

New Hampshire ENERGY STAR® Products Impact and Process Evaluation

FINAL REPORT

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SUBMITTED TO:
New Hampshire EM&V Working Group

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Table of Contents

ABSTRACT **9**

ACRONYM GUIDE **11**

EXECUTIVE SUMMARY **12**

RESEARCH OBJECTIVES 12

IMPACT FINDINGS AND RECOMMENDATIONS 13

PROGRAM- AND PATHWAY-LEVEL PROCESS FINDINGS, RECOMMENDATIONS, AND CONSIDERATIONS 15

KEY PROCESS FINDINGS AND RECOMMENDATIONS FOR SELECTED MEASURES 19

AIR-SOURCE HEAT PUMPS: OVERALL FINDINGS AND RECOMMENDATIONS 21

SECTION 1 INTRODUCTION **25**

1.1 ABOUT THE ENERGY STAR PRODUCTS PROGRAM 25

1.1.1 Incentivized Measures and Program Delivery Pathways 25

1.1.2 Air-Source Heat Pump Offerings 26

1.2 PROGRAM SAVINGS FOR STUDY PERIOD 29

1.3 RESEARCH OBJECTIVES 31

1.4 REPORT ORGANIZATION 31

SECTION 2 METHODS **33**

2.1 OVERALL EVALUATION APPROACH 33

2.1.1 Air Source Heat Pump Evaluation Approach 34

2.1.2 Furnace and Boiler Evaluation Approach 35

2.2 PROGRAM STAFF AND VENDOR INTERVIEWS 35

2.3 INSTALLED MEASURES SURVEY 35

2.4 RECYCLING MEASURES SURVEY 36

2.5 TRM AND LITERATURE REVIEW 36

2.6 PARTICIPATING INSTALLATION CONTRACTOR INTERVIEWS 37

SECTION 3 MEASURE-LEVEL FINDINGS **39**

3.1 SUMMARY OF KEY MEASURE-LEVEL FINDINGS AND RECOMMENDATIONS 39

3.1.1 Impact Findings and Recommendations 39

3.1.2 Key Process Findings and Recommendations for Selected Measures 40

3.1.3 Air-Source Heat Pumps: Overall Findings and Recommendations 43

3.2 CENTRAL ASHPS 49

3.2.1 Recommendations 49

3.2.2 Impact Findings 51
3.2.3 Process Findings 58
3.3 DUCTLESS MINI-SPLIT ASHPS 62
3.3.1 Recommendations 62
3.3.2 Impact Findings 65
3.3.3 Process Findings 71
3.4 NATURAL GAS FURNACES 73
3.4.1 Recommendations 73
3.4.2 Impact Findings 75
3.4.3 Process Findings 81
3.5 NATURAL GAS BOILERS 83
3.5.1 Recommendations 83
3.5.2 Impact Findings 84
3.5.3 Process Findings 88
3.6 GAS WI-FI THERMOSTATS 89
3.6.1 Recommendations 89
3.6.2 Impact Findings 90
3.6.3 Process Findings 92
3.7 HEAT PUMP WATER HEATERS 93
3.7.1 Recommendations 93
3.7.2 Impact Findings 96
3.7.3 Process Findings 103
3.8 NATURAL GAS INTEGRATED WATER HEATERS 107
3.8.1 Recommendations 107
3.8.2 Impact Findings 107
3.8.3 Process Findings 110
3.9 POOL PUMPS 111
3.9.1 Recommendations 111
3.9.2 Impact Findings 112
3.10 ROOM AIR PURIFIERS 115
3.10.1 Recommendations 115
3.10.2 Impact Findings 116
3.11 REFRIGERATOR RECYCLING 118

3.11.1 Recommendations 118
3.11.2 Impact Findings 118
3.12 FREEZER RECYCLING 122
3.12.1 Recommendations 122
3.12.2 Impact Findings 122
3.13 DEHUMIDIFIER RECYCLING 125
3.13.1 Recommendations 125
3.13.2 Impact Findings 125
3.14 ROOM AIR CONDITIONER RECYCLING 129
3.14.1 Recommendations 129
3.14.2 Impact Findings 130
SECTION 4 PROGRAM- AND PATHWAY-LEVEL FINDINGS 133
4.1 KEY PROCESS FINDINGS AND RECOMMENDATIONS 133
4.1.1 Key Process Findings 133
4.1.2 Process Recommendations and Considerations 137
4.2 OVERALL PROCESS FINDINGS FOR THE ES PRODUCTS PROGRAM 138
4.2.1 Program Awareness, Attitudes, and Satisfaction Among Participating Customers 139
4.2.2 Participating Installation Contractor Perspectives 145
4.2.3 Minimizing Free-Ridership 146
4.2.4 Customer Interest in Additional Measures After Installation 147
4.3 DOWNSTREAM REBATE PATHWAY 147
4.3.1 Downstream Rebate Pathway Description 147
4.3.2 Rebate Pathway Participant Satisfaction and Barriers to Participation 148
4.3.3 Participating Contractor Experiences with the Rebate Pathway 149
4.3.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations 150
4.4 MIDSTREAM PATHWAY 151
4.4.1 Description 151
4.4.2 Midstream Pathway Participant Satisfaction and Barriers to Participation 151
4.4.3 Contractor Experiences with the Midstream Pathway 152
4.4.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations 152
4.5 ONLINE MARKETPLACE PATHWAY 153

4.5.1 Online Marketplace Pathway Description 153
4.5.2 Participant Satisfaction with the Online Marketplace Pathway 153
4.5.3 Barriers to Participating in the Online Marketplace Pathway 154
4.5.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations 154
4.6 IN-STORE INSTANT REBATE PATHWAY 154
4.6.1 In-Store Instant Rebate Pathway Description 154
4.6.2 Participant Satisfaction with the In-Store Rebate Pathway 155
4.6.3 Barriers to Participation in the In-Store Rebate Pathway 156
4.6.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations 156
4.7 APPLIANCE RECYCLING PATHWAY 156
4.7.1 Appliance Recycling Pathway Description 156
4.7.2 Participant Satisfaction with the Recycling Pathway 156
4.7.3 Barriers to Participating in the Recycling Pathway 158
4.7.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations 159
APPENDIX A DETAILED METHODOLOGY 160
A.1 INSTALLED MEASURES SURVEY 160
A.1.1 Net-to-Gross Analysis 162
A.1.2 In-Service Rates 163
A.2 RECYCLING MEASURES SURVEY 164
A.2.1 Gross and Net Savings Analysis 165
APPENDIX B INTERVIEW GUIDES 170
B.1 PROGRAM STAFF INTERVIEW GUIDE 170
B.1.1 Introduction and Roles and Responsibilities 170
B.1.2 Successes and Challenges 171
B.1.3 Customer Experience, Channels & Measures 171
B.1.4 General Implementation Topics 173
B.1.5 Conclusion 173
B.2 PARTICIPATING CONTRACTOR INTERVIEW GUIDE 174
B.2.1 Introduction 174
B.2.2 Role and Measures Installed 175
B.2.3 Heat Pumps 175

B.2.4 Heat Pump Water Heaters 177
B.2.5 Furnaces and Boilers 178
B.2.6 General Implementation Topics 179
B.2.7 Conclusion 180
APPENDIX C SURVEY INSTRUMENTS 181
C.1 ENERGY STAR PRODUCTS PROGRAM INSTALLED MEASURES SURVEY 181
C.1.1 Introduction 182
C.1.2 Screening 182
C.1.3 Process 186
C.1.4 Product Persistence and Demand Coincidence 188
C.1.5 Event Type 191
C.1.6 Free Ridership 192
C.1.7 Spillover 193
C.1.8 Baselines 196
C.1.9 Demographic/Economic Factors 205
C.1.10 Closing 209
C.2 NEW HAMPSHIRE ENERGY STAR® PRODUCTS RECYCLING MEASURE PARTICIPANT WEB SURVEY 210
C.2.1 Introduction 210
C.2.2 Verification and Recall 211
C.2.3 Refrigerators (RF SERIES) 212
C.2.4 Refrigerator Free-Ridership (RFR Series) 213
C.2.5 Freezers (FZ SERIES) 214
C.2.6 Freezer Free-Ridership (FFR Series) 216
C.2.7 Dehumidifiers (DH SERIES) 217
C.2.8 Dehumidifier Free-Ridership (DFR Series) 219
C.2.9 Room Air Conditioners (AC Series) 221
C.2.10 Room Air Conditioner Free-Ridership (AFR Series) 225
C.2.11 Program Satisfaction 228
C.2.12 Demographics 230
APPENDIX D DETAILED RESULTS 233
D.1 RESULTS BY MEASURE: HVAC AND CONTROLS MEASURES 233
D.1.1 Air Source Heat Pumps 233

D.1.2 Furnaces and Boilers 241
D.1.3 Demographics and Economic Factors 244
D.2 RESULTS BY MEASURE: WATER HEATING MEASURES 247
D.2.1 Heat Pump Water Heaters 247
D.2.2 Gas Integrated Water Heaters 251
D.2.3 Demographics and Economic Factors 252
D.3 RESULTS BY MEASURE: SMALL APPLIANCE MEASURES 255
D.3.1 Pool Pumps 255
D.3.2 Air Purifiers 258
D.3.3 Wi-Fi Thermostats 260
D.3.4 Demographics and Economic Factors 261
D.4 RESULTS BY MEASURE: RECYCLING MEASURES 263
D.4.1 Refrigerator Recycling 263
D.4.2 Freezer Recycling 266
D.4.3 Dehumidifier Recycling 268
D.4.4 Room Air Conditioner Recycling 272
APPENDIX E HEAT PUMP BASELINES 280
E.1 CENTRAL ASHPS: BASELINES 280
E.1.1 Existing Baseline Definition 280
E.1.2 Development of an Evaluated Baseline for Central ASHPs 280
E.2 DUCTLESS MINI-SPLIT ASHPS: BASELINES 286
E.2.1 Existing Baseline Definition 286
E.2.2 Development of an Evaluated Baseline for Ductless Mini-Split ASHPs 286
APPENDIX F RECOMMENDATIONS & CONSIDERATIONS 289
F.1 IMPACT RECOMMENDATIONS 289
F.1.1 Measure-Specific TRM Entry Recommendations 291
F.1.2 Data Tracking Considerations 294
F.2 OVERALL PROCESS RECOMMENDATIONS AND CONSIDERATIONS FOR THE ES PRODUCTS PROGRAM 295
F.3 KEY PROCESS RECOMMENDATIONS AND CONSIDERATIONS FOR SELECTED MEASURES 297
F.3.1 All Measures 297
F.3.2 Heat Pump Water Heaters 297
F.3.3 Natural Gas Furnaces 298

F.3.4 Other 298
F.4 RECOMMENDATIONS AND CONSIDERATIONS FOR AIR-SOURCE HEAT PUMP MEASURES 299

Abstract

This report presents the results of NMR Group, Inc.'s impact and process evaluation of the NHSaves ENERGY STAR® Products Program, conducted on behalf of the New Hampshire Evaluation, Monitoring and Verification Working Group between mid-2025 and mid-2026. The team designed the evaluation to improve the accuracy of prospective energy savings tracking and identify opportunities to strengthen program design, delivery, and customer experience.

The study focused on all recycling measures and installed measures that delivered more than 5% of overall savings in the 2022–2023 program period, including air-source heat pumps, heat pump water heaters, pool pumps, room air purifiers, and natural gas furnaces, boilers, integrated water heaters, and Wi-Fi thermostats. Evaluation activities included participant surveys, implementer interviews, participating contractor interviews, review of program tracking data, and review of New Hampshire and peer-state technical reference manuals and evaluation reports.

The impact evaluation identified several substantive recommended updates to measure-level savings inputs. A major outcome was the first-time application of measured net-to-gross values to heat pump measures, natural gas furnaces and boilers, heat pump water heaters, pool pumps, and recycling measures. Other findings included increased savings for the top tier of furnaces and boilers, sizable but mixed savings changes for heat pump water heaters, decreased electric savings for room air purifiers, and first-time application of part-use factors for recycling measures. For dehumidifier recycling and purchase incentives, the evaluation found no adjustment was needed due to limited dual-rebate overlap and modest rebate influence.

The process evaluation found that participants generally reported high satisfaction with equipment performance, especially for heat pumps and other installed measures, but were less satisfied with post-installation changes to their energy bills. These findings point to an opportunity for the program to improve guidance on expected bill impacts for contractors and customers. Survey respondents also reported moderate awareness of NHSaves offerings, stronger support for energy efficiency than the broader New Hampshire population, and generally favorable program experiences, with the recycling pathway receiving especially strong ratings.

Air-source heat pumps were a central focus of the study. The evaluation found that the current heat pump offerings have a modest effect on customer decision-making and that measured counterfactual baselines are more complex than the current Technical Reference Manual baseline definition. Most interviewed contractors reported that ENERGY STAR®-certified, program-qualifying heat pumps are already their standard offering, suggesting that future program design may need to feature a change to qualifying equipment specifications and focus more directly on influencing the selected efficiency level by educating customers about efficiency ratings and providing guidance to contractors on recommendation practices. The study includes several recommendations for changes to the heat pump offerings, including revising the offering design to reduce free-ridership rates and bolster energy savings, investigating trends and factors affecting equipment selection, providing more contractor and customer guidance, and maintaining the 2026 baseline definition while reassessing the baseline and net-to-gross approach as the offering evolves.

At the program level, the evaluation recommends increasing communications to contractors and customers about the energy savings customers can expect to see after installing measures; expanding contractor engagement and training; simplifying application and documentation requirements; reviewing incentive levels and rebate consistency annually; and coordinating with the newly launched New England Heat Pump Accelerator and soon-to-launch HEAR programs to support effective air-source heat pump and heat pump water heater offerings. The findings suggest that the program remains an important mechanism for supporting efficient equipment adoption in New Hampshire, but that future savings and customer experience improvements will depend on clear communication, more support for the application process and contractors, and a heat pump offering design that effectively targets the decision to select a more efficient heat pump.

Acronym Guide

AFUE	Annual Fuel Utilization Efficiency
ASHP	Air-source heat pump
Central ASHP	Central (ducted) air-source heat pump, central heat pump
CF	Coincidence factor
Ductless mini-split ASHP	Ductless mini-split air source heat pump; mini-split heat pump
DUR	Demand Usage Ratio
EFLH	Effective full load hours
ER	Early replacement
EULs	Effective useful lives
FR	Free-ridership
HPMS	Heat Pump Metering Study
HPWH	Heat pump water heater
HSPF	Heating Seasonal Performance Factor
HVAC	Heating, ventilation, and air conditioning
ISR	In-service rates
LAM	Label affective magnitude
LO	Lost opportunity
MSHP	Ductless mini-split air source heat pump; mini-split heat pump
NEI	Non-energy impact
NTG	Net-to-gross
PUF	Part-use Factor
ROF	Replace on failure
SO	Spillover
ST	Storage
TRM	Technical Resource Manual
UEC	Unit energy consumption
UEF	Uniform Energy Factor
WH	Water heater

Executive Summary

This report presents the results of the impact and process evaluations of the NHSaves ENERGY STAR® Products Program ("ES Products Program" or "the program"). NMR Group, Inc. ("NMR" or "the team") conducted the evaluation on behalf of the New Hampshire Evaluation, Monitoring and Verification (EM&V) Working Group between mid-2025 and mid-2026. NMR previously delivered the impact results presented in Section 3 in a memo titled "New Hampshire ENERGY STAR® Products Program Impact Evaluation Results Memo" dated May 15, 2026. This report expands the contextual discussions underlying some of the findings in that memo.

This executive summary presents the research objectives and highlights the impact and process evaluation recommendations. The main body of the report includes a program description, describes the methods, and presents detailed findings, recommendations, and considerations.

Research Objectives

This study aimed to improve the accuracy of prospective energy savings impact tracking and to identify opportunities to improve program effectiveness.

The team designed the impact evaluation to achieve the following objectives:

- Verify selected measure-level impact factors for the measures listed in Table 1[1].
- Estimate net-to-gross (NTG) ratios, including free-ridership (FR) and participant spillover (SO), for selected measures as indicated in Table 1.
- Assess whether the NH TRM properly accounted for savings and avoided double counting for measures with both recycling and new equipment offerings (i.e., ENERGY STAR® dehumidifier rebate and dehumidifier recycling).

The team designed the process evaluation to achieve seven objectives:

1. Describe the program design, delivery channels, and implementation processes.
2. Assess participant satisfaction with key aspects of the program, including the participation process, incentives, and equipment quality, and identify opportunities for improvement.
3. Identify how customers learned about the program's offerings, by pathway.
4. Identify barriers to participation experienced by customers, by pathway.
5. Examine contractor experiences with the midstream pathway.
6. Determine how utilities could more effectively target customers who were not free riders.
7. Compare findings with prior process evaluations of the program and similar programs in New England to identify benchmarking insights and best practices.

[1] As part of the impact review, the work scope specified that the evaluation team should note any non-energy impacts reported in the TRMs of comparison states. Because the New Hampshire cost-effectiveness tests do not utilize measure-level NEI values, this data is for informational purposes only.

