

MassDEP Stakeholder Discussion Document
Clean Heat Standard Program Design
March 2023

The purpose of this document is to solicit initial feedback from stakeholders to inform the development of draft Clean Heat Standard (CHS) regulations. MassDEP is interested in comments on all aspects of program design, including the topics listed below and any other relevant topics that stakeholders wish to address. MassDEP is also interested in recommendations for soliciting further input, such as suggested topics, locations, and formats for stakeholder meetings/hearings. Initial written comments are requested by May 1, 2023 and should be submitted via email to climate.strategies@mass.gov. Questions may also be addressed to that email address at any time.

The remainder of this document includes background information about consideration of a CHS in Massachusetts, a short explanation of the basic CHS concept, a list of design questions that stakeholders may wish to address in their comments, a brief discussion of how the CHS may interact with other programs, and several additional questions for stakeholders on economic analysis. The topic of equity is addressed throughout the document.

Massachusetts Clean Heat Standard Background

The Massachusetts Clean Heat Standard concept was first introduced in the Massachusetts Clean Energy and Climate Plan for 2025 and 2030 (“2025/2030 CECP”; see link below) and was subsequently endorsed by the Massachusetts Clean Heat Commission (CHC). The Massachusetts Clean Energy and Climate Plan for 2050 (“2050 CECP”) adopts the framework for a Clean Heat Standard (CHS) as laid out in the CHC’s Final Report.

Strategy B1 in 2025/2030 CECP tasks MassDEP with developing a “a high-level program to meet the emissions limit for residential, commercial, and industrial heating” and identifies a CHS as a regulatory option for addressing this requirement. According to the 2025/2030 CECP, “MassDEP will develop a set of draft regulations that addresses questions relating to the (a) specific entities regulated, (b) the reporting process, (c) the role and magnitude of alternative compliance payments, (d) the use of any revenues associated with the program, and (e) other design features.”

The 2025/2030 CECP also includes a 48 page appendix titled *A Clean Standard for Massachusetts* (“the CHS Appendix”; see link below). The CHS Appendix describes the CHS concept, addresses key design features, and concludes:

- *The Clean Heat Standard is a practical and cost-effective policy tool to meet emissions reduction goals for the thermal sector, and it could be implemented in a progressive, equitable manner consistent with the Commonwealth’s objectives for a timely and equitable transition.*
- *The standard can be implemented to work in concert with other policy tools, and this could lower the cost and improve the benefits of the clean heat transition.*

The Massachusetts Commission on Clean Heat endorsed the CHS as *a powerful tool for creating a new market for clean heating solutions by incentivizing obligated parties to deliver cleaner heating technology, electrify our building stock, increase building efficiency, and move away from fossil fuels.* Their final report included the following key program elements, along with an appendix addressing additional design considerations:

- *To support the decarbonization of the Commonwealth's building stock, the CHS's long-term objective must be to promote electrification of the thermal sector, in alignment with the 2050 Roadmap findings and 2025/2030 CECP policies, and in conjunction with significant thermal load reduction.*
- *Obligated parties of the CHS should be suppliers of energy to building heating systems, including utilities, wholesale liquid fuel and propane suppliers, and retailers as necessary to ensure all fuel delivered to Massachusetts is covered under the standard. MassDEP, in consultation with DOER, should evaluate the impacts, benefits, and drawbacks of including electric utilities as obligated parties along with fuels suppliers from the outset of the standard. Credits should be made available for strategies that reduce GHG emissions, with a strong preference towards pursuing electrification. The Commission recommends that MassDEP utilize full life cycle analysis to evaluate all potentially eligible credit-generating activities and seek to maximize the stringency of the standard to ensure the Commonwealth is achieving all feasible emissions reductions across heating and fuel types, particularly in the near-term as existing fossil fuel equipment is utilized before the end of its useful life.*
- *Consistent with decarbonization goals and building on recent legislation amending Mass Save, the installation of new fossil fuel equipment and services should not be supported under the CHS. Similarly, electrification should be prioritized in buildings that have already undergone or will simultaneously pursue significant thermal load reductions to maximize long-term GHG reductions and ensure proper sizing and operation of electric heating equipment.*
- *The CHS must be designed to include and protect low- and moderate-income (LMI) and Environmental Justice (EJ) populations from the outset. To achieve this objective, the Commission recommends requiring obligated parties to include a specified percentage of credits generated in LMI and EJ populations and households in their annual compliance filings.*
- *The CHS must be viewed as part of an integrated portfolio of policies driving all feasible electrification and energy efficiency, and not as a stand-alone solution. The CHS must work harmoniously with existing programs (e.g., Clean Energy Standard, Renewable Portfolio Standard, Solar programs), as well the Building Decarbonization Clearinghouse, Climate Bank, and Building Benchmarking programs.*

