

August 12, 2022

Department of Energy Resources (DOER)  
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Boston, MA 02114  
Email: [stretchcode@mass.gov](mailto:stretchcode@mass.gov)

**Re: Comments on Stretch Energy Code and Specialized Stretch Code Draft Regulation**

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

**WHO WE ARE**

This letter reflects the study, experience, and discussion of the Technical Subcommittee of the Massachusetts Net Zero Buildings Coalition. As evidenced by the broad support of the MA NZB Coalition's March 2022 public comment letter on the Straw Proposal (signed by elected and appointed officials in 62 municipalities, and signatories including respected building professionals and non-profit organizations), members of the Massachusetts community look to the Coalition for information and guidance. To this end, the Coalition produced the attached document as Appendix A, entitled, "**Good, Better, Best.**"

**NOTABLE IMPROVEMENTS**

DOER has worked diligently to meet the legally mandated schedule and also provided multiple opportunities for public comment. The Massachusetts Net Zero Buildings Coalition and the Technical Subcommittee of the Coalition **applaud the DOER** on the following positive changes made since the release of the Straw Proposal in February 2022:

- Improvement of Net Zero Building definition to align more closely with industry-standard definitions
- Inclusion of retrofits that cross certain thresholds
- Requirement of electrification of curtain wall buildings under certain conditions
- Inclusion of Passive House requirement in Specialized Stretch Code (Specialized Municipal Opt-in Code)

**ROOM FOR IMPROVEMENT**

We **urge the DOER** to push for better regarding the below:

- Simplify
- Electrification
- Energy Performance Limits: Thermal Energy Demand Intensity (TEDI) / Energy Use Intensity (EUI)
- Retrofits

- Curtain Wall
- Embodied Carbon
- Residential
- Technical Inconsistencies
- Correct Cost Studies and Minimize Life Cycle Costs

## SIMPLIFY

We recommend that the DOER simplify the language of the Draft Regulation. Reasonable readers arrived at multiple interpretations at various portions of the draft (refer to the curtain wall and technical inconsistencies sections below for examples). Overly complicated language affects the ease of interpretation and enforcement.

## ELECTRIFICATION

All-electric construction for ALL new buildings and major renovations is key. The current draft regulation limits electrification to buildings with greater than 50% curtain wall, and homes greater than 4,000 square feet, though it does also provide incentives to builders to electrify. To meet the state's climate goals, we need a firm commitment to require electrification across the board.

## ENERGY PERFORMANCE LIMITS: THERMAL ENERGY DEMAND INTENSITY (TEDI) / ENERGY USE INTENSITY (EUI)

- The information given for the basis of the TEDI values is unclear. We are unable to fully comment on the use of TEDI without seeing the modeling inputs and guidelines. While these are to be provided in the fall, at this time there is still confusion, and by fall we will be that much closer to a final code.
- We and the design community would be more comfortable if as seen in the British Columbia energy step code, and per the consensus of AIA Massachusetts, the **EUI is used in parallel with TEDI**. This would prevent manipulation of TEDI calculations and gain overall energy efficiency.
- We recognize and applaud the Passive House pathway, as heating demand, cooling demand, and source energy demand are all required under Passive House (and it is understood that TEDI would not apply under this pathway).

## RETROFITS

As mentioned, we are very pleased to see the inclusion of retrofits in the new draft regulation. We recommend the following, divided into the categories below:

- Existing Buildings Renovations: applies to Residential Use buildings **less than 10,000 sf** undergoing renovation or addition
  - Should apply to existing building rehabs of **50 percent of gross floor area, not 50 percent of appraised value, as this puts a disproportionate burden on environmental justice communities** and low-value structures. Additionally, Including a cost trigger would add a complex enforcement mechanism requiring assessor involvement, which adds a judgment call on the value of the building. This opens the potential for disputes between municipal officials and property owners on whether the trigger has been met or not.
- Existing Buildings Renovations: applies to Residential Use buildings **greater than 10,000 sf**, and all Commercial Buildings undergoing renovation or additions.
  - Recommendations following Alteration Levels 1, 2, and 3 as defined in the 2021 IEBC

- Commercial Tenants Fit-Out: applies to Fit-Out of any size in Core & Shell greater than 20,000 sf
  - This is a **big scope hole in commercial tenant fit-outs**. Many buildings build core and shell only, and then a lot of work gets done outside of these energy codes. It is low-hanging fruit to address this.