IMPACT FINDINGS AND RECOMMENDATIONS

Table 1 summarizes the key impact evaluation findings, including baseline assumptions, in-service rates (ISR), demand impacts, and NTG ratios for installed measures, and Table 2 shows the impact findings for recycling measures. One notable change driven by this study is the first-time application of measured NTG values to heat pump measures, natural gas furnaces and boilers, HPWHs, pool pumps, and recycling measures. Other key impact findings include increased savings for the top tier of furnaces and boilers, sizable but mixed energy savings changes for HPWH measures, decreased electric savings for room air purifiers, and first-time application of part-use factors (PUFs) for recycling measures. Exploration of heat pump baselines is ongoing.

In addition to the recommended impact updates shown below, the evaluators offer one global consideration for tracking measures installed through the program:

- **Consideration DT-1:** Consider tracking the program pathway through which each measure was incentivized to facilitate future analysis and evaluation.

Table 1: Recommended Measure-Level Savings Inputs – Installed Measures

BCR ID	Measure	Baseline	ISR	Demand Usage Ratio (DUR) or Coincidence Factor (CF)	NTG
EA3b003 & EA3b004	Central ASHP	See Table 9, Section 3.2.2.2, and Appendix E	100%	DUR Summer: 0.948 DUR Winter: 0.898	63% (EA3b003 and EA3b004 only)
EA3b005 & EA3b006	Ductless Mini-Split ASHPs	See Table 13, Section 3.3.2.2, and Appendix E	100%	DUR Summer: 0.839 DUR Winter: 0.596	68%
GA3b008 & GA3b009	Natural Gas Furnaces	86.9% AFUE (LO) 87.4% AFUE (ER) 87% AFUE (Blended LO-ER)	100%*	CF Summer: 0.0 CF Winter: 0.45	63%
GA3b006 & GA3b007	Natural Gas Boilers	85.7% AFUE (LO) 87.0% AFUE (ER) 86.7% AFUE (Blended LO-ER)	100%*	N/A	63%
GA3b019 & GA3b020	Gas Wi-Fi Thermostats	A manual or programmable thermostat	88%	N/A	N/A*
EA3b007 & EA3b038	Heat Pump Water Heaters, Downstream (≤55 gal)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)	100%*	CF Summer: 0.41* CF Winter: 0.74*	67%

EA3b008 & EA3b039	Heat Pump Water Heaters, Downstream (>55 gal)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)	100%*	CF Summer: 0.41* CF Winter: 0.74*	67%
GA3b013 & GA3b014	Natural Gas Integrated Water Heaters	85% AFUE boiler with a 0.60 UEF water heater	100%*	N/A	N/A*
EA3b024	Pool Pumps	Pool Pump meeting the July 2021 Federal Standard 10 CFR part 431	99%	CF summer: 0.88 CF winter: 0.00	88%
EA3b025	Room Air Purifiers	1.9 CADR/W (10-100 CADR) 2.4 CADR/W (100-150 CADR) 2.9 CADR/W (≥150 CADR)	88%	CF summer: 0.59 CF winter: 0.67	N/A*

* Factors marked with an asterisk were not in scope and were not evaluated in this study.

Heat Pump Baseline and NTG Findings: Central (ducted) and ductless (mini-split) air-source heat pumps (ASHP) were priority measures for this evaluation. The study found that, contrary to the definition in the 2026 TRM, the counterfactual baseline (based on participant survey responses) is a complex blend of existing and new equipment types and heating fuels. Survey results also indicate that the program had a modest effect on participant decision-making, with measured free-ridership (FR) rates of 46% for central systems and 48% for ductless systems, respectively. For the 2027 program year, the evaluators recommend maintaining the baseline definition as found in the 2026 TRM and applying the measured NTG ratios. For 2028 and beyond, the evaluators recommend that the program investigate a redesign of the heat pump offerings and reassess the baseline definition and NTG ratios accordingly (see Section 3.1.3.1). Future offerings and evaluations should attempt to account for the evolving landscape of heat pump programs in New Hampshire, including the New England Heat Pump Accelerator program having launched in early 2026 and the Home Electrification and Appliance Rebate (HEAR) Program slated to launch in late 2026. Additional discussion can be found in Section 3.1, detailed findings are described in Section 3.2 (central ASHPs) and Section 3.3 (ductless mini-split ASHPs), and Appendix E contains detailed baseline findings for both measures.

Table 2 presents evaluated ISR, unit energy consumption (UEC), and NTG values for recycled measures. Section 3 of the report offers a detailed discussion of the impact findings that underpin these recommendations. The values shown include recommended TRM values based on this evaluation as well as the study team's review of existing TRM values. The table shows existing TRM values where either the specific factor was not included in the study scope (marked with an asterisk) or where the evaluation identified no necessary updates. Measure-specific recommendations are provided within the corresponding measure sections in Section 3.

Table 2: Recommended Measure-Level Savings Inputs – Recycling Measures

BCR ID	Measure	Realization Rate (Part-Use Factor)	Gross Savings (UEC)	NTG
EA3b027 & EA3b028	Refrigerator Recycling, Primary and Secondary	87%	998 kWh	38%
EA3b029	**Freezer Recycling**, Secondary	79%	795 kWh	39%
EA3b037	Dehumidifier Recycling	100%	1,020 kWh	30%
EA3b030	Room Air Conditioner Recycling	100%	245 kWh	35% (retrospective) 36% (prospective)

Assessment of Possible Dehumidifier Recycling and Purchase Incentive Interaction: The study examined whether the New Hampshire TRM should account for the possibility that some participants may have received dual rebates for replacing a dehumidifier (i.e., a rebate for recycling the old unit plus a second rebate for purchasing a new, efficient dehumidifier). The evaluators concluded that no adjustment was needed due to the limited overlap of rebate use and modest influence of the rebates on either the recycling or purchase decision, as found in the NTG analysis.

PROGRAM- AND PATHWAY-LEVEL PROCESS FINDINGS, RECOMMENDATIONS, AND CONSIDERATIONS

The full set of process findings and recommendations for the program and its component participation pathways are found in Section 4.1. Highlights include the following:

Program Awareness, Attitudes, and Satisfaction

- **Program participants who responded to the survey reported moderate awareness of NHSaves.** About two out of three respondents (64%) rated their awareness of NHSaves offerings a 4 or 5 on a scale of 1 to 5.[2]
- **ES Products participants who responded to this survey voiced stronger support for energy efficiency than the general New Hampshire population.** Participants reported significantly more supportive attitudes than the general population for three of four metrics.
- **Most respondents were satisfied with their experiences with the ES Products Program.** The recycling pathway drew the most favorable responses from participants who took the survey (98% would recommend to a friend), while the downstream rebate offering had the lowest satisfaction ratings (76% satisfied).
- **Overall satisfaction was somewhat lower than that found by the prior program evaluation of 2016 participants, though the difference should be interpreted with caution.** Respondents who participated in the downstream, in-store instant rebate, or

[2] Unless otherwise noted, the scaled process evaluation questions relied on a one-to-five-point scale, with one indicating the "negative" anchor of the scale (strongly disagree, not at all aware, etc.) and 5 indicating the "positive" anchor of the scale (strongly agree, very aware, etc.).

online marketplace pathways in 2022–2024 were asked to rate their satisfaction with their experience. Overall, 76% of participants in those pathways reported being satisfied (90% CI: 72%–80%; see Figure 20),[3,4] while 98% of recycling respondents reported they would recommend the offering to a friend (90% CI: 97%–99%). In contrast, the 2016 ES Products evaluation found that approximately 84% of respondents rated their overall experience with the New Hampshire ENERGY STAR Products program favorably (90% CI: 80%–88%)."[5,6,7] The difference is statistically significant. However, notable differences in the survey questions, program offerings, and participant populations between study periods lead the study team to urge considerable caution in drawing comparisons across the two studies.

Overall Program Feedback and Process Findings

- **Participating installation contractors value the program highly and noted improvements made in recent years.** Interviewed contractors credited the program rebates for making it easier to sell high-efficiency equipment and helping to reduce customer costs and noted recent improvements.
- **Contractors also highlighted several opportunities to improve program delivery.** Some suggestions included streamlining the rebate application process, expanding instant or midstream rebate options, and offering more opportunities for contractors to engage directly with the program.
- **Current economic conditions pose challenges for contractors selling projects through the program.** Participating contractors overwhelmingly reported (85%) that rising equipment costs are currently having a significant impact on customer behavior.
- **The study team identified several strategies the program can apply to minimize free-ridership in the future.** Some applicable strategies for minimizing FR can include raising incentives, creating tiered incentives, targeting specific sections of the market, and raising qualifying equipment thresholds. The appropriate modifications depend on the measure's market adoption stage, cost, and other factors.

Process Highlights by Program Pathway

The ES Products Program comprises five pathways for customer participation. Descriptions of each pathway are found in Section 1.1 and Sections 4.3 through 4.7.

[3] Program pathway was self-reported by survey respondents because program tracking data did not include this information.
[4] "Satisfied" responses received a 4 or 5 rating on a scale of 1 to 5, where 1 meant "not at all satisfied" and 5 meant "very satisfied").
[5] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.
[6] Favorable responses included a 4 or 5 rating on a scale of 1 to 5, where 1 meant "unacceptable" and 5 meant "outstanding"), with an average rating of 4.2 out of 5. Respondents included lighting, products, and recycling participants.
[7] Significant differences between the 2016 and 2022–2024 program offerings include (1) the 2016 program was dominated by lighting measures and (2) the in-store instant rebate pathway was not offered in 2016.

- **Downstream Rebate Pathway:** Most responding participants (76%) reported satisfaction with the overall rebate process, indicating room for improvement. The process was noted as time-consuming, cumbersome, and long by those who were less than satisfied. Eleven of the 15 interviewed program-participating contractors also identified the complexity of rebate paperwork as a challenge with the rebate pathway, citing the need to provide technical information (model numbers, capacity, etc.) as intimidating or confusing for some customers.[8]
- **Midstream Pathway:** Relative to the downstream rebate process, heat pump water heater installation contractors generally reported finding the midstream pathway considerably easier to manage because it involves less paperwork, coordination, and risk of application rejection.
- **Online Marketplace Pathway:** Nearly nine in ten (88%) respondents who purchased a gas Wi-Fi thermostat through the online marketplace were satisfied with both their overall purchasing experience and the prices offered. Fewer respondents (62%) were satisfied with the range and selection of products available on the online marketplace.
- **Instant In-Store Rebate Pathway:** Most respondents who reported purchasing a product with an in-store rebate said they were satisfied with both their overall rebate experience (14 of 17) and the time to receive the rebate (14 of 17).
- **Recycling Pathway:** Nearly all respondents (98%) said they would recommend the NHSaves appliance recycling offer to a friend and 95% said it was easy to participate. Satisfaction with the scheduling process and promptness were also high at 95%, while the time it took to receive the rebate received the least 'satisfied' ratings (85% satisfied).

Barriers to Participation

- **Program-participating contractors and customers pointed to the rebate application process as a barrier**, with some customers struggling to provide the required technical details and documentation requirements.
- **Participating contractors overwhelmingly reported (85%) that rising equipment costs are significantly impacting customer decisions**, with customers delaying projects, opting to repair existing systems, and showing more interest in financing options.
- **There are relatively minor barriers to participation in the online marketplace, in-store instant rebate, and recycling pathways**, mainly related to customers needing to provide their account number and transportation logistics for the recycling pathway.

ES Products Program-Level Process Recommendations

The list below summarizes overall process evaluation recommendations and considerations. Note that recommendations have a priority level of *high*, *moderate*, or *low*, while considerations have no priority level. The text of some recommendations and considerations is abbreviated here; the full text is in Section 3.1.3 and Appendix F.2.

[8] Except where noted otherwise, questions about satisfaction used a scale of 1 to 5 where 1 meant "not at all satisfied" and 5 meant "very satisfied."

1. **Recommendation P-1:** Review current education and engagement opportunities for participating HVAC and water heating contractors and identify ways to expand them, such as through partnerships with HVAC companies, dedicated program representatives, and training events. Note that this recommendation supports high-priority recommendations for air-source heat pumps. *(Priority: High)*
2. **Recommendation P-2:** Undertake a comprehensive review of program application and documentation requirements. Remove requirements and questions that are not essential or valuable to the program and provide additional guidance on where and how to find the required information (e.g., consider including videos and/or visual examples of how to find AHRI reference and model numbers). Also continue to offer paper applications to support program accessibility, and consider specifying that by participating, the customer agrees to allow access and/or share their data for evaluation purposes. *(Priority: High)*
3. **Recommendation P-3:** Continue to review the rebate amount for each measure at least annually and raise incentive levels where cost-effective and necessary to drive adoption. Higher incentives tend to decrease FR rates and drive participation and program satisfaction.[9] The evaluators note that the program proactively increased rebate levels for several measures in 2026. *(Priority: Moderate)*
4. **Recommendation P-4:** Increase awareness of and participation in NHSaves and the ES Products Program by promoting them through multiple channels. Revisit existing plans for communications to participating contractors, in-store promotions, and general brand and program marketing activities and identify activities that can be increased within the approved budget. *(Priority: Low)*
5. **Recommendation P-5:** Cross-promote weatherization through the Home Energy Performance and Home Energy Assistance programs with installation of heating and/or cooling measures. Promote the benefits of weatherizing their homes first to customers, and train installation contractors to encourage their heating and cooling customers to pursue weatherization to help customers save additional energy while promoting participation.[10] *(Priority: Low)*
6. **Recommendation P-6:** Tout the careful vetting process and ease of selection as reasons to purchase efficient products from the online marketplace, emphasizing that the limited number of product options on the marketplace is a strength. Additionally, review the offered products and product categories at least annually and consider adding additional types of measures, such as new types of "smart" home technologies, as they become viable. *(Priority: Low)*
7. **Consideration P-7:** Investigate the feasibility of enabling participants and/or contractors to easily track or look up their application status.

[9] This statement applies to measures early in their adoption cycle when incentives reduce barriers, making them more appealing to a wider range of consumers. When a market matures, higher incentives have little impact on adoption and can increase FR rates. See Rogers, E.M. 2003. *Diffusion of Innovations*. 236 to 238. Fifth Edition. Free Press: New York.

[10] The evaluators note that the utilities included a similar strategy in their proposed NHSaves 2027–2029 Plan.

8. **Consideration P-8:** Consider expanding instant and/or midstream rebate offerings for measures with low-to-moderate FR rates to reduce administrative burden and improve customer and contractor experience.
9. **Consideration P-9:** Consider expanding the existing NHSaves financing options to include ES Products measures and offering loan amounts sufficient for customers to undertake major measures such as heat pumps.

KEY PROCESS FINDINGS AND RECOMMENDATIONS FOR SELECTED MEASURES

This section summarizes the process findings and associated recommendations for measures that underwent process evaluation—i.e., HPWHs, natural gas furnaces and boilers, gas integrated water heaters, and gas Wi-Fi thermostats. Key findings and recommendations for ASHPs appear in the next section. Note that recommendations have a priority level of *high*, *moderate*, or *low*, while considerations have no priority level. The text of some recommendations and considerations is abbreviated here; the full text is in Section 3.1.3 and Appendix F.3.

Findings Relevant to Multiple Measures

- **Participant satisfaction with equipment performance was generally high.** Eighty-one percent or more of responding participants reported they were satisfied with the performance of the equipment installed.
- **Participants are less satisfied with the changes to their energy bills after installing program measures, suggesting an opportunity for the program to do more to help customers understand what to expect.**
  - **Recommendation PM-1:** Expand communications about the energy savings customers can expect to see after installing measures through the program and factors affecting those savings. *(Priority: High)*
    - Issue guidance to contractors about how to represent the changes customers can expect in their energy usage after installing a measure.
    - Update the NHSaves website and other communications to inform potential participants about the energy savings they can expect. For example, consider adding a page describing the factors that affect savings.

Heat Pump Water Heaters

- **While most participating customers were satisfied with their HPWH's performance, fewer were satisfied with the changes in their energy bill.**
  - See recommendations for improving satisfaction under "Findings Relevant to Multiple Measures" above.
- **Combining efforts with the New England Heat Pump Accelerator (NEHPA) and Home Electrification and Appliance Rebate (HEAR) programs presents an opportunity to overcome two key barriers to HPWH adoption.** With the New England Heat Pump Accelerator and HEAR programs starting in 2026, customers can stack the HPWH incentives those programs offer with the NHSaves rebate.
  - **Recommendation PM-2:** Coordinate with NEHPA and HEAR to carry out the following activities: *(Priority: Moderate)*

a. Co-promote the HPWH rebate and incorporate education about the advantages of HPWHs and factors that affect their success.
b. Monitor HPWH rebate activity and set the rebate amount at an appropriate level to drive installations while using rebate funds efficiently.
c. Ensure that the language on the rebate form and NHSaves website about combining the ES Products rebate with other offers is clear and specific.

- **Participating contractor HPWH sizing practices vary, with some interviewed contractors saying they always recommend upsizing to a larger-capacity model and others reporting that they right-size to the home's conditions.** Contractors who do not routinely upsize to a larger model did not report performance issues or customer dissatisfaction.
  - **Recommendation PM-3:** Reinforce recommended practices around HPWH sizing in contractor communications and trainings. Consider sharing video or written case studies showing successful approaches to right-sizing. *(Priority: Moderate)*
- **Sentiment towards the midstream pathway was mostly positive among the four contractors reporting experience with it.** Advantages cited included the simplified process for both customer and contractor and the instant incentive. However, contractors alluded to some challenges with distributors and concerns about transparency.
  - **Consideration PM-4:** Undertake a targeted effort to learn more about contractor experiences with the midstream pathway, particularly if there are any issues or uncertainty about how the pathway is functioning.