The 2050 CECP includes the follow additional discussion of how a CHS might be structured:

The CHS is a regulatory construct that is similar to other clean energy standards such that clean heat solutions will receive credits that are valued in the marketplace. In the CHS framework, fuel suppliers will be the obligated parties who must create or own clean heat credits to comply with the regulation. Like other environmental standards that use marketable credits, the CHS will be used to reduce GHG emissions from building heat, with a focus on encouraging electrification and energy efficiency. The standard would require obligated parties to demonstrate a reduction in emissions by deploying applicable clean technologies or purchasing clean heat credits from

parties that have successfully implemented solutions. The standard encourages competition while reducing emissions, minimizing homeowner transaction costs, and sharing the burden of the transition widely and equitably.

For more information, see:

- [Massachusetts Clean Energy and Climate Plan for 2050](#); page 56.
- [Commission on Clean Heat](#) web page.
- [Massachusetts Clean Energy and Climate Plan for 2025 and 2030](#); Strategy B1, page 52.
- [Appendices to the Massachusetts Clean Energy and Climate Plan for 2025 and 2030](#); The CHS Appendix is page 28-75, but includes its own pagination that is used in this stakeholder discussion document.
- [A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study](#); (“Building Sector Report”)

What is a Clean Heat Standard?

The CHS concept builds on the many successful energy and environmental “standards” that use marketable credits to support and document the use of clean energy technologies, such as MassDEP’s Clean Energy Standard (CES), California’s Low Carbon Fuel Standard (LCFS), and the federal Renewable Fuel Standard (RFS). The common element that defines these standards is that they require energy suppliers to demonstrate the deployment of specified types and quantities of clean energy by implementing clean energy themselves or purchasing credits. Using this general structure, a CHS would broadly support clean heat through the sale of credits awarded for replacing fossil heating fuels with clean heat. It would also tend to accelerate projects and minimize costs because, as with any marketable commodity, companies have an incentive to out-produce and undersell their competitors. For example, under a CHS, the ability to participate in a clean heat credit market would be most valuable to contractors that are able to install clean electric heat pumps quickly and at the lowest possible cost to their customers. Finally, because energy suppliers, not individual energy customers, are subject to the credit purchasing requirement, any incremental program costs will be spread widely across consumers in Massachusetts.

While the basic CHS concept is straightforward, several aspects of detailed program design will require careful consideration. The most fundamental questions are: (1) How much clean energy must be deployed for the heating sector each year? (2) Which energy suppliers must comply with the standard by implementing clean energy or purchasing credits? (3) What counts as clean energy that can be awarded compliance credits? This third question is the most complicated, as it requires developing detailed rules describing how the number of credits is calculated for each eligible clean energy type. Other important questions include: (4) Does the program include alternative compliance options for energy suppliers, such as a payment option? (5) What are the detailed reporting requirements for heating energy suppliers? These five questions are further addressed below, with additional information to assist stakeholders in developing detailed comments.

A related, but more general, question for stakeholders to consider is whether a CHS is sufficient to implement the building sector sublimits established in the CECs or whether it should be supported by a declining cap on emissions, such as a “cap-and-invest” program for the building sector. While the detailed design of such a program is beyond the scope of this discussion document, the general topic is addressed in several places below.

