

To: Zoning and Planning Committee, Newton City Council
From: Ann Berwick, Co-Director of Sustainability
Re: Questions from ZAP on Stretch and Specialized Energy Codes
Date: February 9, 2023

What is the City doing to disseminate information regarding Passive House and enforce compliance with Passive House guidelines?

Passive House is one of the authorized green building rating systems for projects subject to the Sustainable Development Design requirements of Newton's Zoning Ordinance (special permit projects >20,000 sf). Throughout the special permit application process, the Climate and Sustainability Team provides information to the project team about both the Passive House standards and available technical support and incentives.

Mass Save offers incentives for the feasibility, design, and construction of Passive House projects, as well as webinars, workshops, and reimbursements for industry professionals to become Passive House accredited professionals. Verification of Passive House compliance is completed by a Passive House rater/verifier before application for a certificate of occupancy.

The State has just promulgated building codes that include Passive House pathways as an option and, in some cases, requires Passive House certification. In light of changes to the codes, statewide organizations such as DOER, Mass Save, and Passive House Massachusetts are preparing for the increased interest in this certification.

What is Phius Zero?

Phius Zero goes beyond the basic Passive House requirements by achieving all of the same requirements and, additionally, netting out energy use on an annual basis with renewable energy. Phius Zero also bans on-site fossil fuel use. See <https://www.phius.org/phius-zero>.

What incentives exist for someone to build to a more efficient building?

[A study commissioned by the DOER](#) has found that across all tested *residential* building types, all-electric HERS 42 projects provide cost savings *during construction and operation* as compared to the baseline of gas HERS 52 homes. Gas HERS 42 projects as compared to gas HERS 52 projects did not lead to as great savings as all-electric HERS 42 projects, and in some cases cost more. The above study includes current rebates and tax credits in its cost comparison calculations, the most sizeable rebates coming from the Mass Save Program.

The same study found slight cost increases (from 0-4%) for most new *commercial* projects to meet the new code, but this analysis did not take into consideration incentives for commercial new construction. There are significant Mass Save incentives for [commercial new construction and major renovations](#).

Projects with 1-4 units are eligible for the [All-Electric Home incentive](#), providing \$15,000-\$40,000, depending on level of efficiency and number of units. Projects with 5+ units are eligible for [Passive House incentives](#), covering 100% of Passive House feasibility study costs, 75% energy modeling costs, and \$3,000 per unit for reaching Passive House certification.

Apart from financial incentives, efficient buildings are more comfortable. Buildings that use electricity rather than fossil fuels are also healthier from a number of perspectives, e.g., no emissions from gas used for cooking. However, individuals with implanted medical devices such as pacemakers should consult with their doctors about the advisability, specifically, of using an induction stove.

Do the subsidies mentioned apply to substantial renovations?

Residential renovations are addressed by the Mass Save [Renovations & Additions incentive](#) and the equipment incentive for [heat pumps](#).

Can the City require more EV chargers than outlined in the codes?

The answer depends on whether the codes themselves have EV charger requirements. If they do not—which had been the case until recently—the City has flexibility to impose its own charger requirements.

Now that the new codes have charger requirements, the answer is straightforward: the City cannot impose charger *requirements* different from what the codes specify.

This is somewhat more complicated in the context of a special permit. Although the City *cannot specifically require* that the number of EV chargers be increased beyond what the codes require, *the number of EV chargers can be considered in the special permit context* as one of the measures included in the project to satisfy the requirements of so-called “criterion 5.”

Section 7.3.3(C)(5) of Newton’s Zoning Ordinance (commonly referred to as “criterion 5”) requires that an application for a special permit “contribute significantly to the efficient use and conservation of natural resources and energy, including through some or all of the following: (a) minimizing operating energy; (b) minimizing the use of fossil fuels; (c) implementing a transportation plan that will minimize carbon footprint.”

Could clarification be provided regarding the residential and commercial definitions used in the code?

My Stretch Code/Specialized Code memos provide the following definitions: “The commercial Stretch Code and commercial Specialized Code apply to all buildings including all mixed use and residential buildings, except for detached one- and two-family dwellings and attached single-family dwellings, such as townhouses.”

Here are the questions directed to DOER's Ian Finlayson, with his answers:

- ***What definition is DOER using to calculate square footage? Is the calculation per unit? What does it include, e.g., all potentially conditioned space? Are attached garages included?***

Where the Stretch code and specialized code refer to square footage, for example in additions over 1,000 sf or new homes over 4,000 sf, the calculation of square footage is based on the total conditioned floor area of the unit. For example a 2 story house with a 1,000 sf floor area on each floor would have a conditioned floor area of 2,000 square feet. Attached garages are not included if they are outside of the conditioned envelope, but spaces that are included in the thermal envelope, such as, in many cases, basements, are included. The location of the air barrier is typically used to differentiate these spaces.

