Renovations and Additions Net-to-Gross Study (MA20X06-B-RENOADDNTG)

Final Report

Final

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SUBMITTED TO:
The Massachusetts Electric and Gas Program Administrators

SUBMITTED BY:
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MA Renovations and Additions NTG Study

(MA20X06-B-RENOADDNTG)

The Massachusetts Program Administrators (PAs) sought to establish retrospective and prospective net-to-gross ratios (NTGRs) for the Mass Save Residential Renovations and Additions (R&A) Initiative. The study relied on self-reported NTG gathered through web-surveys of homeowner and contractor participants who had recently completed a renovation and/or addition project(s) and on program tracking data. A panel comprising PA and EEAC representatives and expert evaluators considered the information and engaged in a consensus process to set the recommended values.

Study Objectives

Established retrospective NTG for 2019 and developed a prospective NTGR for the R&A Program to inform planning for the 2022 to 2024 program cycle.

Account for programmatic changes in baseline in estimating prospective NTGR.

Analyze results of survey questions to better understand topics such as program experience, NEIs and program satisfaction, COVID-19 impacts, and barriers to participation.

Key Findings and Takeaways

Recommended NTGRs

	Free-ridership	Participant Spillover	Non-participant Spillover	NTGR
Retrospective 2019	34%	2%	17%	85%
Prospective 2022 to 2024	22%	2%	12%	92%

Participant Satisfaction and Recommendation

Homeowners and contractors were highly satisfied with the Mass Save Initiative and would recommend the program to others.

Non-Energy Impacts

Homeowners reported increased comfort of their home and reduced noise from the water heater, heating / cooling equipment, and outside the home.

Barriers to Participation

Lack of awareness of the Initiative and the extra hassle of participating were the main barriers preventing more contractors from participating.

Recommendations

The PAs should use the recommended prospective NTGR for 2022, and for 2023 and 2024 if the PAs do not measure NTG again before then.

The implementation contractor should track project contact information for the both the homeowner and primary contractor.

Considerations

The PAs should consider the possibility of measuring NTG again in less than three years.

The PAs should consider continuing their research into identifying, quantifying, and monetizing NEIs associated with the program.

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Acronyms

Acronym	Definition
EEAC	Energy Efficiency Advisory Council
FR	Free rider/ free-ridership
HERS	Home Energy Rating System
HVAC	Heating, ventilation, and air conditioning
ISP	Industry Standard Practices
NEI	Non-energy Impact
NPSO	Non-participant Spillover
NTG	Net-to-Gross
NTGR	Net-to-Gross Ratio
PA	Program Administrators
PSO	Participant Spillover
RNC	Residential New Construction
R&A	Renovations and Additions
UDRH	User-defined Reference Home

Executive Summary

This report presents final results from the Residential Renovations and Additions Net-to-Gross Study (MA20X06-B-RENOADDNTG). The Cross-Cutting Market Effects/Net-to-Gross evaluation team, led by NMR Group, Inc., prepared this report for the Massachusetts Program Administrators (PAs).

The study goals were to establish a retrospective net-to-gross ratio (NTGR) and develop a single prospective NTGR for the 2022-2024 period for the PAs' Renovations and Additions (R&A) Program.

Given the lack of historical measure-level efficiency data for R&A, the evaluation team followed the guidance in the Consistent Methodology for Residential Self-Report Net-to-Gross Measurement (RES19X03-B-RSRNTG) to develop the NTGRs based on self-reports from participating homeowners and contractors and on program tracking data. The study utilized web surveys of homeowners and contractors who participated in 2019 or the first quarter of 2020 and a consensus process to develop preliminary NTGRs. The study used a consensus group approach to set prospective NTGRs for 2022 to 2024, leveraging the 2019 NTGR developed as part of this study, survey and program data, and expectations about the future R&A market. The consensus group comprised PA and EEAC representatives and expert evaluators.

This report also includes information on COVID-19 impacts (Section 5.2), program experience (Section 5.3), non-energy impacts (NEIs) and program satisfaction (Section 5.4), and opportunities and barriers to participation (Section 5.5).

Key Findings, Recommendations, and Considerations

Recommendation: The PAs should adopt the prospective NTG values in Table 1 for 2022, and for 2023 and 2024 if the PAs do not measure NTG again before then.

Table 3 in the main report lists the full range of 2019 NTGRs by measure.

Table 1: Recommended NTGRs for 2019 and 2022 – 2024

	Free-ridership	Participant Spillover	Non-participant Spillover	NTGR
Retrospective 2019	34%	2%	17%	85%
Prospective 2022 to 2024	22%	2%	12%	92%

The self-reported NTG method used in this study follows the guidance from RES19X03-B-RSRNTG to estimate free-ridership through surveys of both participating homeowners and the primary contractors who worked on the projects, using a single contractor free-ridership average for all projects. However, the program tracking data only included contact information for the incentive recipient (i.e., either the homeowner or the contractor, but not both). Since the

homeowners were more likely to receive the incentive than the contractors, the majority of the contact information was for the homeowners. This meant that the contractor data used for the NTG calculations was based on a much smaller sample than the homeowner data. It is possible that there are systematic differences between the participating households who claimed the incentives and those whose contractors claimed them, and between the contractors who claimed the incentives and those who did not. These differences could affect the NTG results.

Recommendation: To avoid the possibility of introducing unknown bias into the sample frame in the future, going forward, the PAs should require the implementation contractor to track contact information for both the homeowner and the primary contractor associated with the project, regardless of which one applies for the incentive.

The homeowners and contractors whom we surveyed for this study participated in 2019 or the first quarter of 2020, when the R&A Program used pre-existing conditions as the baseline. The program has since begun to use industry standard practices (ISP) as the baseline for select measures. During the process of developing the prospective NTGR, the evaluation team and consensus group made adjustments to account for the potential overlap between free-ridership and the new, higher ISP baseline to avoid double-discounting program savings.

Consideration: To ensure the greatest accuracy of the prospective NTGRs, the PAs should consider the possibility of measuring NTG again in less than three years, especially if the program changes again after the recent baseline adjustment.

In this study, more than one-half of respondents reported increased comfort of their home and reduced noise from the water heater, heating/cooling equipment, and outside the home as positive changes that can be attributed to their completed renovation or addition project.

The Residential New Construction NEI Quick Hit Assessment (MA20X14-RNCNEI) is currently underway. This study will use secondary data to identify new NEIs and update NEI values associated with the Residential New Homes and Renovations Initiative which includes the R&A Program.

Consideration: Quantifying and monetizing the non-energy benefits that participants identified could potentially improve the cost-effectiveness screening for the program and inform portfolio decision-making. The PAs should consider continuing their research into identifying, quantifying, and monetizing NEIs associated with the program.

KEY LIMITATIONS AND SOURCES OF UNCERTAINTY

As noted above, that fact that the program did not record both the homeowner and contractor information for each participating project means that there could be systematic differences between the participating households who claimed the incentives and those whose contractors claimed them, and between the contractors who claimed the incentives and those who did not. These differences could affect the NTG results.

The results of this study are based on retrospective research. Asking participants for a counterfactual scenario (what they would have done in the absence of the program) is, by its nature, prone to error.

Past performance is no guarantee of future performance, and the evaluation team developed the prospective NTGR based on data collected from homeowners and contractors who participated pre-pandemic, which adds another layer of uncertainty to the forecasting.

The purpose of the consensus group approach to forecasting the NTGR was to reduce the uncertainty inherent to forecasting. Ideally, to help balance the strengths, weaknesses, potential biases, and threats to validity associated with each NTG estimation method, the evaluation team would have provided the consensus group with NTGRs developed via more than one method. Developing multiple NTGRs was not possible in this case due to the lack of historical measure-level efficiency data for the R&A initiative and broader market. To help the consensus group develop informed forecasts, in addition to the retrospective NTGR, the evaluation team provided the group with program participation data and with survey data about the effects of the pandemic on business and personal decision-making and about the likelihood of contractors participating in the Mass Save® R&A Initiative with more stringent baseline standards. Including more than one stakeholder group in the consensus group process served to reduce the bias inherent with relying on the interpretation of just one stakeholder group.

Section 1 Introduction

This report presents final results from the Residential Renovations and Additions Net-to-Gross Study (study number MA20X06-B-RENOADDNTG). The Cross-Cutting Market Effects/Net-to-Gross evaluation team, led by NMR Group, Inc., prepared this report for the Massachusetts Program Administrators (PAs).[1] The study updates net-to-gross ratios (NTGRs) for the Residential Renovations and Additions (R&A) Program as a broader part of the Residential New Construction (RNC) Initiative.

As with other RNC initiatives, this study developed a single net-to-gross (NTG) value for each year that covers both electric and gas end uses. This is the first time a NTGR is being measured using primary research for this relatively young R&A Program. Historically, the PAs have measured retrospective and forecasted prospective NTGRs late in each cycle to ensure they have the most up-to-date estimates before locking in the values for the next three-year cycle. Massachusetts NTG policy has changed since this research was carried out, and prospective NTGRs are locked until new evaluation results become available. Because the policy changed after NMR had completed nearly all the work, in addition to recommending a NTGR for the PAs to use for this program in 2022, this report proposes NTGRs for the PAs to consider for 2023 and 2024 should they not choose to re-measure NTG before then.

1.1 GOALS

The primary goal of this evaluation was to establish a retrospective NTGR for 2019 and develop a single prospective NTGR for the 2022 to 2024 period for the PAs' R&A Program.

The homeowners and contractors who we surveyed for this study participated in 2019 or the first quarter of 2020, when the R&A Program used pre-existing conditions as the baseline. The program has since begun to use industry standard practices (ISP) as the baseline for selected measures. Measures with the new ISP baseline are shown in Table 10 in Appendix A.1. Together, the evaluation team and consensus group considered the impact of this change in the process of developing the prospective NTGR. In addition, the study sought to measure some of the market effects indicators outlined in the program theory and logic model in the *MA RLPNC 18-12 Renovations and Additions Market Characterization and Potential Savings Study.* The study met the following objectives:

[1] The PAs comprise Berkshire Gas, Cape Light Compact, Eversource, Eversource Gas of Massachusetts, Liberty Utilities, National Grid, and Until.

- Estimated NTGRs by participating customers in 2019
- Explored different approaches to account for programmatic changes in baseline in estimating prospective NTGR
- Analyzed results of survey questions to better understand topics such as program experience, NEIs and program satisfaction, COVID-19 impacts, and barriers to participation
- Convened a consensus group to arrive at mutually agreed-upon NTGRs for 2019 and for 2022 to 2024

While the current value from the benefit-cost ratio models (BCRs) is 96%, this is the first time the NTGRs have been formally measured in an evaluation.

For informational purposes only, this study also estimated NTGRs for the following measures:

1. Water heating
2. Heating, ventilation, and air conditioning (HVAC)
3. Windows
4. Insulation, including ceiling, framed floors, foundation walls, and walls
5. Ducts and air sealing

1.2 PROGRAM DESCRIPTION

The Massachusetts PAs supported the R&A Program as a broader part of the RNC Initiative. Eligible measures include energy-efficient HVAC, water heating, air sealing, duct sealing, windows, and insulation for single-family homes and multifamily homes of three stories or fewer. To qualify, renovation projects must have altered or affected at least 500 sq. ft. of building shell and qualifying additions must have met a minimum of 500 sq. ft. of conditioned floor area. The program incentive structure uses a pay-for-savings model.

Section 2 Research Methods

The evaluation team utilized participant web surveys and a consensus process to develop the recommended NTGRs.

2.1 PARTICIPANT SURVEY

Given the lack of historical measure-level efficiency data for R&A, this study relied on self-reported NTG gathered through surveys of homeowners and contractors. The evaluation team used the results of the homeowner and contractor surveys to develop a weighted retrospective NTG value. The retrospective NTGR is among the values used to inform the estimate of prospective NTG values for the 2022 to 2024 period. We designed and fielded homeowner and contractor web surveys following the survey development guidance in the Consistent Methodology for Residential Self-Report Net-to-Gross Measurement (RES19X03-B-RSRNTG).[2]

2.1.1 Program Data Disposition

The evaluation team developed a sampling frame from 2019 and the first quarter of 2020 R&A Program participants. The program tracking data included the following information for a total of 976 projects:

- Contact information for incentive recipient, including premise address and email address
- Incentive amount
- Description of the home, including heating and cooling equipment and primary and secondary heating fuels
- Estimated program savings

The evaluation team cleaned the program data to remove duplicate contacts and addresses so that participants who completed more than one project did not receive multiple invitations to take the survey. The final sampling frame included 664 unique program participants (shown in Table 2).

Table 2: Program Participants and Savings

Population Projects	Population Participants	Program Electricity Savings	Program Fuel Savings	Total Program Savings
976	664	3,726 MWh	75,026 MMBtu	87,739 MMBtu

[2] Available at https://ma-eeac.org/wp-content/uploads/MA19X03-B-RSRNTG_Residential-SR-NTG-Report_FINAL_2020.5.28.pdf. We thank Carrie Koenig of Tetra Tech for her guidance in implementing the methodology, particularly in answering tricky questions about spillover.

2.1.2 Sampling and Recruiting

One caveat about the program data is that it only tracked the contact information for the incentive recipient. Usually the homeowner received the incentive, not the contractor. This meant that the program data included either the contact information for the homeowner or the contractor associated with a project, but not both. The program data also did not indicate whether the incentive recipient was a homeowner or contractor. Given this, the evaluation team developed a two-step method to assign participants to one of the two surveys. First, we assigned incentive recipients who had contact information containing company names for contractors to the contractor survey. For all remaining incentive recipients, we compared the contact names and premise addresses with homeowner information in the Massachusetts Assessor Databases to identify homeowners versus contractors. We assigned 77% of the projects to the homeowner survey (including property managers) and the remaining 23% to the contractor survey (including home energy rating system [HERS] raters, builders, and architects). Verification questions in the surveys redirected the respondents to the appropriate survey if their responses conflicted with their survey assignment.

After developing the sample frame, the evaluation team sent a recruitment email with a link to the web-only survey to the full sample of 664 participants. The email explained that respondents would receive a gift card ($50 for homeowners and $150 for contractors) via email after completing the survey. The email also included phone numbers to call for more information. We sent reminder emails to email recipients who did not respond to the survey. Towards the second half of fielding, we asked homeowners to provide contact information for their contractors in an effort to increase contractor responses.

While the study originally set out to survey 70 homeowners and 70 contractors, the program tracking data revealed that homeowners received the majority of the incentives compared to contractors, reducing the likelihood of achieving equal numbers of completes from the two groups. The study ultimately surveyed 120 homeowners and 31 contractors who participated in the R&A offering from 2019 through March 14, 2020. Both surveys commenced fielding on December 28, 2020. Survey collection from homeowners ended on January 10, 2021, and survey collection from contractors ended on January 17, 2021. The overall response rate across both homeowners and contractors was 23%. The overall sampling errors for absolute and relative precision using the 90% confidence level are 5.9% and 13.6%, respectively.[3]

2.1.3 Homeowner Surveys

The homeowner survey included questions about the following topics:

- Project scope and timing
- Awareness of energy efficiency prior to participating in the program
- Energy-efficiency aspects of the project
- Motivations for participating in the program

[3] Relative precision is based on a 50% break in responses.

- Where homeowners first learned about the program
- The homeowner's role versus the contractor's role in deciding to participate and deciding the scope of the project
- The importance of energy efficiency in the renovation or addition project, compared to other factors
- Incentivized energy-efficiency features homeowners would have included in the absence of the program
- Importance of the incentives, loans, and direct install measures in deciding to participate
- Effect of the coronavirus on project scope, timing, and energy-efficient features
- Satisfaction with the program

2.1.4 Contractor Surveys

The evaluation team incorporated contractor-specific program data into the surveys so that each contractor received survey questions customized to reflect their actual program practices. Presenting contractors with information on the actual measures they completed ensured we would obtain the most accurate assessment from contractors of what they would have done for a particular measure in the absence of the program.