Stakeholder Topics and Questions

Topic #1 – Setting the Standard

The standard must be set with reference to the building sector emissions sublimits established in the CECs. As explained on page 56 of the 2025/2030 CEC, for the 2030 limit, this translates to required reductions of about 5 million metric tons (MMT) in building sector GHG emissions between 2025-2030, or about 1 MMT each year. Also, as illustrated in Figure 3.2 on page 28 of the 2025/2030 CEC, to ensure adequate progress toward the 2050 emission limit, it will be necessary to achieve a significant fraction of these reductions through electrification; inspection of the figure suggests that an average pace of approximately 100,000 residential heat pump installations per year from 2025-2050 would be adequate. (The pace of 100,000 installations per year is also referenced on page 7 of the Building Sector Report and is consistent with the target of more than 2 million residential heat pumps by 2050 referenced on page 23 of the 2050 CEC.) The standards could be adjusted periodically during scheduled program reviews, such as after the publication of the 2035 CEC in 2027.

To set a standard that can apply to individual regulated entities, the requirements must be converted to a percentage that can be applied to each company’s energy sales and expressed in terms of GHG emissions. Taking account of weather variability and ongoing electrification trends, inspection of table ES2 of page xiv of the 2025/2030 CEC suggests that building emissions may average around 15 MMT per year between 2025 and 2030. In that case, reducing emissions by 1 MMT per year would require a standard that increases in stringency by approximately 7% of reported emissions each year. In other words, a heating energy supplier that supplies fuels each year that result in 10,000 MT of emissions in one calendar year would be required to reduce emissions by 700 MT per year compared to the prior year. It might be desirable to have a separate standard or requirement to ensure progress on electrification, similar to the “carve-out” concept discussed on pp. 42 - 43 of the CHS Appendix. For example, heating energy suppliers might also be required to demonstrate the conversion of approximately 3% of their customers to electric heat each year (100,000 is approximately 3% of the total number of residential units depicted in Figure 3.2 of the 2025/2030 CEC). Note that compliance with emission reduction and electrification requirements would be demonstrated using credits, so energy suppliers would not necessarily have to achieve progress among their own customers.

As suggested on page 21 of the CHS Appendix, the carve-out concept may also be utilized to ensure that electrification benefits LMI consumers, renters, and communities that suffer from poor air quality. In other words, the regulation could simply require, for example, that half of all credits used for compliance each year deliver such benefits.

- Does this general approach to setting the stringency of the standard makes sense? If so, how could it be refined? If not, what alternative would be preferable?

- Should the standard be expressed in terms of GHG emissions reductions, clean heating energy supplied, or something else such as square feet of conditioned space converted to clean heat?
- Is the carve out approach the best way to ensure progress on electrification, or are there other options that should be considered?
- How should the standard accommodate clean heat that is deployed before the program takes effect; should these systems count toward required “reductions”?
- Is a carve-out a good approach to ensuring equity, and if so how could the specific requirement be determined?
- Should the CHS be supported by a separate declining cap on emissions to ensure emissions outcomes, such as a “cap-and-invest” program for the building sector?

Topic #2 – Regulated Heating Energy Suppliers

The basic CHS concept would assign compliance with the standard to suppliers of fossil heating fuels (natural gas, heating oil, and propane). As explained on page 28 of the RAP Appendix, “the principal reason to place a clean heat obligation on energy providers is that they have commercial relationships with end-use customers and thus can work with their customers on choices for heating that reduce emissions.” For natural gas, it is straightforward that natural gas utilities should comply, but for the other “delivered” fuels, there may be several options. On one hand, applying the standard to the companies that deliver fuels directly to homes and businesses would be one way to ensure that all deliveries in Massachusetts are accounted for. On the other hand, some accommodation may be desirable to address the fact that some of these companies are quite small and may find reporting emissions and purchasing credits to be administratively challenging. Therefore, it may make sense to explore ways to regulate larger “wholesale” companies or at least create a streamlined pathway for them (or other intermediaries) to voluntarily comply with the credit holding requirements on behalf of smaller regulated companies in exchange for compensation.

The CHS Appendix also explains, on pp. 32 - 33, that there may also be good reasons to apply the standard to electric energy suppliers that “could focus on heat pumps,” particularly over the long term, when the electricity sector will be expanding and may therefore be better able to comply with a standard. A possible way to manage this transition would be to assign a portion of the compliance obligation to electric energy suppliers. At the outset, the specific portion could be calibrated to maintain the rate of progress currently required by electricity programs such as Mass Save and the Department of Energy Resources’ Alternative Energy Portfolio Standard (APS). Then, perhaps after 2030, the obligation on electricity suppliers could be increased each year in proportion to increasing electricity sales for heating and corresponding declines in the customer base of suppliers of fossil heating fuel. Resulting electrification credits could be made available to fossil fuel suppliers for crediting against required reductions. However, to ensure that electricity suppliers make progress toward electrification, the reverse would not be allowed.