Natural Gas Furnaces

- **The data suggest that program rebates for gas furnaces are moderately effective in driving customer decision-making.** Although the measured NTG ratio is modest at 63%, survey responses suggest that contractor guidance is influential and most interviewed participating contractors reported that they see rebates as influential.
  - **Recommendation PM-5:** Investigate contractor recommendation practices for furnaces and how the program can best support contractors in guiding customer decision-making while highlighting the program's role. *(Priority: Moderate)*
- **Revisiting the program's approach to incentivizing measure installation regardless of the pre-existing equipment type may help support a strong NTG ratio and program savings going forward.**
  - **Consideration PM-6:** Consider revising the program design to differentiate between noncondensing-to-condensing and condensing-to-condensing furnace replacements, or to focus exclusively on noncondensing-to-condensing projects.

Natural Gas Boilers

- **Program-participating contractors report varying practices regarding recommending boiler pumps with ECMs to customers.**
  - **Consideration PM-7:** The electric utilities should consider including ECM motors for boiler circulator pumps as a measure in the midstream pathway.

AIR-SOURCE HEAT PUMPS: OVERALL FINDINGS AND RECOMMENDATIONS

Developing an overall understanding of the ES Products Program's ASHP offerings was a key focus of this study. This section brings together the information gleaned through all research tasks to describe the current offerings and recommended future directions. Note that recommendations have a priority level of *high*, *moderate*, or *low*, while considerations have no priority level. The text of some recommendations is abbreviated here; the full text is in Section 3.1.3 and Appendix F.4.

- **This study determined that the current ASHP offering has a modest impact on customer decision-making.** Among surveyed participants installing central and ductless mini-split units, more than eight in ten (82% and 89%, respectively) stated that they were somewhat or very likely to purchase the exact same efficiency equipment in the absence of the program. However, survey responses indicate that contractor recommendations play a key role in heat pump selection and installed efficiency for many customers, resulting in a relatively moderate estimated free-ridership level overall.
    - **Recommendation HP-1:** Leverage one or more of the strategies described in Section 4.2.3 to revise the ASHP incentive offerings with the goal of reducing FR rates and driving energy savings above current baseline. *(Priority: High)*
    - **Recommendation HP-4:** Reinforce the program's role in customer decision-making by providing contractor guidance on heat pump recommendation practices that help steer customers toward the highest feasible efficiency levels. Consider focusing partnership efforts on firms that specialize in heat pump installation because customers of those contractors are already interested in installing a heat pump, consistent with the program's goal. *(Priority: High)*
- **The overall body of evidence from the study team's NTG analysis and baseline evaluation supports the conclusion that the current heat pump incentives are not having the intended effect (i.e.; influencing customers who are already interested in installing a heat pump to choose a higher efficiency unit).**

    ► **The measured counterfactual baselines for central and ductless mini-split ASHPs are complex blends of existing and replacement equipment and fuel types.** The currently defined baseline—a less-efficient ASHP system—is a minor component of the measured baselines.

    - **Recommendation HP-7:** Maintain the baseline defined in the 2026 TRM for the 2027 program year for central ASHPs and ductless MSHPs. Once the new program design has been implemented, reassess the appropriate baseline definitions based on the redesigned program offering. *(Priority: Moderate)*
    - Consideration HP-9: Consider revising or expanding the line of questioning in the baseline question battery in future surveys to dissect the counterfactual action in more detail and reduce the risk of confirmation bias in responses.

    ►**Almost all interviewed program-participating contractors reported that ENERGY STAR-certified, program-qualifying heat pumps are their standard**

offering.[11] This suggests that the program rebate may have limited influence on equipment selection. It also suggests that raising the qualifying equipment specifications (potentially in conjunction with raising incentives) could help the program achieve its objective of encouraging contractors and customers to install a higher-efficiency heat pump than they would have otherwise.

- **Recommendation HP-2:** Investigate current installed equipment trends and the factors that influence which equipment brands, models, and efficiency levels contractors recommend to customers. Understanding these practices could clarify the program's influence on equipment selection and efficiency levels installed and define appropriate equipment efficiency thresholds or tiers. *(Priority: High)*
- **Recommendation HP-3:** Based on the contractor stocking and recommendation practices findings, increase program qualifying equipment efficiency levels to encourage more customers to adopt higher-efficiency heat pumps. Alternatively, consider creating tiered incentives by efficiency level, with at least one tier at a higher efficiency level than the current offering. *(Priority: High)*
- **Recommendation HP-5:** As part of ongoing coordination with the NEHPA and HEAR programs, devise approaches to drive participants in the other programs to adopt higher-efficiency ASHPs than they would otherwise. For example, provide training and support to the contractors that are engaged by the NEHPA and HEAR programs and align customer marketing and communication approaches to focus the ES Products Program's efforts on efficiency. *(Priority: High)*
- **Consideration HP-10:** Consider adopting a midstream model to capture incremental efficiency savings among customers who are already planning to install a heat pump. Given contractors' reported influence on equipment selection, a midstream approach may provide a more direct mechanism for influencing contractor recommendations and encouraging customers to select higher-efficiency models and improve the customer experience. Two factors to consider before deciding to adopt a midstream model include the current free-ridership rate (which may be increased under a midstream approach) and program costs.

►The NHSaves heat pump webpage focuses on the general benefits of heat pumps, rather than the benefits of choosing an efficient heat pump over a regular heat pump. The webpage includes a Quality Installation Checklist, Heat Pump Installer Questions, and Heat Pump Tips, but it does not include information about efficiency criteria or the wide range of efficiency levels available.

- **Recommendation HP-6:** Revise the Heat Pumps page[12] on the NHSaves website and other customer communications to provide customers with guidance on how to select an efficient ASHP system, how to use their system efficiently to maximize

[11] Because this evaluation included interviews with only participating contractors, it is unclear whether this is the case across the broader contractor community in New Hampshire.
[12] NHSaves, "Heat Pumps," accessed August 12, 2026. https://nhsaves.com/residential/electric-heating-cooling-equipment/

overall energy savings and reduce its impact on summer and winter peak demand, and changes they should expect to see in their energy usage.[13] *(Priority: High)*

a. Include explanations of heat pump efficiency rating criteria and questions they should ask their contractor about the efficiency of suitable models.
b. Building on the "Heat Pump User Tips" already posted on the webpage, the program should provide additional information about ASHP controls and settings, available financing, and related NHSaves opportunities.
c. Inform potential participants about what they can expect. For example, consider adding a page describing the factors that affect savings.[14]

- **Participant satisfaction with the performance of their heat pump was generally high, especially for cooling.** For central ASHPs, 81% of responding participants were satisfied with their heat pump's heating performance, and for ductless mini-split ASHP customers, 84% were satisfied. For both ASHP types, 97% of responding participants said they were satisfied with their heat pump's cooling performance.
- **Approximately one-third of customers were less than satisfied with the changes to their energy bills after installing a heat pump.** As described in Sections 3.2.3.1 and 3.3.3.1, 67% of responding central ASHP participants and 65% of ductless mini-split ASHP participants said they were "somewhat" or "very" satisfied with the changes to their energy bill. Programs in other jurisdictions have seen similarly challenging results around heat pump energy bill impacts: As programs learn more about heat pump performance and customer expectations, they should do more to help customers understand what they can expect and make informed decisions.
    - See Recommendation HP-6 for ways to help customers understand what to expect after installing a heat pump.
- **Interest in adding cooling, improving cooling quality, or replacing failing cooling equipment are drivers for heat pump installations, and the utilities should be mindful of impacts on summer and winter electric demand.** Ductless mini-split ASHPs are more likely than central ASHPs to be used for cooling and installed where no prior cooling existed.
    - See Recommendation HP-6 for ways to help customers learn to use their heat pumps efficiently, including during summer and winter peak periods.
- **Further program attribution research would help the ES Products Program better understand the complex decision-making processes around customers' decisions to install a heat pump and model selection.**
    - **Recommendation HP-8:** Explore program attribution in more depth and fine-tune the NTG evaluation approach in a future evaluation of the heat pump offerings. Ideally, this will occur once program redesign efforts have been put in place and the heat pump baseline is more clearly defined, and as soon as possible after the purchase decision to support respondent recall. Explore the following components:

[13] Consistent with Steps 2 and 3 in Figure 1.
[14] For example, https://nhsaves.com/learn/2020/08/is-it-time-to-invest-in-a-new-heating-system/.

a. Dissect the customer decision-making process to differentiate the decision to install a heat pump from the decision of which type, efficiency level, and specific model of heat pump to install.
b. Investigate the ways in which contractors influence customer decision-making, including the decision to purchase a heat pump, the number and diversity of options presented, as well as how contractors influence installation timing and quantity/system size.
c. Examine customer awareness of the rebate, third-party programs, and financing offerings, and their roles in lowering the purchase price.
d. Examine how free-ridership and spillover estimates vary when the counterfactual heating fuel differs.
e. Develop alternative scoring in NTG algorithms that emphasizes the program influence on efficiency over the decision to adopt and timing.
f. Explore the interaction between the ES Products Program and others, such as the NEHPA and HEAR programs. *(Priority: Moderate).*

Section 1 Introduction

This report presents the results of the impact and process evaluations of the NHSaves ENERGY STAR® Products Program ("ES Products Program" or "the program"). NMR Group, Inc. ("NMR" or "the team") conducted the evaluation on behalf of the New Hampshire Evaluation, Monitoring and Verification (EM&V) Working Group between mid-2025 and mid-2026. The impact results presented in Section 3 were previously delivered in a memo titled "New Hampshire ENERGY STAR® Products Program Impact Evaluation Results Memo" dated May 15, 2026, although this report expands contextual discussions underlying some of the findings.

1.1 About the Energy Star Products Program

The NHSaves ES Products Program encourages residential customers to adopt high-efficiency electric and natural gas appliances, heating, cooling, and water heating systems by providing consumer and contractor education and reducing the incremental costs of efficient products. The program also sponsors recycling to help permanently remove inefficient appliances from use.

This section describes the design and delivery of the ES Products Program, including the incentivized measures and the five delivery pathways that comprise the program.

1.1.1 Incentivized Measures and Program Delivery Pathways

The program's delivery pathways include online and mail-in rebates, midstream incentives, an online marketplace, instant in-store rebates (currently offered by Eversource only), and recycling pickup and drop-off events. Key measures include various large and small appliances, advanced power strips, pool pumps, thermostats, and high-efficiency heating, cooling, and water heating systems (Table 3). Lighting measures previously comprised a major portion of reported savings from the program but are no longer offered in the 2024–2026 term. Table 3 summarizes the five major pathways and measures delivered through each, and Section 4 includes in-depth pathway descriptions.

Table 3: ENERGY STAR Products Program Pathways

Pathway	Measures*	Description
Downstream Rebates	**Air purifiers**, dehumidifiers, clothes washers and dryers, **central (ducted) and ductless mini-split air-source heat pumps (ASHPs)**, **heat pump water heaters (HPWHs)**, **pool pumps**, room ACs, **thermostats**	Customers apply for rebates through the NHSaves website or with a mail-in application
Midstream Incentives	HPWHs, electronically commutated motor (ECM) circulating pumps	Incentives are provided to contractors across the state to encourage customer installation of program equipment

Online Marketplace	Advanced power strips, **air purifiers**, dehumidifiers, **thermostats**, lighting	Customers receive rebates for purchasing energy efficiency products through an online marketplace
In-Store Instant Rebates**	**Air purifiers**, dehumidifiers, **HPWHs**, room ACs	Customers apply for rebates when purchasing equipment in-store at participating retailers
Recycling	**Dehumidifiers, freezers, refrigerators, room ACs**	Customers apply online to have appliances picked up or to drop them off for an incentive

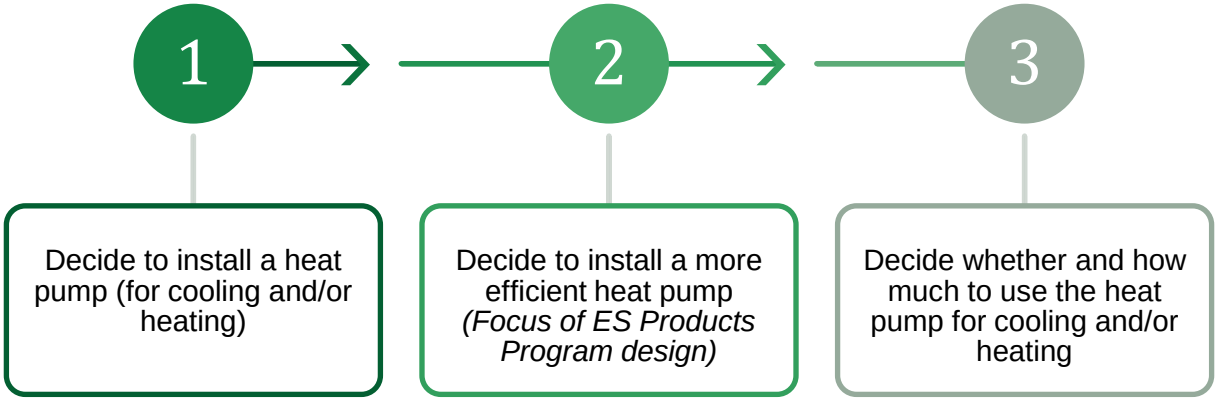
* Bold text indicates measure is in scope for this evaluation.
** The in-store instant rebate pathway launched in mid-2021 and was discontinued by Unitil, Liberty, and NHEC in early 2025. Currently it is offered by Eversource.

1.1.2 Air-Source Heat Pump Offerings

Because air-source heat pumps (ASHPs) were a primary focus of this study, we describe the heat pump offerings in more detail here.

Program Design: The ES Products Program offers rebates intended to incentivize customers who plan to install a heat pump to choose a higher-efficiency heat pump than they would have in the absence of the rebate. For most customers[15], the program is designed to influence Step 2 in the three-step decision-making process represented in Figure 1 below. After the customer has decided to install a heat pump for heating and/or cooling (Step 1), the program aims to influence the customer to opt for a more efficient heat pump through a modest rebate of $250 per ton.

Figure 1: Customer Decision-Making Process for ASHP Installation



The program has efficiency criteria for qualifying heat pumps and qualifying units are listed on a Qualified Product List.[16] The program currently incentivizes central ASHPs and ductless mini-split ASHPs under two installation scenarios, as described in the 2026 Technical Reference Manual (TRM).

[15] The program design and intention differ for customers who use electric resistance heating as their primary heating system. In this instance, the program uses an enhanced incentive to motivate customers to displace or fully replace their inefficient electric heating with an efficient heat pump, thus influencing Step 1 and Step 2 in Figure 1.
[16] https://nhsaves.com/heat-pump-qualified-product-list/

- For lost opportunity or replace on failure installations, the program intends to incentivize customers who are considering a heat pump to choose a higher-efficiency unit than they would choose without the incentive. The baseline specified in the TRM for the lost opportunity energy savings calculations is a heat pump compliant with the current minimum federal standards. The program incentivizes heat pumps displacing or replacing any heating or cooling system as well as installations where no heating and/or cooling system previously existed.
- For replacements of primary electric resistance heating systems, the program incentivizes customers to displace or replace the existing system with high-efficiency heat pumps. The baseline for this replacement scenario is the existing electric resistance heating system. Starting in 2025, the program began offering significantly enhanced incentives for this replacement type.

Customers may obtain a qualifying ASHP directly or by working with an installation contractor. Likewise, customers can self-install the equipment or have it installed by a contractor. The program requires customers or their contractors to submit a rebate form and project documentation either by mail or online to receive ASHP incentives. Customers replacing permanent electric resistance equipment are eligible for enhanced incentives after pre-verification of their existing heating system.[17]

The NHSaves website includes a Quality Installation Checklist, Heat Pump Installer Questions, and Heat Pump Tips designed to give customers information about heat pump installation, operation, and maintenance.

Incentives: Comparing New Hampshire with neighboring states, New Hampshire and Vermont generally offer lower incentives for ASHP installations, while Massachusetts and Maine provide more substantial rebates, particularly for whole-home heat pump conversions.

- **The New Hampshire ES Products Program** currently provides heat pump rebates of $250 per ton (up to $1,250) and enhanced incentives of $2,000 per ton for heat pumps displacing primary electric resistance heating.[18]
- **Massachusetts** offers the largest heat pump incentives in the region. Incentives are tiered, providing up to $8,500 for whole-home and partial-home installations, with a higher per-ton rate for whole-home projects. “Basic” installations (in which the customer is not displacing fossil fuel or electric resistance heat) earn incentives similar to those offered by the New Hampshire ES Products Program ($250/ton up to $2,500). Enhanced incentives of up to $16,000 or more are available for income-qualified households.[19]

[17] Note that the enhanced incentive for replacing electric resistance heating became available in 2025 and were not available during the participation period of customers who responded to the participant survey. As of August 2026, the enhanced incentive was set at $2,000 per ton.
[18] NHSaves, “Heat Pumps,” https://nhsaves.com/residential/electric-heating-cooling-equipment/ accessed July 15, 2026. The electric resistance enhanced incentive was increased from $1,250 to $2,000 in March 2026.
[19] Mass Save, “Air Source Heat Pumps,” https://www.masssave.com/en/residential/rebates-offers-services/heating-and-cooling/heat-pumps/air-source-heat-pumps accessed July 15, 2026.