The contractor surveys included questions about the following topics:

- Where contractors first learned about the program
- Contactor participation in trainings provided by the program
- Efficiency-related practices contractors used in program projects, including use of HERS rater, blower door testing, and air sealing, among others
- Timing of first use of efficiency-related practices
- The baseline requirements contractors were subject to and the likelihood they would have participated had they faced more stringent requirements
- Typical efficiency-related practices in the contractor's non-participating projects compared to pre-existing conditions and the ISP from the *Renovations and Additions Market Characterization and Potential Savings Study (RLPNC 18-12)*
- Influence of the program, including trainings, on participating contractor's efficiency-related practices in non-program homes
- Influence of the program, including trainings, on non-participating contractors' efficiency-related practices
- Typical efficiency-related practices of non-participant contractors compared to the ISP
- The degree to which contractors versus homeowners drove the decision to participate
- The homeowner's interest in energy efficiency
- The degree of homeowner involvement in the decision to participate

- Incentivized energy-efficiency features that would have been included in the absence of the program
- NEIs participants have experienced
- NEIs contractors emphasize to homeowners
- Proportion of contractor's R&A projects participating in the program:
  - From 2019 through March 14, 2020
  - Expected in all of 2020
  - Expected in 2022
- Likely efficiency of typical non-participating projects in 2022 and 2024
- What keeps contractors from participating
- Program satisfaction

2.2 CONSENSUS PROCESS

The purpose of the group was to come to agreement on retrospective NTGRs for 2019 and prospective NTGRs for 2022 to 2024 to inform the PAs' program planning process. The consensus group included two EEAC representatives, four PA representatives, and three evaluators. Other evaluation team members attended the calls to answer questions about the research results and were actively engaged in the consensus process.

The evaluation team prepared a memo summarizing the retrospective NTGRs and offered a preliminary prospective NTGR and circulated this to the consensus group members. The evaluation team also provide a spreadsheet for each set of consensus group members to submit their estimates of retrospective and prospective NTGRs. The evaluation team compiled the submissions from each set and recirculated them in presentation slides prior to the first meeting.

The evaluation team then held three meetings, during which the panelists engaged in a process to reach consensus on the NTGR values recommended in this study. The main factor considered in setting these recommended values was the self-reported NTGR estimates based on the homeowner and contractor web surveys.

The initial consensus group meeting took place on March 17 and focused on setting retrospective NTGRs and prospective participant spillover (PSO). The consensus group met two more times, on March 29 and April 14, to set prospective non-participant spillover (NPSO) and free rider values, respectively.

Section 3 Retrospective NTG

3.1 OVERVIEW

NTGR estimates include three inputs: (1) estimates of free-ridership (FR) among participating customers (participants) adjusted by estimates of participating contractors, (2) PSO among participating customers, and (3) NPSO among participating contractors. We used the following formula to calculate NTG:

$$Retrospective\ NTG = (1 - FR) + PSO + NPSO$$

The survey battery allowed for the calculation of measure-specific FR values. For PSO, it is unlikely participants could assign spillover for specific measures since the R&A Program is a whole-house program. Therefore, the evaluation team calculated PSO savings at the project level and applied it consistently across all measures to estimate measure-level NTG. We assigned NPSO by measure.

Table 3 shows the retrospective 2019 NTGR values derived from primary research by measure and for the program. Participant responses to the web surveys indicated a retrospective NTGR of 85% for the whole program. The NTGR estimates for each measure listed in the table are for informational purposes only.

Table 3: Retrospective 2019 NTGRs

Measure Type	Homeowner Responses	Contractor Responses	FR	PSO	NPSO	NTGR
Water Heating	39	18	39%	2%	NA	63%
Heating	55	23	29%	2%	NA	73%
Cooling	65	17	32%	2%	NA	71%
Air Infiltration	-	5	66%	2%	39%	75%
Ducts	-	4	88%	2%	0%	15%
Ceiling Insulation	99	27	31%	2%	15%	87%
Found Wall Insulation	15	7	33%	2%	15%	84%
Framed Floor Insulation	55	21	35%	2%	15%	83%
Wall Insulation	76	26	33%	2%	15%	85%
Windows	64	20	36%	2%	NA	66%
Program[1]	**120**	**31**	**34%**	**2%**	**17%**	**85%**

[1] Weights used to calculate program values are discussed in the following sub-sections.

3.2 FREE-RIDERSHIP

The FR battery presented in the RES19X03-B-RSRNTG study asks measure-specific FR questions for individual measures. For this study, the homeowner and contractor surveys asked respondents measure-specific FR questions for water heating, HVAC, and shell measures. The contractor survey also asked about duct and air sealing measures.[4] The survey did not ask homeowner respondents about ducts or air sealing because it is not likely they would have the industry knowledge or expertise required to answer questions about these measures. In lieu of asking homeowners FR questions about duct and air sealing measures, we substituted these scores with the average contractor FR scores for ducts and air infiltration.

The evaluation team calculated the program-level FR using the following steps:

1. Calculate measure-specific FR scores installed by each respondent.
2. Average the measure-specific FR scores to estimate a FR score for each respondent (unweighted).
3. Calculate the weighted average of the individual FR scores to get overall program FR (weighted using project-level savings provided in the program tracking data).

3.2.1 Free Rider Reconciliation

Residential FR is typically calculated using homeowner survey responses. However, if the homeowner indicates that the contractor influenced their decision to install the energy-efficient measure, the RES19X03-B-RSRNTG study instructs the evaluator to reconcile the homeowner and contractor FR scores by incorporating the contractor FR score in place of, or in addition to, the homeowner FR score. To meet the criteria for FR reconciliation, homeowner respondents must indicate that the contractor was the most influential factor in their decision *and* either (1) the contractor suggested a measure efficiency level and the customer agreed *or* (2) the contractor suggested various measure efficiency levels and the customer chose the measure.[5] Table 4 shows that only 6% to 13% of homeowners indicated that the contractor was the most influential factor in their decision to install the measure and had a role in the decision-making.

[4] To prevent respondent survey fatigue, the evaluation team asked each homeowner and contractor about a maximum of five and seven measures, respectively.

[5] If the homeowner respondents indicate that the contractor was the most influential factor in their decision *and*
(1) the contractor suggested one measure efficiency level and the customer agreed, then homeowner FR score is the contractor FR score, *or*
(2) the contractor suggested various measure efficiency levels and the customer chose the measure, then the homeowner FR score is the average of the homeowner and contractor FR scores.

Table 4: Homeowner Qualification for FR Reconciliation

Measure	Homeowner Responses	Share of Respondents Indicating Contractor Influence and Decision Making[1]
Water Heating	39	8%
Heating	55	13%
Cooling	65	9%
Ceiling Insulation	99	6%
Found Wall Insulation	15	13%
Framed Floor Insulation	55	7%
Wall Insulation	76	7%
Windows	64	11%

[1] Homeowners indicated that the contractor was the most influential factor in their decision *and* either (1) the contractor suggested one measure efficiency level and the customer agreed *or* (2) the contractor suggested various measure efficiency levels and the customer chose the measure.

The guidance presented in the RES19X03-B-RSRNTG study is ideally suited to situations in which it is possible to obtain both homeowner and contractor survey completes for a reasonable number of projects, and for which contractors can accurately recall specific details of single projects. In this case, the former was not possible due to the program tracking data, and the latter may not be likely for busier contractors who complete many residential projects a year. The program data only included contact information for the incentive recipient, so for most projects in this study, either homeowner or contractor contact information was available, but not both. For this reason, the large majority of projects only included responses from the homeowner or the contractor. As Table 5 shows, the evaluation team was able to obtain completed surveys from both the homeowner and contractor for just seven projects. Given these circumstances, where FR reconciliation was required, the evaluation team applied the average contractor FR score. (See Table 11 in Appendix A for contractor FR scores by measure.)

Table 5: Survey Completes by Project

	Homeowner	Contractor	Both
Number of Projects	113	24	7

3.3 PARTICIPANT SPILLOVER

The RES19X03-B-RSRNTG study recommends referencing the deemed savings values for program measures from the Massachusetts Technical Reference Manual (MA TRM) to calculate PSO. However, the MA TRM does not provide deemed savings or algorithms to calculate savings for shell measures, ducts, and air sealing. To calculate spillover savings for shell measures and air sealing, the evaluation team referenced the deemed savings and algorithms in the 2021 Illinois TRM v9.0[6], shown in Table 12 in Appendix A. (There were no instances of PSO for duct measures.) The web surveys did not allow for further probing of PSO responses by measure to collect the additional project data that is needed to calculate PSO savings for shell measures and

[6] 2021 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 9.0. September 25, 2020. https://ilsag.s3.amazonaws.com/IL-TRM_Effective_010121_v9.0_Volumes_1-4_9-25-2020_Final_Compiled.pdf

air sealing (e.g., type, amount, efficiency level).[7] Lacking this information, to calculate PSO for these measures, we supplemented the savings calculations with measure information from projects that went through the program. For example, if we were not able to collect detailed information about spillover air sealing in a program home, we used the area of the home and average ACH50 for homes that conducted air sealing through the program to calculate the spillover savings, per the sample calculation in Appendix A.3.1. The evaluation team believes there is a strong argument for assuming spillover measures may not achieve the same efficiency outcome as the same measures when they are supported by the program. For this reason, the evaluation team reduced spillover savings for these measures by 50%.

In order to qualify for PSO, spillover measures must be as efficient as those that would qualify for program incentives. The evaluation team did not assign spillover savings to homeowners who indicated their spillover measure(s) did not qualify for program support in the web survey. The evaluation team calculated the program-level PSO using the following steps:

1. Calculate measure-specific PSO scores for each respondent
2. Sum spillover savings for all eligible measures (determined by spillover score) installed by each respondent
3. Calculate the weighted average of the individual spillover to determine overall program PSO (weighted using project-level savings from the program tracking data)

3.4 NON-PARTICIPANT SPILLOVER

For NPSO, the web survey asked **contractors** about shell, duct, and air sealing practices and typical efficiency levels for projects that did not receive program funding. The survey also asked contractors whether the program influenced those practices. To qualify for NPSO, contractors had to indicate that they started these energy-efficient practices after they participated in the program (i.e., after 2018), the practices were influenced by their experience in the program, and the efficiency levels of the practices met a minimum of the average pre-existing conditions of the program homes for renovations and user-defined reference home (UDRH) for additions (as shown in Table 13 in Appendix A.4).

The evaluation team calculated NPSO for efficient shell, duct, and air sealing practices for each respondent. We then used REM/Rate measure-level weights from the 2019 Residential New Construction Baseline/Compliance Study (MA19X02-B-RNCBL),[8] as shown in Table 14 in Appendix A.4, to calculate a weighted average NPSO for each respondent before taking a simple average of the respondent NPSO to obtain the overall program NPSO.

[7] The survey asked for project details, but responses indicated that participants did not understand the question and/or know the answers.
[8] NMR Group, Inc. 2019 Residential New Construction Baseline/Compliance Study (MA19X02-B-RNCBL). For the Massachusetts Program Administrators. April 2020.
https://ma-eeac.org/wp-content/uploads/MA19X02-B-RNCBL_ResBaselineOverallReport_Final_2020.04.01_v2.pdf

Section 4 Recommended NTGRs

As we noted in the Introduction, Massachusetts NTG policy has changed since this research was carried out, and prospective NTGRs are locked until new values become available. Because the policy changed after NMR had completed nearly all the work, in addition to recommending a NTGR for the PAs to use for this program in 2022, this report proposes NTGRs for the PAs to consider for 2023 and 2024 should they not choose to re-measure NTG before then.

This is the first measurement of NTG using primary research for this relatively young R&A Program. The homeowners and contractors who we surveyed for this study participated in 2019 or the first quarter of 2020, when the R&A Program used pre-existing conditions as the baseline. The program has since begun to use ISP for selected measures as the new, higher baseline. Selected measures with the new ISP baseline are shown in Table 10 in Appendix A.1. Thus, FR calculated using the survey responses does not accurately reflect future program FR. While the study attempted to avoid double-discounting by adjusting FR to account for the change to a higher baseline, a NTGR calculated based on data from participants who participated after the baseline change would be more accurate.

4.1 Approach

At the beginning of the consensus process, the evaluation team presented consensus group members with the preliminary retrospective 2019 NTGR for the R&A Program overall and for individual measures obtained through the program, and suggested a prospective (2022 to 2024) NTGR for use in program planning. Each of the three sets of group members (the PAs, EEAC consultants, and evaluators) met separately to discuss and decide on their estimates of retrospective and prospective NTGRs and the rationale for these values.

Consensus group members unanimously agreed not to change the evaluation team's initial retrospective NTG estimate. Over the course of three meetings, group members discussed the appropriate methods and application of homeowner and contractor survey data to calculate FR, PSO, and NPSO for the prospective NTGRs. Below, we offer brief summaries of the discussions about each component of prospective NTG during the consensus group process and present the final prospective NTGR values agreed upon by the consensus group (Table 6).

Participant Spillover. As described in Section 3.3, the evaluation team used deemed savings and algorithms from the 2021 Illinois TRM v9.0 to calculate retrospective PSO for shell, duct, and air sealing measures. The evaluation team supplemented the savings calculations with measure information from projects that went through the program. Given that the spillover savings were predicated on program practices that were incentivized, the evaluation team reduced spillover savings for these measures by 50%, which assumes that the non-incentivized measures did not achieve the same level of efficiency as incentivized ones. **The consensus group agreed to this conservative treatment of spillover savings and to use the retrospective PSO of 2% as the prospective value.**

Non-participant Spillover. The evaluation team estimated retrospective NPSO using the percentage of projects that received incentives in 2019, as determined from the contractor survey. During the second meeting, the evaluation members of the consensus group proposed that the prospective NPSO be calculated using the percentage of projects expected to receive incentives in 2022, resulting in an NPSO of 10%.[9] The EEAC members of the group agreed. The PAs, concerned that the NPSO may be reflecting contractor uncertainty about future contractor jobs as a result of the pandemic, proposed using the retrospective NPSO (17%) instead. **Ultimately, the consensus group agreed to use the average of the NPSO values submitted by each team (12%) as the overall prospective NPSO**.

Free-ridership and ISP Overlap. Since this study surveyed participants that took part in the program when it used a preexisting conditions baseline, before it transitioned to using an ISP baseline, FR calculated using the survey responses does not accurately reflect future program FR. Accounting for overlap between FR and the new, higher ISP baseline is needed to avoid double-discounting program savings. Double-discounting can occur when FR is calculated for a program without adjusting for a higher baseline, while program savings are estimated using the higher baseline. In such a situation, the resulting FR could be overestimated, thereby underestimating program-induced savings. Determining the appropriate method to account for the change in the program baseline ISP in the FR estimation was a critical discussion topic during the meetings. **In the third meeting, the consensus group agreed to account for the change from a preexisting baseline to an ISP baseline in the FR score by adjusting the homeowner and contractor FR responses to the following survey question:**

> ***Without the incentive from the Mass Save® Initiative, how likely is it that you would have installed the exact same high-efficiency level/amount of [MEASURE]?***
>
> *A. Very likely*
> *B. Somewhat likely*
> *C. Slightly likely*
> *D. Not at all likely*

The adjustment was based on the assumption that the higher ISP baseline would likely lead the program to support higher-cost measures, to lower the incremental savings achieved by the measures that were supported at the time that these respondents participated, or both. Thus, respondents who indicated they would be "very likely" to install the same measure without the program incentive under a pre-existing conditions baseline would be only "somewhat likely" to install the measure if the baseline were to change to ISP, and so on. The evaluation team made the following adjustments, per the panel's direction:

- "Very likely" to install the exact same efficiency level or amount of the measure were recoded to "Somewhat likely."
- "Somewhat likely" were recoded to "Slightly likely."
- "Slightly likely" were recoded to "Not at all likely."