- Which companies should be subject to the standard?
- How can compliance be streamlined for small fuel suppliers?

- Should municipally-owned gas and electric utilities be treated differently under the standard? If so, how can this be accomplished in a manner that is fair to customers of fossil fuel suppliers that operate in multiple utility service territories?

Topic #3 – Credit Generation

Setting the rules for credit generation will likely be the most complex aspect of CHS program development. First, there is a need to establish the range of technologies that are eligible for crediting. In theory, anything that reduces emissions might be made eligible, but other approaches are possible. Clearly, electric heat pump installations must be creditable along with, at least in the short term, bioenergy that is manufactured from waste feedstocks and does not adversely affect local air quality. The CHS Appendix also includes repeated references to the importance of crediting weatherization. Other potential options for replacing fossil fuels may have significant enough disadvantages to warrant exclusion, such as current-generation crop-based biofuels (which have significant and highly uncertain indirect land use and emissions impacts), electric resistance heating (which is much less efficient than heat pump technology), reductions that occur in un-weatherized homes (also inefficient), and combined heat and power systems that rely on fossil fuels. A more general rule could also be viable, as suggested on page 37 of the CHS Appendix: “a threshold percentage standard of improvement might also be employed to discourage fuel substitutions that may only marginally improve emissions.”

Once the list of creditable technologies is finalized, the more complex task of assigning the credit value to various creditable actions must be addressed. One model for this, described in the CHS Appendix and currently being implemented as LCFS requirements for transportation fuels in California and Oregon, is to assign every emission reduction “pathway” a specific credit value, denominated in GHG emission reductions. This approach might be workable because Massachusetts could draw on California’s work and simply “adopt” California’s pathways. However, it might be possible to create a simpler system appropriate for Massachusetts’ focus on electrification; one option would be to establish a simple “yardstick” such as by setting one credit equal to the average amount of emission reductions achieved through full electrification of one single family home (up to 3000 square feet). Then each complete home conversion would earn one of these credits toward the emissions reduction standard each year, with other situations, such as biofuel blending, “partial” electrification (where a fossil-fueled backup system is retained), and larger buildings credited on a sliding scale. It might even be possible to establish the entire standard in terms of converted square feet, such that energy suppliers would be required to estimate the amount of conditioned space across their customer base, and the annual standard would be specified as a percentage of this total. A particular advantage of this approach is that it would avoid complications related to the fact that heating emissions vary widely with the weather. Any system will face trade-offs between administrative simplicity and precision.

The regulations will also need to specify who owns the credits. In general, as discussed on page 38 of the CHS Appendix, the heating energy customer likely would be the presumptive owner of the credits, though they might sign the credits over to another party in exchange for a discount on equipment or fuel costs. However, other models might apply in some situations, for example to reduce the administrative burden of crediting biofuel blending by presumptively assigning any credits to the company providing the blended fuel.

Except in the case of electrification projects that permanently eliminate on-site emissions, the regulations will also need to address annual reporting and verification. For example, blended biofuels will require ongoing monitoring of blend levels and feedstocks, and heat pump installations that retain fossil fuel backup systems may require monitoring of the degree to which the heat pumps are being used to reduce fossil fuel consumption. Requiring the use of ‘third party’ verifiers would help ensure accuracy, and could reduce administrative burdens if verifiers bring sufficient expertise to review emission reports efficiently and can review original records on-site vs. requiring very detailed submittals to MassDEP.

Depending on how equity is to be addressed within the standard, there may also be a need to identify credits that represent benefits to LMI consumers, renters, or communities that suffer from poor air quality. At minimum, this will likely be necessary for ongoing program evaluation.

