March 8, 2022

Department of Energy Resources (DOER)
100 Cambridge Street, Suite 1020
Boston, MA 02114

Re: **Stretch Code Straw Proposal Comments**

Dear Commissioner Woodcock, Director McCarey, et al:

Greater Boston Physicians for Social Responsibility (GBPSR) is a physician-led group of health professionals and community members working to address two of the existential threats to human health: nuclear war and climate change. Our members include nationally recognized experts in public health, cancer epidemiology, occupational medicine, environmental health, emergency medicine, disaster preparedness, and the health effects of climate change. We offer state-of-the-science and up-to-date medical and public health information about the effects of fossil fuels on human health and the climate crisis. We are very concerned with the greenhouse gas emissions from burning fossil fuels and the associated health emergency. Heating buildings is a significant source of greenhouse gas emissions in Massachusetts, which must be addressed. We urge the DOER to develop a new net-zero carbon energy code that will accelerate the construction of energy-efficient, all-electric buildings.

We thank DOER for their work on the stretch energy code and the opt-in energy code. However, we were disappointed that the opt-in energy code is not significantly different from the proposed stretch code. We fear the opt-in net-zero code doesn't reflect the urgency of the climate crisis or the intent of the Next Generation Roadmap Climate Policy.

We encourage DOER to consider the following changes to its straw proposal:

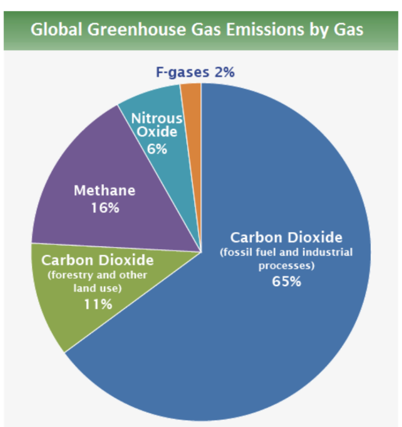
- Develop an all-electric or non-emitting opt-in code;
- Extend the opt-in code to apply to major rehabilitation projects;
- Improve energy efficiency requirements;
- Account for and curb embodied carbon emissions related to construction;
- Include the social cost of methane, carbon dioxide and air pollution in any cost analysis.

The proposed opt-in energy code doesn't adequately curb the use of methane gas and perpetuates a leaking methane gas system. Burning methane gas and ongoing methane leaks will continue to fuel the climate crisis and the associated health emergency.

Climate change is driven by burning fossil fuels and methane leaks

The International Panel on Climate Change (IPCC) stated: "Limiting warming to 1.5°C implies reaching net zero CO_2 emissions globally around 2050 and concurrent deep reductions in emissions of non-CO_2 forcers, particularly methane." Steeper declines in methane are important. The UN Environment Programme called for a 45 percent decline in methane emissions by 2030[1] and the White House committed to a 30 percent reduction in methane emissions from 2020 levels by 2030.[2]

Figure 1: Burning fossil fuels contributes to more than 65%[3] of total GHGs and methane is the second largest cause of global warming[4] [5]



Source: IPCC (2014) EXIT Exit based on global emissions from 2010. Details about the sources included in these estimates can be found in the *Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* EXIT. Exit

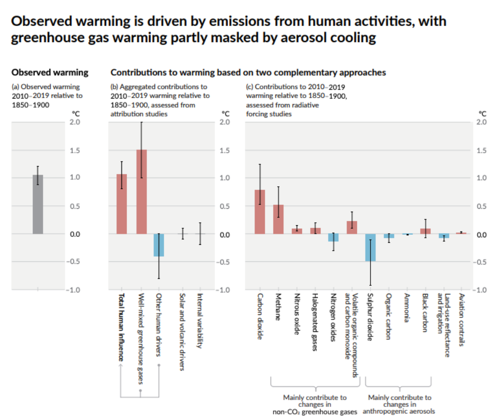


Figure SPM.2 | Assessed contributions to observed warming in 2010–2019 relative to 1850–1900

Panel (a) Observed global warming (increase in global surface temperature). Whiskers show the *very likely* range.

Panel (b) Evidence from attribution studies, which synthesize information from climate models and observations. The panel shows temperature change attributed to: total human influence; changes in well-mixed greenhouse gas concentrations; other human drivers due to aerosols, ozone and land-use change (land-use reflectance); solar and volcanic drivers; and internal climate variability. Whiskers show *likely* ranges.

Panel (c) Evidence from the assessment of radiative forcing and climate sensitivity. The panel shows temperature changes from individual components of human influence: emissions of greenhouse gases, aerosols and their precursors; land-use changes (land-use reflectance and irrigation); and aviation contrails. Whiskers show *very likely* ranges. Estimates account for both direct emissions into the atmosphere and their effect, if any, on other climate drivers. For aerosols, both direct effects (through radiation) and indirect effects (through interactions with clouds) are considered.