[9] Six out of the 31 contractors surveyed did not feel they had enough information to provide project predictions for 2022, so the evaluation team excluded them from the calculations.

- "Not at all likely" were not recoded.

4.2 RECOMMENDATIONS & CONSIDERATIONS

Table 6 shows the NTG values the consensus group agreed to for 2022, 2023, and 2024. **The PAs should adopt the NTG value below for 2022, and for 2023 and 2024 if the PAs do not measure NTG again before then.**

To ensure the greatest accuracy of the prospective NTGRs, the PAs should consider the possibility measuring NTG again in less than three years, especially if the program changes again after the recent baseline adjustment.

Table 6: Prospective 2022 to 2024 NTG Results

Consensus Panel	FR	PSO	NPSO	Prospective NTGR
EEAC Representatives	22%	2%	10%	90%
PAs	22%	2%	17%	97%
Evaluation Consultants	22%	2%	10%	90%
Average	**22%**	**2%**	**12%**	**92%**

Section 5 Additional Results

This section presents additional results from the participant surveys.

5.1 Likely Program Growth and Impact

Contractors expected a lower share of their projects to receive incentives from the R&A Initiative in 2022.

The survey asked contractors the percent of their R&A projects that received incentives from January 1, 2019 through March 14, 2020 (i.e., up to the beginning of the pandemic) and the percent they expected to receive incentives in 2022. As Table 7 shows, contractors indicated that 62% of both R&A projects received incentives from the R&A Initiative between January 1, 2019 and March 14, 2020. On average, contractors said that they expect lower shares of their projects to receive funding in 2022 (50% for renovations and 49% for additions). The differences between responses for R&A projects in the 2019 and 2022 estimates were not statistically significant at the 80% confidence level.

Compared to 2019, the median expected number of R&A projects fell by an average of 40 percentage points (from 90% to 50% for renovations) and 57 percentage points (from 100% to 43% for additions), respectively. Contractors cited uncertainty about whether future projects would qualify for the program and about future contracting opportunities as the primary drivers for expecting lower percentages of program projects. Since the evaluation team conducted the survey during the middle of the pandemic, the lower expected number of R&A projects in 2020 may also reflect the uncertainty surrounding the length and potential economic impacts of the pandemic.

Table 7: Share of R&A Projects that Received / Will Receive Incentives from R&A Initiative

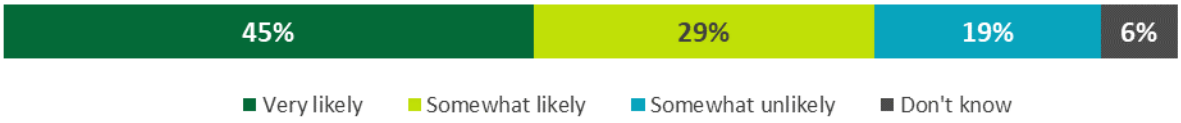
	Renovations		Additions	
	Jan. 1, 2019 – Mar. 14, 2020 (n=29)	Expected 2022 (n=25)	Jan. 1, 2019 – Mar. 14, 2020 (n=15)	Expected 2022 (n=13)[1]
Mean	62%	50%	62%	49%
Median	90%	50%	100%	43%
Min	0%	0%	0%	0%
Max	100%	100%	100%	100%

[1] Estimates restricted to respondents who indicated they completed additions projects during the 2019-2020 program period. The expected 2022 mean is 37% and median is 0% when including all respondents (n=25).

Most contractors indicated they would participate in the program in the future even if R&A Initiative requirements were raised.

When asked how likely they would be to participate in the program if new initiative standards required higher savings to maintain incentive levels (e.g., if the projects had to be more energy efficient than ISPs), 74% of respondents said they would still participate in the program (see Figure 1).

Figure 1: Likelihood of Contractor Participating in Mass Save R&A Initiative with More Stringent Baseline (n=31)

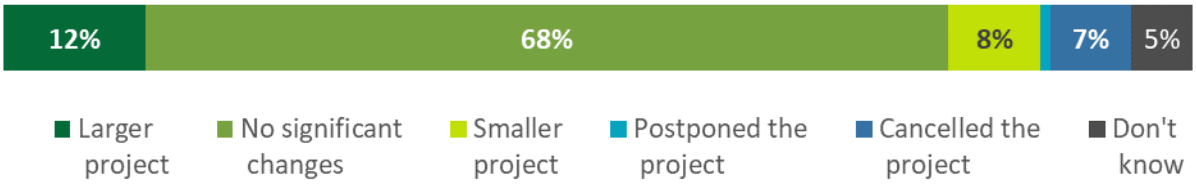


5.2 EFFECTS OF THE CORONAVIRUS

COVID-19 did not appear to affect the scope of projects for the majority of homeowners. Likewise, most contractors completed a similar number of projects in 2020 as they did in 2019.

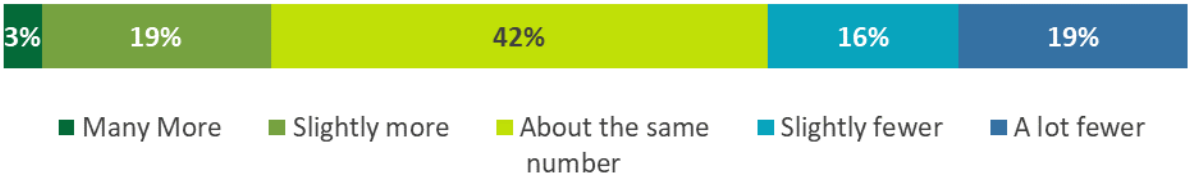
To understand how homeowners' decision-making could be affected by COVID-19, the homeowner survey asked 2019 participants how they thought their project would have been different had it started after March of 2020. As Figure 2 shows, the majority of homeowner respondents (68%) indicated there would have been no significant changes from what they had planned. While one-sixth of homeowners (16%) said they would have reduced the size and/or cost of their project, postponed, or cancelled their project, a similar number (12%) said they would have increased the scope and/or cost of their project.

Figure 2: COVID-19 Impact on Scope of Homeowner Projects (n=116)



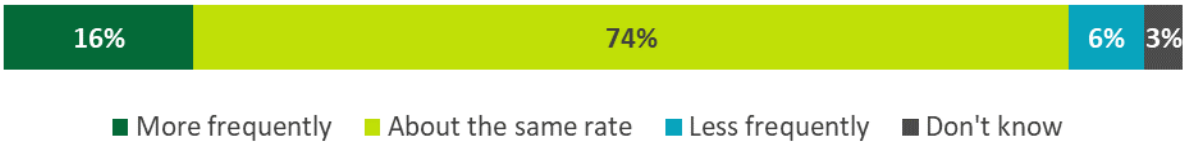
In a similar vein, the contractor survey asked contractors how many renovation and addition projects they completed in Massachusetts in 2020 compared to 2019, and whether they recommended high-efficiency measures for their renovation and addition projects in 2020 more frequently, at about the same rate, or less frequently than in 2019. The contractor responses in Figure 3 show similar results to those of homeowners, with a majority (64%) of contractors saying they had completed the same number of projects, or more, in 2020 compared to 2019. About one-third of contractors (35%) said they completed fewer projects in 2020 than in 2019.

Figure 3: COVID-19 Impact on Number of Contractor Projects (n=31)



Most contractors (90%) also indicated that they recommended high-efficiency measures for their R&A projects at about the same rate, or more frequently, in 2020 than in 2019 (Figure 4). Only 6% said they recommended fewer high-efficiency measures in 2020 than in 2019.

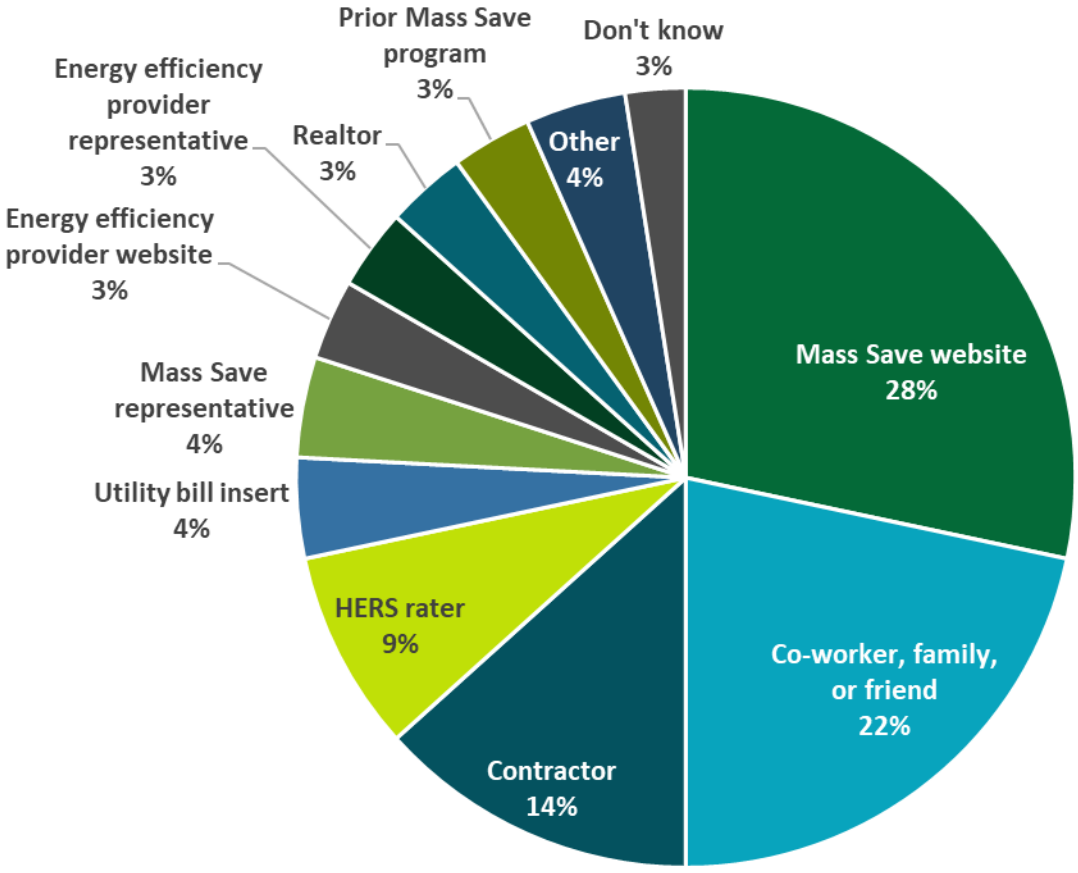
Figure 4: COVID-19 Impact on Contractor Recommendation of High-efficiency Measures (n=31)



5.3 PROGRAM EXPERIENCE

Most homeowners (65%) learned about the Initiative through the Mass Save website, a co-worker, a family member, a friend, or a contractor. The majority of contractors learned about the Mass Save Initiative from either a HERS rater or from the Mass Save website, as shown in Figure 5.

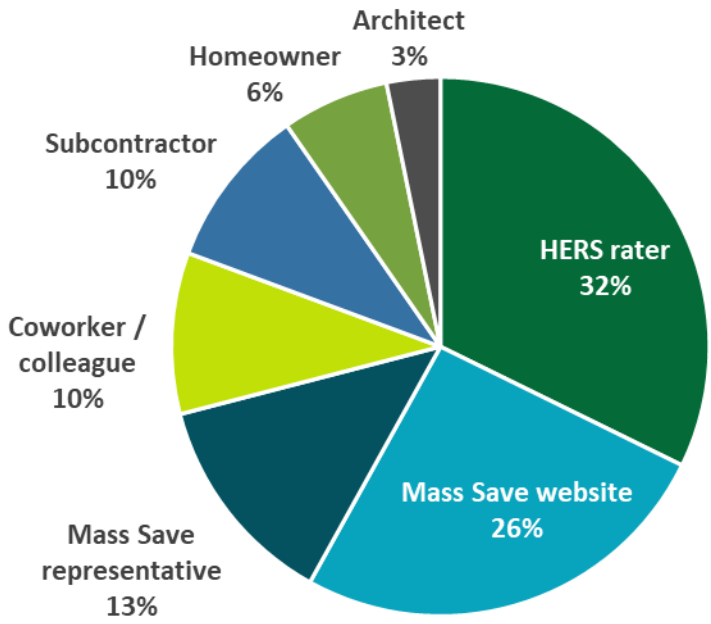
Figure 5: Sources of Homeowner Awareness of the Mass Save Initiative (n=116)



The survey also asked homeowners who learned about the Mass Save Initiative from a co-worker, a family member, or a friend whether the person that told them about the initiative also received an incentive for their own renovation or addition project. About one-third (32%) of respondents said yes.

By comparison, a majority of contractors learned about the Mass Save Initiative from either a HERS rater (32%) or the Mass Save website (26%) (Figure 6).

Figure 6: Contractors Awareness of the Mass Save Initiative (n=31)

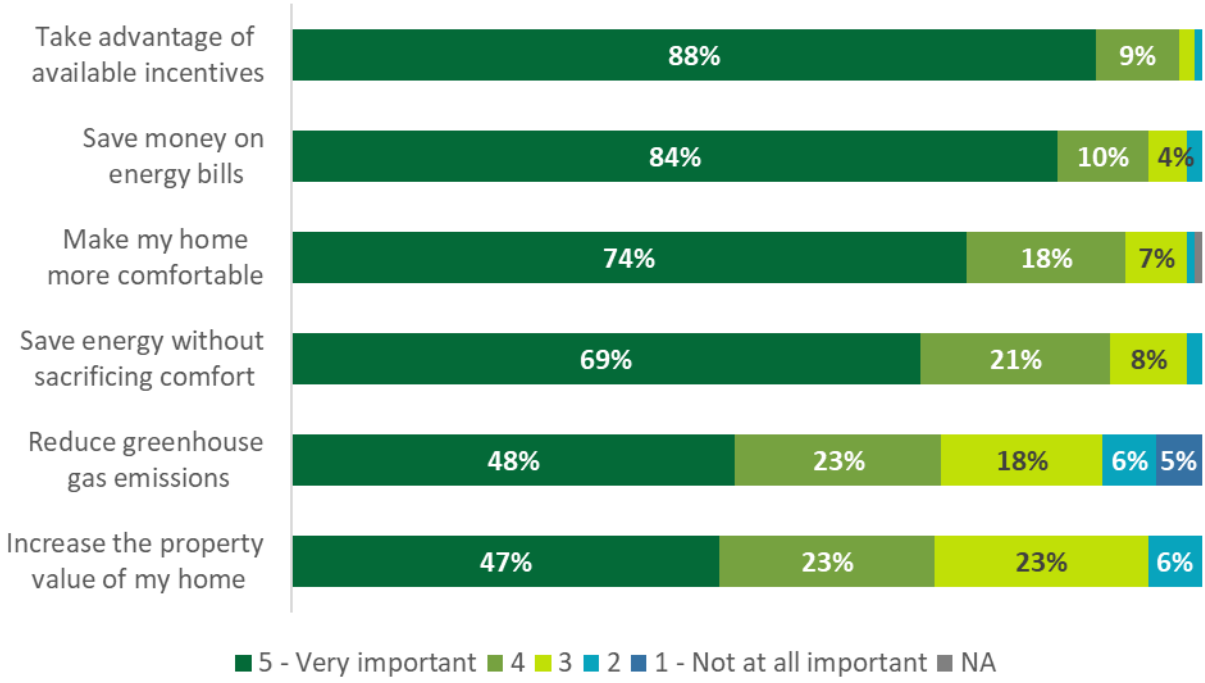


Most contractors did not participate in any Mass Save trainings about the R&A Initiative. However, most contractors indicated that more than half of their recent R&A projects received incentives from the Mass Save Initiative.