- Which clean heat technologies should be eligible for crediting under the CHS? When and how should new options, such as hydrogen and advanced biofuels, be evaluated?
- How should the amount of credits be calculated for the eligible technologies? What existing calculation methods could MassDEP consider, reference, or adopt?
- Is it necessary to develop emission factors for electricity, or can electricity be counted as a zero-emissions energy supply for crediting purposes given the CES requirement to decarbonize the electricity supply? Are there other aspects of electrification emissions that should be incorporated in the standard, such as seasonal emissions factors or refrigerant emissions?
- Should weatherization be credited in the absence of other clean heat? How can weatherization crediting be calculated for projects that include clean heat?
- Should MassDEP require third party verification? If so, what specific requirements are appropriate?
- How should MassDEP define and identify credits that support equitable outcomes?

Topic #4 – Compliance Flexibility and Revenue

The use of marketable credits to demonstrate compliance provides significant compliance flexibility compared to a hypothetical requirement for each heating energy supplier to achieve emission reductions among their own customers. However, additional flexibility may be appropriate, particularly as a way to limit compliance costs and address weather variability.

One widely used option is to allow an alternative compliance payment (ACP) option, whereby regulated energy suppliers could make a payment in lieu of holding compliance credits. This option has the added advantage that it assists regulated companies in planning for compliance by placing an upper limit on compliance costs. Also, because MassDEP could use the payments to fund additional reductions in future years (see “default delivery agent” on page 40 of the CHS Appendix), it can partially compensate for additional emissions that occurred because of the failure to achieve enough creditable reductions in a particular year. The ACP level could be established with reference to the social cost of carbon or with reference to anticipated technology costs. Using anticipated technology costs might be particularly appropriate for an electrification requirement, as the Mass Save program has already established \$10,000 as an appropriate incentive for conversions to a fully electrified home.

ACP funds could also be used to fund projects that benefit LMI consumers, renters, or communities that suffer from poor air quality. However, ACP revenue is not a stable revenue source, so it may be desirable to create a separate funding source to support equitable outcomes. One option might be to charge a “just transition fee” to register creditable projects that do not support equitable outcomes, with funds dedicated to support projects that do. In addition to the direct spending impact, this would support equitable outcomes because projects that benefit LMI consumers, renters, or communities that suffer from poor air quality would inherently be favored because they would not be subject to the just transition fee. Another alternative for generating revenue might be to implement a separate cap-and-invest program along with the standard, consistent with how MassDEP currently regulates electricity emissions and the discussion on page 13 of the CHS Appendix. As discussed on page 42 of the CHS Appendix, revenue from a cap-and-invest program operating “in tandem with the CHS” could also be used to support investments in “long-lived measures” such as heat pumps.

Other options for compliance flexibility include multi-year compliance periods and banking and borrowing of compliance credits. See page 43 of the CHS Appendix for more discussion of these options, but note that they may not be fully compatible with the 2025/2030 CECP requirement to achieve reductions in the year 2030.

- Should the standard include an ACP option? If so, how should the payment level be established?
- Are other revenue generation options, such as a building sector “cap-and-invest” program, necessary or desirable for addressing equity or other revenue needs?
- What are the best ways to use revenue? For example, should all revenue be used to fund new clean heat or would it be appropriate to provide ongoing support to LMI customers that fully electrify their homes (e.g., direct bill assistance, free routine maintenance, etc.).
- Are there other flexibility components that may be appropriate, such as multi-year compliance or credit banking?
- Are the flexibility options presented here sufficient to address weather variability, or will some other approach be needed, such as weather-normalization of reported data?

Topic #5 – Reporting Requirements for Heating Energy Suppliers

Fossil fuel heating energy suppliers will need to report emissions data to MassDEP to determine their compliance obligations (as a percentage of their emissions) and to track their progress in reducing emissions over time. Electric energy suppliers may need to report additional information if they are subject to the standard. Identifying companies subject to the standard and collecting the required data will be reasonably straightforward for suppliers of electricity and natural gas, as these fuels are physically contained within closed distribution systems and are only supplied by companies that are regulated by, and already report information to, the Massachusetts Department of Public Utilities.