- **Maine** provides rebates of $1,000–$3,000 per outdoor unit for ductless systems and up to $9,000 for qualifying whole-home ducted installations, with an additional $500 bonus available through 2026.[20]
- **Vermont** offers incentives starting at $375–$475 per indoor head for ductless heat pumps and $1,200–$2,200 for ducted heat pumps, with additional income-qualified bonuses available.[21]

Concurrent Federally Funded Programs: Beginning in 2026, federally funded programs incentivizing heat pumps are shifting the landscape for customer decision-making in New Hampshire. As of this report, the New England Heat Pump Accelerator program had been active since February 2026, the HEAR Program was expected to start before the end of 2026, and the future of the HOMES Program was uncertain. These programs were not in effect during the study period (i.e., when the surveyed participants installed measures), but may drive significant changes over the next several years.

- **New England Heat Pump Accelerator:** The New England Heat Pump Accelerator (NEHPA) was created to support the advancement of heat pump adoption across five New England states: Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island. This coalition of states, led by The Connecticut Department of Energy & Environmental Protection (DEEP), received a $450 million grant from the Environmental Protection Agency's Climate Pollution Reduction Grants to fund the NEHPA. The program works with distributors, contractors, policymakers, and community organizations to deliver efficient, affordable heat pumps for heating and cooling. By investing in training efforts, community partnerships, and up-front heat pump incentives (up to $750 per unit) for customers, the NEHPA ultimately aims to transform the residential heat pump market and make heat pumps the default choice for heating, cooling, and water heating.[22]
- **Home Electrification and Appliance Rebate (HEAR) Program:** The New Hampshire Department of Energy (NH DOE) was awarded nearly $34.8 million for the implementation of the HEAR program, which was created under the Inflation Reduction Act (IRA). The New Hampshire HEAR program, which is expected to launch in the fall of 2026, will provide rebates for the purchase and installation of appliances and building envelope materials to help reduce homeowners' utility bills. The program provides households with up to $14,000 in rebates either through installation contractors or at point of sale at retail outlets. Households earning less than 80% of the area median income will be eligible for a maximum rebate amount up to 100% of the project costs, while households earning between 80% and 150% of the area median income will be eligible for a maximum rebate

[20] Efficiency Maine. "Whole-Home Heat Pump Rebates," https://www.efficiencymaine.com/whole-home-heat-pump-rebates/
[21] Efficiency Vermont. "Rebates for Your Home," https://www.efficiencyvermont.com/Media/Default/docs/printable-resources/GeneralInfoForHomes/efficiency-vermont-homeowner-flyer.pdf
[22] New England Heat Pump Accelerator. "About the Accelerator," https://www.nehpa.org/, accessed August 14, 2026.

amount up to 50% of the project costs. The program will offer rebates for efficient HVAC appliances, electric stoves and ovens, weatherization upgrades, and electrical wiring.[23]

- **Home Efficiency Rebates (HOMES) Program:** The HOMES Program focuses on whole-house energy saving retrofits to help reduce the upfront cost of whole-home energy efficiency upgrades in single-family and multifamily homes. The New Hampshire Department of Energy (NH DOE) was awarded over $34.8 million for the implementation of this program. Qualifying retrofits must address at least one major upgrade related to heating and cooling, building envelope, or water heating end uses.[24] The program plans to cover project costs up to $15,000 for 20%–34% modeled energy savings and up to $20,000 for a minimum of 35% modeled energy savings, although these amounts are not yet approved by the United States Department of Energy. The rebate will also be dependent on the total income of the household.[25]

1.2 Program Savings for Study Period

This study was designed to evaluate program measures that individually delivered more than 5% of overall electric and gas savings during the 2022 and 2023 program years.[26] Table 4 and Table 5 below show the quantities of measures installed, the resulting electric and gas savings claimed by the program, and the percentage of total program savings during that period. Measures that were not included in this study's scope are indicated by blue shading. Excluding lighting, installed measures incentivized through downstream pathways (i.e., online and mail-in rebates, in-store instant rebates and online marketplace purchases) comprised 71% of overall electric ES Products Program savings, while recycling measures accounted for 28% of total savings and midstream measures accounted for 1% of savings in 2022–2023. In the same time period, just over half of reported gas savings came from Wi-Fi thermostats, and most of the remainer (41%) came from furnaces, boilers, and integrated water heaters (i.e., combination boiler/water heaters). The remaining 8% was attributable to water heaters and programmable thermostats.

[23] New Hampshire Department of Energy. "Home Electrification and Appliance Rebates Program". https://www.energy.nh.gov/funding-opportunities/funding-opportunities-homeowners/home-electrification-and-appliance-rebates, accessed August 14, 2026.
[24] ENERGY STAR. "Home Efficiency Rebates (HOMES) Program." https://www.energystar.gov/partner-resources/state-and-tribal-rebate-programs/homes-program, accessed August 14, 2026.
[25] New Hampshire Department of Energy. "Home Efficiency Rebates Program." https://www.energy.nh.gov/funding-opportunities/funding-opportunities-homeowners/home-efficiency-rebates-program, accessed August 14, 2026.
[26] The study expanded to encompass 2024 program year data for the installed measures survey in order to deliver the most recent possible feedback from customers and 2025 data to provide useful feedback on current heat pump savings calculation practices. For recycling measures, the team used 2024 data as the 2022 and 2023 data lacked adequate information to fulfill study objectives.

Table 4: ES Products Electric Measures Installed Statewide, 2022–2023

Measure	Reported Quantity	Reported Gross kWh Savings	Percentage of Total Savings	Percentage of Total Savings (excluding lighting)
Mini Split Heat Pump (EA3b005 & EA3b006)	4,986	3,276,935	22%	27%
Refrigerator, Primary Recycling (EA3b027)	1,392	1,418,291	10%	12%
Heat Pump Water Heater – Downstream (EA3b007, EA3b008, EA3b038, EA3b039)	1,333	1,173,301	8%	10%
Room Air Purifier (EA3b025)	1,682	996,031	7%	8%
Pool Pumps, ES (EA3b024)	751	964,284	7%	8%
Refrigerator, Secondary Recycling (EA3b028)	735	748,267	5%	6%
Dehumidifier Recycling (EA3b037)	1,107	553,454	4%	5%
Freezer, Secondary Recycling (EA3b029)	488	373,352	3%	3%
Central Air Source Heat Pump (EA3b003 & EA3b004)	577	334,543	2%	3%
Room Air Conditioner Recycling (EA3b030)	2,295	259,448	2%	2%
LED Lighting *(not in scope)*	41,883	2,638,796	18%	-
All Other Electric Measures *(not in scope)*	17,173	1,936,460	13%	16%
Total	**111,626**	**14,673,162**	**100%**	**100%**

Table 5: ES Products Natural Gas Measures Installed Statewide, 2022–2023

Measure	Quantity	Sum of Total	Percentage
Thermostat, Wi-Fi (GA3b019 & GA3b020)	3,827	22,197	51%
Water Heater, Integrated (GA3b013 & GA3b014)	542	6,929	16%
Furnace (GA3b008 & GA3b009)	662	6,557	15%
Condensing Boiler (GA3b006 & GA3b007)	294	4,195	10%
Water Heater, Tankless	295	2,180	5%
Thermostat, Programmable	231	748	2%

Measure	Quantity	Sum of Total	Percentage
Water Heater, Indirect	62	248	1%
Water Heater, ES Storage	22	66	0%
Boiler Reset Controls	8	41	0%
Water Heater, Condensing	5	35	0%
Water Heater, Storage Stand Alone	1	3	0%
Total	**5,949**	**43,199**	**100%**

1.3 RESEARCH OBJECTIVES

This study aimed to improve the accuracy of prospective energy savings impact tracking and to identify opportunities to improve program effectiveness.

The objectives of the impact evaluation were to:

- Verify measure-level impact factors for the measures.
- Estimate net-to-gross (NTG) ratios, including free-ridership (FR) and participant spillover (SO).
- Assess whether the NH TRM properly accounted for savings and avoided double counting for measures with both recycling and new equipment offerings (i.e., ENERGY STAR dehumidifier rebate and dehumidifier recycling).

The process evaluation objectives were to:

- Describe the program design, delivery channels, and implementation processes.
- Assess participant satisfaction with key aspects of the program, including the participation process, incentives, and equipment quality, and identify opportunities for improvement.
- Identify how customers learned about the program's offerings, by pathway.
- Identify barriers to participation experienced by customers, by pathway.
- Examine contractor experiences with the midstream pathway.
- Determine how utilities could more effectively target customers who were not free riders.
- Compare findings with prior process evaluations of the program and similar programs in New England to identify benchmarking insights and best practices.

1.4 REPORT ORGANIZATION

The research findings are presented in Section 3 and Section 4, with supplementary details in Appendices D and E.

- Section 3 is mainly organized at the individual measure level and presents the impact results and process findings specific to individual measures.

  - Section 3.1 summarizes the high-level impact findings and recommended impact values, the measure-specific process findings and recommendations, and compares the findings for central and ductless mini-split ASHPs.
- Section 4 presents the process findings that apply to the program overall and to the five program pathways – downstream and midstream rebates, the online marketplace, in-store instant rebates, and appliance recycling.
  - Section 4.1 summarizes the key process findings and recommendations.
  - Section 4.2 presents the program-level process findings.
  - Sections 4.3 through 4.7 describe the findings specific to the five program pathways.
- The appendices include additional methodological details (Appendix A), data collection instruments (Appendices B and C), detailed survey results (Appendix D), and heat pump baseline findings (Appendix E), and all report recommendations and considerations (Appendix F).

Section 2 Methods

This section provides an 2.1 Overall Evaluation Approach, which includes separate methodologies for heat pumps, furnaces, and boilers. It also summarizes the key data collection and research components that inform the evaluation, including 2.2 Program Staff and Vendor Interviews, 2.3 Installed Measures Survey and 2.4 Recycling Measures Survey, 2.5 TRM and Literature Review, and 2.6 Participating Installation Contractor Interviews. Additional detailed methodology can be found in Appendix A.

2.1 Overall Evaluation Approach

This study encompassed ES Products Program measures that individually delivered more than 5% of overall program savings as well as all recycling measures offered (Table 4 and Table 5).[27] The evaluation used participant surveys as the primary research method to assess baselines, in-service rates (ISRs), demand impacts, NTG ratios, and process insights for the measures in scope. Table 6 defines the specific factors to be measured, which varied across measures.

Table 6: Measures and Factors Included in Evaluation

Measure Information	Factors Assessed				
Installed Measures					
Measure	**Baseline**	**ISR**	**Demand**	**NTG**	**Process**
ASHP (central, ductless mini-split)	Yes	Yes	Yes	Yes	Yes
Gas Furnace and Boiler	Yes	No	No	Yes	Yes
Heat Pump Water Heater, Downstream	Yes	No	No	Yes	Yes
Pool Pump	Yes	Yes	Yes	Yes	No
Gas Integrated Water Heater	Yes	No	No	No	Yes
Room Air Purifier	Yes	Yes	Yes	No	No
Gas Wi-fi Thermostat	Yes	Yes	No	No	Yes
Recycling Measures					
Measure	**RR**	**Unit Energy Use**	**NTG**	**Process**	
Refrigerator, Primary	Yes	Yes	Yes	Yes	
Refrigerator, Secondary	Yes	Yes	Yes	Yes	
Freezer, Secondary	Yes	Yes	Yes	Yes	
Dehumidifier	Yes	Yes	Yes	Yes	
Room Air Conditioner	Yes	Yes	Yes	Yes	

[27] The study included air source heat pumps with 3% of savings to learn more about this priority measure.

2.1.1 Air Source Heat Pump Evaluation Approach

Central (ducted) and ductless mini-split ASHPs were priority measures for this evaluation effort. The EM&V Working Group wanted to better understand customer usage patterns, baseline conditions, associated energy savings, and strategies for targeting customers who otherwise would have installed a less efficient heat pump. NMR designed the workplan to address these research topics and, critically, to account for differences between New Hampshire's program design and theory and those of comparison states. Unlike other states in the Northeast, the New Hampshire TRM specifies two different ASHP baselines: (1) for customers with existing electric resistance heating, the baseline is the existing heating system, while (2) for lost opportunity (LO) or replace-on-failure (ROF) projects, the baseline is a code-compliant SEER2 14.3, HSPF2 7.5 heat pump unit. The utilities calculate savings on a project-specific basis according to an algorithm defined in the TRM.

The workplan envisioned using the installed-measures participant survey to:

1. Characterize ISRs and demand impacts by asking customers about their daily and seasonal use of the heat pump and existing heating and cooling system(s). The team would combine the survey findings with findings from the literature and TRM review to inform New Hampshire's understanding of load shapes and summer and winter demand impacts.
2. Explore the range of baseline conditions among participants by asking participants about their pre-existing heating and cooling system(s) and fuel type(s) and usage.
3. Estimate NTG ratios inclusive of FR and SO.
4. Investigate process questions, including strategies for targeting customers who otherwise would have installed a less efficient heat pump.

This was the first known instance of a heat pump evaluation attempting to measure baselines and NTG through the same survey.

Feedback from the EM&V Working Group during study implementation led the evaluators to modify the participant survey scope to include an extensive baseline question series effectively identical to one used in the Massachusetts and Connecticut Heat Pump Metering Study.[28] This battery takes an in-depth approach to characterizing each respondent's counterfactual baseline.

Additionally, the heat pump evaluation scope included a sub-task intended to verify the utilities' claimed energy savings through a database review. Specifically, the evaluators reviewed 2025 tracking data from each of the four electric utilities to assess whether heat pump TRM algorithms were applied correctly and consistently.

The evaluation team delivered to each utility a workbook that appended verified calculations to their tracking databases and summarized findings, including where utility calculations deviated from the TRM and where potential data tracking errors were identified. The evaluation team

[28] Guidehouse and Ridgeline Energy Analytics. Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS / CT R2246). August 2024, updated April 2025. https://ma-eeac.org/wp-content/uploads/MA-HPMS-CT-R2246-Heat-Pump-Metering-Study-Final-Report_April_2025.pdf.

invited the utilities to engage with the task by reviewing the verified calculations, providing feedback, and correcting errors in their tracking data.

The workbook also presented realization rates for illustrative purposes only, as the objectives of the calculation verification task were to provide feedback on adherence to the current TRM and facilitate more accurate impact accounting going forward, not to develop realization rates for future TRM updates.

2.1.2 Furnace and Boiler Evaluation Approach

To evaluate gas furnaces and boilers, the participant survey built upon the Baseline Practices study[29] to explore the appropriateness of a bifurcated baseline for furnaces and boilers by asking respondents what type of system their incented measure replaced. The survey also asked customers about their typical use of the furnace or boiler and included process topics.

Additionally, the study team reviewed the inputs to the TRM-defined deemed savings based on the survey findings and literature and TRM review, proposing adjustments as needed. The study also reviewed the utilities' tracking practices to ensure that they were consistently applying deemed savings values from the current TRM.

2.2 Program Staff and Vendor Interviews

To learn about program implementation, NMR conducted eight in-depth interviews with 12 implementers. Interviewees included utility program staff, with at least one individual from each of the four utilities, and at least one staff person from each of the primary delivery vendors (rebate processing, field marketing and recycling drop-off, recycling pick-up, midstream, and online marketplace). Program evaluation staff, in consultation with program implementation staff, identified the key individuals for interviews.

The evaluation team developed an in-depth interview guide with input from the EM&V Working Group. The guide grouped questions by program pathway (i.e., downstream rebate, recycling, etc.) and covered success and challenges implementing the program, customer experiences with the program, and suggestions for future improvements. Not all questions were relevant to all interviewees, and the interviewer asked follow-up questions as needed. The interview guide is in Appendix B.

The evaluation team conducted interviews between August and October 2025. In May 2026, the team followed up by email to ask interviewees about any recent changes and to clarify certain points from the initial interviews.

2.3 Installed Measures Survey

The study team surveyed 2023 and 2024 participants who installed central or ductless (mini-split) ASHPs, gas furnaces or boilers, HPWHs incentivized through the downstream pathway, pool

[29] NMR Group, "Baseline Practices Final Report," Submitted to the New Hampshire EM&V Working Group, November 20, 2023, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/27-nh-baseline-practices-report.pdf.

pumps, gas integrated water heaters, room air purifiers, or Wi-Fi thermostats with natural gas heating, achieving an approximately 9.5% response rate overall.[30] The survey was the primary data source for ISRs, NTG ratios, and home characteristics and a critical source for baselines and measure use during peak demand periods. The survey also addressed program processes, including awareness, marketing and outreach, participant satisfaction, and participation barriers.

For a detailed description of the Installed Measures Survey methodology, including NTG and ISR analyses, see Appendix A.1 Installed Measures Survey.

2.4 Recycling Measures Survey

The study team surveyed 2023 and 2024 participants who recycled refrigerators, freezers, dehumidifiers, and air conditioners, achieving a 15% overall response rate. The survey was designed to understand participants' experiences with the program and gathered information for both the impact and process analyses. The impact portion of the survey covered topics including measure verification, appliance operating condition, frequency of use prior to recycling, appliance location, and participants' likely actions in the absence of the program. The process questions focused on participant satisfaction.

For a detailed description of the Recycling Measures Survey methodology, including gross and net savings, see Appendix A.2 Recycling Measures Survey.