## CURTAIN WALL

We applaud the introduction of an all-electric requirement. However, we have an **overarching concern that the code might be “gamed.”** For instance, people might add ventilation to avoid electrification under Pathway 2.

- 100 percent electrification requirement should be **lowered from a trigger of 50 percent to 40 percent**.
- The code as written is unclear.
  - If a building is, for instance, 60 percent curtain wall, and meets envelope backstop, what is the requirement?
  - C401 Pathway 2: standard buildings (excluding labs and healthcare) will not get to 0.5 cfm/sf. Pathway 2 should have 25 percent base electrification, require TEDI and envelope backstop.
  - C401 Pathway 3: is 25 percent electrification required? This depends on whether the building will exceed 0.5 cfm/sf or not.

## EMBODIED CARBON

The idea is to get the industry **thinking about embodied carbon now to prepare for actual threshold requirements in the future**. The code should offer a list of suggested low embodied carbon materials for all projects to consider, and a list of suggested resources – but the embodied carbon requirement would be limited to analysis and reporting at this time.

- Require Whole Building Life Cycle Analysis for buildings over 100,000 GSF
- Require Global Warming Potential calculation for buildings over 25,000 GSF

## RESIDENTIAL

- The lighting code is left over from a previous standard and is a missed opportunity. Lumens/watt should be increased by 50 percent. Standard commercially available lighting is 50 percent better than as specified in the draft regulation.
- As it is written, the draft regulation is unclear as to whether one is testing the addition only or the whole building to achieve a HERS score. We recommend that only the addition should be tested.

## TECHNICAL INCONSISTENCIES

We recommend that the DOER address technical inconsistencies in the proposed code language. For example:

- Solar requirements
  - The following are opposites. The first means shading is 30 percent or less. The latter means shading is 70 percent or more.
    - R202 General definition says “where the annual solar access is 70 percent or greater.”
    - RC105.C says “where all areas of the roof that would otherwise meet the requirements of Section RC105 are in full or partial shade for more than 70 percent of daylight hours annually.”

- RC 105 defines roof area azimuth as between 110 and 270 degrees, while the R202 general definition defines roof area azimuth as between 90 and 300 degrees.
- Electric vehicles
  - The proposed code requires a 40 amp circuit and also 9.6 kVA power. While 40 amps are required to deliver 9.6 kVA power with a 240 Volt single phase circuit, the electrical code would require a 50 amp circuit for a 40 amp load. A 40 amp circuit is only allowed to serve a 32 amp load, which would provide 7.68 kVA of power on a single phase 240V circuit. On the other hand, a 40 amp circuit on a 3 phase / 208 Volt circuit would provide 11.5 kVA. One simple fix to the proposed code language would be to delete the phrase “a 40-amp”. That leaves the 9.6 kVA power requirement regardless of what type or size of the circuit the charger is on. Simpler, cleaner, clearer.
  - EV Ready R202 definition says Level 2 charging as defined by SAE J1772 standard, but the R404 section says a circuit shall comply with either a NEMA receptacle or J1772 standard connector. Should the R202 definition include a reference to the NEMA standard?
- Retrofit trigger
  - This can be read as renovation of 50 percent area AND (OR) 50 percent appraised value. We recommend that the **retrofit trigger utilize area only and not appraised value** (see above).

#### **CORRECT COST STUDIES AND MINIMIZE LIFE CYCLE COSTS**

We urge DOER to **run models once more using current fuel and electricity costs**. The data used in the straw proposal/draft regulations are two years old. Additionally, total life cycle costs should include the cost of retrofitting fossil fuel buildings built today and in the near future. To meet the Global Warming Solutions Act targets, fossil fuel buildings will need to be retrofitted, as the state is legally mandated to reach zero by 2050.

