March 18, 2022

Department of Energy Resources
100 Cambridge Street
Suite 1020
Boston, MA 02214

[Electronically submitted to: stretchcode@mass.gov]

RE: Stretch Code Straw Proposal Comments

Dear Sir or Madam:

On behalf of Bradford White Corporation (BWC), thank you for providing an opportunity to comment on Massachusetts Department of Energy Resources (DOER) Stretch Code Straw Proposal.

BWC is an American-owned, full-line manufacturer of residential, commercial, and industrial products for water heating, space heating, combination heating, and water storage. In Massachusetts, a significant number of individuals, families, and job providers rely on our products for their hot water and space heating needs.

As a manufacturer of water and space heating products, we have made substantial investments in products that provide significant energy and environmental benefits, such as heat pump water heater (HPWH) technology. As a testament to these efforts, our company has been recognized as an ENERGY STAR® Partner of the Year in both 2020 and 2021.

Bradford White Corporation Recommendations

We strongly believe that a thorough analysis of electricity generation capabilities and limitations is an important step in determining a pathway to minimize greenhouse gas emissions. A study by U.C. Davis explains that natural gas and other fossil fuels supply baseload and peak electricity demand in Massachusetts[1]. Natural gas fueled about two-thirds of Massachusetts' total in-state electricity net generation[2]. Currently, all the state's planned electricity generation additions will be fueled by renewable

[1] Nelson Ditcher, Aref Aboud, Analysis of Greenhouse Gas Emissions from Residential Heating Technologies in the USA p. 8 (2020).
[2] U.S. EIA, State Energy Data System, Electric power sector consumption by source, End-use energy consumption 2019.

energy or natural gas[3]. Additional electricity use will generate higher emissions than that of natural gas. Building electrification could result in an increase in greenhouse gas emissions and would benefit more from rebates and incentives for all high-efficiency appliances, regardless of fuel source, to upgrade the current mix of heating equipment.

Incorporating options for multiple fuel systems into the Massachusetts decarbonization policy is a critical step to minimizing increased emissions and ensuring sufficient heating in colder climates. We commend DOER for proposing multiple fuel types via a performance path for low-rise residential buildings.

The Home Energy Rating System (HERS) scoring index has been used in Massachusetts energy code as a baseline requirement. DOER's slide #16 states an average HERS score of 51 in Massachusetts in 2020. The slide also states 87% of new homes used HERS in 2020. HERS activity by state indicates in 2019 Massachusetts rated 8,348 homes with an average HERS score of 52 in 2019. We do have the following observations and questions relative to proposed requirements for low-rise residential new construction:

- The Base Code's rating option of HERS score of 55 to HERS score of 52 is a 5% change. DOER suggests a reduction in the Stretch Code from a HERS score of 55 to a HERS score of 42 for low-rise residential buildings with gas heating. This reduction equates to a >20% change in a single code cycle. We believe this reduction is too aggressive for a single code cycle.

- The average HERS score by climate zone in IECC climate region 5A (Massachusetts' climate zone) is 59[4]. Massachusetts has made great progress on Building Code requirements, resulting in an average HERS score of 51. We recommend DOER consider an update to the Stretch Code HERS score of 47, at maximum, which should equate in a reduction between 10-15% from the previous code cycle.

Performance-based decarbonization policies that do not favor certain technologies over others will prevent inadvertent emission increases while Massachusetts still relies on non-renewable power generation sources.

- BWC recommends the Stretch Code HERS score requirements for fossil fuel heating and for electric heating are in parallel with identical HERS scores. As suggested previously, we recommend DOER consider a HERS score of 47 for the updated Stretch Code.

BWC commends DOER in providing options for multiple fuel system types in commercial buildings. BWC agrees that a one-size-fits-all approach does not apply to the complexity and diversity of Massachusetts' building stock.

[3] U.S. EIA, Preliminary Monthly Electric Generator Inventory, Inventory of Operating Generators as of June 2021 and Inventory of Planned Generators as of June 2021.
[4] RESNET, 2019 HERS Activity by Climate Zone, https://www.resnet.us/wp-content/uploads/2019-HERS-Activity-by-Climate-Zone.pdf

- Targeted performance is a new option proposed in the Stretch Code, and Thermal Energy Demand Intensity (TEDI) is briefly covered on slides #38 and #39. We respectfully request DOER provide any studies, worksheets, software, tools, etc. to stakeholders and be reinforced by peer review. At this time, BWC abstains from approval of TEDI in the Stretch Code.

BWC advises DOER to consider an update to the HERS score for multi-family. We recommend a Stretch Code HERS score of 47 for multi-family, which would equate in a reduction between 10-15% from the previous code cycle.

