



September 1, 2023

Massachusetts Department of Environmental Protection
100 Cambridge Street Suite 900
Boston, Massachusetts 02114

RE: Comments on the Massachusetts Clean Heat Standard Program (CHS)

The Northeast Chapter of the Combined Heat and Power Alliance (“NE Chapter”) submits these comments in response to the Massachusetts Department of Environmental Protection’s (“Mass DEP”) March 2023 Stakeholder Discussion Document for the Clean Heat Standard Program Design and the July 2023 Technical Sessions.

The NE Chapter is a group of manufacturers, system developers, engineers, and end-user representatives united in pursuit of reducing energy costs and carbon emissions using the highly efficient technology of Combined Heat and Power (“CHP”). The NE Chapter and its member organizations fully support the innovative, extensive goals and objectives that are the foundation of the Massachusetts Clean Energy and Climate Plan for 2050 (“2050 CECP”). The NE Chapter believes that CHP technology will play a critical role in facilitating the state’s mission, specifically as it relates here to the proposed Clean Heat Standard (“CHS”).

The NE Chapter recommends the following for the design of the MA CHS program.

- 1. MassDEP should adopt a standard that is expressed in greenhouse gas (“GHG”) reductions, regardless of the technology employed to effectuate such reductions.**

The expressed purpose of the CHS is to reduce climate pollution¹, and as such, all credits given to solutions and technologies should be tied intrinsically to the life cycle reduction in GHG emissions, which these methods provide. Under this protocol, all technologies, including non-electrification solutions, must be included within the CHS, and measured accordingly.

- 2. Renewable natural gas (“RNG”), certain biofuels, and hydrogen should be credited within the CHS program design.**

All clean fuels should be eligible within any proposed CHS, provided that their use reduces lifecycle GHG emissions, relative to traditional fossil fuels. RNG has a lower carbon intensity

¹ Regulatory Assistance Project (RAP). A Clean Heat Standard for Massachusetts. June 2022. <https://www.mass.gov/doc/clean-heat-standard-2-page-summary/download>.



than fossil fuels or electricity.² Likewise, clean hydrogen produced from renewable energy (“green hydrogen”) has zero carbon emissions once combusted.³

Seven northeastern states, including Massachusetts, recently submitted a proposal to U.S. Department of Energy (“DOE”) for \$1.25 billion in federal funding for a Northeast Regional Clean Hydrogen Hub. The goal of these hubs, for which Congress has appropriated up to \$8 billion under the Bipartisan Infrastructure Law, is to “create networks of hydrogen producers, consumers, and local connective infrastructure to accelerate the use of hydrogen as a clean energy carrier that can deliver or store tremendous amounts of energy.”⁴ The Commonwealth’s interest in these clean sources of hydrogen provides clear support for the inclusion of such clean fuels in any CHS decarbonization plan.

3. The MA CHS should be technology neutral and include non-electrification solutions, provided they deliver GHG reductions, relative to fossil fuels.

The NE Chapter and its members heartily endorse the inclusion of CHP within the Commonwealth’s toolkit of emissions reducing technologies for the following reasons:

- a. CHP is an established, high-efficiency technology recognized by the U.S. Environmental Protection Agency and DOE as a carbon reducing technology as shown in the diagram below.⁵

² Argonne National Laboratory. Renewable Natural Gas (RNG) for Transportation: Frequently Asked Questions. March 2021. <https://www.anl.gov/esia/reference/renewable-natural-gas-rng-for-transportation-frequently-asked-questions>.

³ US DOE. Alternative Fuels Data Center. Hydrogen Basics. https://afdc.energy.gov/fuels/hydrogen_basics.html

⁴ New York State Energy Research and Development Authority (NYSERDA). Seven States in NE Regional Clean Hydrogen Hub Announce DOE Proposal for Funding and Designation as a National Hub. April 7, 2023. <https://www.nyserdera.ny.gov/About/Newsroom/2023-Announcements/2023-4-7-Seven-States-in-Northeast-Regional-Clean-Hydrogen-Hub>

⁵ Entropy Research, LLC. CHP’s High Efficiency Saves CO2 Emissions Today. July 28, 2022.