2.5 TRM and Literature Review

NMR referenced relevant New Hampshire-specific sources where available to validate the reasonableness of the NH TRM's savings approaches and assumptions (including baselines, ISRs, demand coincidence factors [CFs], and NTG ratios) for a subset of measures consistent with Table 6. The team also referenced prior New Hampshire studies to provide context for the process evaluation. Referenced New Hampshire sources included the 2020 New Hampshire Residential Baseline Study,[31] the 2023 Baseline Practices Study,[32] and the prior evaluation of the ES Products Program (2018).[33]

The team also reviewed peer state TRMs to benchmark the NH TRM's savings approaches and assumptions against nearby jurisdictions while considering the distinct purpose of the New Hampshire heat pump incentives relative to other jurisdictions. NMR reviewed current TRMs and studies from 2020 to 2026 from the other New England states and New York. The team added reviews of Pennsylvania and Illinois TRMs for certain measures where New England and New

[30] For central air-source heat pumps, furnaces, boilers, pool pumps, and integrated water heaters, the survey also included 2022 participants to increase the available sample frame.
[31] Itron, "New Hampshire Residential Baseline Study," https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/18-nh-residential-baseline-study.pdf.
[32] NMR Group, "Baseline Practices Final Report," https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/27-nh-baseline-practices-report.pdf .
[33] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

York TRMs did not include comparable algorithms or input parameters. As part of the TRM review, the evaluators also reviewed associated savings calculation workbooks when necessary.

For recycling measures, the team also recorded the Unit Energy Consumption (UEC). The evaluators also noted non-energy impacts (NEIs) and effective useful lives (EULs) included in peer TRMs for future review and consideration by the EM&V Working Group. Finally, the evaluators reviewed currently applicable federal standards and ENERGY STAR criteria to investigate whether any baseline assumptions or efficient conditions should be adjusted for recent changes.[34]

2.6 Participating Installation Contractor Interviews

NMR conducted in-depth interviews with 15 participating installation contractors (i.e., contractors who have installed one or more ASHPs, HPWHs, furnaces, and/or boilers through the program) about the characteristics of these markets in New Hampshire and their experiences with the ES Products Program. The team developed an interview guide with feedback from the EM&V Working Group. The questions covered the contractors' experiences with customers installing heating, cooling, and water heater equipment and the successes and challenges of the program. When appropriate, the interviewers also asked about the new midstream approach for HPWH incentives. Not all questions were relevant to all interviewees, and the interviewer probed as needed.

The evaluators used 2025 project data provided by the utilities to develop a list of more than 1,300 unique email addresses[35] for participating contractors, constituting the sample frame for the interview effort. The team sent invitations to 825 addresses in six waves. Each wave was contacted twice with an initial invitation to interview and a reminder email. The team randomly determined which emails to contact. Early waves included an equal number of contacts by utility to improve the likelihood of completing interviews with at least two contacts from each utility. After achieving two completions per utility, the team exhausted the contact lists from the smaller utilities and filled out the remaining sample with contacts from Eversource. Initially, the team offered a $150 incentive for completing an interview. Due to low response, NMR increased the incentive to $200 for waves 5 and 6. While the response rate to the first wave was over 5% (see Appendix B.1.2), the overall response rate was low at 1.8%.

Responding Contractor Characteristics: Interviewed contractors primarily fell into two service categories. Six companies reported specializing exclusively in heat pump installations and related products, while nine firms offered ductless mini-split ASHPs as well as a broader mix of HVAC equipment, including central ASHPs, furnaces, boilers, water heaters, air conditioning systems,

[34] See list at https://appliance-standards.org/national-standards#NationalProductTable. Recent legislative actions may reduce the ability to determine compliance with the standards, but the standards currently remain in place. https://appliance-standards.org/document/house-bill-undoing-appliance-standards-certification-update-does-not-change-efficiency.

[35] Some were individual emails and others were general office emails.

and generators. Participation in the NHSaves ES Products Program was generally long-standing, with most of the responding contractors (12 of 15) having participated for eight years or more.[36]

All fifteen respondents reported installing ductless mini-split ASHPs, while 13 contractors installed central ASHPs and 12 contractors installed HPWHs. Fewer than half (7 of 15) of the interviewed contractors reported installing natural gas boilers or furnaces, while two contractors noted that they previously installed fossil fuel equipment but had since shifted their business focus entirely to heat pump technologies. Most contractors (13 of 15) also installed other rebated products, including smart thermostats, central air conditioning systems, and various water heater technologies.

Geographically, contractors were represented across all major regions of New Hampshire, with the highest concentration in the southern portion of the state. Eight of the 15 respondents were based in southern New Hampshire, where population density and contractor activity are highest, including one respondent located in Methuen, Massachusetts (near the New Hampshire border). Five respondents were based in central New Hampshire, and two were in northern New Hampshire. Overall, the geographic distribution reflects broad statewide coverage while aligning with New Hampshire's population and contractor density patterns.

The 15 interviewees represented a range of roles within their HVAC companies, with nearly half (7 of 15) serving as company owners, consistent with the prevalence of small, owner-operated HVAC companies in New Hampshire. Additional respondents included office managers and administrative staff (four), sales representatives or comfort advisors (two), an operations manager, and a rebate and energy credit specialist. Experience levels varied widely, ranging from one year to more than 35 years with their companies, although most respondents had at least six years of experience in their current roles.

[36] Note that the perspectives of non-participating contractors may differ from those of the participating contractors included here. Additionally, due to the relatively small number of interviews, results may not fully capture the perspectives of all participating contractors.

Section 3 Measure-Level Findings

This section presents impact and process results at the individual measure level. The first section, 3.1 Summary of Key Measure-Level Findings, summarizes the quantitative results across measures and provides a clickable link to each measure section. The subsequent sections present the detailed recommendations, impact findings, and process findings for each measure included in the study.

The objectives of the impact evaluation included the following:

1. Verify measure-level impact factors as indicated for the measures shown in Table 6.
2. Estimate NTG ratios (i.e., FR and participant SO) as indicated in Table 6.
3. Check whether the NH TRM properly accounts for savings and avoids double counting for measures that have both recycling and new equipment offerings (e.g., ENERGY STAR dehumidifier rebate and dehumidifier recycling).

3.1 Summary of Key Measure-Level Findings and Recommendations

Table 7 summarizes the key evaluation findings, including baseline assumptions, ISR, demand impacts, and NTG ratios for installed measures. Table 8 presents evaluated ISR, unit energy consumption (UEC), and NTG values for recycled measures. The values shown are a mix of recommended TRM values based on this evaluation and existing TRM values where either the specific factor was not included in the study scope (marked with an asterisk) or where the evaluation identified no necessary updates. Measure-specific recommendations are provided within the corresponding measure sections below.

3.1.1 Impact Findings and Recommendations

The study identified substantive recommended changes for several evaluated measures. One notable change affecting multiple measures is the first-time application of measured NTG values to heat pump measures, natural gas furnaces and boilers, HPWHs, pool pumps, and recycling measures. Other key findings include increased savings for the top tier of furnaces and boilers, sizable but mixed energy savings changes for HPWH measures, decreased electric savings for room air purifiers, and first-time application of part-use factors (PUFs) for recycling measures. Exploration of heat pump baselines is ongoing and is discussed in detail in Appendix E.

The study team offers one consideration for future data tracking of all measures:

- **Consideration DT-1:** Track the program pathway through which each measure was incentivized to facilitate future analysis and evaluation.

Table 7: Measure-Level Results Summary – Installed Measures

Measure	Baseline	ISR	Demand Usage Ratio (DUR) or Coincidence Factor (CF)	NTG
Heat Pump, central air-source (Sec 3.2)	Table 9. Section 3.2.2.2, and Appendix E	100%	DUR Summer: 0.948 DUR Winter: 0.898	63%
Heat Pump, ductless (Sec 3.3)	Table 13, Section 3.3.2.2, and Appendix E	100%	DUR Summer: 0.839 DUR Winter: 0.596	68%
Gas Furnace (Sec 3.4)	86.9% AFUE (LO) 87.4% AFUE (ER) 87% AFUE (Blended LO-ER)	100%*	CF Summer: 0.0 CF Winter: 0.45	63%
Gas Boiler (Sec 3.5)	85.7% AFUE (LO) 87.0% AFUE (ER) 86.7% AFUE (Blended LO-ER)	100%*	N/A	63%
Gas Wi-fi Thermostat (Sec 3.6)	A manual or programmable thermostat.	88%	N/A	N/A*
Heat Pump Water Heater, Downstream (≤55 gal) (Sec 3.7)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)	100%	CF Summer: 0.41* CF Winter: 0.74*	67%
Heat Pump Water Heater, Downstream (>55 gal) (Sec 3.7)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)	100%	CF Summer: 0.41* CF Winter: 0.74*	67%
Gas Integrated Water Heater (Sec 3.8)	85% AFUE boiler with a 0.60 UEF water heater	100%*	N/A	N/A*
Pool Pump (Sec 3.9)	Pool Pump meeting the July 2021 Federal Standard 10 CFR part 431	99%	CF summer: 0.88 CF winter: 0.00	88%
Room Air Purifier (Sec 3.10)	1.9 CADR/W (10-100 CADR) 2.4 CADR/W (100-150 CADR) 2.9 CADR/W (≥150 CADR)	88%	CF summer: 0.59 CF winter: 0.67	N/A*

* Factors marked with an asterisk were not in scope and were not evaluated in this study.

Table 8: Measure-Level Results Summary – Recycling Measures

Measure	Realization Rate (Part-Use Factor)	Gross Savings (UEC)	NTG
Refrigerator, Primary and Secondary (Sec 3.11)	87%	998 kWh	38%
Freezer, Secondary (Sec 3.12)	79%	795 kWh	39%
Dehumidifier (Sec 3.13)	100%	1,020 kWh	30%
Room Air Conditioner (Sec 3.14)	100%	245 kWh	35% (retrospective) 36% (prospective)

3.1.2 Key Process Findings and Recommendations for Selected Measures

This section summarizes the key process findings for the measures that included a process component, i.e., HPWHs, natural gas furnaces and boilers, gas integrated water heaters, and gas

Wi-Fi thermostats. (Note that key findings and recommendations for ASHPs are described separately in Section 3.1.3.) Process findings for the five program pathways and the program are presented in Section 4.1.

Multiple Measures

- **Participant satisfaction with equipment performance was generally high.** The participant survey asked respondents to rate their satisfaction with how their HPWH, gas boiler, gas furnace, gas integrated water heater, or gas Wi-Fi thermostat was working. For each of these measures, 81% or more of responding participants reported satisfaction with the performance of the installed equipment.
- **Participants are less satisfied with the changes to their energy bills after installing program measures, suggesting an opportunity for the program to do more to help customers understand what to expect.** For HPWH, gas boilers and furnaces, gas integrated water heaters, and gas Wi-Fi thermostats, a notable fraction of responding participants (29%–47%) indicated that they were less than satisfied with the changes in their energy bills after installing the measure (see Figure 21).
  - **Recommendation PM-1:** Expand communications to participating contractors and customers about the energy savings customers can expect to see after installing a measure(s) through the program and the factors that affect those savings (e.g., weather, insulation levels, occupancy, equipment settings, fuel conversion, etc.). *(Priority: High)*
    - Issue guidance to participating contractors about how to represent the changes customers can expect in their energy usage after installing a measure.
    - Update the NHSaves website and other communications to inform potential participants about the energy savings they can expect. For example, a new webpage or blog post can describe the factors that affect energy bill savings. Consider revising or replacing content that does not acknowledge these factors.

Heat Pump Water Heaters

- **While most participating customers were satisfied with their HPWH's performance, fewer were satisfied with the changes in their energy bill.** Eighty-seven percent of survey respondents reported being "somewhat" or "very" satisfied with the water heater's performance. In contrast, just over one-half (55%) of respondents were satisfied with the changes to their energy bill after installing the new equipment. However, satisfaction was notably higher among those who replaced an electric resistance water heater with a heat pump water heater (73%). (See recommendations for improving satisfaction under "Multiple Measures" above.)
- **Combining efforts with the New England Heat Pump Accelerator (NEHPA) and Home Electrification and Appliance Rebate (HEAR) programs presents an opportunity to overcome two key barriers to HPWH adoption.** Contractors told us that upfront cost has continued to be a primary barrier to HPWH adoption, even with the significant rebate offered by the ES Products Program (currently $900), and general customer awareness of HPWHs remains fairly low. With the New England Heat Pump Accelerator and HEAR programs starting in 2026, customers will be able to stack the HPWH incentives offered by those programs with the NHSaves rebate, potentially making

HPWHs less expensive than other water heater options,[37] and the additional program offerings may help increase awareness.

- **Recommendation PM-2:** Coordinate with NEHPA and HEAR to the extent possible to
  a. Co-promote the HPWH rebate and incorporate education to help customers understand the advantages of HPWHs and factors that affect their success.
  b. Monitor HPWH rebate activity and set the rebate amount at an appropriate level to drive installations while using rebate funds efficiently.
  c. Ensure that the language on the rebate form and website about combining the ES Products rebate with other offers is clear and specific to prevent customer confusion. *(Priority: Moderate)*

- **Contractor practices around HPWH sizing vary, with some contractors saying they always recommend upsizing to a larger-capacity model and others reporting that they right-size to the home's conditions.** Contractors who do not routinely upsize to a larger model did not report performance issues or customer dissatisfaction.
  - **Recommendation PM-3:** Reinforce recommended practices around HPWH sizing in contractor communications and trainings. Consider sharing video or written case studies showing successful approaches to right-sizing. *(Priority: Moderate)*
- **Sentiment towards the midstream pathway was mostly positive among the four contractors reporting experience with it.** Advantages cited included the simplified process for both customer and contractor and the instant incentive. However, contractors alluded to some challenges with distributors and concerns about transparency.
  - **Consideration PM-4:** Undertake a targeted effort to learn more about contractor experiences with the midstream pathway. Because the evaluators spoke with only a small number of contractors who had experience with the midstream pathway, it may be worthwhile to hear from additional contractors, particularly if there are any issues or uncertainty about how the pathway is functioning. Note that this investigation could be conducted internally or through an evaluation study.

Natural Gas Furnaces

- **The data suggest that program rebates for gas furnaces are moderately effective in driving customer decision-making.** The measured NTG ratio of 63%, based on participant survey responses, implies that program rebates are not strongly influencing most customers. However, survey responses suggest that contractor guidance is influential and most contractors reported that they see rebates as influential.
  - **Recommendation PM-5:** Investigate contractor recommendation practices for furnaces and how the program can best support contractors in guiding customer decision-making while highlighting the program's role. Note that this investigation could be conducted internally or through an evaluation study. *(Priority: Moderate)*
- **Revisiting the program's approach to incentivizing measure installation regardless of the pre-existing equipment type may help support a strong NTG ratio and**

[37] ES Products currently offers a $900 rebate and the NEHPA offers $300. HEAR is slated to offer up to $1,750.

program savings going forward. While not statistically significant, there is a suggestion in the data that FR may be lower for customers replacing a non-condensing furnace with a condensing one, and energy savings are more than five times greater for this replacement type.

- **Consideration PM-6:** Consider revising the program design to differentiate between noncondensing-to-condensing and condensing-to-condensing furnace replacements, or to focus exclusively on noncondensing-to-condensing projects.

Natural Gas Boilers

- **Contractors report varying practices regarding recommending boiler pumps with ECMs to customers.** While some contractors reported always installing ECM pumps with boilers, others reported viewing it as an optional item or an area where they can trim project costs for customers.
  - **Consideration PM-7:** The electric utilities should consider including ECM motors for boiler circulator pumps as a measure in the midstream pathway, akin to the existing furnace ECM offering.

3.1.3 Air-Source Heat Pumps: Overall Findings and Recommendations

Developing an overall understanding of the ES Products Program's ASHP offerings was a key focus of this study. This section brings together the information gleaned through the impact- and process-oriented research tasks to describe the current functioning of the offerings and recommendations for future directions.

3.1.3.1 Conclusions and Recommendations for Air-Source Heat Pump Measures

This section summarizes the key data and information gathered about the ES Products Program's air-source heat pump offerings and the study team's resulting conclusions and recommendations. The recommendations presented here are also listed in Appendix F.4. Note that recommendations are assigned a priority level of *high*, *moderate*, or *low*, while considerations are not assigned a priority level.

- **This study determined that the current ASHP offering has a modest impact on customer decision-making.** As noted in Section 3.1.1 above, the estimated NTG ratio for central ASHPs was 63%, with 46% free-ridership (FR). For ductless mini-split ASHPs, the study found a 68% NTG ratio with 48% FR. Among surveyed participants installing central and ductless mini-split units, more than eight in ten (82% and 89%, respectively) stated that they were somewhat or very likely to purchase the exact same efficiency equipment in the absence of the program. Contractors reported that rebates play a limited role in driving full-system replacements or covering the significant upfront cost of the heat pump system and suggested that rebates are slightly more influential in driving customers to choose a more efficient heat pump than they would otherwise install. However, survey responses indicate that contractor recommendations play a key role in heat pump selection and installed efficiency for many customers, resulting in a moderate estimated free-ridership level overall. While we did not directly examine this issue, the program may have influenced (and continue to influence) contractors to recommend high-efficiency equipment types and models.

