Memorandum

TO: MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)

FROM: SUSTAINABLE ENERGY ADVANTAGE AND SYNAPSE ENERGY ECONOMICS

DATE: MAY 8, 2023

RE: OPTIONS FOR ROLE OF ELECTRIC DISTRIBUTION COMPANIES (EDCS), OBLIGATED FUELS, AND OBLIGATED ENTITIES

Purpose

In designing a Clean Heat Standard (CHS), a key set of decisions will be related to the fuels and entities on which the standard's performance obligation is placed. The Regulatory Assistance Project (RAP) paper included in the Massachusetts Commission on Clean Heat's Final Report focuses on a CHS levied upon fossil fuels, though it also briefly discusses the possibility of initially placing the obligation on electricity sales (or potentially shifting it to electricity sales over time). This memo further explores how a CHS obligation might be implemented, criteria to consider when making this decision, and a discussion of the economic implications of several potential approaches to implementing the CHS obligation.

Primary Obligation Design Decisions

In designing how a CHS obligation would be applied, there are two primary considerations – the obligated fuel and the obligated entity.

Obligated Fuel

The first question is which fuel or set of fuels would be subject to the CHS obligation. This decision drives key market dynamics, the most important of which is changes in the price of the obligated fuels. The primary options are clear – natural gas, heating oil, propane, and electricity. Choosing the obligated entity is also heavily influenced by the selection of the obligated fuels.

Obligated Entity

However, the choice of obligated fuel does not inherently answer the question of which obligated entities should have a compliance obligation. By obligated entity, we mean the entity or entities that are ultimately responsible for retiring a specified number of Clean Heat Credits (CHCs) each year or for making Alternative Compliance Payments (ACP) if they have an insufficient volume of CHCs. Obligated entities may or may not also play a role in activities related to generating CHCs.

If the decision is made to obligate fossil fuels, there are still multiple options for the obligated entity. For example, for delivered fuels, the obligation could be levied on retailers or the wholesalers those retailers purchase from. If the obligation is placed on electricity sales, the obligated entity could be the electric delivery company (EDC)[1] or the load serving entity (LSE), which would include EDCs providing last resort service and competitive suppliers. The choice of obligated entity may have less of an impact on market dynamics than the choice of obligated fuel, but it still has major implications, particularly regarding the ease of implementing a CHS and its overall effectiveness.

Potential Obligated Entities

We briefly introduce and discuss some of the key attributes and interests of primary candidates for obligated entities below. Some interests that are universal and self-evident (e.g., no energy supplier will likely want to be the obligated entity) are not discussed.

Electric Obligated Entities

Electric Distribution Companies

EDCs have interests that are generally in line with the overall objectives of a CHS. The increased load associated with customers electrifying heating may therefore be viewed favorably by the EDCs. This is especially true if revenue decoupling for EDCs is revisited. In the short term, the EDCs may have some concern about the pace of electrification and whether they have sufficient capacity to meet increasing loads without compromising reliability or substantially increasing rates. Anecdotally, we're aware of municipal customers considering alternatives to electric space heating because their local EDC didn't have sufficient capacity to meet the new load.

It may also be hypothetically feasible that the increased electric load associated with a CHS could increase the electric system load factor (especially in conjunction with grid modernization and demand management investments), offsetting some of the price increases associated with a CHS obligation levied on electricity sales.

Furthermore, EDCs have extensive experience delivering energy efficiency and other programs to customers, and are also experienced with designing, promoting, and delivering/charging income-differentiated rates. Further, effectively all of the buildings in the Commonwealth that would be subject to a CHS are a customer of one (and only one) of the EDCs, a fact that could be valuable in promoting and verifying CHC projects.

Overall, while EDCs' interests may be in line with the overall *objective* of a CHS, they will likely oppose placing the CHS obligation on electricity sales, especially in the nearer term, and may assert that increasing the cost of electricity is at odds with the goal of convincing more customers to heat their

[1] Unless otherwise specified in this memo, we do not differentiate between investor-owned utilities (IOUs) and municipal light plants (MLPs).

buildings with electricity. It might be possible to mitigate this concern if the CHS is structured such that CHS impacts on electricity prices are phased in gradually.

Load-Serving Entities/Competitive Suppliers

LSEs, including competitive suppliers, are the obligated entities for the Renewable Portfolio Standard (RPS), making them an obvious candidate to serve as the CHS obligated entity. LSEs already manage a set of RPS obligations based on various market designs (e.g., the Class 1 market vs. the Clean Peak Energy Standard), so they are already familiar with trading, banking, and pricing obligations associated with performance standards into their products.

