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July 15, 2021

RE: **Greenhouse Gas Emissions Reduction Goal for Mass Save**

Dear Mass Save Program Administrators,

On March 26, 2021, Governor Baker signed comprehensive legislation that codifies the Baker-Polito Administration's commitment to achieve Net Zero emissions in 2050 and furthers the Commonwealth's nation-leading efforts to combat climate change and protect vulnerable communities. An Act Creating A Next-Generation Roadmap For Massachusetts Climate Policy (the Climate Act) builds upon the framework established in the Administration's 2050 Decarbonization Roadmap (2050 Roadmap) and 2030 Interim Clean Energy and Climate Plan (2030 Interim CECP) and requires the Commonwealth to pursue ambitious emissions reduction goals in a cost-effective and equitable manner while creating jobs and opportunities for economic development throughout Massachusetts.

The Climate Act made significant changes to the Global Warming Solutions Act (the GWSA). Among other requirements, the Climate Act requires the Secretary of Energy and Environmental Affairs to set a goal, expressed in tons of carbon dioxide equivalent, every three years for the succeeding Mass Save Energy Efficiency Plans' necessary contribution to meeting each statewide greenhouse gas (GHG) limit and sublimit adopted under the GWSA. Our Mass Save programs will be a key policy driver to meeting our GHG emissions reduction requirements and the programs must reflect this imperative.

Section 106 of the Climate Act requires me to establish the first goal for the Mass Save Energy Efficiency Plans no later than July 15, 2021. Since this deadline precedes the finalization of the statewide GHG emissions limits and sublimits to be adopted under the GWSA, as amended by the Climate Act, these first Mass Save goals are informed by the 2050 Roadmap and

2030 Interim CECP, both released in 2020.[1] By this letter, I set the following GHG emissions reduction goals for the 2022–2024 Energy Efficiency Plans, which are currently being reviewed by the Energy Efficiency Advisory Council (EEAC), pursuant to the Green Communities Act, G.L. c. 25, § 21(c), and which you must submit by October 31, 2021, to the Department of Public Utilities (DPU) for a decision, pursuant to G.L. c. 25, § 21(d).

The Green Communities Act requires that:

> *Every 3 years, on or before April 30, the electric distribution companies and municipal aggregators with certified efficiency plans shall jointly prepare an energy efficiency investment plan [the statewide electric energy efficiency plan] and the natural gas distribution companies shall jointly prepare a natural gas efficiency investment plan [the statewide natural gas energy efficiency plan].*

Greenhouse Gas Emissions Reduction Goals

Below in Table 1, I set goals for the statewide electric energy efficiency plan and the statewide natural gas energy efficiency plan for 2022–2024. These goals represent the aggregate GHG emissions reductions to be achieved with energy efficiency measures implemented in 2022–2024 and are expressed as aggregate metric tons of carbon dioxide equivalent, to be measured at the conclusion of the three-year plan period. As required by section 3B of chapter 21N, these goals were selected with a view towards their necessary contribution to meeting the limits and sublimits that will be adopted under the GWSA. The detailed methodology and assumptions supporting the goals may be found in Appendix 1.

Because these GHG emission limits and sublimits will be in place every five years beginning in 2025 and ending in 2050, in order to count towards meeting the goal, a GHG emissions reduction achieved by the plan must be sufficiently long-lasting so that it will "contribut[e] to meeting" those future limits and sublimits. G.L. c. 21N, § 3B. In order to resolve the disconnect between the three-year time period for the plans and the 5 year time period between successive limits (and sublimits) under the GWSA, I have decided that an emissions reduction measure must be sufficiently permanent to contribute to meeting, at a minimum, the next two statewide goals adopted pursuant to M.G.L. c. 25, § 21(d)(5) in order to count towards achieving the goals set forth in Table 1 below.[2] I have set these goals for the Energy Efficiency Plans with that limitation in mind. Therefore, I expect that, when the DPU

[1] I note that the 2030 Interim CECP was designed to achieve a reduction of 45% below 1990 levels in 2030, prior to the Climate Act requiring that I adopt a more stringent 2030 limit of at least 50% below 1990 levels.