- **Recommendation HP-1:** Leverage one or more of the strategies described in Section 4.2.3 (i.e., increase and/or implement tiered incentives, target specific market segments, and/or raise qualifying equipment thresholds) to revise the ASHP incentive offerings with the goal of reducing FR rates and driving energy savings above current baseline. *(Priority: High)*
- **Recommendation HP-4:** Reinforce and highlight the program's role in customer decision-making by providing contractors with guidance on heat pump recommendation practices that align with program theory and help steer customers toward the highest feasible efficiency levels. Consider focusing partnership efforts on contractor firms that specialize in heat pump installation because customers of those contractors are already interested in installing a heat pump, consistent with the program's goal. Partnership efforts could include direct outreach (email, newsletters), events, trainings, and/or collaboration through an installer network. *(Priority: High)*

➢ **The overall body of evidence from the study team's NTG analysis and baseline evaluation supports the conclusion that the current heat pump incentives are not having the intended effect (i.e., influencing customers who are already interested in installing a heat pump to choose a higher efficiency unit).**

► **The measured counterfactual baselines for central and ductless mini-split ASHPs are complex blends of existing and replacement equipment and fuel types.** The currently defined baseline—a less-efficient ASHP system—is a minor component of the measured baselines, with most survey respondents indicating that they would have continued to use their old cooling and heating system or installed a dedicated air conditioning system and a fossil fuel heating system.

- **Recommendation HP-7:** Maintain the baseline defined in the 2026 TRM for the 2027 program year for central ASHPs and ductless MSHPs. Once the new program design has been implemented, reassess the appropriate baseline definitions based on the redesigned program offering. *(Priority: Moderate)*
- **Consideration HP-9:** Consider revising or expanding the line of questioning in the baseline question battery in future surveys to dissect the counterfactual action in more detail and reduce the risk of confirmation bias in responses.

► **Almost all interviewed program-participating contractors reported that ENERGY STAR-certified, program-qualifying heat pumps are their standard offering.** This suggests that the program rebate may have limited influence on equipment selection, as contractors are already presenting these systems as the default option. It also suggests that raising the qualifying equipment specifications (potentially in conjunction with raising incentives) could help the program achieve its objective of encouraging contractors and customers to install a higher-efficiency heat pump than they would have otherwise.

- **Recommendation HP-2:** Investigate current installed equipment trends and the factors that influence which equipment brands, models and efficiency levels

contractors recommend to customers. The utilities might use recent program participation data to understand the distribution of installed equipment efficiency levels and other criteria, and use interviews, focus groups, or other market research methods to explore the underlying drivers. In particular, it would be helpful to assess to what extent program rebates influence contractor decisions to recommend higher-efficiency equipment that meets program requirements or whether those models would be their standard offering regardless. Understanding these practices could help clarify the program's influence on equipment selection and efficiency levels installed and define appropriate equipment efficiency thresholds or tiers. Note that this investigation could be conducted internally and/or through an evaluation study. *(Priority: High)*

- **Recommendation HP-3:** Based on the contractor stocking and recommendation practices findings, increase program qualifying equipment efficiency levels to encourage more customers to adopt higher-efficiency heat pumps. Alternatively, consider creating tiered incentives by efficiency level, with at least one tier at a higher efficiency level than the current offering. *(Priority: High)*
- **Recommendation HP-5:** As part of ongoing coordination efforts with the NEHPA and HEAR programs, devise approaches to drive customers participating in the other programs to adopt higher-efficiency ASHPs than they would otherwise. For example, provide training and support to the contractors that are engaged by the NEHPA and HEAR programs and align customer marketing and communication approaches to focus the NHSaves Products program's efforts on high-efficiency model selection, sizing, and quality installation. *(Priority: High)*
- **Consideration HP-10:** Consider adopting a midstream model to capture incremental efficiency savings among customers who are already planning to install a heat pump. Given contractors' reported influence on equipment selection, a midstream approach may provide a more direct mechanism for influencing contractor recommendations and encouraging customers to select higher-efficiency models. In addition, a midstream design could improve the customer experience by reducing paperwork and simplifying rebate delivery, which may increase program satisfaction. Two key factors to consider before deciding to adopt a midstream model include the current free-ridership rate (which may be increased under a midstream approach) and program costs associated with the delivery method.

► **The NHSaves heat pump webpage focuses on the general benefits of heat pumps, rather than the benefits of choosing an efficient heat pump over a regular heat pump.** The webpage includes a Quality Installation Checklist, Heat Pump Installer Questions, and Heat Pump Tips, but it does not include information about efficiency criteria or the wide range of efficiency levels available.

- **Recommendation HP-6:** Revise the Heat Pumps page[38] on the NHSaves website and other customer communications to provide customers with guidance on how to select an efficient ASHP system, how to use their system efficiently to maximize overall energy savings and reduce its impact on summer and winter peak demand, and changes they should expect to see in their energy usage.[39] *(Priority: High)*
  a. Include explanations of heat pump efficiency rating criteria (e.g., SEER and HSPF ratings) and questions they should ask their contractor about the efficiency levels of models suitable for their home.
  b. Building on the "Heat Pump User Tips" already posted on the webpage, the program should provide additional information about ASHP controls and settings, available financing, and related NHSaves opportunities (e.g., incentives for smart thermostats and participation in the utilities' demand response programs.
  c. Inform potential participants about the energy savings they can expect. For example, consider adding a page or blog post describing the factors that affect energy bill savings (e.g., annual weather variation, occupancy, fuel switching, changes in rates), and revise or replace existing content that does not acknowledge these factors.[40]

- **Participant satisfaction with the performance of their heat pump was generally high, especially for cooling.** The participant survey asked respondents to rate their satisfaction with how their ASHP was working. For central ASHPs, 81% of responding participants were satisfied with their heat pump's heating performance, and for ductless mini-split ASHP customers, 84% were satisfied. For both ASHP types, 97% of responding participants said they were satisfied with their heat pump's cooling performance.

- **Approximately one-third of customers were less than satisfied with the changes to their energy bills after installing a heat pump**. As described in Sections 3.2.3.1 and 3.3.3.1, 67% of responding central ASHP participants and 65% of ductless mini-split ASHP participants said they were somewhat or very satisfied with the changes to their energy bill; the averages varied according to customers' pre-existing heating system type, with higher satisfaction among central ASHP participants replacing non-electric heating (73%) and ductless mini-split ASHP participants replacing electric heat (77%). Programs in other jurisdictions have seen similarly challenging results around heat pump energy bill impacts: For example, about one-third of Massachusetts and Connecticut heat pump participants reported satisfaction with the cost of operating their heat pump.[41] As programs learn more about heat pump performance and customer expectations, they should do more to help customers understand what they can expect and make informed decisions.

[38] NHSaves, "Heat Pumps," accessed August 12, 2026. https://nhsaves.com/residential/electric-heating-cooling-equipment/
[39] Consistent with Steps 2 and 3 in Figure 1.
[40] For example, https://nhsaves.com/learn/2020/08/is-it-time-to-invest-in-a-new-heating-system/.
[41] Guidehouse and Ridgeline Energy Analytics. Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS / CT R2246). August 2024, updated April 2025. https://ma-eeac.org/wp-content/uploads/MA-HPMS-CT-R2246-Heat-Pump-Metering-Study-Final-Report_April_2025.pdf.

- See Recommendation HP-6 (above) for ways to help customers understand what to expect after installing a heat pump.

- **Interest in adding cooling, improving cooling quality, or replacing failing cooling equipment are drivers for heat pump installations, and the utilities should be mindful of impacts on summer and winter electric demand.** Ductless mini-split ASHPs are more likely than central ASHPs to be used for cooling and installed where no prior cooling existed. Almost all participants (97%) reported being satisfied with the cooling provided by their heat pump installed through the program.
  - See Recommendation HP-6 (above) for ways to help customers learn to use their heat pumps efficiently, including during summer and winter peak periods.

- **Further program attribution research would help the ES Products Program better understand the complex decision-making processes around customers' decisions to install a heat pump and model selection.** Contractors reported that their customers have widely varying levels of awareness and understanding of heat pumps and available incentives. Participating contractors frequently educate customers about heat pump technology and available incentives, often serving as the primary source of information on NHSaves rebates, equipment eligibility, energy savings, and operating costs. Most contractors reported recommending heat pumps even when customers do not specifically request them, with estimated recommendation rates ranging from 50% to 100%.
  - **Recommendation HP-8:** Explore program attribution in more depth and fine-tune the NTG evaluation approach in a future evaluation of the heat pump offerings. Ideally, this will occur once program redesign efforts have been put in place and the heat pump baseline is more clearly defined, and as soon as possible after the purchase decision to support respondent recall. Explore the following components:
    a. Dissect the customer decision-making process to differentiate the decision to install a heat pump from the decision of which type, efficiency level, and specific model of heat pump to install.
    b. Investigate the ways in which contractors influence customer decision-making, including the decision to purchase a heat pump, the number and diversity of options presented for specific models or efficiency levels, as well as how contractors influence installation timing and quantity/system size. It would also be informative to look at the role of the ENERGY STAR label in equipment selection.
    c. Examine customer awareness of the rebate, third-party programs, and financing offerings, and their roles in lowering the purchase price.
    d. Examine how FR and SO estimates vary when the counterfactual heating fuel differs.
    e. Develop alternative scoring in NTG algorithms that emphasizes the program influence on efficiency over the decision to adopt and the timing of that adoption.
    f. Explore the interaction between the NHSaves ES Products Program and other program offerings in New Hampshire, such as the NEHPA and HEAR programs. *(Priority: Moderate)*

3.1.3.2 Comparison of Central and Ductless Mini-Split ASHP Findings

This section compares the key findings and highlights differences between the two types of incentivized heat pump equipment. Parallel evaluation of central (ducted) and ductless (mini-split) ASHPs revealed similarities and differences between participants' use case of the two system types.

Users of central and ductless mini-split ASHPs both report using their heat pump for heating, but central ASHP users reported more heating use than mini-split users. In the Installed Measures Survey, more central ASHP respondents (32%) indicated their previous system was removed, disconnected, or is no longer operational compared to ductless mini-split ASHP respondents (12%). Two-thirds (66%) of central ASHP and nearly nine in ten (87%) ductless mini-split respondents reported supplementing space heating with another system, either because the original system was replaced with a similar type or remains installed and operational. These differences are statistically significant at the 90% confidence level, suggesting central ASHPs are more likely to be used for primary heating. Consistent with this pattern, significantly more central ASHP respondents (85%) reported using their heat pump between 5 and 7 pm on an average weekday in December and winter compared to ductless mini-split users (57%).

Ductless mini-split ASHPs are more likely than central ASHPs to be used for cooling and installed where no prior cooling existed, while central ASHPs are primarily installed for heating or combined use. Nearly all central ASHP respondents (98%) reported purchasing their heat pump for heating only or for both heating and cooling, with only 2% indicating it was purchased for cooling. In contrast, a significantly higher share of ductless mini-split ASHP respondents (18%) reported purchasing their heat pump for cooling only. Further supporting this observation, significantly more respondents reported installing ductless mini-split ASHPs in spaces that previously had heating but no cooling (55%) compared to central ASHPs (32%). For detailed side-by-side results, see Appendix D.1.1 Air Source Heat Pumps. Note that added cooling and heating use during peak periods have implications for system demand. See Recommendation HP-6 in Section 3.1.3.1 above.

Regarding the NH heat pump market overall, contractors noted that high upfront costs, electricity prices, concerns about cold weather performance, and limited rebate awareness are limiting factors for heat pump adoption. Participating installation contractor interviews identified high upfront costs and elevated electricity prices as major barriers to heat pump adoption, along with concerns about performance in New Hampshire's cold climate. Contractors also noted that many customers are unaware of available rebates, and noted that even when they are aware, the incentives are too low to meaningfully offset the high upfront costs of the systems for many customers. Overall, contractor responses indicated that they viewed the program's rebates as being designed to drive the decision to install a heat pump rather than designed to drive the decision to install a higher-efficiency heat pump, as intended by the program theory. Recommendation HP-4 in Section 3.1.3.1 (above) is intended to help the program achieve alignment with contractors about the purpose of program incentives. Refer to Section 3.2.3.2 for additional details on contractor perspectives.

3.2 CENTRAL ASHPS

This measure is titled "HVAC Central Air-Source Heat Pump" in New Hampshire's 2026 TRM and involves the installation of a high-efficiency, central ASHP unit to serve the heating and cooling loads of a residential unit. For the ES Products Program, the measure includes two lost opportunity BC measure IDs (one for cooling and one for heating), as well as one electric resistance retrofit BC measure ID.[42] The two BC measure IDs included in this analysis are:

- EA3b003 (Air-source Heat Pump – Lost Opportunity (Cooling))
- EA3b004 (Air-source Heat Pump – Lost Opportunity (Heating))

For the lost opportunity measure IDs, the program currently only claims electric savings, assuming a less efficient ASHP as the baseline. The 2026 TRM does not include deemed savings for the central ASHP measure; instead, it specifies engineering algorithms and assumptions for calculating energy and demand savings for each unit installed based on the capacity and efficiency of the installed unit as compared to a defined baseline efficiency.

3.2.1 Recommendations

This section details recommended impact updates and process improvements for central ASHPs in the ES Products Program that are not replacing primary electric resistance heating. The most impactful change to central ASHP impacts for 2027 is application of the estimated NTG ratio of 0.63.

3.2.1.1 Recommended Impact Updates

Per the work plan, the study team measured the **NTG ratio, ISR,** and **demand usage ratio (DUR)** for central ASHPs offered through the ES Products Program. The team also researched alternative **baseline** definitions for central ASHPs, but we do not recommend baseline changes for the 2027 TRM. Section 3.2.2.2 and Appendix E describe the baseline findings. Table 9 summarizes the existing and recommended values for evaluated factors.

Table 9: Factor Summary, Central ASHP

(Applies to EA3b003, EA3b004, and EA3b034 unless otherwise noted)

Factor	Existing (2026 TRM)	Recommended
Baseline Condition	Lost opportunity (LO) / Replace on Failure (ROF): Heat pump baseline 14.3 SEER2, 7.5 HSPF2 [EA3b003, EA3b004] Retrofit electric resistance: existing equipment (HSPF 3.412) [EA3b034]	EA3b003, EA3b004: Recommendation for 2027 TRM: No change. Alternatives for 2028 and later TRM updates to be determined. EA3b034: No change.
NTG Ratio	Not included	63% for 2027 TRM for EA3b003 and EA3b004 only. Additional

[42] The electric resistance measure (EA3b034) is not included in this analysis because it came into use in 2025 when the utilities implemented an enhanced incentive offering for heat pumps that are verified to replace electric resistance heating.

Factor	Existing (2026 TRM)	Recommended
		analysis may revise this value for future years.[1]
Efficient Condition	Meets or exceeds ENERGY STAR v6.1 (15.2 SEER2, 7.8 HSPF2)[2]	No change
ISR	100%	100%
Demand	CF: 0.346 (summer) CF: 0.620 (winter)	DUR: 0.948 (summer)* DUR: 0.898 (winter)*

*Recommended demand factors do not reflect a true peak demand CF, but rather a ratio informed by participant responses to usage during the summer (1pm-5pm on weekdays from July-Aug) and winter peak periods (5pm-7pm on weekdays from Dec-Jan).

[1] Recommended NTG ratio applies only to EA3b003 and EA3b004, not EA3b034.

[2] Note that the program has additional (cold-climate) efficiency requirements that are not reflected in the TRM.

Table 10 summarizes the recommended central ASHP TRM and benefit-cost model inputs. Note that because central ASHPs do not rely on deemed savings in the current NH TRM framework, deemed savings factors are not included in Table 10**.**

Table 10: Recommended TRM and BC Model Inputs, Central ASHP[1]

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change
EA3b003 (ASHP LO Cooling)	NTG	Not included	0.63*	-
	ISR	100%	100%	0%
	CF_{SP}	0.346	0.948**	174%
	CF_{WP}	0.000	0.000	0%
EA3b004 (ASHP LO Heating)	NTG	Not included	0.63*	-
	ISR	100%	100%	0%
	CF_{SP}	0.00	0.00	0%
	CF_{WP}	0.620	0.898**	45%

* Recommended value for 2027; may change for future years based on further analysis or program changes.

** Recommended demand factors do not reflect a true peak demand CF, but rather a ratio informed by participant responses to the survey in this study regarding usage during the summer (1pm-5pm on weekdays from July-Aug) and winter peak periods (5pm-7pm on weekdays from Dec-Jan).

[1] Recommended NTG ratio applies only to EA3b003 and EA3b004, not EA3b034.

The study team also recommends certain updates to the TRM entry text to clarify it for users:

- **Recommendation TRM-1:** For consistency and alignment with the most up-to-date heat pump rating metrics, the team recommends **defaulting the TRM algorithms to be in terms of "SEER2, HSPF2, and EER2" instead of "SEER, HSPF, and EER."** Further,

we recommend leaving the conversion tables in place and **adding the EER to EER2 conversion** which is currently missing from the 2026 NH TRM.