- ***What is the increased cost per square foot for development under the updated residential Stretch and Specialized codes, for residential buildings below 4,000 sf and above 4,000 sf and also for multi-family buildings?***

DOER hired national experts to analyze the costs and benefits of the updated stretch code from 2019-2021 and they looked at 12 different building types including several different residential home sizes and types. This information is available on the DOER website at: <https://www.mass.gov/lists/stretch-energy-code-development-support-documentation>

The level of detail in these case studies is significantly more detailed than can be reduced to a general increased cost per square foot, as the costs are different for every building type. So we don't attempt to provide a single cost number. The utility costs and mortgage rates have both changed significantly in the past year, although the bigger change is in utility costs and that serves to improve the cost savings for the improved energy efficiency in the Stretch code.

We invite the City Council and the public to review all of the case studies, they generally show that there are net savings to home buyers or commercial property owners over the expected mortgage period of the building. For residential homebuyers it almost always results in a lower cost of ownership of a new home from day 1 when a home is purchased with a standard 30-year mortgage.

- ***Can mixed-use buildings receive Passive House certification for a portion but not all of the building?***

Yes. This is already existing practice for both multi-family buildings that have additional community or retail spaces and for large commercial buildings with a mix of residential units and office spaces. The code has different compliance paths for different building use types and mixed-use buildings can apply the code compliance approach to a portion of the building as appropriate.

- ***Are long-term care facilities, such as assisted living facilities, considered multifamily housing required to achieve Passive House standards? These often include integrated health care and physical therapy facilities and swimming pools.***

Long term care facilities such as assisted living facilities are considered R-use buildings and as such if they are over 12,000 square feet and 4 stories or above then they would be required to achieve passive house standards for the residential sleeping units. Where these facilities have health care facilities or swimming pools onsite, these can be designed to be outside of the Passivehouse certified spaces as a mixed-use building if that is preferable to the design team.

- ***Will the codes require actual Passive House certification?***

Short answer: Yes.

Longer answer: The language in the stretch code on the Passive House pathway (which is also referenced in the Specialized code) details out the documentation required for compliance with the Passive house pathway. The requirements for documentation allow a certificate of occupancy to be issued prior to a building completing the Passive house certification process. This is intentional so that any delay in the certification process would not impact the code approval process. However, the documentation requirements also make clear that the full certification documentation must be provided to the code official having jurisdiction prior to a certificate of occupancy being issued, so the intent is that these buildings will be certified in due course.

- ***Is it correct to say that the only significant difference between the July 2024 version of the residential Stretch code as compared to the residential Specialized code is for homes larger than 4,000 sf that use any fossil fuels?***

No. The July 2024 version of the Stretch code and the Specialized code are similar for all electric buildings, but they are quite different for any buildings that are new mixed-fuel buildings. The Specialized code has requirements that impact mixed fuel homes of all sizes, and notably requires multi-family buildings over 12,000 sf and 4 stories or more to use the Passive house certification pathway. The Specialized code also has additional requirements for wiring for future electrification and solar installations on commercial buildings with any fossil fuel or biomass usage onsite.

- ***How would you describe the difference between the July 2024 version of the commercial Stretch code and the commercial Specialized code?***

The major differences between the July 2024 commercial stretch code and the commercial Specialized code are the following additional requirements in the Specialized code:

- a) **Mixed-fuel buildings** (not all-electric) will need to be pre-wired for future electrification and have appropriate electric service when first built.

- b) **Mixed-fuel buildings** in the Specialized code will be required to have on-site solar PV systems installed if they have sufficient unshaded roof area to make a solar PV system feasible. The solar system can be installed either on the roof or elsewhere on the site – for example with a parking canopy based solar array.
In the Stretch code these buildings need to have solar-ready roofs, but not to install solar systems.
- c) **Mixed-fuel buildings using gas or propane** have to meet higher efficiency requirements for space or water heating than in the Stretch code.
- d) **Multi-family buildings over 12,000 sq feet** than fall under the commercial code chapters have to follow the Passive house code compliance pathway in the Specialized code whereas under the Stretch code after July 2024 they would be able to choose between three pathways: Passive House, HERS rating (42 or 45 per unit) or the TEDI pathway.