Natural Gas Obligated Entities

Perhaps the entity that is the most natural fit as an obligated entity would be the gas local distribution companies (LDCs). Though competitive gas suppliers exist in the Commonwealth, the relatively low volume of customers they serve suggests there is likely little value in including them as an obligated entity, as opposed to the LDC.

Delivered Fuel Obligated Entities

For delivered fuel obligated entities (primarily propane and heating oil), the key choice is between retail suppliers or wholesalers that work further upstream. There is a diverse set of delivered fuel retailers in the Commonwealth. Smaller, single-truck operations tend to focus almost exclusively on fuel sales, while larger firms generally offer other services, including the installation and servicing of equipment (including electric heat pumps). For retailers that do provide repairs, maintenance, or installation services, there may be a viable path for them to maintain or grow their business as a CHS is implemented, and thus may be open to engaging with a CHS policy as a clean heat solutions provider. On the other hand, if the CHS includes limits or prohibitions on fuel-blending to produce CHCs, delivered fuel wholesalers are not likely to see any upside potential in the implementation of a CHS. It may be possible to identify and enforce the CHS on distributors who directly supply retailers in Massachusetts (provided they have the information to split sales between Massachusetts and other states). However, enforcing an obligation on any fuel supply entity further upstream is likely impossible due to lack of in-state operations and inability to track the ultimate destination of commodity fuels transported by many different means.

Other Obligated Entities

In theory, a CHS obligation could be placed on a variety of other entities, such as large property owners or management companies (as is the case for policies such as Boston's Building Emissions Reduction and Disclosure Ordinance (BERDO)). Given that owner-occupied, single-family homes and other smaller buildings make up a significant portion of the conditioned space in Massachusetts and given that a CHS consistent with Massachusetts's policy goals will require an obligation that ultimately applies to effectively all buildings in the Commonwealth, making large property owners, as opposed to fuel

suppliers, an obligated entity seems impractical, and would also create coverage for a CHS that is incomplete. Such incompleteness can undermine the effectiveness of a CHS.

We also note that other entities are likely to play a key role in the CHS, even if they are not the obligated entity. Most prominent, perhaps, are the entities involved in implementing, measuring, and verifying projects that produce CHCs. These include HVAC contractors, the Mass Save Program Administrators (PAs), lead vendors that oversee energy efficiency programs (e.g., CLEAResult, ICF), and evaluation contractors that help quantify and verify savings associated with various energy efficiency measures (e.g., Guidehouse, DNV).

Criteria to Consider in Selecting Obligated Fuels and Entities

We discuss below some of the key criteria to consider in selecting obligated fuels and entities for a CHS.

Impact on Energy Rates/Prices

Applying a CHC obligation to different fuels will yield different price impacts for those fuels. If we assume that the total cost of meeting a CHS obligation is roughly the same regardless of the obligated fuel selected, then unit price impacts will be larger if obligated fuels with lower sales are selected. This dynamic also has a time dimension, as the electrification of the heating sector will increase electricity sales and decrease fossil fuel sales over time. So, for example, placing an obligation on fossil fuels that have decreasing sales over time would likely result in the price impact of the CHS per unit sold increasing over time. Conversely, if the obligation were placed on electricity sales, which are expected to rise over time with greater electrification of the transportation and buildings sector, the per-unit impact could decrease over time (subject to the design of the ACP and the trajectory of the CHC obligation).

The interaction of the CHS with other policy mechanisms will influence how important a consideration this criterion is. If, for instance, other policies (e.g., Mass Save, building codes and standards, federal incentives for weatherization and electrification) and/or market dynamics (e.g., rising fossil fuel prices, falling heat pump costs) allow the Commonwealth to meet CHS targets at low or no incremental cost, the price impact of the CHS would be minimal, and the selection of obligated fuel would be less relevant. Conversely, if a CHS were to have a clean heat compliance obligation level substantially higher than the amount of clean heat supply (e.g., in order to meet building sector emission reduction sublimits), the cost of the policy could be more substantial.

Consistency of Price Signal with Policy Goal

Most clean energy policies are designed to ensure a price signal that directly (and sometimes indirectly) supports the policy goal (or at least doesn't interfere with it). For example, an RPS increases the retail price of electricity, providing an incentive for behind-the-meter distributed generation. Similarly, by funding energy efficiency programs through electricity and gas rates, the increase in rates provides an additional incentive for customers to reduce consumption. We are aware of few examples of policies in which the price signal conflicts with the overall policy goal. One such example is found in the Mass Save

program, which funds delivered fuel to electric heat pump conversions through energy efficiency surcharges on the electric bill. In the event the price signal is small (in absolute terms or relative to other sources of price volatility), it is unlikely to have a material effect on customer choices or program design.