We also asked contractors if they participated in any Mass Save trainings specifically about the Mass Save Residential R&A Initiative. Only three out of the 31 respondents reported participating in trainings related to R&A, but it is not clear whether the respondents were referencing trainings offered by the R&A Initiative or another program such as the Codes and Standards Compliance and Support Initiative. Two of the three that received training reported learning new energy-efficient practices during the training(s). The respondents reported learning about practices related to lighting density, combination water heating and HVAC systems, and other water heating systems.

The survey asked homeowners to rate the importance of various factors on their decision to participate in the Mass Save Initiative. Figure 7 shows that at least 90% of homeowners said taking advantage of available incentives, saving money on energy bills, making the home more comfortable, and saving energy without sacrificing comfort were very or somewhat important factors (i.e., a 4 or 5 rating) in their decision to participate in the program. By comparison, 71% of homeowners said reducing greenhouse gas emissions was a very or somewhat important factor, and 70% said increasing the property value of their home was a very or somewhat important factor.

Figure 7: Factors Influencing the Decision to Participate in the Mass Save Initiative (n=120)



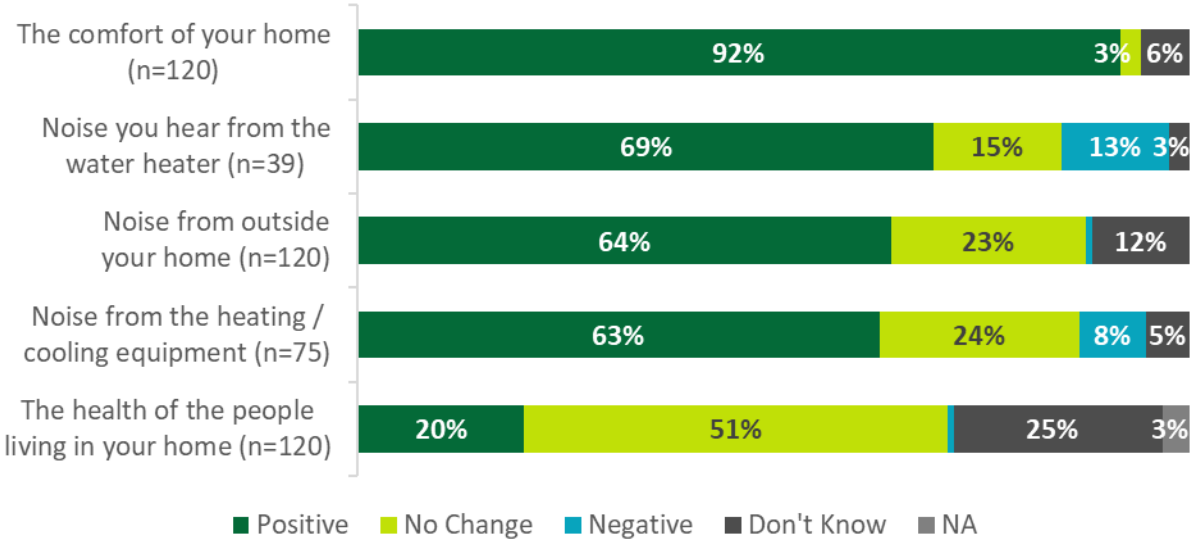
5.4 Non-Energy Impacts (NEIs) and Program Satisfaction

5.4.1 NEIs

The majority of homeowners reported increased comfort of their home and reduced noise from the water heater, heating/cooling equipment, and outside the home as positive changes that can be attributed to their completed project. Contractors reported similar NEIs based on their experience working with homeowners.

When asked about NEIs that could be attributed to their completed renovation or addition project, nearly all homeowner respondents (92%) indicated that the home was more comfortable, shown in Figure 8**.** Other NEIs reported by a substantial share of homeowners included reduced noise from the water heater (69%), from heating/cooling equipment (63%), and from outside their home (64%).

Figure 8: NEIs in the Home that can be Attributed to the Completed Project



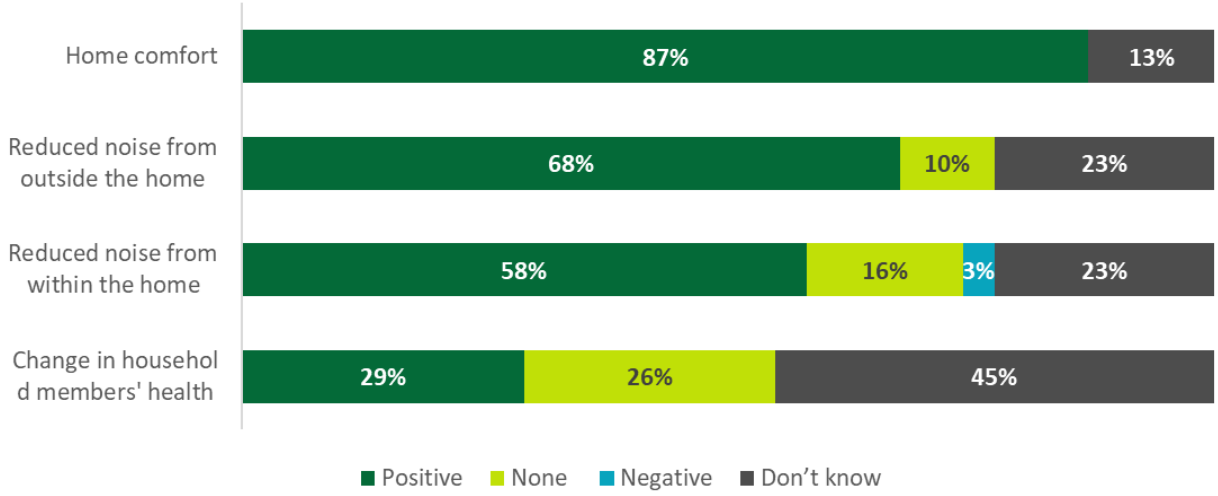
The survey asked homeowner respondents who indicated that people in their household experienced changes to their health due to the project to describe the change. Table 8 shows seven of the 24 respondents who said their household experienced house impacts cited improved air quality and five indicated reduced colds and/or sinus infections. Other homeowners reported improved emotional health, reduced allergies, improved sleep/rest, and reduced mold. One respondent indicated a negative change due to drier air resulting in sore throats.

Table 8: Health Impacts Since Project Completion (n=24)

NEI	Respondents
Improved Air Quality	7
Reduced Colds and/or Sinus Infections	5
Improved Emotional Health	4
Reduced Allergies	4
Improved Sleep/Rest	2
Reduced Mold	2

The survey also asked contractors if any of the customers for whom they have performed renovations or additions through the R&A Initiative told them they had experienced specific NEIs. Contractor responses (Figure 9) were similar to those of homeowners. A majority of contractors indicated that customers had told them about increases in home comfort (87%), and about reduced noise from outside (68%) and from within (58%) the home. Close to a third (29%) of contractors said that customers had reported positive changes in household members' health.

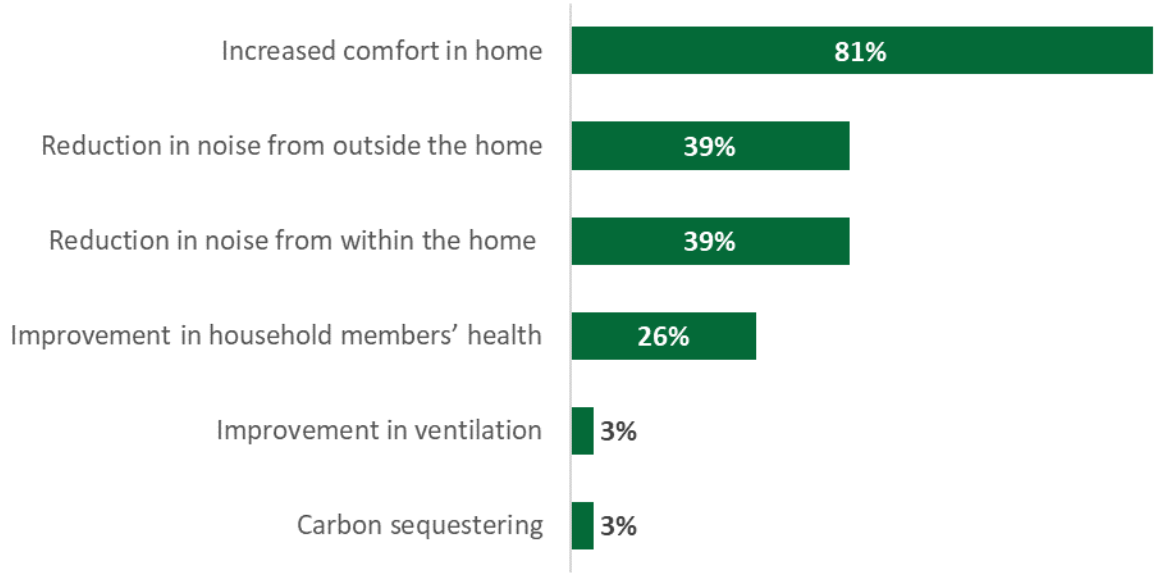
Figure 9: Contractors Perspective on Changes in Customers Homes Due to Completed Projects (n=31)



The survey asked contractors about which NEIs, if any, they emphasize to potential renovations or additions customers (Figure 10). Most responding contractors (81%) emphasized increased comfort in the home to customers. Other popular responses included reduced noise from outside the home (39%), reduced noise from within the home (39%), and improvement in household members' health (e.g., fewer asthma, cold/flu, or arthritis symptoms; 26%). Other responses included improvement in ventilation and the carbon sequestering properties of cellulose insulation.

Figure 10: NEIs Contractors Emphasize to R&A Customers (n=31)

(Multiple Response)

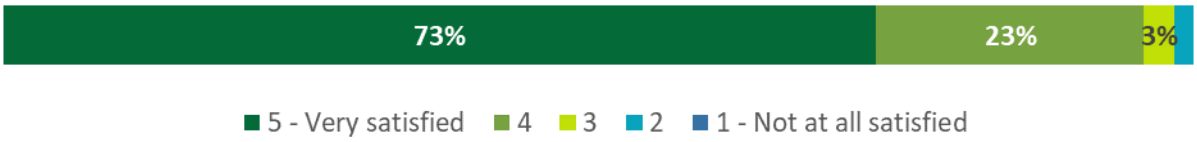


5.4.2 Program Satisfaction and Recommendation

Nearly all homeowners and contractors were highly satisfied with the Mass Save Initiative. Nearly all the homeowners had recommended the initiative to others, and the few who had not recommended it said they would be likely to. A majority of the contractors said they would recommend the program to customers.

When asked about their satisfaction with the Mass Save Initiative on a scale of 1 to 5, where one is "not at all satisfied" and 5 is "very satisfied," nearly all respondents (96%) indicated they were satisfied (4 or 5 rating) with the R&A Initiative (Figure 11). Homeowner respondents who indicated lower levels of satisfaction explained that the Mass Save project led to decreased comfort or that there was a lack of collaboration between homeowner and Mass Save staff during project planning.

Figure 11: Homeowner Satisfaction with the Mass Save Initiative (n=120)



Contractor responses were similar to those of homeowners. The large majority of contractors (94% of 31 respondents) indicated they were satisfied (4 or 5 rating) with the initiative. One contractor was neutral (3 rating), and one was not satisfied (2 rating). The contractor respondent who indicated a lower level of satisfaction explained that the incentive delivery process takes too long.

When asked if they had recommended the Mass Save Initiative to others, a large majority of homeowner respondents (93% of 120 respondents) indicated that they had, while only a few had not (6%) or did not know (1%).

For the homeowner respondents who had not recommended the initiative to others in the past (eight of 120 respondents), the web survey asked how likely they would be to recommend the R&A Initiative to a friend on a scale of zero to ten, where zero is "extremely unlikely" and ten is "extremely likely." This rating is used to calculate the Net Promoter Score (NPS)[10] by grouping respondents as promoters (score 9-10), passives (7-8), and detractors (0-6). The NPS is calculated by subtracting the percentage of detractors from the percentage of promoters. The web survey also asked contractors the likelihood that they would recommend the initiative to customers, using the same response scale.

The NPS is 100% for homeowners and 68% for contractors, as shown in Table 9.

[10] The NPS is a well-established measure of customer loyalty.

Table 9: Likelihood of Recommending R&A Initiative

Recommendation Likelihood	Homeowners	Contractors
Number of Respondents	8	31
9 to 10 (Promoters)	7	74%
7 to 8 (Passives)	1	20%
0 to 6 (Detractors)	0	6%
NPS	100%	68%

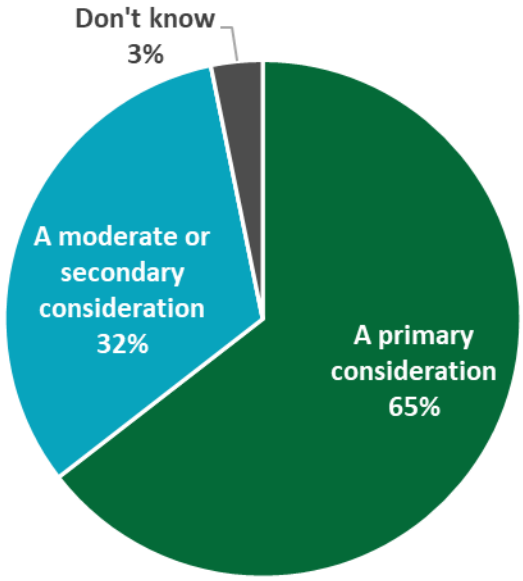
5.5 Opportunities and Barriers to Participation

5.5.1 Opportunities

Nearly all contractors indicated that the energy efficiency of the project was at least a moderate consideration for the homeowner.

When asked how much of a priority the energy efficiency of the renovation or addition project was for the homeowner, 65% of responding contractors said this was a primary consideration for the homeowner, whereas 32% said energy efficiency was a moderate or secondary consideration for the homeowner (see Figure 12).

Figure 12: Importance of Energy Efficiency to the Homeowner for Their R&A Project (n=31)



5.5.2 Barriers

Lack of awareness of the initiatives and the extra hassle of participating were the main barriers preventing more contractors from participating.

The survey asked contractors what barriers they believe prevent other contractors from participating in the Residential R&A Initiative. Figure 13 shows that respondents believe the top barriers to participation include contractors not knowing about the Initiative (58%), homeowners not knowing about it (39%), and the extra hassle it takes to participate (39%). One-quarter of responding contractors (26%) also indicated that a lack of contractor interest in or awareness of efficient practices, complex or unclear participation requirements, and/or too low of an incentive were barriers preventing more contractor participation. Other responses included a lack of customer interest in or awareness of efficient practices (16%) and timing concerns when it comes to filing for and receiving rebates (13%).

Figure 13: Barriers Preventing More Contractors from Participating in the R&A Initiative (n=31)
(Multiple Response)

Appendix A NTG Supporting Details

A.1 Baselines by Measure

Table 10 shows the current program measure baselines.