#### **CALL TO ACTION**

The new stretch and specialized stretch codes must get us to the 2030 limit for building sector emissions. We encourage the DOER to **accelerate adoption** of the Specialized Stretch Code. The schedule as currently proposed by DOER would realistically result in an effective date of January 1, 2024. This will take too long. Municipalities are eager to make improvements now. Please enable them to do so by allowing municipal adoption any time before January 1st or July 1st effective dates.

There is precious time left until the draft regulation is transformed by DOER into the new codes. We urge DOER to strengthen the draft regulation while this is still possible. The world is already suffering from the effects of climate change. **Please act now.**

Sincerely,

**Massachusetts Net Zero Buildings Coalition**

The MA NZB Coalition's strength and diversity is reflected by the below:

- MA NZB Coalition Facilitator (NEEP)
- MA NZB Coalition Participants (approximately 40)
- MA NZB Coalition Technical Subcommittee (approximately 12)
- MA ZNB Coalition March 11th DOER Comment Letter Signatories (elected and appointed representatives from 62 municipalities plus building professionals and advocacy organizations)

## **SIGNATORIES**

### **Massachusetts Net Zero Buildings Coalition, Facilitator**

Northeast Energy Efficiency Partnerships

### **Massachusetts Net Zero Buildings Coalition, Technical Subcommittee**

Isaac Elneave	Policy Specialist & Project Certifier, PHIUS
Hank Keating	President, Passive House Massachusetts
Mark Sandeen	President, MassSolar, Lexington Select Board Member
Darren Port	Senior Codes and Standards Manager, NEEP
Christopher Schaffner	CEO, The Green Engineer, Inc.
Ellen Watts	Architect & Elected BSA/AIA Representative to AIA MA Board
Rachel White	CEO, Byggmeister Design-Build
Cornelia Wu	Building Policy Manager, NEEP

### **Massachusetts Net Zero Buildings Coalition**

Larry Chretien	Executive Director, Green Energy Consumers Alliance
Lisa Cunningham	ZeroCarbonMA, and Warner + Cunningham, Inc., Architects
Sarah Dooling	Executive Director, Massachusetts Climate Action Network
Elizabeth Galloway	Payette
Patrick M Hanlon	Arlington Town Meeting Member
Emily Jones	Local Initiatives Support Corporation (LISC)
Alison Nash	Alison Nash, AIA, LEED AP ID+C, CPHC, WELL AP BSA Board Director & Sustainability Coordinator, Sasaki Associates, Inc.
Deb Pasternak	State Director, Sierra Club Massachusetts

**Elected and Appointed Representatives, Non-Profit Organizations, Building and Business Professionals, and Additional Stakeholders**

Peter J Barrer	Green Newton Building Standards Committee
Marty Bitner	Town Meeting Member, Energy Committee Member
Fred Bunger	Wellesley Town Meeting Member, Member of Climate Action Committee
Mary Gard	Sustainable Wellesley
Jennifer Glass	Lincoln Select Board Member
Lori Goldner	Building Electrification Accelerator
Etel Haxhiaj	Worcester City Councilor
John Hayes	Chair, City of Salem, Sustainability, Energy, and Resiliency Committee
Mary Hutton	LexCAN
Lin Jensen	Lexington Town Meeting member
Karen Kraut	Massachusetts resident
Julia Livingston	Chair of the Edgartown Climate Committee
Werner Lohe	Town Meeting Member, Zero Emissions Advisory Board
Kerry Mackin	Ipswich Select Board
David Mendels	Director, ZeroCarbonMA
Kai Palmer-Dunning	Director of Environmental Justice, HEET
Ricki Pappo	Chair, Lexington Climate Action Network (LexCAN)
Maggie Peard	Sustainability & Resilience Officer
Paul Popinchalk	350 Central Mass
Kathleen Scanlon	Brookline ZEAB member, Zero Emissions Advisory Board member
Michael Schaaf	Member, Town of Ipswich Finance Committee, Board Director, Harborlight Community Partners
Marilyn Ray Smith	Attorney retired from state government
Wendy Stahl	ZeroCarbonMA, and member of Brookline Zero Emissions Advisory Board
Kate Warner	Chair, West Tisbury Energy Committee
Roger Wrubel	Belmont Energy Committee

## MA NZB COALITION'S COMMENTS - DOER DRAFT CODE LANGUAGE - GOOD, BETTER, BEST

### DOER Deserves Applause...

#### ... Proposed Updated Stretch Code Effective Date

The updated stretch code will take effect in 299 communities on January 1, 2023, per DOER's Massachusetts Municipal Association presentation.