- **Recommendation TRM-2:** The 2026 NH TRM references a pilot offering starting in 2021 to account for baselines in homes that are oil or propane-heater. Because this pilot is not in effect, the evaluators recommend **removing the language about the pilot**.
- **Recommendation TRM-3:** The team recommends **replacing the current effective full-load heating and cooling values in the 2026 TRM section,** which are sourced from the New York State TRM and represent an average of values for Albany and Massena (1,020 $EFLH_{heat}$ and 280 $EFLH_{cool}$). By adopting the effective full load heating and cooling hours developed in this study using 2023 data specific to Concord, NH (1,663 $EFLH_{heat}$ and 377 $EFLH_{cool}$), the TRM will provide more current and representative values for use in heat pump impact calculations. Please see the attached workbook titled "NH EFLH calculator 14Apr26.xlsx."
- **Recommendation TRM-4:** The evaluators recommend **clarifying whether cooling impacts are considered for the electric resistance retrofit BC measure ID (EA3b034).** The impact factor summary table provides both winter and summer CFs.[43]
- **Consideration TRM-5:** Since the utility implementation vendors do not currently track COP and capacity at 5°F, **consider including a secondary algorithm that captures seasonal demand** using the delta HSPF as the savings basis.

3.2.1.2 Data Tracking Considerations

Based on findings from the impact evaluation, the study team offers the following data tracking recommendations:

- **Consideration DT-2:** The 2026 NH TRM peak demand savings algorithm requires the COP and capacity of the installed heat pump unit at 5°F. The study team recommends collecting and tracking these parameters for future projects to enable use of the peak demand savings algorithm used in the 2026 TRM.
- **Consideration DT-3:** Specify in the tracking system data fields whether efficiency values reflect the 1.0 or 2.0 efficiency parameter rating system. The utility tracking databases currently do not indicate whether the tracked heat pump efficiency parameters reflect the 1.0 or 2.0 version of the rating system (i.e., (HSPF/SEER/EER or HSPF2/SEER2/EER2). The NH utilities have confirmed that the tracked values consistently use the version 2.0 rating system, despite the variables being labeled as "HSPF," "SEER," and "EER."

3.2.2 Impact Findings

This section presents the baseline, NTG ratios, ISR, DUR, and TRM benchmarking review findings for central ASHPs offered through the ES Products Program.

3.2.2.1 Calculation Verification

NMR reviewed 2025 tracking data from each of the four electric utilities to assess whether heat pump TRM algorithms were applied correctly and consistently. The following inconsistencies were

[43] Note that the efficiency baseline does not provide any cooling baseline metrics for the retrofit – resistance scenario (BC measure ID EA3b034).

the most notable findings from our verification and, while not consistently observed in the data from all four utilities, do serve to highlight the areas all utilities should be attentive to.

- **Effective Full Load Hours (EFLH) misapplication**. For two of the four utilities, calculations for most of the reported central ASHP measures incorrectly used the specific EFLH heating and cooling values from the ductless mini-split ASHP TRM section (535 and 218 hours, respectively) rather than the central ASHP section (1,020 and 280 hours). For both utilities, the EFLH heating misapplication resulted in nearly a 100% understatement of heating savings, while the EFLH cooling misapplication led to an approximately 25% understatement of cooling savings. Although this issue affected nearly 90% of all central ASHP records in the 2025 tracking databases across both utilities, central ASHP installations represent only a small share of total reported heat pump savings, as ductless mini-split ASHPs account for most ASHP savings.
- **Inconsistencies in efficiency rating standard.** The utility databases did not clearly indicate which rating system was being applied (1.0 or 2.0) to the unit efficiency values (e.g., SEER or SEER2 and HSPF or HSPF2).
- **Missing efficient unit capacity and efficiency values.** In a handful of cases, the team found that the utility databases were missing unit capacity and efficiency values, resulting in reported savings of zero.
- **Lack of reported capacity and COP at 5°F.** None of the utility databases included data on unit capacity and COP at 5°F, required to apply the peak heating demand algorithm. Instead, most utilities quantified a seasonal demand savings using the difference of baseline and installed unit HSPF.

NMR provided each utility with a workbook containing verified calculations appended to their tracking databases, along with a summary of calculation verification findings. Two of the four utilities corrected the calculation inconsistencies noted in the findings summary, including the four issues bulleted above, and confirmed the corrections to NMR. The other two utilities acknowledged that they were taking NMR's findings into consideration but did not confirm whether they had made corrections to their tracking databases.[44]

In the Data Tracking Recommendations section above, the study team highlights two recommendations resulting from the calculation verification task.

3.2.2.2 Baseline

The study findings regarding heat pump baselines are presented in Appendix E. The EM&V Working Group and study team reached a consensus decision to maintain the current baseline definition for the 2027 program year and apply the NTG ratio as estimated under the current baseline framework. The baseline definition for 2028 onward is pending decisions related to program design and/or further research informed by these study results.

3.2.2.3 Net-to-Gross

[44] The timing of this verification exercise allowed the utilities time to reflect the corrections in their 2025 annual reports.

This section describes the results of the survey-based self-report NTG analysis and contractor perspectives gleaned from in-depth interviews.

Note About NTG Results: The EM&V Working Group and study team came to a consensus decision to apply the evaluated NTG ratio described below (63%) to the 2027 program year. The NTG ratio to be applied in 2028 onward is pending decisions related to program design changes and/or further research informed by these study results. If the heat pump offer undergoes a substantial redesign, the evaluators recommend re-evaluating NTG as soon as practicable after implementation. In the absence of such further action, the estimate should continue to be applied until replaced by the results of a new evaluation.

Existing NTG ratio: The NH 2026 TRM does not define an NTG ratio for central ASHPs because this factor had never been evaluated.

Recommended NTG ratio for 2027 TRM: Central ASHPs received an FR score of 46% and SO of 9%, resulting in an NTG value of 63%. The relatively high FR score is driven by strong respondent intent to purchase and install the same efficiency level and quantity of central ASHPs, with the same timing, absent the rebate, as reflected in reported likelihoods related to equipment efficiency, purchase timing, and quantity installed. Similarly, 86% of respondents reported that in the absence of the rebate they would have somewhat or very likely purchased the heat pump at the time they did (i.e., they would not have delayed the purchase), and 86% of respondents who installed multiple heat pumps indicated they would have purchased the same quantity. Among respondents who reported some likelihood of purchasing a central ASHP without the NHSaves or utility rebate at the same time, 82% indicated they would have selected the same efficiency level (80% of all respondents).

These likelihoods were tempered by the influence score, which captures the role of the program, the NHSaves website, marketing materials, and contractor recommendations in respondents' decision-making. The average influence score was 7.7 on a 0 to 10 scale and reflects the highest influence rating reported across the individual components for each respondent, where higher values indicate greater program influence and correspondingly lower FR. An influence score at this level suggests that the program had a moderate effect on driving participation.

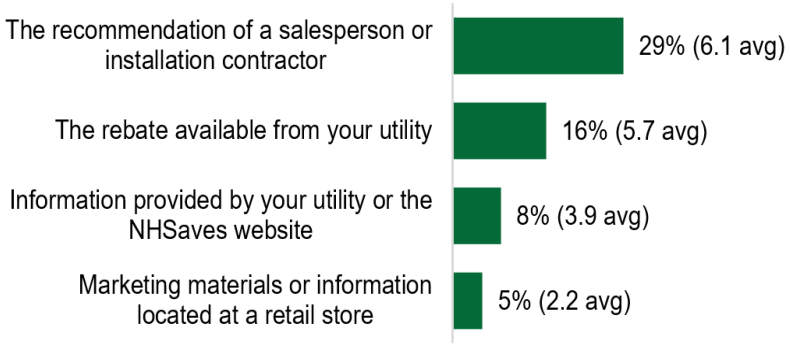
Among these components, respondents rated contractor recommendations as the most influential factor in their decision to purchase a heat pump, with 29% giving a rating of 9 or 10, indicating a very influential role (6.1 average rating).[45] The rebate was the next most influential factor, with 16% of respondents rating it as very influential (5.7 average rating). See Figure 2 for details.

[45] In the in-depth interviews, participating contractors mentioned promoting heat pumps by emphasizing their ability to provide both heating and cooling, their "energy efficiency and comfort," the ability to save customers money in the long term, and their ability to reduce reliance on fossil fuels. In terms of rebates, three of the 15 contractors mentioned they would recommend heat pumps without rebates, and that current heat-pump incentives are often too small to change the recommendation. However, two of the contractors also mentioned that they use the rebates as a marketing tactic to reduce the perceived upfront cost.

Figure 2: Respondents' Ratings of Influence on Central ASHP Purchase

("On a scale of 0 to 10, where 0 is "not at all influential" and 10 is "very influential", how influential were the elements listed below on your decision to purchase the air source heat pump?"

Respondents providing a rating of 9 or 10)



Spillover: The SO score reflects participants' reports that NHSaves influenced their decisions to install additional energy efficiency measures, including Wi-Fi thermostats, insulation, and water heating equipment, without the use of program incentives. SO savings are relatively large relative to claimed savings for central ASHPs because claimed savings from the heat pump are based on the incremental electric savings between the unit installed and a less-efficient heat pump baseline.[46] These assumptions result in a smaller program savings denominator relative to the achieved SO savings. Note that all claimed SO savings are electric only, as the program does not claim savings from fuel-switching.

Participating Contractor Perspectives on Customer Baselines and NTG:

Of the 15 program-participating contractors the evaluators interviewed, six reported that their firm focuses primarily or exclusively on selling and installing heat pumps (in most cases including HPWHs as well as space conditioning equipment), while the other nine install both heat pumps and other types of HVAC and/or water heating equipment.

Note:
The questions posed to interviewed contractors did not differentiate between central (ducted) and ductless (mini-split) ASHPs. Therefore, this section is relevant to both measure types.

Overall, most contractors reported that they frequently recommend heat pumps to customers. Even when not pushing for adoption of a heat pump, contractors reported consistently "bringing it up" to educate customers about their options. Approximately half of the contractors interviewed indicated they recommend heat pumps in 75–100% of applicable cases, while the other half reported raising the option about 50% of the time. The contractors noted that their recommendations are typically influenced by factors such as the customer's existing system (with two contractors stating that gas-heated homes are less likely candidates for heat pump

[46] Heat pump savings are calculated based on the current baseline assumption that, in the absence of participation, respondents would have installed a lower-efficiency heat pump. This assumption results in modest savings.

recommendations for economic reasons), home compatibility (e.g., ductwork configuration), and customer cost considerations.

Contractor estimates of the rate of heat pump adoption among their customers varied significantly based on contractor specialization. Contractors who focus on and actively market heat pump installations reported that 75–95% of customers request a heat pump upfront, while general HVAC contractors experience much lower initial demand, typically between 5–30%. One contractor noted that heat pumps are "on fire right now" in New Hampshire, reflecting a marked increase in customer interest compared to five years ago. Contractors estimated that among customers who initially express interest in heat pumps, adoption rates range from 50–100%, with two outliers of 10% and 25%. This range can be attributed to the "sticker shock," as said by one contractor, that interested customers sometimes experience in response to unexpected heat pump installation costs. While customers who initially express interest in heat pumps usually follow through with installation, consistent with the program design intent, contractors noted a clear pattern of high heat pump system costs driving away customers who were not already interested.

Contractors reported that rebates play a limited role in driving full system replacements or covering the significant upfront cost of the heat pump system, but one contractor explained how the rebate can help convince customers to upgrade to a more efficient unit. The evaluators asked contractors to rate how influential NHSaves program rebates are in motivating the average customer to choose a heat pump across a range of decision factors (Table 11). Overall, while some contractors said they believe that the rebates are effective in nudging some customers to choose heat pumps over other systems, the program's rebates have a low to moderate influence on purchasing decisions and serve more as a supporting factor than a primary driver. However, the data from the contractor interviews suggest that rebates are slightly more influential in driving customers to choose a more efficient heat pump than they would otherwise install. Asked "On a scale of 1 to 5, where 1 means 'not at all influential' and 5 means 'very influential,' how influential are the NHSaves program rebates in getting the average customer to select a more efficient heat pump than they would otherwise?", one contractor stated, "Probably about 3 out of 5, I'd say. Some people are steadfast in whichever option they want. Others, you say, 'Well, if you spend an extra $1,500 on such a unit, but then you get a rebate back of $1,200, you're only really spending the $300, but you're getting so much more…,' they kind of see the value in it."

Table 11: Contractor Ratings of Influence of Rebates on Customer Decisions (n=15)

(Using a scale of 1 to 5, where 1 means "not influential at all" and 5 means "very influential," how influential are the NHSaves program rebates in getting the average customer to…)

Influence on customers' decision to…	Average Rating	Median	Mode	Range
choose a heat pump for heating needs	2.7 out of 5	2	2	1–4

choose a heat pump for cooling needs	2.4 out of 5	2	1	1–4
choose a more efficient heat pump than they would otherwise	3.0 out of 5	3	4	1–5
replace their entire system with heat pumps *(n = 14)*	2.5 out of 5	2.5	3	1–5

Program-participating contractors said that most of their heat pump sales are for program-qualifying equipment. Most interviewed contractors reported that 90–100% of their heat pump installations involve ENERGY STAR-certified, program-qualifying equipment, with only occasional exceptions. One contractor noted a lower rate (around 50%) due to specific cases where equipment did not qualify, but the overall rate of equipment meeting program standards seems to be high.

Contractors estimated that program-incentivized heat pumps displace between 35% and 100% of their customers' heating loads, with an average range of about 50–65%. Two contractors noted a recent shift in behavior: rising electricity rates have led more customers to favor integrated systems that combine heat pumps with existing heating sources rather than fully displacing the existing system. Full displacement is more common in new construction, whereas retrofit customers often prefer to retain some level of fossil fuel backup.

3.2.2.4 Non-Energy Impacts

NEIs refer to the secondary effects of program measures, such as improved comfort, specific health benefits, and reduced maintenance costs. As part of the review of TRMs and relevant literature, the work scope for this study specified that the evaluation team should note any non-energy impacts reported in the TRMs of comparison states.[47] Through this review, the study team identified NEIs related to central ASHPs in the Massachusetts TRM, Connecticut PSD, and Rhode Island TRM.

- The MA TRM[48] reports annual NEIs of $196.46 per unit for ducted heat pumps displacing electric resistance heating, $64.24 for ducted heat pumps displacing delivered fuels (propane and oil), and $67.24 for ducted heat pumps displacing natural gas.
- The RI TRM assigns $201.56 in NEIs per ducted heat pump unit.[49]
- The CT PSD claims $475.32 in NEIs for ducted heat pumps. Table 4-4 of Appendix A in the CT PSD[50] gives a full breakdown of the NEIs, which include improved appearance, comfort, safety, maintenance, and health impacts that all contribute to the total NEI value.

[47] Because the New Hampshire cost-effectiveness tests do not utilize measure-level NEI values, this data is for informational purposes only.
[48] Massachusetts 2025-2027 Three Year Plan TRM. https://ma-eeac.org/wp-content/uploads/Appendix-L-2025-2027-Three-Year-Plan-TRM.pdf#page=91&zoom=100,68,96
[49] Rhode Island Technical Reference 2026 Program Year https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2025-10/25-37-EE%202026%20Rhode%20Island%20Technical%20Reference%20Manual%20-10-15-2025.pdf
[50] Connecticut's 2026 Program Savings Document, https://www.energizect.com/media/31441/download?inline=

3.2.2.5 TRM Benchmarking Results

Table 12 summarizes the findings of the TRM and literature review for central ASHPs. This table includes EUL for informational purposes.

Table 12: Comparison of NH Factors to Peer State TRMs, Central ASHP

Factor	2026 NH	NH Recommendation	MA	CT	RI	VT	ME	NY	IL
Baseline Condition	Federal code minimum SEER2 14.3 / HSPF2 7.5	No change for 2027 TRM. Alternatives for later TRM updates are currently under analysis.	Varies by displaced system. Furnace: 92% AFUE (ER) Boiler: 85% AFUE (ER) Elec Resistance: COP 1.0	Federal code minimum SEER2 14.3 / HSPF2 7.5	Federal code minimum SEER2 14.3 / HSPF2 7.5	Varies by displaced system type	Federal code minimum SEER2 14.3 / HSPF2 7.5	Federal code minimum SEER2 14.3 / HSPF2 7.5	Federal code minimum SEER2 14.3 / HSPF2 7.5
Efficient Condition	ES v6.1 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	ES v6.1 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	ES v6.2 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	ES v6.2 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	ES v6.2 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	NEEP ccASHP list or ES Cold Climate	NEEP ccASHP list	ES v6.2 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	ES v6.2 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2
NTG	1.00	0.63	0.88 (Guidehouse, 2021)	N/A	1.00	1.00	FR=0.16, SO=0.02	N/A	N/A
ISR	100%	100%	100%	100%	100%	100%	100%	100%	100%
EUL (Years)	18 (GDS Associates, 2007)	18 (GDS Associates, 2007)	18 (GDS Associates, 2007)	20 (Michaels Energy, 2022)	20 (Michaels Energy, 2022)	18 (GDS Associates, 2007)	17 (Michaels Energy, 2022)	23 (DNV, 2024)	16

*Sourced from current or recent state-wide TRMs, unless noted otherwise.

3.2.3 Process Findings

This section describes the process findings for central ASHPs. Process results for the program as a whole are in Section 4.2 and for the downstream rebate pathway in Section 4.3.

