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From: Jessica Ruprecht <jdruprecht@gmail.com>
Sent: Saturday, 30 July 2022 12:49 PM
To: STRETCHCODE (ENE)
Subject: BUILDING CODE COMMENTS

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Hi,

As a MA resident, I have concerns about the adequacy of the proposed net zero stretch code. I have included detailed comments below. I would like to highlight particularly my concern about the current draft's allowance for the continued use of fossil fuels in buildings, as the continued use of fossil fuels directly opposes the goals of achieving true net zero emissions in our buildings in Massachusetts. ***The continued use of fossil fuels in buildings directly undermines the Commonwealth's ability to meet its 2030 emissions reduction goals over the next eight years.***

We must eliminate the use of fossil fuels in homes by moving to fully electrified systems and appliances. At the same time, we must ensure that our electrified buildings are not being powered by fossil fuels upstream at power plants that consume fossil fuels and produce CO2 emissions. Only if we power our fully electrified homes and buildings with renewable energy, will we be close to achieving true net zero buildings in our state.

This is why it is important to include provisions in the proposed code that require all buildings to include on-site solar panels in proportion to gross square feet and the extent of available solar access. Requiring on-site solar for all buildings is an essential way to increase renewable power generation in our state and to reduce the reliance of buildings on power generated using dirty, CO2 emitting power generation infrastructure already a part of the Massachusetts power grid.

Finally, I would like to highlight that in order to measure our progress against these goals and hold builders, owners, and operators accountable for meeting the standards required by the new net zero code, it is essential to require annual reporting of building energy consumption broken down by energy source.

The window we have to act to avoid the most catastrophic climate outcomes is rapidly closing and the net zero stretch code represents an unprecedented opportunity to implement the strongest possible requirements on emissions reductions in buildings in the state of Massachusetts. This work could not be more urgent or important.

Thank you for your consideration.

Sincerely,

Jessica Ruprecht
Cambridge, MA

Category	Comment
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Definition of Net Zero	<p>Thank you for updating the definition to net zero in both the Updated Stretch and Opt-In Specialized Stretch Code. We appreciate DOER incorporating an 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.</p> <p>A net zero home is one that is affordable to heat and cool, has healthy indoor air due to all electric cookstoves, and has access to renewable energy -- either on site or bought off site.</p> <p>A true net zero building does not allow for on-site combustion of fossil fuels.</p>
Equity goals are part of a true net zero stretch code	<p>As the state accelerates a clean energy transition, we cannot afford to leave out utility burdened residents who live in frontline and environmental justice communities. Towards this end, I urge the DOER to eliminate the fossil fuel pathway in the current draft of the specialized opt-in code. By allowing fossil fuels, the state will certainly straddle low income residents with the high costs of heating with fossil fuels as more people transition to clean energy. This is unacceptable.</p> <p>The revised draft of the specialized stretch code still allows fossil fueled buildings. Allowing fossil fuels perpetuates public health risks and keeps utility bills high, especially for people living in poorly constructed homes. Allowing fossil fuels in new buildings also creates another generation of existing buildings that will soon need to be retrofitted with electrified heating at significantly greater expense, burdening our workforce and taxpayers. This strategy will drag our economy down and leave MA out of the clean energy economy boom that is already happening.</p> <p>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.</p> <p>DOER must ensure that vulnerable residents are prioritized in the clean energy transition, and that fossil fuel pathways are removed or allowed under a very limited set of conditions.</p>
Workforce Development	<p>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.</p>