Thus, the CHS would, ideally, be designed such that the selection of the obligated fuel changes the price of that fuel in a way that is consistent with the overall policy goal. The CHS will favor broad electrification of heating and a reduction in the use of fossil fuels. From this perspective, an ideal policy would lower (or not increase) electricity prices and raise (or not lower) fossil prices. Higher electricity prices degrade the economics of switching to heat pumps, requiring higher incentives to persuade customers to switch. Conversely, higher fossil fuel prices improve the economics of electrification, reducing the incentive required to encourage customers to switch.

Designing the obligation to have a price signal consistent with the policy goal leads to an elegant dynamic, in which there are both penalties for heating with fossil fuels (i.e., higher prices) and incentives for switching to clean heat (earning CHCs). Strategically using both sticks (i.e., higher fossil fuel prices) and carrots (CHC revenue) is likely to reduce the total cost of CHS compliance and generally increase the efficacy of the policy. Though a CHS that places the obligation on electricity sales could likely still be made effective, it would require overcoming a systemic negative feedback loop; higher prices resulting from a CHC obligation make electrification less attractive, requiring higher incentives (and CHC prices) to incentivize electrification, further driving up electricity prices. As noted above, the importance of this dynamic will depend on its magnitude relative to other factors that affect the price of electricity and alternative fuels.

Equity

The choice of obligated fuel and entity will have important equity implications. Though we acknowledge there are other significant equity considerations beyond income of participating and/or non-participating customers, for the purposes of this analysis, we focus on income as the primary metric of equity.

In general, we consider policies that introduce costs that are tied to energy sales generally to be regressive. In this memo, we consider the impact of a policy on energy burden (as opposed to total energy spend) to be the best yardstick for considering whether a policy is regressive or not. While it is true that higher-income households generally use more energy for heating than lower-income customers do, energy burden—the percent of household income that is spent on energy—is substantially higher for lower-income households than higher-income households. Thus, increasing energy prices has an outsized impact on lower-income households. This is why we would consider a policy that increases energy prices generally to be regressive.

However, policy makers can also take direct actions to mitigate the potential increase in energy burden that would result from a CHS. First, relief can be provided by offering income-qualified reductions in energy *rates*. For example, regulated fuel (i.e., electricity and natural gas) providers in Massachusetts offer discount rates for income-qualified customers. Second, the policy could be designed to help customers manage their overall *bills* by providing higher incentives to low- and moderate-income (LMI)

customers that would allow these customers to reduce the volume of energy they consume or to switch to a less expensive fuel. A potential downside of this type of incentive, however, is that non-participating ratepayers, including LMI ratepayers, are still impacted by higher rates. There exist numerous systemic reasons that may make it impractical or impossible for some households, especially LMI households, to access the very incentives that were designed to benefit them. Some of these obstacles include language barriers, short-term housing arrangements (which make it impractical to undertake any large home improvement project), landlords who are not willing to participate (known colloquially as the "split incentive" problem in the energy efficiency space), and buildings that cannot be retrofitted, weatherized, or otherwise renovated in an economic manner.

If regulated fuels are obligated, policy makers' ability to mitigate the regressive impacts of a CHS is enhanced, because those policy makers can then design income-based rates. For example, California is considering adapting rate design to favor electrification through adoption of a customer charge ($/month) and a corresponding reduction in the volumetric electric rate ($/kWh). To mitigate regressive impacts of a customer/fixed charge, the state is establishing an income-based fixed charge. While programs like the Low Income Home Energy Assistance Program (LIHEAP) help reduce the energy burden of customers who heat with delivered fuels, LIHEAP is federally funded. Thus, LIHEAP-based funding support for low-income households would not increase specifically to offset CHS compliance costs. There are few other existing options that could help provide lower prices for delivered fuels for LMI customers.

Participants in dockets discussing the future of natural gas distribution systems raise the concern that LMI and other customer types who face challenges in switching to alternative sources of heat would be stuck with increasing rates as LDCs seek to recover fixed costs over a declining sales base. Higher-income customers, on the other hand, may be more able to switch to electric heat and avoid the rising rates driven by the LDC "death spiral." Depending on the specific design of the CHS, it is possible that a similar situation could arise if the CHS obligation is placed on fossil fuels and if certain customer groups struggle to switch from fossil fuels to electricity. That said, this is a longer-term concern that, with thoughtful CHS design, can be anticipated and avoided.