[2] The Plans for 2046–2048 will, of course, need to contribute only to the 2050 goal. The legislature may wish to consider amending the law before the 2049–2051 plans are established, as any goal set in 2048 will not be realized until after the 2050 limit is achieved. Alternatively, the legislature might consider changing the Energy Efficiency Plans to five-year terms and synchronize with the GWSA limits and sublimits.

issues its "statement . . . indicating the degree to which the activities undertaken pursuant to the performance of each plan met the goal for the plan set by the secretary pursuant to section 3B of chapter 21N" that the DPU will not consider emissions reductions that will no longer be effective in 2030. M.G.L. c. 25, § 21(d)(5). Therefore, the goals below are expressed in cumulative annual metric tons of CO2e reductions expected in 2030, directly associated with the measures implemented in 2022–2024.

The Climate Act requires that every three years a new goal to be established for the succeeding plans' contribution to future GHG emission limits and sublimits. Each successive goal will incrementally build upon the reductions to GHG emissions achieved under prior plans.

Table 1: Greenhouse Gas Emissions Reduction Goal

	2022–2024 Joint Statewide Energy Efficiency Plan (electric)	**2022–2024 Joint Statewide Gas Efficiency Plan (gas)**
Emissions Reductions in metric tons of CO_2e	504,000	341,000

As the Climate Act requires both economy-wide and sector limits, I recommend that the plans include emissions reductions in the following individual sectors:

Table 2: Sector-Specific Goals

	Residential and Income Eligible Electric Energy Efficiency	**Residential and Income Eligible Gas Efficiency**	**Commercial and Industrial Electric Energy Efficiency**	**Commercial and Industrial Gas Efficiency**
2025 Cumulative Annual Emissions Reduction (metric tons of CO_2e)	392,000	252,000	296,000	156,000
2030 Cumulative Annual Emissions Reduction (metric tons of CO_2e)	351,000	191,000	153,000	150,000

Priorities

Meeting the Climate Act's 2050 Net Zero limit and 2030 limit of at least 50% GHG emissions reductions relative to 1990 levels will require a significant increase in the scope and scale of building retrofits, through a focus on envelope improvements and efficient electrification. Consistent with the EEAC Resolution of March 24, 2021, [3] I expect the Mass Save Program Administrators to achieve the GHG goals established above through:

[3] https://ma-eeac.org/wp-content/uploads/FINAL-EEAC-Priorities-Resolution_Adopted-3.24.2021.pdf

- Equitable program investments that ensure weatherization and electrification of homes and businesses in environmental justice communities and low-moderate income households;
- Significantly increasing the number of buildings retrofitted and weatherized each year;
- Significantly ramping up electrification of existing buildings through heat pump goals that set the Commonwealth on a path to achieving one million homes and 300–400 million square feet of commercial buildings using electric heat pump for space heating by 2030;
- Eliminating measures that increase the use of natural gas for space heating, including those associated with combined heat and power or fuel cells, since they are not consistent with the GHG emission reduction goals;
- Prioritizing measures consistent with the 2050 Roadmap and 2030 Interim CECP, such as insulation and heat pumps, and reduce support for measures like lighting and fossil-fuel heating incentives;
- Committing to phase out fossil fuel incentives aligned with the Interim 2030 CECP policy recommendations; and
- Significantly increasing workforce development investments through coordination with the Massachusetts Clean Energy Center, to increase diversity and expand the workforce necessary to achieve our GHG goals and provide economic opportunities.

Conclusion

As set forth above, the final 2022–2024 Energy Efficiency Plans filed with the DPU in October of this year must be designed to realize the GHG goal set forth above and should focus on programs that accelerate market transformation needed to achieve Net Zero in 2050. Consistent with the Climate Act, each Plan should "be constructed to meet or exceed the [respective] goal" set forth above. M.G.L. c. 25, § 21(d)(4). I encourage the Mass Save Program Administrators and the EEAC to prioritize energy efficiency investments that reduce GHG emissions and are aligned with the state's 2050 Roadmap.