	<p>A true net zero code will work in tandem with the state’s residential electrification and workforce development efforts.</p> <p>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.</p> <p>A true net zero stretch code will leverage state investment in jobs training and electrification incentives, ensuring good jobs and a strong economy. Continuing to allow a fossil fuel pathway in the specialized stretch code will only delay the clean energy transition and limit investment in a clean energy economy.</p> <p>DOER must put forward a true net zero specialized stretch code that we will work to align with investments in workforce development and the stimulation of the clean energy economy in MA.</p>
Carbon neutrality goals	<p>Decarbonizing our buildings is crucial for ensuring a livable, breathable future for everyone.</p> <p>Allowing for fossil fuel pathways in the specialized stretch code undermines the Commonwealth’s ability to meet its 2030 emissions reduction goals. The state has eight years to meet the 2030 goal.</p> <p>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.</p> <p>DOER needs to correct their previously conducted cost studies to reflect current gas and electricity prices and add significant cost premiums for retrofitting fossil-fuel heated buildings.</p> <p>DOER must produce a specialized stretch energy code that aligns with the state’s 2030/2050 emissions targets. We urge DOER to begin this by correcting their previously conducted cost studies to reflect current gas and electricity prices and add significant cost premiums for retrofitting fossil-fuel heated buildings.</p> <p>More technical comments below: DOER slides from the 2/8/22 webinar Slide 1 (mass.gov) indicate that building sector emissions are currently about 22 MMTCO₂e annually. <i>(Slide 2)</i> By 2030 MA must achieve 50% reductions in GHG emissions. <i>(Slide 7)</i> By</p>

	<p>DOER's computations, if the revised specialized stretch energy code is enacted, it would yield 500,000 MMTCO₂e reductions per year by 2030. 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.</p>
Embodied Carbon	<p>Embodied carbon is the energy and carbon emissions that are part of constructing a new building. This includes the sourcing, production, transportation, and installation of building materials. DOER's current emissions calculations DO NOT include embodied carbon emissions.</p> <p>DOER needs to restore the deleted embodied carbon provisions.</p> <p>DOER needs to require Whole Building Life Cycle Assessment to account for and minimize embodied carbon.</p> <p>Targets for reducing embodied carbon for all building types must be included in the future revisions of the specialized stretch energy code.</p>
Renewable Energy #1	<p>The revised draft of the specialized stretch code needs to clarify and expand on-site solar generation. This code provision must apply to all buildings (not just those heated by fossil fuels), and require on-site solar panels in proportion to gross square feet relative to the extent of available solar access.</p> <p>A true net zero stretch code that requires renewable energy to offset 100% annual site emissions is needed to level emissions.</p> <p>A true net zero stretch code would provide buildings to be powered by 100% renewable energy (either generated on-site or purchased from off-site sources).</p> <p>A net zero building has 3 piers to its foundation: high energy efficiency; all-electric; and renewable energy. Not requiring renewable energy in the revised specialized stretch code means that the state is not able to meet our 2030 mandated targets to reduce emissions from buildings.</p> <p>DOER must include provisions requiring solar energy access or on-site generation for all building types. Also require on-site solar panels in proportion to gross square feet relative to the extent of available solar access.</p>
Renewable Energy #2	<p>DOER must clarify and expand provisions for on-site solar generation for all buildings (not just those heated by fossil fuels) in the revised specialized stretch energy code. The revised specialized stretch energy code must</p>

	<p>require on-site solar panels in proportion to gross square feet to the extent of available solar access.</p> <p>DOER must include these provisions in an updated version of the specialized stretch energy code.</p>
All renovations	<p>The draft of the specialized code only applies to major renovations but not smaller, which are a significant part of the building activities in MA.</p> <p>This omission ignores a crucial step in decarbonizing our buildings as mandated by the Next Generation Roadmap bill.</p> <p>As outlined in the 2050 <u>Decarbonization Roadmap</u>, the most cost-effective time for any sized existing building to transition to clean energy technology, like a heat pump, is during routine home improvements or when an older HVAC system must be replaced (see page 45).</p> <p>The electrification of space and water heating is a low-risk, cost effective strategy for decarbonizing the majority of the Commonwealth's building stock (see page 44 of the Decarbonization Roadmap).</p> <p>To eliminate smaller renovations from the specialized stretch code is to make it far more difficult for residents to transform buildings from polluters to protectors of our health.</p> <p>DOER must include renovations <1,000 sq ft for residential buildings and <20,000 sqft for commercial buildings.</p>
Curtainwall & Electrification Threshold	<p>DOER must define the curtainwall area as the entire system including framing, glazing, and spandrel panels. DOER must require electrification for buildings with 30+% (not 50+%) curtainwall area.</p> <p>Curtainwalls are typically a thin, usually aluminum-framed wall, containing in-fills of glass, metal panels, or thin stone. The framing is attached to the building structure and does not carry the floor or roof loads of the building.</p> <p>DOER must include provisions in an updated version of the specialized stretch energy code to include defining curtainwalls as the entire system and requiring electrification for buildings with 30+% curtainwall area.</p>
TEDI Limits	<p>Thermal Energy Demand Intensity (TEDI) is a metric of the building's modeled heating needs that is primarily influenced by building enclosure insulation and airtightness and by the ventilation system. A more highly insulated, airtight enclosure with heat recovery ventilation will achieve a better (that is, lower) TEDI value.</p> <p>DOER must pair TEDI Limits with energy use intensity limits by building type. DOER must set EUI limits at least equal to those in the 2021 Base</p>