Additional clarity is required for stakeholders to understand both the residential and commercial Specialized Opt-in codes. The name Specialized Opt-in for the code could be misleading, as stakeholders may believe this is a code that they are able to opt-in, and therefore is optional. Rather, our understanding is that this code would be a third option a community could adopt and enforce. In other words, a community would adopt either the Base Code, the Stretch Code, or the Specialized Opt-in code.

The Specialized Opt-in code requires fossil fuel new construction to have solar on roof, where feasible, and pre-wiring for electric stoves, dryers, hot water, and heating.

- The slides indicate required solar photovoltaic (PV) installation on all unshaded roof with good solar access, and on other slides indicate solar on roof where feasible. We recommend DOER provide additional information regarding solar PV requirements. What parties would be responsible for determining the feasibility of solar PV installation?

- Has DOER considered alternative approaches to electrification and the costs associated with them, such as using higher efficiency gas products and low carbon gases, such as renewable natural gas or hydrogen?

- Has DOER considered prewiring the building; sizing the electrical panel for future electrical use; and installation of solar PV on all unshaded roof, any of which may never be utilized thereby creating burdensome costs to builders, building owners, and tenants?

- We encourage DOER to consider consumer equity in its decarbonization policies. Policies dependent upon building electrification for reducing emissions, if not carefully executed, will place an undue burden on low-income housing. We recommend that Massachusetts perform a holistic cost-benefit analysis of any decarbonization policy and ensure that any recommendations are equitable to all its residents.

- The Specialized Opt-in code for multi-family requires Passive House. On slide #46, DOER indicates actual costs and percentages without any supporting data. BWC recommends any data should be provided to stakeholders for peer review. The cost statements in the Passive House Challenge 2019 are based on a quantity of 8 projects, while slide #45 states Massachusetts has over 6,500 Passive House units since 2017. The Passive House Challenge data is insufficient to allow a comparative analysis.

- We suggest the Specialized Opt-in code for commercial multi-family new construction to provide the options of a HERS score of 47, or Passive House.

Massachusetts' summers are generally mild, and mid-winter temperatures are often below freezing[5]. Northern states, such as Massachusetts tend to be less favorable for conversion from natural gas to electricity for heating end-users.

- Has DOER considered the performance of heat pumps (HP) in low temperature conditions (i.e., 30ºF to -15ºF? Such conditions may impact the performance of HPs, including capacity and Coefficient of Performance (COP) degradation, auxiliary heating needs to supplement HP capacity, and peak demands to the grid. BWC recommends DOER preserve multiple fuel types in the Stretch Code.

Only one in six Massachusetts households use electricity as their primary energy source for home heating, and electricity use for air conditioning is relatively low.[6]

- Has DOER considered that houses will gain the capability of air conditioning as a result of installing HPs in place of gas-space heating equipment? This will result in increased summer and winter incremental load for electrification scenarios. This raises questions about increased demand on the electric grid, especially during peak load.

The COVID-19 pandemic, along with geopolitical events have created supply chain disruptions. Manufacturers of space heating and water heating equipment are experiencing supply-side restraints, which have not eased. Part shortages also impact the repair and service of space and water heating equipment.

- Has DOER considered that this transition to electrification could result in a very limited number of higher-cost products to be available to the market, including acute shortages of the most efficient products?

Plumbers, technicians, engineers, and inspectors require training for proper sizing, installation, troubleshooting, maintenance, and installation of HPs and HPWHs.

- What feedback has DOER received from equipment wholesalers, plumbers, electricians, mechanical contractors, and mechanical design engineers on the Massachusetts Stretch Code Straw Proposal?

[5] U.S. EIA, State Energy Analysis, Massachusetts, last updated September 16, 2021
[6] U.S. Census Bureau, Massachusetts, House Heating Fuel, Table B25040, 2019 ACE 1-Year Estimates Detailed Tables

- Has DOER considered that increasing market share for electrification goes beyond incentive programs and must also focus on contractor training and public education? How can DOER contribute to education and training regarding space heating and water heating equipment?

High levels of building electrification and renewable generation will shift the daily and seasonal supply and demand curves, which will likely require new strategies to reduce costs and ensure reliability. Energy system reliability is dependent upon diversification of energy sources, and we support DOER providing multiple fuel types for all buildings.

Bradford White Corporation thanks the Department of Energy Resources for the opportunity to provide feedback on Massachusetts Stretch Code Straw Proposal. Should you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,

Bradford White Corporation

Eric Truskoski
Senior Director of Government and Regulatory Affairs

Cc: R. Wolfer; B. Ahee