Table 10: Current Program Measure Baselines

Measure	Baseline
Water Heating (indirect/tankless coil)	Pre-existing conditions
Water Heating (all others)	ISP
Heating	ISP
Cooling	ISP
Windows	ISP
Ceiling Insulation	ISP
Framed Floor Insulation	ISP
Wall Insulation	ISP
Foundation Wall Insulation	Pre-existing conditions
Duct Insulation	Pre-existing conditions
Air Infiltration	Pre-existing conditions

A.2 Free-ridership

Table 11 through Table 14 provide the measure-level results, baseline efficiency values, and weights used in the FR, spillover, and NTG calculations.

Table 11: Average Contractor Retrospective FR by Measure

Measure	Sample size	Average Contractor FR Score
Water Heating	18	0.81
Heating	16	0.68
Cooling	11	0.78
Windows	16	0.83
Ceiling Insulation	14	0.83
Framed Floor Insulation	13	0.85
Foundation Wall Insulation	4	0.76
Wall Insulation	13	0.88
Duct Insulation	3	0.92
Air Infiltration	4	0.66

A.3 PARTICIPANT SPILLOVER

Table 12: PSO Savings by Measure

Measure	kWh Savings	MMBtu Savings	Total Savings (MMBtu)	TRM Source
Prescriptive Measures				
Appliance - Clothes Dryer (ENERGY STAR)	160	--	0.55	MA 2019-2021
Appliance - Clothes Washer	255	--	0.87	MA 2019-2021
Appliance - Dehumidifier	167.6	--	0.57	MA 2019-2021
Appliance - Room Air Cleaner (ENERGY STAR)	391	--	1.33	MA 2019-2021
ENERGY STAR Compact dishwasher with electric DHW	19.01	--	0.06	IL TRM 2021
ENERGY STAR Compact dishwasher with gas DHW	8.4	0.46	0.49	IL TRM 2021
HVAC - Central Air Conditioning	345.3	--	1.18	MA 2019-2021
HVAC - Communicating Thermostat	18	3.11	3.17	MA 2019-2021
HVAC - Ductless Mini-split Heat Pump	499	--	1.70	MA 2019-2021
HVAC - Furnace, Gas	104.2	10.05	10.41	MA 2019-2021
Lighting - LED Bulb	37.1	--	0.13	MA 2019-2021
Refrigerators and Refrigerator-freezers with manual defrost	36.9	--	0.13	IL TRM 2021
Water Heater, On Demand, Gas	-43	7.3	7.15	MA 2019-2021
Water Heater, On Demand, Other	-43	5.4	5.25	MA 2019-2021
Custom Measures				
Air infiltration		Algorithm		IL TRM 2021
Attic Insulation		Algorithm		IL TRM 2021
Basement Wall Insulation		Algorithm		IL TRM 2021

A.3.1 Sample Participant Spillover Calculation

Below, we present an example of the PSO calculation of energy savings for air sealing. We used the air sealing algorithms provided in the 2021 Illinois TRM v9.0.

Example: A single story single-family non-income eligible home in Newburyport, MA, that participated in the R&A Program installing attic insulation has a 93.8 AFUE gas furnace for heating and mini-split with 26 SEER for cooling. The area of the home is 1,680 square feet. As a result of participation in the program, this household also completed air sealing that did not receive incentives through the program.

The evaluation team was not able to collect detailed information about the air sealing, so we applied the average ACH50 for homes that conducted air sealing through the program, which we collected from the program tracking data. The average ACH50 for program homes was 14.24 before program participation and 4.59 after. We used the area of the home and average ACH50 to calculate CFM50 for the algorithm.

$$CFM50_{existing} = (Area * 8 * ACH50_{existing})/60$$

$$= (1{,}680 * 8 * 14.24)/60$$

= 3,189.75

$$CFM50_{new} = (Area * 8 * ACH50_{new})/60$$

$$= (1{,}680 * 8 * 4.59)/60$$

= 1,029.26

The algorithm for calculating electric cooling savings for air sealing is as follows:

kWh cooling savings $= ((((CFM50_{existing} - CFM50_{new})/N_{cool}) * 60 * 24 * CDD * DUA * 0.018)/(1000 * \eta_{cool}) * LM * Adj_{air\ sealing\ cool}) * IE_{net\ correction} * \%_{cooling}$

$$= ((((3{,}189.75 - 1{,}029.26)/20) * 60 * 24 * 3{,}432 * 0.75 * 0.018)/(1{,}000 * 26) * 3.2 * 121\%) * 110\% * 100\%$$

$$= 1{,}180.65\ kWh$$

The evaluation team applied the same method to calculate the electric savings from reduced fan use due to heating and natural gas savings. The evaluation team used a conversion factor to convert kWh to MMBtu so that the savings could be summed to a single savings value. The evaluation team believes there is a strong argument for assuming spillover measures are more limited in scope and efficiency when compared to the same measures supported with program incentives. For this reason, we applied a 50% discount factor to the savings as follows:

Discounted kWh cooling savings $= (kWh\ cooling\ savings\ \times discount\ factor)$

$$= (1{,}180.65 \times 50\%)$$

$$= 590.33\ kWh$$

A.4 NON-PARTICIPANT SPILLOVER

Table 13: NPSO - Average Program Baseline R-values

Measures	Renovations Average Pre-existing Condition Program R-values	Additions Average UDRH Minimum Program R-values[1]
Above-Grade Exterior Walls	5.14	21.8
Attic Floors	12.02	43.8
Finished Basement Walls	2.59	15.2
Floors Over Unfinished Basements, Ambient Space	3.75	30.1
Supply Ducts in Unfinished Attics	NA	6.6
Supply Ducts in Unfinished Basements	0.46	5.6
Unfinished Basement Walls	NA	0.6
Vaulted Ceilings / Roof Rafters	7.42	41.6

[1] NMR Group, Inc. 2019 Residential New Construction Baseline/Compliance Study (MA19X02-B-RNCBL). For the Massachusetts Program Administrators. April 2020. https://ma-eeac.org/wp-content/uploads/MA19X02-B-RNCBL_ResBaselineOverallReport_Final_2020.04.01_v2.pdf

Table 14: REM/Rate MA-REC Measure-level Weighting[1]

Measure	Weight
Air Leakage	15%
Duct Leakage and Insulation	11%
Insulation	74%

[1] NMR Group, Inc. 2019 Residential New Construction Baseline/Compliance Study (MA19X02-B-RNCBL). For the Massachusetts Program Administrators. April 2020. https://ma-eeac.org/wp-content/uploads/MA19X02-B-RNCBL_ResBaselineOverallReport_Final_2020.04.01_v2.pdf

Appendix B Participant Survey Frequency Tables

The surveys asked a battery of FR and spillover questions related to the measures installed through the program. Table 15 through Table 24 provide the responses to the questions.

B.1 HOMEOWNER SURVEY

B.1.1 Free-ridership

Table 15: How Homeowners Selected the Measures to Include In their Project

	DHW	Heating	Cooling	Windows	Foundation Walls	Walls	Framed Floors	Ceilings
Number of respondents	39	55	65	64	15	76	55	99
I did research and made my own choice	41%	31%	21%	36%	53%	38%	24%	21%
My contractor suggested one efficiency level, and I agreed	39%	44%	48%	34%	33%	32%	49%	43%
My contractor suggested various efficiency levels, and I chose one	20%	25%	31%	30%	14%	30%	27%	36%

Table 16: Likelihood of Installing Any Type of Measure Without Program Incentive

	DHW	Heating	Cooling	Windows	Foundation Walls	Walls	Framed Floors	Ceilings
Number of respondents	17	35	55	64	15	76	55	99
Very likely	47%	37%	56%	52%	33%	64%	62%	66%
Somewhat likely	23%	34%	20%	23%	33%	16%	14%	16%
Slightly likely	18%	20%	17%	8%	7%	7%	13%	10%
Not at all likely	12%	9%	5%	12%	27%	11%	7%	6%
Don’t know	0%	0%	2%	5%	0%	3%	4%	2%

Table 17: Timing of Installing Measure Without Program Incentive

	DHW	Heating	Cooling	Windows	Foundation Walls	Walls	Framed Floors	Ceilings
Number of respondents	7	19	20	20	6	17	15	26
Within 6 months of installation	2	8	6	13	3	12	5	11
Between 6 months and 12 months of installation	0	0	4	1	0	0	2	2
More than 1 year after installation	4	7	7	3	2	1	2	4
Don't know	1	4	3	3	1	4	6	9

Table 18: Likelihood of Installing the Exact Same High-efficiency Level / Amount of Measure Without Program Incentive

	DHW	Heating	Cooling	Windows	Foundation Walls	Walls	Framed Floors	Ceilings
Number of respondents	39	55	65	64	15	76	55	99
Very likely	46%	45%	48%	53%	40%	37%	46%	46%
Somewhat likely	20%	35%	29%	23%	13%	25%	22%	17%
Slightly likely	20%	9%	9%	13%	7%	13%	16%	18%
Not at all likely	14%	9%	11%	8%	33%	21%	9%	17%
Don't know	0%	2%	3%	3%	7%	4%	7%	2%

Figure 14: Contractor Influence on Decision to Install High-efficiency Measure
(Scale of 0 to 10, where 0 is “not at all influential” and 10 is “very influential”)

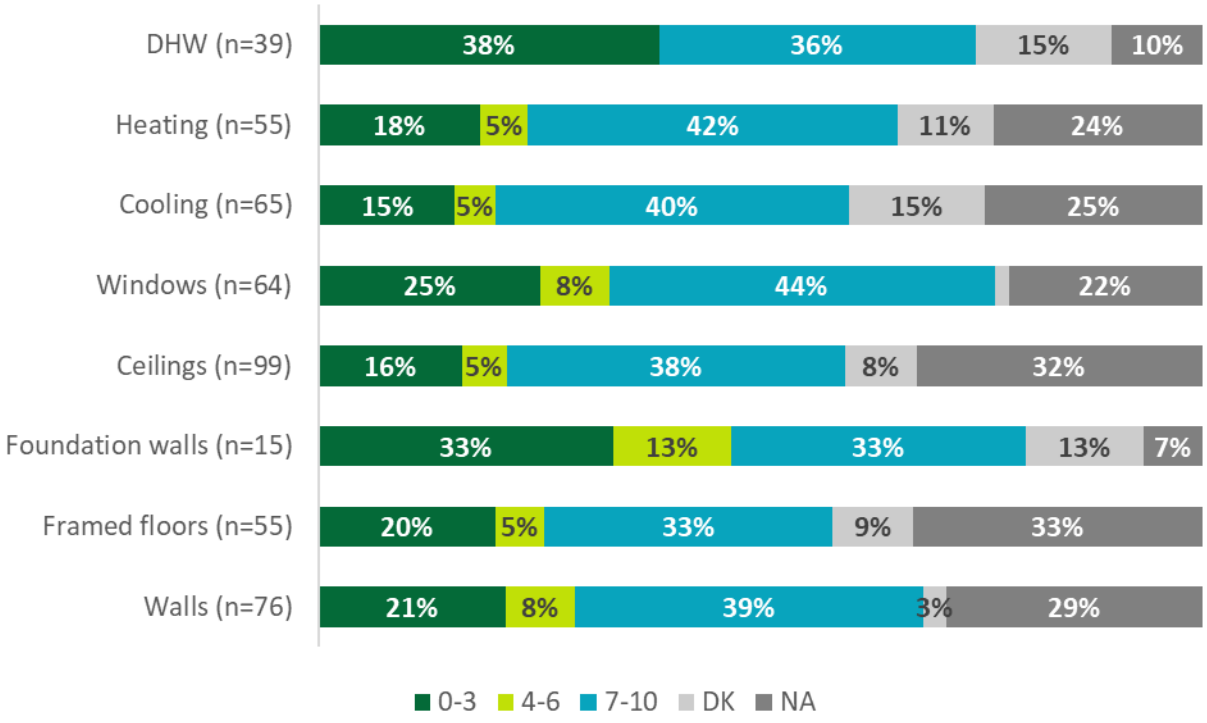
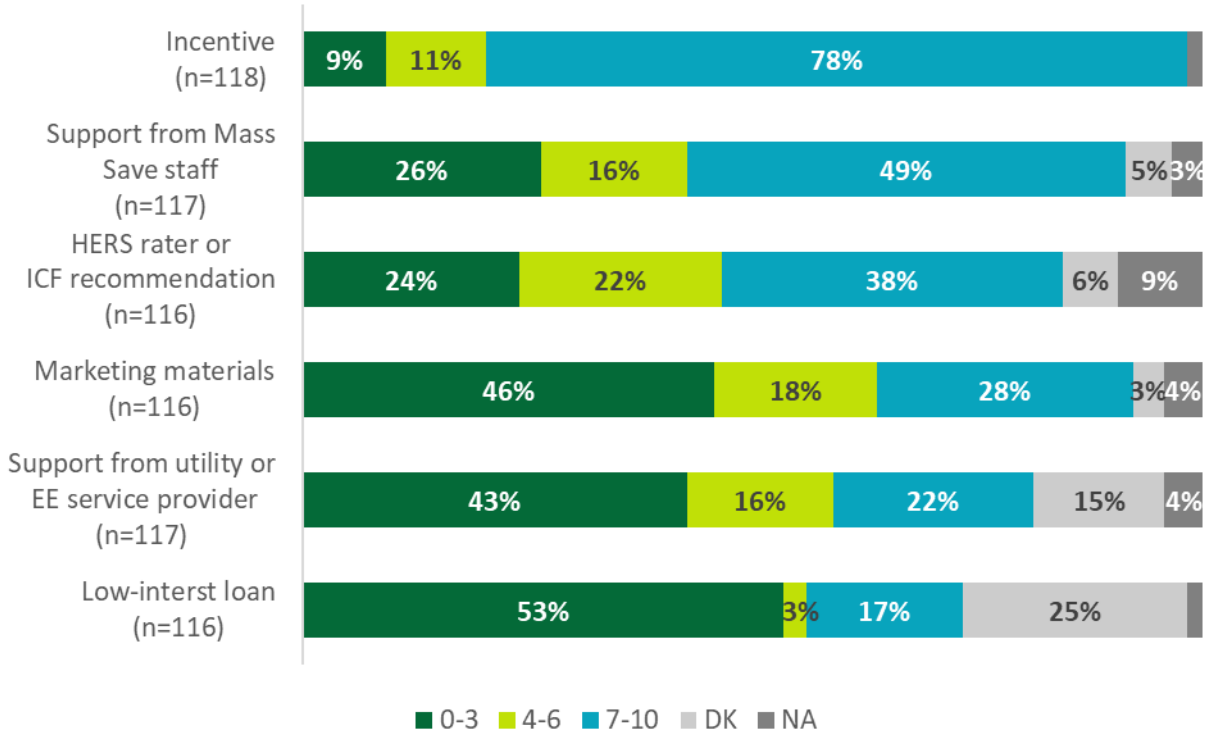


Figure 15: Program Influence on Project Efficiency Level

(Scale of 0 to 10, where 0 is “not at all influential” and 10 is “very influential”)



B.1.2 Participant Spillover

Table 19: Importance of Program Experience on Decision to Install Spillover Measures

	Energy-efficient Appliance(s)	HVAC Equipment	Attic, wall, or basement insulation	Duct sealing or duct insulation	Sealing of air leaks / drafts	Smart Thermostat	Water Heater	Other
Number of respondents	15	4	6	4	10	6	3	3
Very important	5	2	3	2	4	3	2	0
Somewhat important	4	1	1	1	3	0	1	2
Slightly important	2	0	1	0	1	0	0	0
Not at all important	2	1	1	1	2	2	0	1
Don't know	2	0	0	0	0	1	0	0

Table 20: Likelihood of Installing Spillover Measures Without Incentive

	Energy-efficient Appliance(s)	HVAC Equipment	Attic, wall, or basement insulation	Duct sealing or duct insulation	Sealing of air leaks / drafts	Smart Thermostat	Water Heater	Other
Number of respondents	10	4	9	4	14	6	3	4
Very likely	4	2	3	2	5	4	1	1
Somewhat likely	4	1	4	1	5	1	1	2
Slightly likely	2	1	1	1	3	0	1	1
Not at all likely	0	0	1	0	1	1	0	0
Very likely	4	2	3	2	5	4	1	1

B.2 CONTRACTOR SURVEY

B.2.1 Free-ridership

Table 21: Contractor Likelihood of Installing the Same Efficiency / Amount of Measure Without Program Incentive

	DHW	Heating	Cooling	Windows	Ceilings	Framed Floors	Foundation Walls	Walls	Ducts	Air Infiltration
Number of respondents	18	16	11	16	14	13	4	13	3	4
Very likely	11	9	6	9	10	6	4	9	2	2
Somewhat likely	5	5	3	5	3	5	0	3	0	1
Slightly likely	1	1	1	1	1	1	0	1	0	0
Not at all likely	1	1	1	1	0	1	0	0	1	1

B.2.2 Non-participant Spillover

Table 22: Contractor Insulation Practices that Do Not Receive Incentives[1]
(Practices starting after 2018)

	Above-grade Exterior Walls	Attic Floors	Vaulted Ceilings / Roof Rafters	Unfinished Basement Walls	Finished Basement Walls	Supply Ducts in Unfinished Basements
Total respondents	5	1	3	1	2	2
Renovations	5	1	3	1	2	2
Additions	0	0	0	0	0	2

[1] To qualify as spillover, contractor reported R-values for insulation practices must meet the minimum for the average pre-existing condition in program homes for renovation projects and UDRH minimum for addition projects.