Impact of Market Actor Behavior

Different choices for obligated fuels and entities under a CHS may influence how energy suppliers engage with the CHS. If the CHS is structured such that any entity could build or support CHC-creating projects, any entity, regardless of whether or not they were directly subject to a CHS obligation, could contribute to the supply of CHCs. The CHS obligation would not need to fall entirely on retail suppliers in order for those retail suppliers to consider leveraging their existing customer base to self-supply CHCs.

Still, being directly subjected to a CHC obligation may increase engagement with a policy. For example, if fossil fuel providers are directly responsible for acquiring and paying for CHCs, fossil fuel suppliers may more proactively provide visibility into the CHS policy/program and encourage CHC projects. Placing the CHS obligation on delivered fuel suppliers, some of whom are already in the business of providing HVAC system maintenance and installation, could spur a shift in business if those entities have an incentive to

assist their customers in switching away from fossil fuels. However, delivered fuel suppliers who do not provide HVAC services would not have the same opportunity to adjust their behavior to adapt to the deployment of a CHS.

The potential creation of a Building Decarbonization Clearinghouse that might manage the creation and distribution of CHCs could have several ramifications on the entities that can generate CHCs, especially fossil fuel providers. If the Clearinghouse model results in statewide contracts for coordinating weatherization or heating electrification, this could lead to a narrow set of fossil fuel providers being engaged in the creation of CHCs. For example, Mass Save—partially in response to encouragement from the Massachusetts Energy Efficiency Advisory Council (EEAC)—has become more involved in the selection of installers for heat pumps through special incentives, promotion in Mass Save materials, and restricting eligibility to qualified contractors. Alternatively, if the Clearinghouse serves as a centralized source of information but plays no or little role in determining which contractors can implement CHC-eligible projects, fossil fuel providers who were not involved in or aware of the CHS at the time of its implementation could still generate CHCs.

Ease of Implementation

There are several existing attribution and tracking systems deployed in Massachusetts that could be adapted for use in a CHS, especially if CHS obligations are placed on electricity. The Mass Clean Energy Center's production tracking system (PTS), the New England Power Pool Generation Information System (NEPOOL GIS), and the renewable portfolio standard (RPS) compliance reports, among other systems, are all currently used for the attribution and tracking of electric products and attributes. There are several aspects of these systems that could be adopted or repurposed for use in tracking the creation and retirement of CHCs if CHCs are tied to the consumption of electricity. Credit tracking is an important economic consideration because it contributes to formation of an efficient credit market.

There may be a logistical benefit to EDCs serving as the obligated entities that verify CHC projects—EDCs serve the entire state and a given premise is only served by a single EDC. In other words, each customer served by an EDC is metered separately and uniquely by that EDC. Having one account per customer is a key component of the current Mass Save programs, where EDCs use account numbers to guard against claiming multiple incentives for the same project or product. Although there are other ways to conduct attribution and tracking, such as by verifying projects by postal address, the use of electric account number for this purpose is established and effective. It is theoretically possible that, even if EDCs are not the obligated entities, they could play a role in project verification that leverages existing Mass Save processes.

Options and Implications for Obligated Fuels and Obligated Entities

Below, we discuss three primary options for obligated fuels, considering the criteria discussed above.

Obligation on Fossil Fuels

In this scenario, we assume that the obligation is placed on fossil fuel sales, namely natural gas, heating oil, and propane.

Impact on Rates/Prices

Assuming that initial CHC requirements are met primarily through Mass Save-incentivized projects and/or biofuel blending, the initial impact of the CHS obligation on fossil fuel prices would be minimal. Assuming that the CHC requirements scale more quickly than Mass Save budgets and savings goals, CHC compliance costs would increase fossil fuel pricing as marginal CHC-producing actions require CHC revenue to be financially viable. The price impact would likely accelerate as fuel switching from fossil fuels to electricity reduced fossil fuel sales, reducing the volume over which CHC costs could be recovered. This dynamic would likely be tempered somewhat by improvements to the economics of electrification driven by increasing fossil fuel prices. The above, however, is sensitive to the specific design of the CHS (e.g., ACP level, CHC requirement trajectory) and the role of Mass Save.

Consistency of Price Signal with Policy Goals

As previously discussed, placing the obligation on fossil fuels sends a price signal consistent with the overall goals of a CHS, by increasing the cost of fuels that the policy is intended to reduce the use of. Fossil fuel customers would be encouraged to convert both by the increased cost to operate their fossil-fuel system in addition to the incentives (associated with CHC sales) available for converting to clean heat. The importance of a fuel price signal would depend partly on its magnitude relative to other factors that affect the price of fuels, including commodity price volatility, fuel supplier costs and profit margins, and DPU ratemaking processes.