	<p>Code Appendix (“Zero Code”) to prevent manipulation of TEDI calculations and to gain overall energy efficiency.</p>
Building Energy Reporting and Commissioning	<p>Requiring the reporting of buildings’ annual energy use is a standard approach to tracking progress and evaluating how buildings are working as they are intended to -- and in the case of a net zero building, requiring commissioning would allow developers to assess how a building performs relative to the net zero standards of performance.</p> <p>In the revised draft of the specialized stretch code, there is no requirement for energy reporting and no requirement for commissioning.</p> <p>The Office of Energy and Environmental Affairs recently finalized legally mandated 2025 and 2030 emissions limits. DOER needs to model progress toward these goals under various growth and opt-in assumptions.</p> <p>The residents of MA want to know how our net zero buildings perform towards supporting transparency and accountability in assessing progress towards meeting our climate goals.</p> <p>DOER must require building energy reporting and commissioning to ensure we are making progress towards emissions reductions in our buildings in a transparent manner.</p>
Electrification	<p>There need to be new code provisions requiring primary heating and cooling systems, appliances and other systems to be 100% electric. All-electric buildings can take full advantage of renewable energy and provide cost-effective heating and air-conditioning.</p> <p>Failing to require electrification means that the specialized stretch code is not a true net zero code. It means that buildings will still create disease-inducing, heat-trapping emissions.</p> <p>DOER must include provisions requiring all-electric heating and cooling systems and appliances. Electrical pre-wiring does not go far enough.</p>
Incentivizing Green Communities	<p>DOER’s stretch code proposal violates the statute by allowing green communities to retain their designation without adopting a true net zero opt-in stretch code -- a code that is more beneficial for public health and reducing emissions.</p> <p>I urge DOER to 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.</p> <p>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</p>

	<p>communities receive their awards could be the basis for a second round of grant applications by green communities still using the updated stretch code.</p> <p>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.</p>
Refrigerants	<p>The revised version of the specialized stretch code does not address refrigerants.</p> <p>I urge DOER to require the selection of low-impact refrigerants and refrigerant recycling (and prohibiting disposal) to limit ozone depletion and other carbon emissions.</p> <p>We must take a holistic approach to ensuring buildings promote human health and wellness, are affordable to heat and cool and meet our carbon emissions targets. Requiring low-impact refrigerants is a core part of a true net zero building code that transforms our buildings from polluters to protectors of our health and communities.</p> <p>DOER must insert provisions for low-impact refrigerants in the next revised version of the specialized stretch energy code.</p>
Exemption and Waivers	<p>The benefits of statewide specialized stretch code is that every community will agree to the same code -- which will ensure consistency across the state for building professionals, developers and municipal government.</p> <p>There must also be consistency and clarity for exemptions and waivers.</p> <p>Waivers should only be available in limited instances through a clearly defined process. These limited instances might include emergency generation.</p> <p>The risk of not narrowly defining exemptions that are fully justified and not identifying the limited instances for granting a waiver include an ad hoc approach that would ultimately dilute the effectiveness of a true net zero stretch code. We cannot afford to dilute a true net zero stretch code.</p> <p>DOER must require narrow definitions of what can be exempted from a true net zero stretch code. These exemptions must be fully justified and subject to review as technology changes.</p>

Implementation is Urgent	<p>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.</p> <p>If DOER produces a weak specialized stretch code, we will not meet the 2030 goal and building sector emissions will continue to rise. The rise in building emissions threatens our health, our economy and our futures.</p> <p>DOER must produce a finalized, true net zero specialized stretch energy code for municipal adoption by the end of 2022.</p>
Accelerate Effective Dates	<p>DOER must allow municipal adoption any time before Jan 1 st or July 1 st effective dates, anticipating possible voting in late December (special session), Spring, or Fall.</p>