I look forward to the collaborative work of the Program Administrators and the EEAC to continue and enhance Massachusetts's national leadership on energy efficiency while boldly combatting climate change and ensuring these programs are accessible to low- and moderate-income residents and environmental justice communities.

Sincerely,

K. Theoharides

Kathleen Theoharides
Secretary of Energy and Environmental Affairs

APPENDIX 1
ASSUMPTIONS AND METHODOLOGY

Greenhouse Gas Emissions Reduction Requirement for Mass Save® - Methodology

Interim Clean Energy & Climate Plan for 2030

The primary actions in the Interim Clean Energy & Climate Plan (CECP) for 2030 relevant to the Mass Save® plans[4] include retirement and replacement of space heating and cooling equipment, domestic hot water equipment, and key components that comprise a building's envelope, such as windows and insulation. The sum of these changes to equipment and envelope stock in any given year in the full CECP (2021 – 2030) over time results in a net change in annual energy consumption, which, through the emissions factors described below, results in a projection of net change in annual greenhouse gas (GHG) emissions.

The aggregation of the equipment turnover modeled in 2022, 2023, and 2024, and the resulting year-over-year changes in energy consumption, correspond to the measures and annual energy savings comprising the 2022–2024 Mass Save plans. Since Mass Save only covers the service territories of the Commonwealth's investor-owned gas and electric utilities, for the purposes of this computation, a portion of the changes to statewide energy savings (reflecting an estimate of built square feet serviced by municipal-owned utilities) are excluded from the Mass Save GHG reduction requirement. The resulting annual energy savings from each of the three years are summed to produce a cumulative annual energy savings representing the impact of all relevant measures installed from January 1, 2022 through December 31, 2024. Since the actions described in the CECP reflect long-lived building components, no degradation by 2030 is assumed.

In the CECP, cumulative annual energy savings are simply multiplied by the average emission factors noted below to arrive at the cumulative annual GHG emission reduction that the 2022–2024 Mass Save plans should achieve in order to align with the reductions specified in the CECP. Because the emissions limits and sublimits specified in M.G.L. Ch. 21(N) reflect emissions in 2025 and 2030, separate quantifications of GHG emission reductions are estimated, anticipating future deployment of non-emitting electricity resources.

Mass Save Plans by Fuels

The Mass Save® programs are established every three years and require two joint statewide plans; an energy efficiency plan funded through electric ratepayers, and a gas efficiency plan funded through gas ratepayers. The joint statewide energy efficiency plan includes electric, heating oil, and propane energy efficiency measures, including fuel switching from delivered

[4] Mass Save refers to the joint effort of the Massachusetts electric and gas program administrators to implement energy efficiency measures pursuant to G.L. c. 25, sec. 21.

fuels to electricity and active demand management programs. The joint statewide gas efficiency plan includes measures that apply to natural gas usage. The net change in use of these fuels (electricity, gas, heating oil, and propane) is the source of GHG emissions reductions achieved through the Mass Save program.

Sectors

The budgeting and implementation of these two statewide plans is conducted on a sector basis, with funding provided by residential ratepayers for residential and income-eligible programs, and by commercial ratepayers for commercial and industrial programs.

Measures

The Mass Save plans are implemented through investments that result in a reduction and/or shift in fuel or energy use in buildings over time. These fuel-use and energy-saving quantities are calculated in the benefit-cost models during the development of each of the three-year plans. The plans include a budget and target energy-savings level for each program, initiative, and measure to be implemented over the three-year term. Each measure also has an expected measure life, calculated based on independent monitoring and evaluation studies. The "measure life" is a forecast of the average expected time that a measure is predicted to perform above and beyond what would otherwise have occurred absent the Mass Save program. These energy savings by fuel and the evaluated timespan of these measures were used to calculate GHG emissions reductions. Measure lives are rounded to the nearest 6 months and range from 1 year to 25 years, depending on the durability of the measure.