Equity

As discussed above, any program funded through surcharges on energy sales may be considered regressive unless steps are taken to mitigate the impacts. Placing the CHS obligation on fossil fuels raises some challenges in trying to mitigate equity impacts through rates, as the obligation would fall on both regulated (e.g., natural gas) and unregulated (e.g., heating oil and propane) fuels. Nevertheless, policy makers could consider adjustments to the current natural gas discount rate (or the qualification process and/or eligibility criteria) in concert with the introduction of a CHS. We are unaware of existing policy levers in Massachusetts (short of legislation) that would allow for a similar discount rate to be offered to LMI heating oil and propane customers. LIHEAP offers financial assistance to some households, but it is federally funded; increases in energy burden resulting from a CHS would not be met with a commensurate increase in LIHEAP grants to customers.

The CHS could also be designed with a carveout or multiplier that would promote CHC-generating projects that benefit LMI households to facilitate their transition to electric heat. Existing energy efficiency programs already offer 100 percent incentives for low-income households for most measures, although they have been somewhat slow to promote electrification of heat for such customers. Thus, while some income equity concerns could be mitigated through natural gas discount rates and

promoting electrification for LMI customers, LMI customers heating with delivered fuels that do not electrify would experience an increased energy burden as a result of a CHS, unless new policy mechanisms are introduced. For example, because all fossil heating fuel customers also use electricity, it might be possible to partially address LMI fuel price impacts across fuels through a mechanism associated with LMI customers' winter electric bills.

Impact on Market Actor Behavior

Selecting delivered fuel retailers as the obligated entities could make the need to adapt most tangible for these retailers. Simultaneously seeing the pressure of higher retail prices and incentives for electrification could help encourage these retailers to introduce (or increase emphasis on) clean heating system installation and service.

Ease of Implementation, Interaction with Other Policies

Massachusetts does not have ready access to a system designed for fossil fuel providers to track, trade, and retire credits such as CHCs. It's not clear that adapting existing infrastructure, namely, the NEPOOL GIS, would be practical. The sale of delivered fuels for home heating are exempt from Massachusetts sales tax; thus, leveraging tax collection infrastructure may also not provide a simple solution for tracking sales volumes that would be subject to the CHS.

There are a large number of delivered fuel retailers in Massachusetts; including them as obligated entities would increase the complexity of administering the CHS. Given that many of these are smaller organizations without staff versed in policies or obligations similar to a CHS, they may struggle to understand and comply with the new standard. This would likely necessitate additional DEP staff to work directly with obligated entities. The CHS could be designed such that retail delivered fuel providers (perhaps below a specified size threshold) could "assign" their obligation to the wholesaler they purchase from or another entity, although this would introduce additional complexities.

Having a large number of obligated entities (particularly at the retail level) could also pose challenges to providing a consistent set of programs or incentives for building efficiency and electrification measures. Obligated entities could choose to offer incentives for electrification directly to their own customers, which would not necessarily be aligned with incentives being offered elsewhere, such as through Mass Save. This could lead to significant confusion, which would increase the cost and decrease the pace of decarbonization. A Building Decarbonization Clearinghouse or a continuation of Mass Save could address this challenge, although this would depend on their specific roles and other CHS design choices related to the process of minting CHCs, eligible projects, etc.

Additional Design Considerations

If an obligation is placed on fossil fuels, a number of key questions related to how the obligation is implemented remain:

- *Selection of obligated entities* – Delivered fuel wholesalers vs. retailers; natural gas LDCs or competitive suppliers.

- *Role of Mass Save and the EDCs* – Even if an obligation is placed on fossil fuels, the CHS could be implemented such that the EDCs continue to play a prominent role in verification of certain CHC projects and coordinating weatherization, electrification, and market-transformation efforts. This role could also be played by a Building Decarbonization Clearinghouse.
- *Electrification of fossil-fuel customers* – Related to the above, if the CHS obligation is placed on fossil fuels, it would be reasonable to question whether the electric Mass Save PAs should be allowed to continue to incentivize (and claim benefits from) delivered fuel customers installing heat pumps. Eliminating the ability of electric PAs to provide incentives for delivered fuel customer electrification could shift responsibility for converting these customers to delivered fuel providers (potentially reducing the confusion that might result from competing incentives from Mass Save and other parties) and reduce the increase in electricity prices associated with funding these measures through electric rates. Alternatively, electric PAs could be allowed to continue to offer incentives for delivered fuel customers to install heat pumps, with a requirement that incentives be funded through the sale of CHCs generated by these projects.