Delivered fuels, in contrast, can be bought and sold multiple times after entering Massachusetts and can be transported across state lines and to interim storage sites while on their way from large regional distribution terminals to homes and businesses. For this reason, it appears that companies that deliver these fuels directly to homes and businesses in Massachusetts must be subject to a reporting requirement to ensure that all of the fuel is included in emission reports. However, streamlined

reporting options may be appropriate in some situations. For example, a company that operates primarily or exclusively in Massachusetts might be able to calculate emissions based on their total fuel throughput instead of their individual deliveries in Massachusetts, with detailed reporting only being necessary to document shipments out of Massachusetts. Or, as suggested above under topic 2, there may be options for imposing requirements on larger “wholesale” suppliers for some shipments.

Because of the complexity and importance of emissions reporting, MassDEP is also sharing “discussion draft” regulatory text for initial stakeholder comment at this time. That document includes detailed instructions for fossil heat energy suppliers to calculate emissions based on the quantity of fuel delivered to consumers in Massachusetts and some “straw” streamlining options. Please note that this is not a public hearing draft; MassDEP will need to complete a formal rulemaking process to require reporting, including additional opportunities for oral and written comment.

- How should MassDEP structure the reporting requirements for delivered fuels to ensure that all emissions from heating homes and businesses in Massachusetts are reported while minimizing the administrative burden of reporting?
- Should any exceptions or special requirements be included, such as for cooking fuel or for synthetic fuels such as “renewable diesel”?
- How often should reporting be required (monthly/quarterly/annually)?

Interactions with Other Programs

As explained in the CHS Appendix, “although a Clean Heat Standard is broadly compatible with a wide range of other policies, it is also important to consider more specific ways that these policies might interact.” In general, the CHS would complement other policies by providing a new or additional incentive to deploy clean heat technologies and, perhaps more importantly, a requirement to deploy clean heat technologies at a pace consistent with the requirements of the 2025/2030 CECP. This way of thinking builds on MassDEP’s experience implementing the Clean Energy Standard (CES); that program is not the only program supporting renewable energy in Massachusetts, but it is generally supportive of renewable electricity deployment and establishes in regulation the necessary pace of clean energy deployment through 2030 and 2050. On the other hand, the CES also includes detailed requirements designed to ensure that the stringency, eligible technologies, and reporting requirements are compatible with other Massachusetts energy policies. Stakeholders are encouraged to assist MassDEP in identifying cases where similar accommodations may be important for the CHS.

It will be particularly important to understand and address any interactions with the APS program, which requires electric energy suppliers to hold compliance credits (certificates) representing clean heat. One option, referred to as an “umbrella” approach on page 22 of the CHS Appendix and used in the CES, would be to simply count APS compliance certificates (and any ACPs) toward compliance with a portion of the CHS that applies to electric energy suppliers. Or, at least for blended biofuels, it might make more sense to align the CHS eligibility rules with the APS such that each time APS certificates are issued by DOER a corresponding amount of marketable CHS compliance credits are automatically issued to the same company by MassDEP. Changes to the APS program might be appropriate at some point, but that topic is beyond the scope of this discussion document.

- Are there cases where “double dipping” to earn incentives from multiple programs should be prevented, or possibly encouraged such as to support LMI energy consumers?
- How can the APS program best be accommodated in the CHS program design?
- Should the program be supported by a declining cap on emissions/cap and invest program for the heating sector?

Economic Analysis

The macroeconomic impacts of the clean energy transition during the 2025-2030 time period are discussed in chapter 9 of the 2025/2030 CECP. That chapter concludes that “the increased adoption of electrified transportation and heating systems mean that the average Massachusetts household will spend less money on energy every year.” As discussed above, the CHS credit market will create an incentive to implement low-cost solutions, potentially providing additional economic benefits beyond those documented in the CECP. However, MassDEP recognizes the potential need for additional economic analysis to address particular aspects of the CHS, including impacts on LMI energy consumers.

- Consumers will incur energy costs, including costs of the clean energy transition, regardless of whether MassDEP pursues a CHS. How can incremental impacts of a CHS be isolated from these costs?
- What information sources could MassDEP consider or rely on if there is a need to project future prices of fuels, heat pump installations, etc.?
- How could economic benefits be quantified, such as the macroeconomic benefit to Massachusetts of substituting spending on local heat pump contractors for spending on imported fossil fuels?
- How can economic analysis be structured to inform equitable program design that benefits LMI energy consumers?
- How can recent changes in federal incentives be incorporated into the analysis?