{Cross-Chapter Box 2.3, 3.3.1, 6.4.2, 7.3}

High rates of methane leaks in Massachusetts

Leaked methane is an unresolved problem in Massachusetts and in the U.S threatening a livable climate. Bottom-up methane inventories estimate that distribution and end use contribute 6% of US emissions from the methane gas supply chain[6] but that estimate is an undercount according to more accurate top-down inventories. A recent report in 2022 by the International Energy Agency found the emissions from energy sector are 70% higher than reported.[7] In Massachusetts, in 2020 alone there were more than 14,000 unrepaired leaks along the distribution pipelines.[8] A recent Harvard study found no significant trend in the methane gas loss rate over eight years, despite efforts from the state to increase the rate of repairing pipeline leaks. They estimated that about 2.5% of the gas entering the urban region is lost, much higher than state bottom-up estimates. And disturbingly, many of the leaks occur inside buildings.[9]

The climate crisis is a health emergency

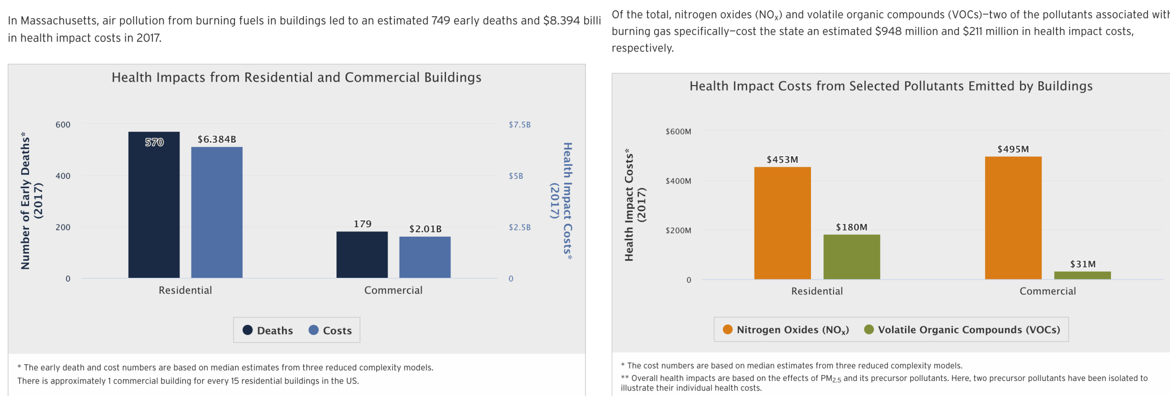
We cannot continue to expand a leaking gas system into new construction because the climate crisis is already a health emergency. Over 100 public health and health organizations[10] and the City of Boston have declared the climate crisis a health emergency.[11] Ignoring the impact of natural gas could cause catastrophic harm that is impossible to reverse. In 2021, in an unprecedented action, the New England Journal of Medicine, and over 200 other health journals published a *Call for Emergency Action to Limit Global Temperature Increases, Restore Biodiversity, and Protect Health.* "The science is unequivocal: a global increase of 1.5° C above the pre-industrial average and the continued loss of biodiversity **risk catastrophic harm to health that will be impossible to reverse.**"

Burning fossil fuels in buildings contributes to air pollution

Burning fossil fuels is not only bad for the planet, but also for health, and we should be moving away from burning fossil fuels in buildings, especially because the technology is already available to do so. In Massachusetts, buildings powered by fossil fuels contribute more than five times more outdoor nitrogen oxides (a precursor to smog) and more than twenty times more outdoor fine particulate pollution than electricity generation.[12] Outdoor air pollution is associated with increased rates of asthma, chronic obstructive pulmonary disease **(**COPD), and cardiovascular disease.[13] [14]

In a recent Harvard study the authors found that the cost of burning fossil fuels in **buildings alone** was more than $8 billion in Massachusetts in 2017. The data portrays the impacts of building pollution originating in the state. These figures from the Harvard report are underestimates of the actual health costs because they do not account for health impacts from exposure to indoor air pollution, direct exposure to other outdoor pollutants such as ozone or nitrogen oxides, or other health burdens like asthma or emergency room visits.[15]

Figure 2: Health Impacts from burning fossil fuels in residential and commercial buildings in Massachusetts[16]



We know that burning methane gas is unhealthy for children. Cooking with gas stoves contributes to household air pollution. Children living in homes with gas cooking stoves have a 42% higher risk of current asthma.[17] A longitudinal study in Massachusetts showed that children with asthma had more severe and frequent asthma symptoms if they lived in homes with gas cooking stoves.[18]

Health Equity Considerations

Asthma is a public health challenge in Massachusetts and air pollution is a driver of health disparities in asthma,[19] which disproportionately affects African-Americans, Latinos, and low-income communities in Massachusetts. Air quality improvements resulting from the transition to electric, clean heating and cooking can ameliorate some of the asthma burden in these communities.[20]

To better understand **the social cost of methane, carbon dioxide, and air pollution,** they should be included in analysis comparing the proposed code to an all-electric code. It's important to understand the true costs of ignoring the climate crisis. The California Public Utilities Commission considered the societal benefits of electrification[21] in cost-effectiveness analysis and found that social benefits of building electrification far exceed cost (see Figure 3). We encourage the DOER to consider these costs and impacts on health in their analysis of different code options.