Obligation on Electricity Sales

In this scenario, we assume that the obligation is placed on electricity sales.

Impact on Rates/Prices

If the CHS obligation were applied to electricity sales, the costs of meeting the CHS's obligation would be spread across a higher volume of sales than if the costs were applied to fossil fuels, which would reduce the rate impacts on a unit-of-energy basis. Additionally, as electrification progresses, the increased volume of electricity sales would likely temper the price impact of the CHS.

Electricity bills already have a substantial number of public policy costs embedded in them, including RPS costs, energy efficiency charges, electric vehicle program charges, and distributed solar program charges. For most of these charges, including them in electric rates is the most logical choice. Fossil fuel prices, however, have relatively few policy-driven charges included in them. This suggests it may be more appropriate to apply the CHS obligation to fossil fuel sales.

Consistency of Price Signal with Policy Goals

Applying a CHS obligation to electricity sales produces a price signal that conflicts with the goals of a CHS. This is because it would increase the price of electricity while not impacting the price of fossil fuels. As discussed above, this could yield a negative feedback loop—increased electricity prices require higher incentives (based on higher CHC pricing) to drive electrification which, in turn, further increases electricity prices.

Equity

Placing the CHC obligation on electricity sales may have some advantages from an equity perspective. If, as suggested above, price impacts from an obligation on electricity sale are lower than if the obligation were on fossil fuels, this may mitigate impact on energy burden.[2]

Furthermore, the current availability of an income-based electric discount rate and the option to explore other income-differentiated rates in the future provide opportunities to mitigate the rate impact of a CHS on LMI customers. This would be in addition to opportunities to impact the bill impact of a CHS by encouraging energy efficiency.

As long as Mass Save is responsible for incentivizing a significant portion of total CHS supply, customers of investor-owned utilities (IOUs) would shoulder a disproportionately high share of CHS compliance costs relative to MLP customers, as Mass Save incentives (paid by IOU customers) would offset CHS costs. The same dynamic would be true with a CHS obligation on fossil fuels unless Mass Save ceased providing incentives for delivered fuel customers to electrify.

Impact on Market Actor Behavior

It's not clear that applying a CHS obligation to electricity sales would significantly alter the behavior of EDCs. IOUs (and, generally to a lesser extent, MLPs) are already involved in the promotion of efficiency and electrification. If the obligation were applied to load-serving entities as opposed to EDCs, it is possible that there would be a more competitive dynamic in the purchase of CHCs, which could drive lower compliance costs and market innovation. However, as discussed above, a more decentralized ecosystem for programs and incentives for efficiency and weatherization may lead to customer confusion (particularly for residential customers) and may not result in the type of predictable, sustained efforts that help drive market transformation.

[2] We acknowledge that this dynamic is complicated. While it's true that electricity is used for more than just heating and, thus, the impact on unit pricing may be lower with a CHC obligation on electricity sales, electricity is consumed by households for more than just heating, so the impact on overall energy spending could be similar across the two scenarios. This may be less true for LMI households as they, on average, use less energy than higher-income households. These outcomes are also dependent on factors such as the role of Mass Save, the trajectory of the CHC obligation, and the design of the ACP. This is an area ripe for quantitative study.

Aside: Competitive Forces in a CHS

This last point opens up a larger question about market dynamics under a CHS. In theory, a performance standard (e.g., the CHS) is intended to unleash competitive market forces that drive innovation and reduce costs; as the RAP CHS paper puts it, "a performance standard creates competitive pressure across technologies and fuels."[3] However, a robustly competitive market should have neither a monopoly (i.e., one or limited number of parties controlling *supply*) nor a monopsony (i.e., one or limited number of parties control *demand*).

Unless or until the CHS obligation significantly exceeds the number of CHCs that result from Mass Save-incentivized projects, Mass Save would effectively be a monopoly, setting incentive levels and potentially claiming title to CHCs from the resulting projects. If the CHS obligation were placed on the EDCs, there would be some competition given that there are three investor-owned utilities and 41 MLPs that operate in Massachusetts, but this would likely look more like an oligopoly than a truly competitive market. This would mean that the CHS would consist of a limited number of parties controlling both the supply of CHCs (Mass Save PAs) and the demand for them (EDCs). If the role of Mass Save in incentivizing CHC-eligible projects was transitioned to a Building Decarbonization Clearinghouse, this Clearinghouse might also effectively be a monopsonist, reducing competition.