Figure 16: Program Influence on Decision to Incorporate Efficient Insulation Practices (n=22)
(Scale of 0 to 10, where 0 is "not at all influential" and 10 is "very influential")

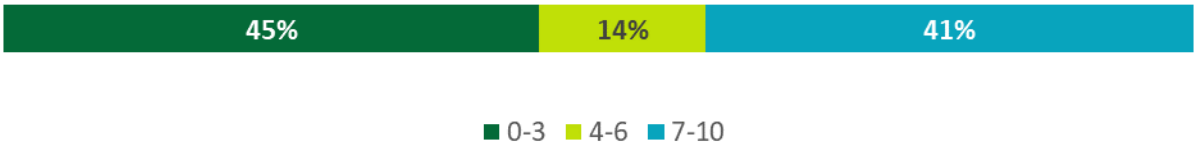


Table 23: Contractor Energy-efficient Practices that Do Not Receive Incentives
(Practices starting after 2018)

	Duct Practices	Air Sealing Practices
Total respondents	2	4
Renovations	2	3
Additions	1	2

Table 24: Program Influence on Decision to Incorporate Energy-efficient Duct and Air Sealing Practices (n=22)
(Practices starting after 2018)

	Duct Practices	Air Sealing Practices
Total respondents	2	5
Very influential	0	2
Somewhat influential	0	3
Not at all influential	2	0
Don't know	0	0

Appendix C Survey Instruments

C.1 HOMEOWNER SURVEY

C.1.1 Overview

Table 25: Overview of Data Collection Activities

Descriptor	This Instrument
Instrument Type	Web survey
Estimated Time to Complete	20 minutes
Respondent Type	Participating homeowners through 3/14/20
Completion Goal	70

Table 26: Research Topics and Associated Question Numbers

Topic	Question Numbers
Introduction/ Verification	V1-V7
Awareness and Motivation	A1-A3
NTG	FR1-FR11, SO1-SO7
NEIs and Satisfaction	NE1-NE2, SA1-SA5
COVID-19	CO1

Table 27: Variable Information

Read-in Variable	Variable Description
Year	Year in which contractor's project was completed
Address	Address where measure(s) was installed
Measure	Measure(s) installed through program. Anticipated measures to include for homeowner survey include the following: • Insulation; • Heating and cooling systems; and • Water heaters. Other measures factored into performance-based incentive but not included in measure-level questions include lighting, air sealing, duct sealing, and any direct install water measures.
Equipment	Broad category of all measure(s) installed through program. Anticipated equipment types include heating and/or cooling system, water heater, and insulation.

C.1.2 Introduction

INTRO1. We are conducting a survey on behalf of your local electric and natural gas utilities and energy-efficiency service provider to assess some of the energy-efficiency offerings from the Sponsors of Mass Save.

Our records show that you or your contractor received an incentive from Mass Save for a renovation or addition project in 2019 or 2020, through the Mass Save Residential R&A Initiative. This survey asks about your experience with that process.

All of your responses will be maintained in strict confidentiality. This survey should take approximately 20 minutes to complete. We will send you a $50 Amazon gift card to thank you for completing the survey.

If you need help participating in this survey, you may contact Shirley Pon of NMR at (617) 544-2032 or spon@nmrgoupinc.com.

If you have questions about the purpose of this study, you may contact Tracy Dyke-Redmond of Eversource at (781) 441-3389 or tracy.dyke-redmond@eversource.com.

INTRO2. In this survey, we will be asking about renovations and additions, which for the purposes of this survey, are defined as follows:

Renovations are major remodeling projects. Examples include updating a kitchen, bathroom, bedroom, or living room by removing drywall, exposing framing members, or changing the room substantially. These projects **do not** make the home bigger. They **do not** include routine maintenance or repair work such as painting, decorating, fixing broken water pipes, doing a like-for-like replacement for failed heating or cooling equipment, or landscaping.

Additions make the home bigger. Examples include building a new section of the home, adding a story, or turning a basement or attic into finished living space. Changing the function of a room, such as turning a closet into a bathroom is **not** an addition; that is a renovation for our purposes.

C.1.3 Verification

[BASE: ALL]

V1. Our records show that you completed a renovation and/or addition project within the last two years at **[ADDRESS]**. Is that correct?

1. Yes
2. No, that home did not recently undergo a renovation or addition. **[GO TO T1]**
3. No. It was completed at the following address: _____ **[OPEN END].**
98. Don't know **[GO TO T1]**

V2. Are you the homeowner most knowledgeable about what was included in your renovation or addition project?

1. Yes
2. No, there is another homeowner more knowledgeable about the project **[GO TO V3]**

3. No, I'm the contractor who was involved in this project **[SEND TO CONTRACTOR SURVEY LINK]**
98. Don't know **[GO TO T1]**

V3. **[ASK IF V2=2]** Can you provide the email address of the homeowner most knowledgeable about the details of that renovation or addition project?
[OPEN ENDED RESPONSE; 99 = REFUSED]
[GO TO T2]

V4. Our records show that your project was completed in **[YEAR].** Is that correct?
1. Yes
2. No. It was completed in ____ **[OPEN END]**.

V5. Which of the following did your renovation or addition project include? Please select all that apply. **[ALLOW MULTIPLE RESPONSE]**
Common renovations: [RANDOMIZE 1-5]
1. Kitchen
2. Bathroom
3. Bedroom
4. Living/dining room
5. Combining rooms by removing interior walls
6. Other: _____ **[OPEN END]**

Common additions: [RANDOMIZE 1-4]
1. Finishing a basement
2. Finishing a porch or sunroom
3. Finishing an attic space or bonus room over a garage
4. Building a new section or story that is attached to the existing home
5. Other: _____ **[OPEN END]**

V6. While there may have been other measures installed, we ask that you focus on the measures listed below. Can you confirm that the following measures listed below were included in your project?
[POPULATE FOR RELEVANT MEASURES IN MATRIX]
1. Yes **[GO TO NEXT SECTION]**
2.No, I do not recall the work you are describing **[GO TO T1]**
98.Don't know **[GO TO T1]**

A. **[DISPLAY IF MEASURE = INSULATION]**
B. **[DISPLAY IF MEASURE = HVAC]**
C. **[DISPLAY IF MEASURE = DHW]**

D. **[DISPLAY IF MEASURE = Windows]**

[IF V1=3, REASSIGN ADDRESS =3]
[IF V4=2, REASSIGN YEAR =2]
[IF V6=97 OR 2, REASSIGN MEASURE flag =0]
[IF ALL V6=2 or 98, TERMINATE T1]

T1. You do not qualify for this survey; thank you for your time. **[TERMINATE]**

T2. **[IF V42=1]** Those are all the questions we have. Thank you for your cooperation. **[TERMINATE]**

C.1.4 Awareness and Motivation

Topics Listed in the Workplan & MPIs Listed in Market Characterization and Potential Study:	**Q no.**
Motivations for participating in the program	A3
Where they first learned about the program	A1
Satisfied participants increase program participation: new participants report they were referred to the program by past participants.	A2
The importance of energy efficiency compared to other factors in the renovation or addition project	A3

For the rest of this survey, we will refer to the recent renovation and/or addition at your home as your "project." We also refer to the Mass Save Residential Renovations and Additions Initiative as the "Mass Save Initiative."

[BASE: ALL]

A1. How did you first learn about the Mass Save Initiative? **[RANDOMIZE 1-9, ALLOW SINGLE RESONSE]**

1. Co-worker, family, or friend **[GO TO A2]**
2. Utility bill insert
3. Mass Save website
4. Mass Save representative
5. Electric/natural gas utility or energy efficiency service provider website
6. Electric/natural gas utility or energy efficiency service provider website representative
7. Contractor
8. HERS rater

9. Social media (Facebook, LinkedIn, Twitter, Instagram, etc.)
10. Other: _____ **[OPEN END]**
98. Don't know

A2. **[IF A1=1]** Did the person who told you about the Mass Save Initiative also receive an incentive for their own renovation or addition project? **[ALLOW SINGLE RESPONSE]**

1. Yes
2. No
98. Don't know

A3. Using a scale of 1 to 5, where one is 'not important' and 5 is 'very important', how important were each of the following factors on your decisions to participate in the Mass Save Initiative? **[RESPONSE MATRIX]**

1. 1 – Not at all important
2. 2
3. 3
4. 4
5. 5 – Very important
97. Not applicable
98. Don't know

A. To save money on energy bills
B. To take advantage of available incentives
C. To reduce greenhouse gas emissions
D. To make my home more comfortable
E. To increase the property value of my home
F. To save energy without sacrificing comfort
G. Other: _____ **[OPEN END]**

C.1.5 Free-ridership

Topics Listed in the Workplan:	**Q No.**
Their role vs. the contractor's role in deciding to participate and deciding the scope of the project	FR1
Project scope and timing	FR2-FR6
Incentivized energy-efficiency features they would have included in the absence of the program (following the guidance from Consistent Methodology for Residential Self-Report Net-to-Gross Measurement (RES19X03-B-RSRNTG) "The team does not believe that homeowners will be able to answer questions about specific efficiency levels and as a result they will be asked a more generic battery of NTG questions regarding what they would have done without the program."	FR7-FR9
Importance of the incentives, loans, and direct install measures in decision to participate	FR10-FR11

[BASE: INSULATION, WINDOWS, HVAC, or DHW] [LOOP FOR RELEVANT MEASURES]

FR1. Which of the following best describes how you selected the **[MEASURE]** to include in your project? **[RANDOMIZE 1-3, ALLOW SINGLE RESPONSE]**

1. I did research and made my own choice
2. My contractor suggested one efficiency level, and I agreed
3. My contractor suggested various efficiency levels, and I chose one
4. Something else: _____ **[OPEN END]**

[END LOOP]

[BASE: HVAC or DHW] [LOOP FOR RELEVANT MEASURES]

FR2. Did the **[MEASURE]** you installed replace an existing **[EQUIPMENT]** system or was it installed in addition to other systems already in your home? **[ALLOW SINGLE RESPONSE]**

1. Replaced existing equipment
2. New equipment **[SKIP TO NEXT SECTION]**
98. Don't know

FR3. **[ASK IF FR2=1]** Which of the following best describes the condition of your old **[EQUIPMENT]**? **[ALLOW SINGLE RESPONSE]**

1. The old equipment was working with no need of repair **[GO TO FR4]**
2. The old equipment was working with need of minor repair **[GO TO FR4]**
3. The old equipment was working with need of major repair
4. The old equipment was no longer working
98. Don't know **[GO TO FR4]**

FR4. **[ASK IF FR3=1, 2, 98]** Do you think your old **[EQUIPMENT]** would have lasted another two years? **[ALLOW SINGLE RESPONSE]**

1. Yes **[GO TO FR5]**
2. No
98. Don't know

[END LOOP]

[BASE: INSULATION, WINDOWS; HVAC, SKIP FOR HVAC IF HVAC FR3=4; OR DHW, SKIP FOR DHW IF DHW FR3=4] [LOOP FOR RELEVANT MEASURES]

FR5. **[ASK IF FR4=1]** Without the incentive from the Mass Save Initiative, how likely is it that you would have installed any type of **[EQUIPMENT]** as a part of your project? **[ALLOW SINGLE RESPONSE]**

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
98. Don't know

FR6. **[ASK IF FR5=2, 3]** Without the incentive from the Mass Save Initiative, when do you think you would have installed the **[EQUIPMENT]**? **[ALLOW SINGLE RESPONSE]**

1. Within 6 months of when you did
2. Between 6 months and 12 months of when you did
3. More than 1 year after when you did
98. Don't know

FR7. Without the incentive from the Mass Save Initiative, how likely is it that you would have installed the exact same **[IF MEASURE = HVAC OR DHW OR WINDOWS USE 'high-efficiency level of'; IF MEASURE = INSULATION USE 'amount of'] [MEASURE]**? **[ALLOW SINGLE RESPONSE]**

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
98. Don't know

[END LOOP]

[BASE: ALL]

FR8. On a scale of 0 to 10 where 0 is 'not at all influential' and 10 is 'very influential,' how influential was each of the following on the final energy-efficiency level of your project? **[ALLOW NUMERIC RESPONSE FROM 0 TO 10; RANDOMIZE]**

Feature	Rating	N/A	DK
a. The incentive from the Mass Save Initiative	_____		
b. Mass Save marketing materials	_____		

c. Low-interest loan from Mass Save	_____		
d. HERS rater or ICF (Program Implementer) recommendation	_____		
e. Support from electric/natural gas utility or energy efficiency service provider staff	_____		
f. Support from Mass Save staff			
g. Contractor recommendation			

[BASE: INSULATION, WINDOWS, HVAC, OR DHW] [LOOP OR MATRIX FOR RELEVANT MEASURES]

FR9. Using a 0 to 10 scale where 0 is 'not at all influential' and 10 is 'very influential,' how influential was the contractor on your decision to install the high-efficiency **[MEASURE]**? **[ALLOW NUMERIC RESPONSE FROM 0 TO 10]**

1. Rating: _____
66. Not applicable
98. Don't know

FR10. Did you make the decision to install the high-efficiency **[MEASURE]** before or after you learned of the incentive from the Mass Save Initiative? **[ALLOW SINGLE RESPONSE]**

1. Before
2. After
98. Don't know

FR11. Please describe the influence that the incentive from the Mass Save Initiative had on your decision to install the high-efficiency **[MEASURE]**: _____ **[ALLOW OPEN END RESPONSE]**

[END LOOP]

C.1.6 Spillover

[BASE: ALL]

SO1. Since participating in the program, have you made other energy-saving purchases or changes that did not receive an incentive through any other Mass Save energy-efficiency offering? **[ALLOW SINGLE RESPONSE]**

