meet full load
- Pre-wiring for future electrification
 - To be 2050 net-zero ready homes required to size electric panel and prewire to appliances for future electric conversion
 - E.g. install 240volt wire to cooking and dryer appliances, and adjacent to furnace & water heater



Specialized Opt-in Code (Net Zero) - Commercial



NEXT STEPS



DOER is seeking comments on its Straw Proposal updating the Stretch Energy Code and Proposing the new, Specialized Stretch Energy Code.

DOER highly encourages written comments be submitted electronically to <u>stretchcode@mass.gov</u> with the subject line "Stretch Code Straw Proposal Comments". Responses will be accepted until 5 pm on **March 9, 2022**. Written comments may also be submitted via mail to the Department of Energy Resources, 100 Cambridge Street, Suite 1020, Boston, Ma 02114, attention Nina Mascarenhas.