CHP's High Efficiency Saves CO₂ Emissions Today

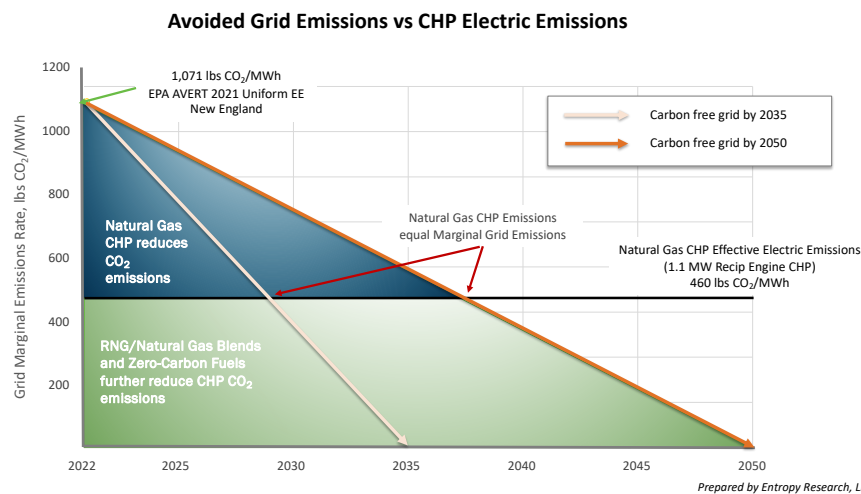
- **CHP is a low carbon resource**, not a zero-carbon resource like PV & Wind, but it reduces grid carbon by displacing higher marginal emission sources
- **CHP's high operating efficiency and high capacity factor** enables it displace more marginal grid generation and reduce more CO₂ than the same capacity of zero carbon wind or PV

Category	Natural Gas CHP	Utility Solar PV	Utility Wind	Biogas CHP
Capacity, MW	20.0	20.0	20.0	20.0
Annual Capacity Factor	90%	24.3%	34.3%	90%
Annual Electricity, MWh	157,680	42,574	60,094	157,680
Annual Thermal Provided, MWh _{th}	169,466	None	None	169,466
Annual Energy Savings, MMBtu	628,000	382,992	540,002	628,300
Annual CO ₂ Savings, Tons	70,114	32,654	46,092	163,187
Annual NOx Savings, Tons	53.5	16.4	23.1	53.5

Savings based on EPA AVERT Uniform EE Emissions Factors as a first level estimate of displaced marginal generation
<https://www.epa.gov/avert>
 Prepared by: Entropy Research, LLC, 7/28/2022

- b. Today, CHP is reducing marginal grid emissions in the New England power generation zone by displacing dirtier grid resource CO₂ emissions, as demonstrated in the diagram below.⁶

Renewable and Net-Zero Carbon Fuels Maintain CHP's Advantage



- c. CHP is not a “technology lock in,” but is fuel-flexible and capable of using low-carbon

⁶ Entropy Research, LLC. Renewable and Net-Zero Carbon Fuels Maintain CHP's Advantage. September 28, 2022.



and zero-carbon fuels, such as RNG, biofuels, and green hydrogen.

- d. Carbon reductions today have more value than those in the future. The time value of carbon is the concept that greenhouse gas emissions cuts today are more valuable than promised future cuts due to the escalating risks associated with the pace and extent of climate action. “Because emissions are cumulative and because we have a limited amount of time to reduce them, carbon reductions now have more value than carbon reductions in the future. The next couple of decades are critical.”⁷
- e. Low carbon and zero carbon fuels will be initially costly and valuable, and thus best employed in the high efficiency technology of CHP (85%+ efficiency value).
- f. CHP is dispatchable to electric system operators and, as such, helps remedy the intermittency issues faced by renewables, thereby hardening the grid.
- g. CHP can provide resiliency in the instance of central power grid failures for critical infrastructure.
- h. Regarding energy equity concerns, CHP has been employed across many public housing sites, both in Massachusetts and elsewhere. The energy cost savings enjoyed by these sites has been used, and can be used in the future, to finance electrification and other decarbonization projects moving forward, which helps solve some of the financing conundrums LMI are facing today.

The NE Chapter of CHPA strongly supports reducing GHG emissions through a Clean Heat Standard. Such a program should be technology neutral and should allow credits for RNG and other clean fuels based on their lifecycle emissions. CHP must be included with these creditable technologies if the Commonwealth is earnestly seeking to reduce GHG emissions both now and in the future.

Our sincere thank you to MA DEP for consideration of our comments.

Respectfully,

Diane Molokotos

Diane Molokotos
President, NE Chapter of CHP Alliance

⁷ “Time Value of Carbon,” Larry Strain. Carbon Leadership Forum. April 2020.