#### ... Appointment of a Technical Advisory Group

These 20 building energy experts include members of the Coalition's technical advisory subcommittee and will work to strengthen and clarify the code language.

#### ... Approach to Making "Stretchy" Stretch Codes

Both the Updated and Opt-In Net Zero Stretch Codes require nearly 20% improved for energy efficiency relative to the 2021 Base Code for residential buildings – AND – add a stringent TEDI requirement (up to 90% better) for commercial buildings.

### Thanks, DOER, for Changes Showing You Listened...

#### ... Existing Buildings Are Now Included

Both the Updated and Opt-In Net Zero Stretch Codes will now help reduce existing emissions per the Coalition's Net Zero Stretch Code Framework.

#### ... Curtainwall Buildings Now Require Renewables

Renewables will partly compensate for diminished thermal performance of glassy building envelopes while expanding solar generation capacity.

#### ... Multi-Family Housing > 12,000 SF Are Now Required to Meet Passive House Standards

Requiring affordable and market-rate housing to deliver long-lasting economic and health benefits will help meet 2025 and 2030 emissions limits.

#### ... Net Zero Building Definition Is Improved

Both the Updated Stretch and Opt-In Net Zero Code now incorporate the industry-standard definition and optional pathway found in the 2021 Base Code Appendix or so-called "Zero Code" advanced by AIA 2030 and endorsed by the national AIA.

### DOER Still Needs to Optimize the Opt-In Net Zero Code...

#### ... Expand Electrification Requirements

Make electrification a requirement not just for buildings with 50+% curtainwall but for ALL new buildings and major renovations. Not just for homes greater than 4,000 square feet but for all new and substantially renovated homes. Any building built today with fossil fuels will need to be retrofitted at greater cost and complexity before the end of its useful life.

#### ... Restore Deleted Embodied Carbon Provisions

For all buildings, require certain cost-effective low-carbon materials. For larger buildings, additionally require Whole Building Life Cycle Analysis reporting.

#### ... Accelerate Effective Dates

Allow municipal adoption any time before Jan 1<sup>st</sup> or July 1<sup>st</sup> effective dates, anticipating possible voting in late December (special session), Spring, or Fall.

#### ... Clarify and Expand On-Site Solar Generation

For all buildings (not just those heated by fossil fuels), require on-site solar panels in proportion to gross square feet to the extent of available solar access.

#### ... Clarify Curtainwall & Electrification Threshold

Define curtainwall area as the entire system including framing, glazing, spandrel panels. Require electrification for buildings with 30+% (not 50+%) curtainwall area.

#### ... Pair TEDI Limits with EUI Limits by Building Type

Set EUI limits at least equal to those in the 2021 Base Code Appendix ("Zero Code") to prevent manipulation of TEDI calculations and to gain overall energy efficiency.

#### ... Show How 2030 Building Sector Limits Are Met

EEA recently finalized legally mandated 2025 and 2030 emissions limits. Model progress toward these goals under various growth and opt-in assumptions.

#### ... Correct Cost Studies & Minimize Life Cycle Costs

Cost studies should be revised to reflect current gas and electricity prices – AND – to add significant cost premiums for retrofitting fossil fuel heated buildings.

## Why Heed These Comments

**They're substantive.** Devised by a technical subcommittee of more than a dozen building practitioners.

**They're practical.** These suggestions drive toward the legally binding 2030 emissions reduction goal for the building sector. Further, they jive with the position of the MA Attorney General's office which stated clearly in its straw proposal comment letter that DOER can require electrification in the opt in net zero code.

**They're widely supported.** Reflecting the strength of the Coalition that submitted a straw proposal comment letter signed by elected and appointed officials from 62 municipalities representing 40% of the MA population, leading building professionals including NESEA, BSA/AIA and Passive House Massachusetts, and climate advocates such as the MCAN.