Figure 3: California Public Utilities Commission Cost Effectiveness Analysis[22]

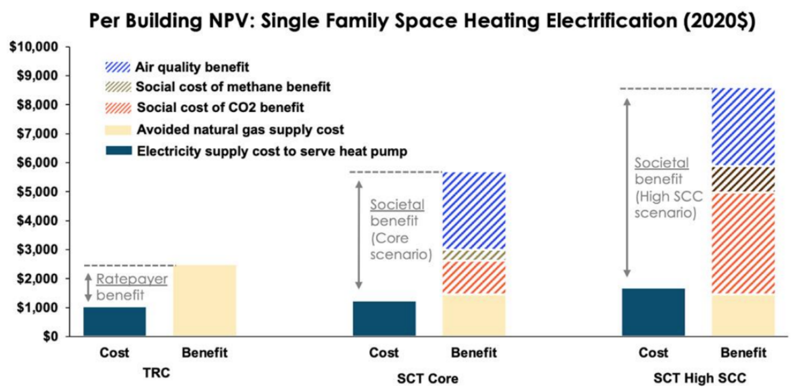


Figure 3. Cost effectiveness of a sample building electrification measure under a TRC vs the "Core" and "High SCC" SCT scenarios.

Resiliency is important: heat-related illnesses and deaths

The climate is changing, and the opt-in code should consider climate resiliency needs, including cooling. Heat-related illnesses are becoming more common and kill more people than any other type of extreme weather.[23] By 2050, the number of hot days in Massachusetts will more than triple; increasing from 7 to 25 by 2050.[24] The health impacts of extreme outdoor heat are well documented and profound. Increases in outdoor temperature and humidity threaten the health of vulnerable populations, including the elderly, children, pregnant women, outdoor workers, and people with underlying health conditions. Exposure to high temperatures increases the risk of cardiovascular and respiratory-related morbidity and mortality, impairs kidney functioning, and negatively affects pregnancy outcomes and mental health. In Massachusetts, the health impacts of extreme heat are disproportionately borne by environmental justice communities.

As the climate warms, air conditioning (AC) will become essential for home safety. In a cohort of over 72,000 people, a retrospective study found that people without central AC were 72% more likely to die in periods of high outdoor heat than those with AC.[25] Air conditioning is the best protection against heat. Heat pumps can provide efficient heating and cooling and are less expensive than installing a gas furnace and an air conditioning unit.[26]

Local demand for all-electric building code

Current energy code is not meeting the needs of municipalities to meet their greenhouse gas reduction targets, and in turn, the Commonwealth's targets. The Massachusetts 2030 Climate Energy and Climate Plan recommends retrofitting one million buildings with heat pumps. Continuing to build new construction with fossil fuels is in direct contradiction to these plans.

Cities and towns are demanding an all-electric building code to stop ma. Boston recognized the importance of reducing building emissions in new construction in the *Carbon Free Boston* report,[27] which found that to meet Boston emission reduction targets, new construction must be zero emissions.[28] The Boston Department of Neighborhood Development already requires that construction projects receiving funds from the City be zero emissions.[29] In the absence of a net-zero opt-in stretch code, the Boston Planning and Development Agency (BPDA) is updating its zoning code to require new construction projects larger than 20,000 square feet to be net-zero carbon.[30] Similarly, Cambridge and Sommerville passed incentives and requirements for building net-zero carbon buildings. Acton, Arlington, Brookline, Concord, and Lexington have petitioned the legislature with home rule petitions to allow them to implement all-electric building codes. Because the opt-in code is not compulsory, no city or town is compelled to use it, but an all-electric net-zero code should be available for those calling for it.

We ask the DOER to develop an all-electric net-zero opt-in stretch code to better comply with the Next Generation Climate Roadmap passed in 2021 and the Massachusetts 2030 Clean Energy and Climate Plan. Doing so will help mitigate the climate crisis that threatens our health and wellbeing.

Sincerely,

Brita Lundberg, MD
Board Chair

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2 Wintour, P. Biden unveils pledge to slash global methane emissions by 30%. The Guardian. Nov 2, 2021. https://www.theguardian.com/environment/2021/nov/02/joe-biden-plan-cut-global-methane-emissions-30-percent Accessed 11/30/21
3 https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data
4 https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf
5 https://www.unep.org/news-and-stories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them

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[9] https://www.pnas.org/content/118/44/e2105804118

[10] https://climatehealthaction.org/

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