1. Yes
2. No **[SKIP TO NEXT SECTION]**
98. Don't know **[SKIP TO NEXT SECTION]**

SO2. **[ASK IF SO1=1]** Did your experience with the Mass Save Initiative influence your decision to take any of these energy-saving actions? **[ALLOW SINGLE RESPONSE]**

1. Yes
2. No **[SKIP TO NEXT SECTION]**
98. Don't know **[SKIP TO NEXT SECTION]**

SO3. **[ASK IF SO2=1]** What energy-saving purchases or changes did you make that did not receive incentives from any Mass Save offerings? **[ALLOW MULTIPLE RESPONSES]**

1. LEDs/Energy-efficient light bulbs
2. Energy-efficient appliance(s): _____ **[OPEN END] [GO TO SO4]**
3. HVAC equipment: _____ **[OPEN END] [GO TO SO4]**
4. Attic, wall, or basement insulation
5. Duct sealing or duct insulation
6. Sealing of air leaks/drafts
7. Smart thermostat
8. Water heater: _____ **[OPEN END] [GO TO SO4]**
9. Other purchases or changes: _____ **[OPEN END] [GO TO SO4]**

[ASK SO4 THROUGH SO5 FOR EACH MEASURE OTHER THAN LIGHTING SELECTED IN SO3]

SO4. **[IF SO3 = 2 or 3 or 8]** Can you describe the **[RESPONSE FROM SO3]** work in more detail? If applicable, include the quantity installed, the type of equipment, and the efficiency levels installed. **[ALLOW OPEN END RESPONSE]**

SO5. How important was your experience with the Mass Save Initiative on your decision to install the following without an incentive from Mass Save:
[LIST RESPONSES FROM SO3] [RESPONSE MATRIX; ALLOW SINGLE RESPONSE]

1. Not at all important
2. Slightly important
3. Somewhat important
4. Very important
97. Not applicable
98. Don't know

SO6. If you had not already received an incentive through the Mass Save Initiative for your renovation/addition project, how likely is it that you would still have installed following:
[LIST RESPONSES FROM SO3] [RESPONSE MATRIX; ALLOW SINGLE RESPONSE]

1. Not at all likely
2. Slightly likely
3. Somewhat likely

4. Very likely
97. Not applicable
98. Don't know

SO7. Why did you not submit an application for an incentive through Mass Save for this additional equipment? **[ALLOW OPEN END RESPONSE]**

C.1.7 NEIs and Satisfaction

Topics Listed in the Workplan & MPIs Listed in Market Characterization and Potential Study:	**Q no.**
NEIs they have experienced	NE1-NE2
Satisfaction with the program	SA1-SA2
Satisfied participants increase program participation: Participants report encouraging others to participate.	SA3-SA5

[BASE: ALL]

NE1. Since your project was completed, have you noticed a positive, negative, or no change in any of the following that can be attributed to the completed project? (A positive change would be an improvement, while a negative change would be worse than before).

1. Positive
2. Negative
3. No change
98. Don't know

A. The comfort of your home
B. Noise you hear from outside your home
C. The health of the people living in your home
D. **[IF NEW HVAC]** Noise you hear from the heating/cooling equipment
E. **[IF NEW DHW]** Noise you hear from the water heater

NE2. **[IF NE1C = 1 OR 2]** For any health changes that you attribute to the completed project, please describe how the health of the people living in your home has changed since your project was completed. **[ALLOW OPEN END]**

[BASE: ALL]

SA1. Using a scale of 1 to 5, where 1 means 'not at all satisfied' and 5 means 'very satisfied,' please tell us how satisfied you are with the Mass Save Initiative. **[ALLOW SINGLE RESPONSE]**

1. 1 - Not at all satisfied **[GO TO SA2]**
2. 2 **[GO TO SA2]**
3. 3
4. 4
5. 5 - Very satisfied
98. Don't know

SA2. **[IF SA1= 1 OR 2]** We would appreciate if you could tell us why you are not satisfied. **[ALLOW FOR OPEN END RESPONSE]**

[BASE: ALL]

SA3. Have you recommended the Mass Save Initiative to others?

1. Yes
2. No **[GO TO SA4]**
98. Don't know **[GO TO SA4]**

SA4. **[IF SA3 = 2 OR 98]** Using a scale of 0 to 10, where 0 is “extremely unlikely” and 10 is “extremely likely,” how likely are you to recommend the Mass Save Initiative to a friend? **[RECORD A WHOLE # 0-10; DON’T KNOW = 98]**

SA5. **[IF SA4<5]** Why would you be unlikely to recommend the Mass Save Initiative to a friend? **[ALLOW FOR OPEN END RESPONSE]**

C.1.8 COVID-19

Topics Listed in the Workplan:	Q no.
Effect of the coronavirus on project scope	CO1

[BASE: ALL]

CO1. Imagine that you had not yet started your project, and were in the early planning phases. Understanding that many habits and daily activities may have changed since March 2020, had how do you think your project would be different had it started after March of 2020? **[ALLOW SINGLE RESPONSE]**

1. No significant changes from what I had planned
2. I would make it a smaller or less expensive project
3. I would make it a larger or more expensive project
4. I would have cancelled the project **[SKIP TO END]**
5. Other: _____ **[OPEN END]**
98. Don't know

C.1.9 Closing

[BASE: ALL]

CL1. Those are all the questions we have. Thank you for your cooperation. Please enter the email address to which you'd like us to send your $50 electronic gift card. **[ALLOW OPEN END RESPONSE] [CONFIRM E-MAIL ADDRESS]**

C.2 CONTRACTOR SURVEY

C.2.1 Overview

Table 28: Overview of Data Collection Activities

Descriptor	This Instrument
Instrument Type	Web survey
Estimated Time to Complete	40 minutes
Respondent Type	Participating contractors through 3/14/20
Completion Goal	70

Table 29: Research Topics and Associated Question Numbers

Topic	Question Numbers
Introduction	V1-V6
Program Experience	P1-P8a
NTG	FR1-FR2
Energy-Efficiency Practices	EE1-EE20
NEIs, Barriers, and Satisfaction	H1, B1, NE1-NE2, SA1-SA4
COVID-19	CO1-CO2

Table 30: Variable Information

Read-In Variable	Variable Description
Year	Year in which contractor's project was completed
Address	Address where measure(s) was installed
Existing	What was installed before the high-efficiency measure was installed
Measure	Measure installed through program
Efficiency	Efficiency level of measure (e.g., AFUE, R-value, etc.)
Type	Project type (renovation, addition, or both)

C.2.2 Introduction

INTRO1. We are conducting a survey on behalf of the Sponsors of Mass Save ® to assess the Mass Save Residential Renovations and Additions Initiative.

Our records show that you provided contractor services to one or more Massachusetts customers who participated in the Residential Renovations and Additions Initiative in 2019 or 2020. We would like to ask you some questions about your experience.

All of your responses will be combined with answers from other respondents and all of your information will be maintained in strict confidentiality. This survey will take approximately 40 minutes to complete. We will send you a $150 electronic gift card to a retailer of your choice to thank you for completing the survey.

If you need help participating in this survey, you may contact Shirley Pon of NMR at (617) 544-2032 or spon@nmrgoupinc.com.

If you have questions about the purpose of this study, you may contact Tracy Dyke-Redmond of Eversource at (781) 441-3389 or tracy.dyke-redmond@eversource.com.

INTRO2. The Mass Save Residential Renovations and Additions Initiative provides incentives for installing of high-efficiency equipment in residential renovation and addition projects. For the purposes of this survey, renovations and additions are defined as follows:

Renovations include remodeling or major improvements that do not add to the conditioned (i.e., heated or cooled) square footage of the house. Examples include updating a kitchen, bathroom, bedroom, or living room by removing drywall, exposing framing members, or changing the room substantially. Renovations generally involve changes to multiple home components such as adding insulation to the building shell, replacing HVAC, electrical and plumbing work. They **do not** include routine maintenance or repair work such as painting, decorating, fixing broken water pipes, landscaping, new roof shingles, or projects limited to replacing a heating/cooling system or water heater.

Additions expand the conditioned square footage of the home. Examples include building a new section of the home, adding a story, or turning a basement or attic into finished living space. Changing the function of a room, such as turning a closet into a bathroom is **not** an addition; that is a renovation for our purposes.

[BASE: ALL]

V7. Our records show that you recently completed a renovation and/or addition project at **[ADDRESS]** that received an incentive from the Mass Save Residential Renovations and Additions Initiative. Is that correct?

1. Yes
2. No, I do not recall the work you are describing. **[GO TO T1]**
3. No, it was completed at _____ **[OPEN END]**.

98. Don't know **[GO TO T1]**

V8. Are you the contractor most knowledgeable about what was included in that renovation or addition project?

1. Yes
2. No, there is another contractor more knowledgeable about the project **[GO TO V9]**
3. No, I'm the homeowner that was involved in this project **[SEND TO HOMEOWNER SURVEY LINK]**

98. Don't know **[GO TO T1]**

V9. **[ASK IF V8=2]** Can you provide the email address of the contractor most knowledgeable about the details of that renovation or addition project?
[OPEN ENDED RESPONSE; 99 = REFUSED]

[GO TO T2]

V10. Our records indicate that this project was completed in **[YEAR]**. Is that correct?

1. Yes
2. No. It was completed in ____ **[OPEN END]**.

[BASE: ALL]

V11. Which of the following did this renovation or addition project include? Please select all that apply. **[MULTIPLE RESPONSE, RANDOMIZE 1-5]**

Common renovations:

1. Kitchen
2. Bathroom
3. Bedroom
4. Living/dining room
5. Combining rooms by removing interior walls
6. Other: _____ **[OPEN END]**

Common additions:

1. Finishing a basement
2. Finishing a porch or sunroom
3. Finishing an attic space or bonus room over a garage
4. Adding a story to the home
5. Building a new section or story that is attached to the existing home
6. Other: _____ **[OPEN END]**

V12. While there may have been other measures installed, we ask that you focus on the measures listed below. Can you confirm that the following measures listed below were included in your project?
[POPULATE FOR RELEVANT MEASURES IN MATRIX]

1. Yes **[GO TO NEXT SECTION]**
2. No, I do not recall the work you are describing **[GO TO T1]**
98. Don't know **[GO TO T1]**

A. **[DISPLAY IF MEASURE = HVAC]**
B. **[DISPLAY IF MEASURE = DHW]**
C. **[DISPLAY IF MEASURE = AIR INFILTRATION]**
D. **[DISPLAY IF MEASURE = DUCTS]**
E. **[DISPLAY IF MEASURE = FOUNDATION WALL INSULATION]**
F. **[DISPLAY IF MEASURE = WALL INSULATION]**
G. **[DISPLAY IF MEASURE = FRAMED FLOOR INSULATION]**
H. **[DISPLAY IF MEASURE = CEILING INSULATION]**
I. **[DISPLAY IF MEASURE = WINDOWS]**

[IF V1=3, REASSIGN ADDRESS =3]
[IF V4=2, REASSIGN YEAR =2]
[IF V12=2 OR 97, REASSIGN MEASURE FLAG=0]
[IF V12=2 AND/OR 97 FOR ALL THEN TERMINATE – T1]

T1. You do not qualify for this survey; thank you for your time. **[TERMINATE]**

T2. **[IF V53 = 1]** Thank you for your time. **[TERMINATE]**

For the rest of this survey, we will refer to the recent renovation and/or addition at **[ADDRESS]** as "the project."

C.2.3 Program Experience

Topics Listed in the Workplan & MPIs Listed in Market Characterization and Potential Study:	**Q no.**
Where they first learned about the program	P1
Participation in trainings provided by program	P2
Market actors learn new practices: Market actors participate in trainings that cover R&A work and report learning new practices	P3, P4
Frequency of repeat projects	P5

Proportion of contractor's renovations and additions projects participating in the program: • In 2019 • In 2020 • Expected in 2022 • Expected in 2024	P6, P7
Proportion of current non-participating contractors' renovations and additions projects participating in the program: • Expected in 2022 • Expected in 2024	P7
The baseline requirements they were subject to and the likelihood they would have participated had they faced more stringent requirements	P8

[BASE: ALL]

P1. How did you first learn about the Residential Renovations and Additions Initiative? **[RANDOMIZE 1-8, ALLOW SINGLE RESONSE]**

1. Coworker/colleague
2. Mass Save website
3. Mass Save representative
4. Electric/natural gas utility or energy efficiency service provider website
5. Electric/natural gas utility or energy efficiency service provider representative
6. Homeowner
7. Subcontractor
8. HERS rater
9. Other: _____ **[OPEN END]**
98. Don't know

[BASE: ALL]

P2. Did you participate in any Mass Save trainings specifically about the Mass Save Residential Renovations and Additions Initiative? **[ALLOW SINGLE RESONSE]**

1. Yes
2. No
98. Don't know

P3. **[ASK IF P2=1]** Did you learn any new energy-efficient practices in the training(s)? **[ALLOW SINGLE RESONSE]**

1. Yes
2. No
98. Don't know

P4. **[ASK IF P3=1]** What energy-efficient practices did you learn? **[OPEN END RESPONSE]**

[BASE: ALL]

P5. Approximately how many renovation and addition projects did you complete in Massachusetts in 2019? Please count all of your projects regardless of program participation. For projects that included a renovation to the existing home and also building an addition, please count the project twice, once as a renovation and once as an addition.

1. **[OPEN-ENDED NUMERIC RESPONSE FROM 0 TO 99]**
98. Don't know

a. Renovations ___	b. Additions ___

[BASE: ALL]

P6. Approximately what percent of your renovation and addition projects completed in 2019 received incentives from the Mass Save Renovations and Additions Initiative? **[ALLOW PERCENTAGE RESPONSE FROM 0% TO 100%; INCLUDE DK OPTIONS FOR EACH]**

1. Renovations **[DISPLAY IF P5a>0]**	2. Additions **[DISPLAY IF P5b>0]**

[BASE: ALL]

P7. What percent of your renovation and addition projects do you expect to receive incentives from the Mass Save Renovations and Additions Initiative in each of the following time periods? **[ALLOW PERCENTAGE RESPONSE FROM 0% TO 100%; INCLUDE DK/N/A OPTIONS FOR EACH, BUT ENCOURAGE THEM TO ESTIMATE]**

	a. Renovations	b. Additions
In all of 2020?		
In 2022?		

P7c. **[ASK IF P61<100 OR P62<100 OR P7a<100 OR P7b <100]** Why do you not expect some of your renovation and/or addition projects to receive incentives from the Mass Save Renovations and Additions Initiative? **[OPEN END]**

P8. **[ASK IF TYPE = RENOVATION OR BOTH]** To qualify for the incentive from the Mass Save Renovations and Additions Initiative, your renovation project at **[ADDRESS]** had to be more energy efficient than the pre-existing condition of the home. Now, suppose that the Initiative has found that the renovations and additions marketplace was already more energy efficient than was expected. As a result, new Initiative standards will require higher energy savings to maintain incentive levels, or incentives for a project may be

reduced. Under that scenario, how likely would you have been to participate in the Mass Save Renovations and Additions Initiative?

Example: Suppose the Initiative finds that the common practice in the renovations and additions marketplace for insulating walls is to fill the cavity. Instead of the pre-existing condition of the home, the new minimum efficiency criteria will require the wall insulation to have a more efficient R-value than filling the cavity in order to receive the same amount of the incentive from the Mass Save Renovations and Additions Initiative.