Timing of GHG Emission Reductions

For the 2022–2024 Mass Save plans (2022–2024 Plans), investments begin on January 1, 2022, and continue until December 31, 2024. As a result, the first full year during which the maximum energy reductions for the 2022–2024 investments will occur is calendar year 2025. Due to the long measure lives of many Mass Save investments, the majority of GHG emission reductions from investments made during the 2022–2024 Plan are expected to continue in 2030, with a smaller proportion in 2040, and have little quantifiable emissions impact in 2050.

Historically, the Mass Save programs have reported GHG emissions on both an annual basis, and over the full lifetime of a measure or set of measures. Both metrics take a single year in isolation and ignore the emissions reductions of preceding and subsequent years, the gradual decay of the emissions reductions over time, or changes to the emissions impacts of a unit of energy conserved (see electricity emission factors below). This approach does not allow for alignment and comparison between the historical Mass Save program reporting and the annual statewide

inventory of Mass DEP[5] and the GHG reporting requirements of the Commonwealth. Accordingly, the Mass Save GHG emissions reduction goals are being set, and will be required to be reported on, as the aggregate GHG emissions reductions to be achieved with energy efficiency measures implemented in 2022–2024 and are expressed as aggregate metric tons of carbon dioxide equivalent, to be measured at the conclusion of the three-year plan period.

Evaluated Measure lives

Because evaluated measure lives can be changed by future evaluation studies, DOER and the Mass Save program administrators will use the measure lives as currently calculated effective July 1, 2021 and anticipated for the 2022–2024 plans as the basis for setting and assessing achievement towards this GHG emissions reduction goal.

Part Year Measure Application

For a subset of measures, their expected measure life results in the end of life part-way through either 2025 or 2030. For example, measures with a measure life of 7 years installed in the 3rd quarter of 2023 would be modeled to end their expected energy savings and corresponding GHG emissions reduction in the 3rd quarter of 2030. In the real world, there will be a gradual decay in measure emission reductions over a much wider time horizon, averaging 7 years in this example. For simplicity of calculation, DOER and the Program Administrators will assume that all measures installed at any time during a plan year, for example in 2023 with a 7-year measure life, will count as having 50% of their annual GHG emissions reduction in calendar year 2030, and so forth for other measure lives that end during calendar year 2025 or 2030.

Adjusted Gross Savings

The Mass Save programs conduct evaluation studies to assess the extent to which supported measures would have been otherwise installed absent their intervention. Based on these evaluation studies, they apply net-to-gross adjustment factors that generally reduce claimable 'net' savings from the adjusted gross savings achieved by the measures installed. Net savings are the best way of showing the economic benefit of the Mass Save program investments. However, adjusted gross savings are the more applicable metric for the purpose of quantifying GHG emission reductions. Accordingly, the adjusted gross savings are used to set and assess progress towards achieving the Mass Save GHG reduction goal.

[5] https://www.mass.gov/lists/massdep-emissions-inventories

Emission Factors

To set a transparent and fair GHG emissions reduction requirement, the emission factors used to set the GHG reduction goal should also be used to report and assess progress towards achieving the Mass Save GHG reduction goal. This consistency across multiple years argues for simplicity and transparency in selecting the emission factors, while accounting for predictable changes in these factors over time.

Electric Sector GHG Emission Factors

For the purposes of developing the CECP for 2030[6] and the Massachusetts Decarbonization Roadmap for 2050,[7] the Executive Office of Energy and Environmental Affairs (EEA) produced a forecast of emission factors from the electric generation sector for each 5-year increment from 2020 to 2050 and an interpolation for each year in between. The 2030 CECP is still under development, so the emission factors listed below, while fixed for this Mass Save GHG emission reduction goal, are subject to change in the final 2030 CECP, pending additional policies that impact gross load, deployment of non-emitting electricity sources, or settlement of clean energy attributes. This use of the current EEA forecast of average electric emission factors, shown in Table 3 below, allows for a consistent basis for both planning and evaluating the 2022–2024 plans' achievement of their GHG emissions reduction goals. Based on the broad mix of Mass Save program measures and the years-long time horizon for evaluating them, the average annual emissions factor, rather than more granular marginal emission factor will be applied to all measures.