While describing the potential role of a Decarbonization Clearinghouse and more thoroughly exploring the implications of limited competition in a CHS are beyond the scope of this memo, we do note that the selection of obligated fuels and entities provide an opportunity to increase competitive forces in the CHC market.

Ease of Implementation, Interaction with Other Policies

Placing the obligation on electricity sales would allow some existing systems, such as the NEPOOL GIS, to be adapted for use in the implementation of the CHS. The GIS is already used for state-specific performance standards that aren't limited to renewable energy (e.g., the Alternative Portfolio Standard and the Clean Peak Energy Standard).

If EDCs were made the obligated entities, the limited number of obligated entities would also ease implementation; this is especially true since the EDCs have the resources and expertise to understand and comply with a new performance standard such as the CHS. If LSEs were the obligated entities, the number of entities would increase, but competitive suppliers are also already experienced in complying with performance standards, reducing the need for DEP to provide potentially resource-intensive guidance and assistance to the market.

[3] Richard Cowart, Nancy L. Seidman and Mark LeBel. 2022. *A Clean Heat Standard for Massachusetts*. Massachusetts Executive Office of Energy and Environmental Affairs. Accessed at https://www.raponline.org/wp-content/uploads/2022/07/rap-cowart-seidman-lebel-clean-heat-standard-massachusetts-2022-July.pdf. Page 33.

Additional Design Considerations

If an obligation is placed on electricity sales, a number of key questions related to how the obligation is implemented remain:

- *Selection of obligated entities* – EDCs or LSEs. While Massachusetts performance standards have placed the obligation on the LSE, placing the CHS obligation on EDCs appears to be feasible. This decision may hinge on the future role of Mass Save and a larger discussion about the importance of competitive forces in the CHS market. LSEs may be more inclined to offer differentiated products, increasing innovation, relative to an EDC-based Mass-Save-like approach, although this comes with associated risk of customer confusion between offerings. LSEs may also have more of a short-term focus in their program design than EDCs, given that they may lose customers at any time. Unless overall program costs are materially different between LSE and EDC implementation pathways (which we think is unlikely), the decision of which to select is likely to be driven by implementation concerns, the desired level and form of regulatory oversight, and considerations about where associated costs may appear on the bill.
- *Allocation of obligations* – While not the focus of this memo, placing the obligation on electricity sales raises several questions related to how the total obligation is allocated between individual entities. For instance, would the assignment be based on kWh sales, emissions, square feet of building served, or some other metric? Would there be an adjustment for buildings already using clean heat sources? Before answering these questions, a metric for the CHS must be selected.

Obligation Placed on Both Fossil Fuels and Electricity Sales

As the RAP paper considers, the CHS obligation could be placed both on fossil fuels and electricity sales. While this could be designed multiple ways, perhaps the most obvious choice would be to implement an obligation that is applied to various fuels based on the proportion of those fuels used to heat buildings in Massachusetts. Thus, in the initial years of the policy, most of the impact would fall on fossil fuel sales, while, over time, the obligation would shift towards electricity sales.

Impact on Rates/Prices

This approach would help moderate price impacts, by avoiding the challenge of placing the entire CHS obligation on a set of fuels with sales that decline over time. Focusing on the impacts to electricity rates, the initial impact would be relatively small, as approximately 85 percent of the obligation would fall on fossil fuels. The proportion of the obligation falling on electricity would grow over time, but this would be in parallel with growing sales resulting from electrification.

Consistency of Price Signal with Policy Goals

While the conclusion here is sensitive to the specific design, having an obligation on fuels proportional to their use for heating would generally lead to a price signal consistent with policy goals. Initially, most of the obligation (and resulting price impacts) would be on fossil fuels, yielding a relative improvement in the cost to heat with electricity. While the obligation would shift to electricity sales over time, this would happen as electricity sales increase, moderating the price impact. The CHS could also be designed

to ensure (or make more probable) that CHS obligations yield a substantial impact on fossil fuel prices throughout the life of the policy.

Equity

The equity impacts of this approach would effectively shift over time, based on the equity impacts described in the preceding sections on obligations on fossil fuels or electricity sales. While there would still be challenges to mitigating the rate impacts on unregulated heating fuels (i.e., delivered fuels), the price impact on these fuels would likely be lower than in the scenario in which the obligation was exclusively placed on fossil fuels.

Impact on Market Actor Behavior

A phased obligation would likely yield similar impacts on fossil fuel retailers as described in the fossil fuel obligation scenario. While the obligation would shift away from fossil fuels over time, we anticipate that, by the time the obligation on fossil fuels appreciably declined, the trend towards clean heat and electrification would appear inexorable to fossil fuel retailers.