[ALLOW SINGLE RESPONSE]

1. Very likely
2. Somewhat likely
3. Somewhat unlikely
4. Very unlikely
98. Don't know

P8a. **[ASK IF P8=1 OR 2]** Why would you be likely to participate in the Mass Save Renovations and Additions Initiative if the minimum efficiency criteria changed? **[OPEN END]**

[ASK IF P8=3 OR 4] Why would you be unlikely to participate in the Mass Save Renovations and Additions Initiative if the minimum efficiency criteria changed? **[OPEN END]**

[ASK IF P8=98] Why are you unsure whether you will participate in the Mass Save Renovations and Additions Initiative if the minimum efficiency criteria changed? **[OPEN END]**

C.2.4 Free-ridership

Topics Listed in the Workplan:	**Q no.**
Incentivized energy-efficiency features that would have been included in the absence of the program (following the guidance from Consistent Methodology for Residential Self-Report Net-to-Gross Measurement [RES19X03-B-RSRNTG]) "The team will ask contractors about their measure-level practices and what specific levels of efficiency they would have installed without the program."	FR1, FR2

[BASE: ALL] [LOOP FOR RELEVANT MEASURES]

FR1. Our records show that **[EQUIPMENT]** was installed at the project before you installed a **[EFFICIENCY] [MEASURE]**. Without the Mass Save Renovations and Additions Initiative incentive, how likely would you have been to install the same **[IF MEASURE = HVAC OR DHW USE 'efficiency'; IF MEASURE = INSULATION USE 'amount of'] [MEASURE]**?

1. Very likely **[SKIP TO EE1]**
2. Somewhat likely **[SKIP TO EE1]**
3. Somewhat unlikely **[GO TO FR2]**
4. Very unlikely **[GO TO FR2]**
98. Don't know **[SKIP TO EE1]**

FR2. **[IF FR1 = 3 or 4]** Without the incentive from the Mass Save Renovations and Additions Initiative, what **[IF MEASURE = HVAC OR DHW USE 'efficiency'; IF MEASURE = INSULATION USE 'amount of'] [MEASURE]** would have been installed instead?

1. **[OPEN-ENDED RESPONSE]**
98. Don't know

[END LOOP]

C.2.5 Energy-Efficiency Practices and Spillover

Topics Listed in the Workplan & MPIs Listed in Market Characterization and Potential Study:	**Q no.**
Efficiency-related practices used in program projects including use of HERS rater, blower door testing, and air sealing, among others	*N/A (program tracking data)*
Typical efficiency-related practices in the contractor's non-participating projects compared to pre-existing conditions and the ISP from RLPNC 18-12 (Renovations and Additions Market Characterization and Potential Savings Study)	EE1, EE5, EE10, EE15
Typical efficiency-related practices of non-participant contractors compared to the ISP	*None*
Timing of first use of efficiency-related practices	EE2, EE6, EE11, EE16
Influence of the program, including trainings, on participating contractor's efficiency-related practices in non-program homes	EE3, EE7, EE12, EE17
Influence of the program, including trainings, on non-participating contractors' efficiency-related practices	*None*
Participants carry over practices to other non-program projects: Participants report that they bring newly learned efficient practices to their other, non-program projects	EE1, EE4, EE6, EE8, EE9, EE11,

	EE13, EE14, EE16, EE18
Likely efficiency of typical non-participating projects in 2022 and 2024 • If the program continues • If the program is suspended after 2021	EE4, EE5, EE8, EE10, EE13, EE15, EE18

[BASE: IF P6a<100% AND/OR P6b <100%]
[SKIP TO NEXT MODULE IF P6a =100% AND P6b =100%]

EE1. The next series of questions focuses on your renovation/addition projects that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative. How often were each of the following practices used at your renovation/addition projects that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[RESPONSE MATRIX]**

1. Always
2. More than half the time
3. About half the time
4. Less than half the time
5. Never
97. N/A
98. Don't know

	Renovations **[DISPLAY IF 0< P5a<100]**	Additions **[DISPLAY IF 0< P5b<100]**
HERS rating		
Blower door testing		
Air sealing		
Duct leakage testing		
Duct sealing		

[BASE: FOR EACH EE1 PRACTICE WHERE EE1=1 OR 2]

EE2. When did you begin to regularly incorporate the following practice(s) at your renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative? Please indicate the approximate year for each practice. **[DROP DOWN WITH YEAR FOR EACH EE1 PRACTICE WHERE EE1=1 OR 2 STARTING WITH "2018 or earlier", 2019, 2020]**

	Renovations **[DISPLAY IF P5a>0]**	Additions **[DISPLAY IF P5b>0]**
HERS rating		
Blower door testing		
Air sealing		
Duct leakage testing		
Duct sealing		

[BASE: FOR EACH EE1 PRACTICE WHERE EE1=1 OR 2]

EE3. Using a scale of 0 to *10*, where 0 is "not at all influential" and 10 is "very influential," how influential was the Mass Save Residential Renovations and Additions Initiative on your decision to incorporate this/these practice(s) at your renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[DROP DOWN # 0-10, DON'T KNOW = 98] [RESPONSE MATRIX]**

	Renovations **[DISPLAY IF P5a>0]**	Additions **[DISPLAY IF P5b>0]**
HERS rating		
Blower door testing		
Air sealing		
Duct leakage testing		
Duct sealing		

[BASE: IF P6a<100% OR P6b <100%]

EE4. Please describe the R-value of the insulation you typically use in each of the following places when they are part of your renovations/additions that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative. **[ALLOW SINGLE RESPONSE FOR EACH COLUMN] [RESPONSE MATRIX]**

1. Enter an R-value:____ **[OPEN END]**
97. N/A
98. Don't know

	Renovations **[DISPLAY IF P5a>0]**	Additions **[DISPLAY IF P5b>0]**
	Enter an R-value:	
Above-grade exterior walls		
Attic floors		
Vaulted ceilings / roof rafters		
Unfinished basement walls		
Finished basement walls		
Supply ducts in unfinished attics		
Supply ducts in unfinished basements		
Floors over unfinished basements, ambient space (cantilever/overhang) or garages		

[BASE: IF P6a<100% OR P6b <100%]

EE5. When did you begin to regularly incorporate these insulation practices at renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative? Please indicate the approximate year. **[OPEN END RESPONSE]**

[BASE: IF P6a<100% OR P6b <100%]

EE6. Using a scale of 0 to *10*, where 0 is "not at all influential" and 10 is "very influential," how influential was the Mass Save Residential Renovations and Additions Initiative on your decision to incorporate these practices at your renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[DROP DOWN # 0-10, DON'T KNOW = 98]**

EE7. During the next five years, what R-values do you anticipate using on your typical additions or renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[ALLOW SINGLE RESPONSE] [MATRIX FOR RENOVATION AND ADDITION]**

1. Much higher R-values than current practices
2. Somewhat higher R-values than current practices
3. Same R-values as current practices
4. Somewhat lower R-values than current practices
5. Much lower R-values than current practices
98. Don't know

EE8. **[IF EE7 = 1 OR 2]** Over the next five years, how influential do you think the Mass Save Residential Renovations and Additions Initiative will be on your **decision to incorporate higher R-values** on your typical additions or renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative?

1. Very influential
2. Somewhat influential
3. Not at all influential
98. Don't know

C.2.5.1 Ducts

[BASE: ALL]

EE9. Have your renovation or addition projects ever included installing or working with duct work for HVAC systems?

1. Yes
2. No **[SKIP DUCT SECTION]**
3. DK **[SKIP DUCT SECTION]**

[BASE: INSTALLED DUCTS EE9=YES]

EE10. Which of the following best describes your typical duct work practices for additions/renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[ALLOW SINGLE RESPONSE FOR EACH COLUMN]**

	Renovations **[DISPLAY IF P5a>0]**	Additions **[DISPLAY IF P5b>0]**
(1) Leave ducts alone		
(2) Perform limited duct sealing (no duct leakage testing)		
(3) Perform high levels of duct sealing (no duct leakage testing)		

(4) Perform high levels of duct sealing and conduct duct leakage testing		

[BASE: FOR EE10A AND/OR EE10B = 3 OR 4; PRACTICE THAT IS ENERGY-EFFICIENT]

EE11. When did you begin to regularly incorporate this duct work practice at renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative? Please indicate the approximate year.

[OPEN ENDED RESPONSE]

[BASE: FOR EE10 PRACTICE THAT IS ENERGY-EFFICIENT]

EE12. How influential was the Mass Save Residential Renovations and Additions Initiative on your decision to incorporate this practice at your renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative?

1. Very influential
2. Somewhat influential
3. Not at all influential
98. Don't know

EE13. During the next five years, how much duct sealing do you anticipate conducting on your typical additions or renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[ALLOW SINGLE RESPONSE]** **[MATRIX FOR RENOVATION AND ADDITION]**

1. Much more duct sealing than current practices
2. Somewhat more duct sealing than current practices
3. Same duct sealing as current practices
4. Somewhat less duct sealing than current practices
5. Much less duct sealing than current practices

EE14. **[IF EE13= 1 OR 2]** Over the next five years, how influential do you think the Mass Save Residential Renovations and Additions Initiative will be on your **decision to incorporate more duct sealing** into your typical additions or renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative?

1. Very influential
2. Somewhat influential
3. Not at all influential
98. Don't know

[END DUCT SECTION]

C.2.5.2 Air Sealing

EE15. Have your renovation or addition projects ever included air sealing?

4. Yes
5. No **[SKIP AIR SEALING SECTION]**
6. DK **[SKIP AIR SEALING SECTION]**

[BASE: CONDUCT AIR SEALING EE14=YES]

EE16. Which of the following best describes your typical air sealing practices for additions/renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[ALLOW SINGLE RESPONSE FOR EACH COLUMN]**

	Renovations **[DISPLAY IF P5a>0]**	Additions **[DISPLAY IF P5b>0]**
(1) Do not conduct air sealing		
(2) Perform limited air sealing (no blower door test)		
(3) Perform high levels of air sealing (no blower door test)		
(4) Perform high levels of air sealing and testing		

[BASE: FOR EE16A AND/OR B = 3 OR 4 ; PRACTICE THAT IS ENERGY-EFFICIENT]

EE17. When did you begin to regularly incorporate this air sealing practice at renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative? Please indicate the approximate year.

[OPEN ENDED RESPONSE]

[BASE: FOR EE16 PRACTICE THAT IS ENERGY-EFFICIENT]

EE18. How influential was the Mass Save Residential Renovations and Additions Initiative on your decision to incorporate this practice at your renovations/additions that did not receive incentives through the Mass Save Residential Renovations and Additions Initiative?

1. Very influential
2. Somewhat influential
3. Not at all influential
98. Don't know

EE19. For this next question, assume the Mass Save Residential Renovations and Additions Initiative incentives were available over the next five years.
During the next five years, how much air sealing do you anticipate conducting on your typical additions or renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative? **[ALLOW SINGLE RESPONSE]**
[MATRIX FOR RENOVATION AND ADDITION]

6. Much more air sealing than current practices
7. Somewhat more air sealing than current practices
8. Same air sealing as current practices
9. Somewhat less air sealing than current practices
10. Much less air sealing than current practices

EE20. **[IF EE19= 1 OR 2]** Over the next five years, how influential do you think the Mass Save Residential Renovations and Additions Initiative will be on your decision to incorporate more air sealing into your typical additions or renovations that do not receive incentives through the Mass Save Residential Renovations and Additions Initiative?

1. Very influential
2. Somewhat influential
3. Not at all influential
98. Don't know

[END AIR SEALING]

C.2.6 NEIs, Barriers, and Satisfaction

Topics Listed in the Workplan:	**Q no.**
The homeowner's interest in energy efficiency	H1
NEIs participants have experienced	NE1
NEIs contractors emphasize to homeowners	NE2
What keeps contractors from participating	B1
What keeps homeowners from participating	*None*
Program satisfaction	SA1, SA2, SA3, SA4

[BASE: ALL]

H1. How much of a priority was the energy efficiency of the project for the homeowner at **[ADDRESS]**? **[ALLOW SINGLE RESPONSE]**

1. A primary consideration
2. A moderate or secondary consideration

3. Not a consideration
98. Don't know

[BASE: ALL]

B1. What, if any, barriers do you think prevent more contractors like yourself from participating in the Mass Save Residential Renovations and Additions Initiative? **[ALLOW MULTIPLE RESPONSE OPTION; DO NOT READ RESPONSES]**

1. Contractors do not know about it
2. Homeowners do not know about it
3. Timing concerns
4. Extra hassle
5. Lack of customer interest in or awareness of efficient practices
6. Lack of contractor interest in or awareness of efficient practices
7. Complex or unclear participation requirements
8. Incentive too low
9. Other: _____ **[OPEN END]**
10. I do not think there are any barriers
98. Don't know

[BASE: ALL]

NE1. Non-energy impacts are impacts other than energy savings resulting from using energy-efficient practices. They can be positive (benefits) or negative (drawbacks). Have any of the customers for whom you've performed renovations or additions through the Mass Save Residential Renovations and Additions Initiative told you they experienced any of the following non-energy impacts? **[RESPONSE MATRIX]**

	1. Yes – positive impact	2. Yes – negative impact	3. No – no impact	98. Don't know
Home comfort				
Reduced noise from outside the home				
Reduced noise from within the home				
Change in household members' health				

[BASE: ALL]

NE2. Which if the following non-energy impacts, if any, do you emphasize to potential renovations or additions customers? **[RANDOMIZE 1-4, ALLOW MULTIPLE RESPONSES]**

1. Increased comfort in home
2. Reduction in noise from outside the home
3. Reduction in noise from within the home
4. Improvement in household members' health (e.g., fewer asthma, cold/flu, or arthritis symptoms)
5. Other: _____ **[OPEN END]**
6. None
98. Don't know

[BASE: ALL]

SA1. Please tell us how satisfied you are with the Residential Renovations and Additions Initiative using a number from 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied". **[ALLOW SINGLE RESPONSE]**

1. 1 - Not at all satisfied **[GO TO SA2]**
2. 2 **[GO TO SA2]**
3. 3
4. 4
5. 5 - Very satisfied
98. Don't know

SA2. **[ASK IF SA1=1 OR 2]** We would appreciate if you could tell us why you are not satisfied.

1. **[ALLOW OPEN END NON-NUMERIC RESPONSE]**
98. Don't know

SA3. Using a scale of 0 to *10*, where 0 is "extremely unlikely" and 10 is "extremely likely," how likely are you to recommend Residential Renovations and Additions Initiative to a customer? **[DROP DOWN # 0-10, DON'T KNOW = 98, REFUSED = 99.]**

SA4. **[IF SA3 <5]** Why would you be unlikely to recommend Residential Renovations and Additions Initiative? **[OPEN END RESPONSE]**

C.2.7 COVID-19

Topics Listed in the Workplan:	Q no.
impacts of COVID-19 on the renovations and additions market	CO1, CO2

[BASE: ALL]

CO1. Understanding that many habits and daily activities have changed since March 2020, we would appreciate your feedback about how these changes might be affecting you and other contractors who work on renovations and additions.

Compared to 2019, how many renovation and addition projects have you completed in Massachusetts in 2020? **[ALLOW SINGLE RESPONSE]**

1. A lot fewer
2. Slightly fewer
3. About the same number
4. Slightly more
5. Many more
98. Don't know

[BASE: ALL]

CO2. In 2020, did you recommend high-efficiency measures for your renovation and addition projects more frequently, at about the same rate, or less frequently than as you did in 2019? **[ALLOW SINGLE RESPONSE]**

1. More frequently
2. About the same rate
3. Less frequently
98. Don't know

C.2.8 Closing

[BASE: ALL]

CL1. Those are all the questions we have. Thank you for your cooperation. Please enter the email address to which you want us to send your $150 electronic gift card. **[ALLOW OPEN END]**