Table 3. Average Electric Emission Factors by Year for Massachusetts in 2025 and 2030

Year	Metric Tons of Emissions per MWh (metric tons of CO_2e)
2025	0.1869
2030	0.1065

On-Site Fuel GHG Emission Factors

The emission factors of fossil fuels relevant to the Mass Save programs, natural gas, #2 heating oil, propane, are much more stable over time than the average emission factor for electricity utilized by buildings in Massachusetts over the course of a calendar year. While the carbon content and GHG emissions of these fuels vary over time, for ease of transparency and simplicity, the Program Administrators should hold emission factors constant, based on carbon dioxide emissions from combustion of these fuels, using currently reported national values from the US Energy Information Administration (EIA)[8] and reproduced below with units of metric tons of CO_2e per million BTU in Table 4:

[6] https://www.mass.gov/info-details/massachusetts-clean-energy-and-climate-plan-for-2030
[7] https://www.mass.gov/info-details/ma-decarbonization-roadmap
[8] https://www.eia.gov/environment/emissions/co2_vol_mass.php accessed on July 1, 2021

Table 4: EIA Carbon Dioxide Emissions Coefficients by Fuel

Year	Natural Gas (metric tons of CO_2e/MMBtu)	Heating Oil (metric tons of CO_2e/MMBtu)	Propane (metric tons of CO_2e/MMBtu)
2025	0.05307	0.07879	0.06307
2030	0.05307	0.07879	0.06307

In holding these emission factors constant, this assumption does not include upstream emissions, such as from methane leaks in the natural gas distribution network or leakage of SF_6 in the electric transmission and distribution grid. Equally this assumption ignores the potential for renewable fuel blending such as bio-fuels and renewable natural gas or green hydrogen being introduced into these fuels in the 2025 and 2030 time horizon, which would reduce the GHG emissions reductions from energy efficiency measures. This assumption of unchanged fuel emissions factors assists in the avoidance of double-counting between Mass Save investments and other potential policy actions that might change the carbon content in the supply of these fuels. It allows Mass Save to compare investing in a measure to a counterfactual of not doing so.

Other Unanticipated Variables

In the event of unforeseen and unanticipated variables leading to notable changes between the 2022–2024 plan forecast and the 2025 and 2030 reporting years, the Mass Save Program Administrators and the Massachusetts Department of Energy Resources will endeavor to follow the principles of transparency and simplicity in quantifying any modifications needed and agreed to by both parties in reporting the results of the 2022–2024 plans.

Reporting on the Mass Save GHG Emissions Reduction Goal

To provide a fair evaluation of the Mass Save program implementation results, the final set of energy savings and resulting GHG emission reductions need to use a consistent set of assumptions to the set that were used to calculate the requirement initially. However, by 2025 and 2030 there will be updated information related to savings, measure lives, emissions factors and so on, that if applied would change the results. In recognition of this inevitable outcome, the reporting on the success of each the plan's achievement of its GHG emissions reduction goal will be done in two separate sets of calculations. The first is an 'apple-to-apples' calculation using the available information in July 2021 to evaluate the Mass Save plan results using the same set of assumptions used to set this goal. The second is a 'best-available-data' calculation using updated assumptions on emissions factors, measure effectiveness, measure lives, and other variables that incorporate updated data at the time of reporting. The former 'apples-to-apples' calculation is intended to provide a fair benchmark to evaluate the success of the plans in meeting this goal.

The ‘best-available-data’ calculation is intended separately to inform progress towards the Commonwealth’s GWSA limits and sublimits.