Ease of Implementation, Interaction with Other Policies

This scenario would be the most challenging to implement, as it would involve the largest number of obligated entities and it would include the additional complexity of an obligation that shifts between fuels over time (although a similar dynamic would likely be a part of obligating fossil fuels, given that there are multiple fuels). Should this path be selected, it would be critical to make other policy design choices that favor simplicity, both for DEP and for obligated entities.

Observations

Based on the discussion above, we offer several observations below.

Price Signal vs. Equity and Ease of Implementation – Our exploration reveals a likely tension between having a policy that provides a price signal consistent with policy goals (obligation on fossil fuel sales) vs. a policy that most effectively addresses equity concerns and may be marginally easier to implement (obligation on electricity sales).

On Equity – The primary tools for mitigating equity impacts discussed above (namely, discounted rates for regulated fuel sales and providing higher incentive/CHC value for LMI projects) are good, but imperfect. Managing equity concerns will be a challenge regardless of which fuels are obligated under the CHS. The difference in equity impacts between a CHS with an obligation on fossil fuels vs. electricity may be relatively small relative to larger energy equity concerns. Thus, while efforts should be made to moderate the contributions of a CHS to inequity, we suggest that larger conversations around equity (e.g., reforming criteria and qualification process for existing discount rates, exploring the potential for Massachusetts-funded additions to LIHEAP funding to address the cost of delivered fuels) are likely to be more important in addressing energy equity than the question of whether the CHS obligation is on electricity or fossil fuel sales.

We offer a similar opinion on ease of implementation. While the choice of obligated fuels and obligated entities will certainly impact ease of implementation, other choices in the design of the CHS (e.g., choice of CHS metric, mechanism for adjusting ACP and compliance level, use of multipliers) are likely to have a larger impact on ease of implementation, and therefore other drivers (e.g., impact on prices) should drive the decision of which fuels to place the CHS obligation on.

However, ensuring that price signals are consistent with overall policy goals, is almost exclusively a function of which fuels are obligated under the CHS. This suggests that this should be the primary criterion used in selecting obligated fuels, particularly if the price signal is significant enough (in absolute terms or relative to other sources of price volatility) to have a material impact on consumer choice.

Role of Mass Save and the Building Decarbonization Clearinghouse – Uncertainty over the future role of Mass Save and a potential Building Decarbonization Clearinghouse will complicate the design of a CHS. While it is possible to design a CHS that accommodates this uncertainty, it will prove more challenging. The role of Mass Save and a Building Decarbonization Clearinghouse will affect the following, among other things:

- Level of competition in the market
- Cross-subsidization, especially between EDC and MLP customers, as well as delivered-fuel and non-delivered fuel customers
- The extent to which there is or is not an entity that plays a prominent role in providing consistent incentives and programs promoting building heat electrification statewide

Competition in CHC Market – As discussed above, the selection of obligated entity will influence the level of competition in the CHC market. If EDCs are the obligated entities and Mass Save continues to play a prominent role in subsidizing CHC-eligible projects, both the demand for and supply of CHCs would be highly concentrated. Therefore, DEP should emphasize selecting obligated entities that would promote competition in the purchase of CHCs and/or deliberately consider the implications of a market with both a monopoly and a monopsony. We note the inherent tension between promoting competition in the supply of CHCs and the creation of a set of programs and incentives that is consistent statewide.

Competition spurred by a CHS could occur at different levels within the energy and equipment supply chains, with different implications for a building owner's consumer experience. Competition implies some type of consumer making a choice between competing alternatives. However, this consumer need not be the building owner making a choice about equipment or fuels. For example, Massachusetts consumers do not have a choice of different efficiency incentive programs; Mass Save is their only choice. However, Mass Save uses competitive forces to select program implementers. In Vermont, the state puts the operation of the Efficiency Vermont efficiency utility out to bid on a recurring (albeit infrequent) basis. In an RPS or in the Zero Emission Vehicle (ZEV) programs, suppliers compete to provide credits to obligated entities, entirely separate from customer choice of energy supplier or vehicle. (Obligated entities which perform poorly in these marketplaces may be forced to ask higher prices, thereby indirectly shaping consumer behavior.) Depending on how it is developed and implemented, a clearinghouse for information and programs on building decarbonization could facilitate competition between different customer-facing suppliers or could serve as a screen behind which

competition takes place to determine which more uniform but limited set of offerings are made to customers.