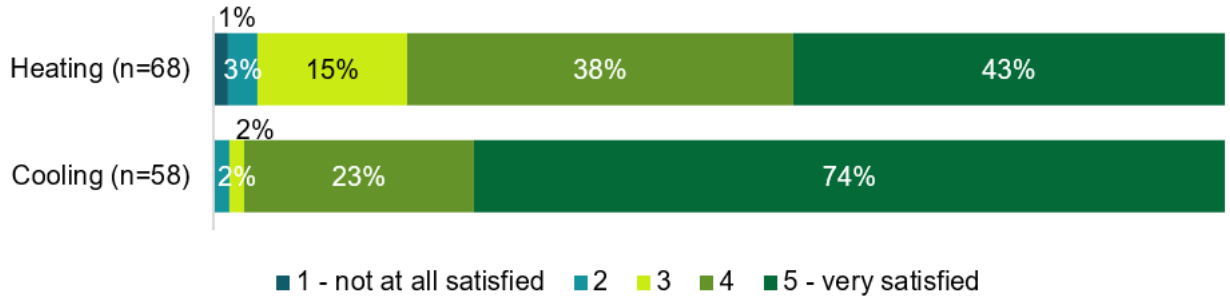
3.2.3.1 Participant Satisfaction

More than eight in ten respondents who installed a central ASHP reported satisfaction with its heating performance, and nearly all were satisfied with how well it cools their home. When asked to rate satisfaction on a scale of 1 to 5 (where 1 is "not at all satisfied" and 5 is "very satisfied"), 81% of respondents reported being satisfied (rating of 4 or 5) with how well the heat pump heats their home, while 97% reported being satisfied with its cooling performance (Figure 3).

Respondents who were not fully satisfied with their central ASHP's performance most often cited insufficient heating in winter (six), poor efficiency in cold weather (three), system failures or poor performance (three), high electric bills (two), and noise (two).

Figure 3: Participant Satisfaction with Central ASHP Performance

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with how well the heat pump is working for heating/cooling your home?)

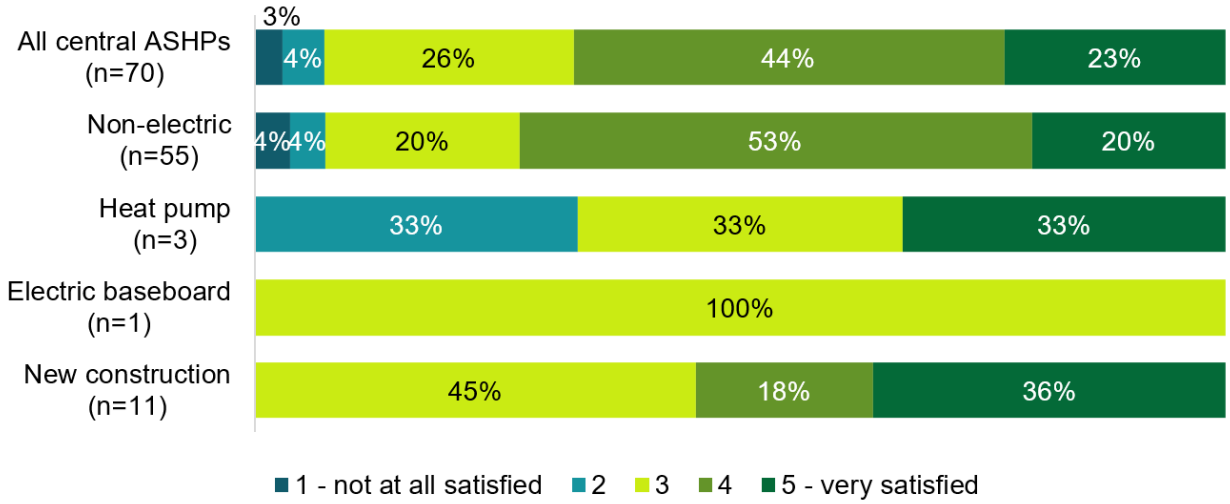


Respondents were less satisfied with changes to their energy bills, citing limited energy savings or increases in overall costs. Approximately two-thirds (67%) of respondents said they were satisfied with the changes to their energy bill after installing the new equipment (Figure 4). Satisfaction was slightly higher among central ASHP respondents who replaced a non-electric heating system (73%), the most common prior heating fuel type.

Respondents who were less than satisfied most often reported expecting greater savings or seeing little or modest savings (55%), followed by experiencing higher energy bills or challenges with high electricity rates (32%). See Section 3.1.3.1 for a recommendation to address satisfaction issues and Section 4.2.1 for a comparison of participant satisfaction with changes to their energy bills across measure types.

Figure 4: Central ASHP Participant Satisfaction with Changes to Energy Bill by Prior Heating Fuel Type

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with the changes to your energy bill after installing the new equipment?)



3.2.3.2 Participating Installation Contractor Perspectives

All 15 interviewed participating installation contractors reported installing ductless mini-split ASHPs, while 12 also installed central ASHPs. By firm type, eight reported being specialists focusing primarily on heat pump installations, while the remainder are full-service HVAC providers that install heat pumps as well as other equipment, such as water heaters and natural gas boilers and furnaces. Geographically, 8 of 15 respondents were based in southern New Hampshire, 5 in central New Hampshire, and 2 in northern New Hampshire.

Note that contractor interview questions referenced all ASHPs, not exclusively central systems.

Contractors report that high costs, performance concerns, and aesthetics are the main barriers to customers choosing to install a heat pump. When asked to identify the main reasons customers have for *not* choosing to install a heat pump, seven of ten interviewed contractors cited high upfront costs. Many customers expect prices similar to window air conditioner units and experience sticker shock when they learn that systems cost several thousand dollars. Additional customer concerns include uncertainty about rising electricity rates in New Hampshire and hesitation toward newer technology, sometimes influenced by the perceptions of earlier heat pump systems that had more performance issues. Performance concerns in extreme cold, particularly during defrost cycles, further contribute to customer hesitation towards installing heat pumps. Aesthetic considerations—especially the appearance of ductless wall units—also play a role. One contractor noted that rural customers may be especially hesitant to fully switch to heat pumps due to the risk of being without heat during power outages.

Contractors reported widely varying rates of program rebate awareness among their customers. Interviewed contractor estimates of awareness rates ranged from approximately 10% to 100%, with an average of around 50%. Contractors observe that customers typically learn

about these programs through word of mouth, online research (especially the NHSaves website), contractor guidance, utility communications, and less commonly, newspapers.

Participating contractors influence customer heat pump adoption and equipment choice. In interviews, participating contractors indicated that they frequently educate customers about heat pump technology and available incentives, often serving as the primary source of information on NHSaves rebates, equipment eligibility, energy savings, and operating costs.[51] Most contractors reported recommending heat pumps even when customers do not specifically request them, with estimated recommendation rates ranging 50%–100%. The interview guide did not explore to what extent contractors attempt to steer customers to higher levels of efficiency or present their customers with multiple heat pump options at differing efficiency levels once the customer has chosen to install a heat pump.

Contractors reported that they overwhelmingly install ENERGY STAR-certified heat pumps that would qualify for the program. Twelve of the fifteen interviewed contractors said that approximately 90% or more of their heat pump installations are program-qualifying systems, and two contractors estimated their rates at 70%–85%, making qualifying equipment the default offering for more interviewed installers. One contractor stated, "I think almost all the units nowadays are all ENERGY STAR, so it's kind of not an issue," and another said, "Once you run the numbers and you'd have to buy a certain model, the rebate's going to pay that down. So I can't think of a single instance where we would not go to the ENERGY STAR rebate-qualifying equipment."

There was no regional difference in contractor-reported rates of installing primarily program-qualifying equipment. To investigate the hypothesis that Massachusetts program effects on distributor stocking and/or contractor practices might be driving the finding that New Hampshire contractors recommend program-qualifying equipment at a high rate, we compared the responses of the seven contractors located in southern New Hampshire and the eight contractors located in the central and northern regions of New Hampshire. This analysis found virtually no difference in the reported installation of program-qualifying ENERGY STAR equipment. Contractors located near the Massachusetts border indicated that approximately 91% of their installations are ENERGY STAR certified, compared to 90% among central and northern contractors. These findings suggest that contractors across the state have broadly adopted qualifying equipment and that proximity to Massachusetts does not appear to influence overall installation rates.

However, there was some indication of regional differences in contractor tendency to recommend heat pumps and perceptions of program influence. Southern contractors reported recommending heat pumps in 91% of applicable situations on average, compared to 70% among contractors in the middle and northern regions. Southern contractors also assigned slightly higher ratings to the influence of rebates on customer decisions to replace their existing

[51] To investigate the information provided by the NHSaves website to customers considering a heat pump, the study team reviewed the webpage dedicated to the heat pump offering. We found that the webpage includes a Quality Installation Checklist, Heat Pump Installer Questions, and Heat Pump Tips. The content focuses on the benefits of heat pumps in general, how to ensure quality installation, and high-level information about how to use heat pumps. However, it does not include information about efficiency criteria or the benefits of choosing a more efficient heat pump.

systems, 2.7 out of 5, compared to 2.2 out of 5 among contractors located farther from the Massachusetts border. While rebate influence was relatively modest for both groups, southern contractors were somewhat more likely to view incentives as contributing to customer adoption.

The most notable regional difference was in contractors' recommendations in the absence of rebates. Ninety-two percent of contractors in the middle and northern regions said they would still recommend ENERGY STAR equipment without incentives, compared to 67% of southern contractors. Conversely, 85% of southern contractors believed customers would choose ENERGY STAR equipment even without rebates, compared to 63% of contractors in the middle and northern regions.

Contractors offered several suggestions for ways the program can motivate customers to install high-efficiency ENERGY STAR heat pump systems.

- **Increasing incentive levels:** There was a strong consensus among the interviewed contractors that current heat pump rebates are too low to meaningfully offset the upfront costs of high efficiency heat pump systems relative to non-heat pump system types. Contractors would like to see higher incentives to encourage more customers to install heat pumps; however, this is not consistent with the program's intended impact, which is not to drive adoption but rather opting for a higher-efficiency heat pump than the customer would have otherwise selected.
- **Enhancing marketing and training:** Some contractors suggested increasing outreach efforts, such as distributing informational pamphlets at supply houses or expanding advertising, emphasizing that broader awareness could significantly increase program participation. Some contractors also voiced interest in a centralized training network for contractors to improve their knowledge about the program so they can pass it along to their customers.
- **Simplifying rebate delivery:** Contractors also emphasized the benefits of a more streamlined program experience, favoring instant or midstream rebates for their reduced paperwork, and simpler processes for customers.

Combined Ducted and Ductless Systems: Contractors reported that combined ducted and ductless mini-split ASHP installations are relatively rare, occurring in approximately 0%–5% of cases. When they do occur, they are typically used to address specific rooms that are not adequately served by an existing ducted system or to meet customer preferences for individual room control. Installation trends differ by context: new construction projects are predominantly ducted (around 90%), while retrofits in existing homes are largely ductless (approximately 80%).

3.3 DUCTLESS MINI-SPLIT ASHPS

This measure is titled "HVAC Ductless Mini-Split Air-Source Heat Pump" in New Hampshire's 2026 TRM and involves the installation of a high-efficiency, ductless mini-split ASHP system to serve the heating and cooling loads of a residential unit. For the ES Products Program, the measure includes two lost opportunity BC measure IDs (one for cooling and one for heating), as well as one electric resistance retrofit BC measure ID.[52] The two BC measure IDs included in this analysis are:

- EA3b005 (Ductless Mini-split Heat Pump (cooling) – Lost Opportunity)
- EA3b006 (Ductless Mini-split Heat Pump (heating) – Lost Opportunity)

For the lost opportunity measure IDs, the program currently only considers electric savings, assuming a less efficient ductless mini-split ASHP as the baseline. The 2026 TRM does not include deemed savings for the ductless mini-split ASHP measure; instead, it specifies engineering algorithms and assumptions for calculating energy and demand savings for each unit installed based on the capacity and efficiency of the installed unit as compared to a defined baseline efficiency.

3.3.1 Recommendations

This section details recommended impact updates and process improvements for ductless mini-split ASHPs in the ES Products Program. The most impactful change to ductless mini-split ASHP impacts for 2027 is application of the estimated NTG ratio of 0.68.

3.3.1.1 Recommended Impact Updates

Per the work plan, the study team measured the **NTG ratio, ISR,** and **DUR** for ductless mini-split ASHPs offered through the ES Products Program. The team also researched alternative **baseline** definitions for ductless mini-split ASHPs, but we do not recommend baseline changes for the 2027 TRM. Section 3.3.2.2 and Appendix E describe the baseline findings. Table 13 summarizes the existing and recommended values for evaluated factors.

Table 13: Factor Summary, Ductless Mini-Split ASHP

(Applies to EA3b005, EA3b006, and EA3b031 unless otherwise noted)

Factor	Existing (2026 TRM)	Recommended
Baseline Condition	LO / ROF: Heat pump baseline 14.3 SEER2, HSPF2 7.5 [EA3b005, EA3b006] Retrofit electric resistance: existing equipment (HSPF 3.412) [EA3b031]	EA3b005, EA3b006: Recommendation for 2027 TRM: No change. Alternatives for 2028 and later TRM updates to be determined. EA3b031: No change.

[52] The electric resistance measure (EA3b031) is not included in this analysis because it came into use in 2025 when the utilities implemented an enhanced incentive offering for heat pumps that are verified to replace electric resistance heating.

Factor	Existing (2026 TRM)	Recommended
NTG Ratio	Not included	68% for 2027 TRM. Additional analysis may revise this value for future years.[1]
Efficient Condition	Meets or exceeds ENERGY STAR v6.1 (15.2 SEER2, 7.8 HSPF2)[2]	No change for lost opportunity; Exceeds existing unit efficiency for early replacement
ISR	100%	No change
CF	0.290 (summer) 0.620 (winter)	0.839 (summer)* 0.596 (winter)*

* Recommended demand factors do not reflect a true peak demand CF, but rather a ratio informed by participant responses to usage during the summer (1pm-5pm on weekdays from July-Aug) and winter peak periods (5pm-7pm on weekdays from Dec-Jan).

[1] Recommended NTG ratio applies only to EA3b003 and EA3b004, not EA3b034.

[2] Note that the program has additional (cold-climate) efficiency requirements that are not reflected in the TRM.

Table 14 summarizes the recommended ductless mini-split ASHP TRM and benefit-cost model inputs. Since ductless mini-split ASHPs do not rely on deemed savings in the current NH TRM framework, deemed savings factors are not included in Table 14.

Table 14: Recommended TRM Inputs, Ductless mini-split ASHP[1]

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change[41]
EA3b005 (Ductless mini-split ASHP LO Cooling)	NTG	Not included	0.68	-
	ISR	100%	100%	0%
	CF_{SP}	0.290	0.839*	189%
	CF_{WP}	0.000	0.000	0%
EA3b006 (Ductless mini-split ASHP LO Heating)	NTG	Not included	0.68	-
	ISR	100%	100%	0%
	CF_{SP}	0.00	0.00	0%
	CF_{WP}	0.620	0.596*	- 4%

* Recommended demand factors do not reflect a true peak demand CF, but rather a ratio informed by participant responses to the survey in this study regarding usage during the summer (1pm-5pm on weekdays from July-Aug) and winter peak periods (5pm-7pm on weekdays from Dec-Jan).

[1] Recommended NTG ratio applies only to EA3b005 and EA3b006, not EA3b031.

The study team also recommends certain updates to the TRM entry text to clarify it for users:

- **Recommendation TRM-6:** For consistency and alignment with the most up-to-date heat pump rating metrics, the team recommends **defaulting the TRM algorithms to be in terms of "SEER2, HSPF2, and EER2" instead of "SEER, HSPF, and EER."** Further, we recommend leaving the conversion tables in place and **adding the EER to EER2 conversion** which is currently missing from the 2026 NH TRM.

- **Recommendation TRM-7:** The 2026 NH TRM references a pilot offering starting in 2021 to account for baselines in homes that are oil or propane-heater. Because this pilot is not in effect, the evaluators recommend removing the language about the pilot.
- **Recommendation TRM-8:** The team recommends replacing the current effective full-load heating and cooling values in the 2026 TRM section, which are sourced from the New York State TRM and represent an average of values for Albany and Massena (1,117 $EFLH_{heat,full\ disp}$, 535 $EFLH_{heat,partial\ disp}$, and 218 $EFLH_{cool}$). By adopting effective full load heating and cooling hours developed by the team using 2023 data specific to Concord, NH (1,663 $EFLH_{heat,full\ disp}$, 1,255 $EFLH_{heat,partial\ disp}$, and 377 $EFLH_{cool}$), the TRM will provide more current and NH-representative values for use in heat pump impact calculations. Please see the attached workbook titled "NH EFLH calculator 14Apr26.xlsx."
- **Recommendation TRM-9:** The evaluators recommend clarifying the criteria for partial- and full-displacement in the TRM to ensure the correct EFLH heating value is applied. Further, to match the implementation default, consider adding language to clarify that lost opportunity ductless mini-split ASHPs should be considered as partial displacement only.
- **Recommendation TRM-10:** The evaluators recommend clarifying whether cooling impacts are considered for the electric resistance retrofit BC measure ID (EA3b031). The impact factor summary table provides both winter and summer CFs, but the efficiency baseline does not provide any cooling baseline metrics for the retrofit – resistance scenario.[53]
- **Consideration TRM-11:** Since the utility implementation vendors do not currently track COP and capacity at 5°F, consider including a secondary algorithm that captures seasonal demand using the delta HSPF as the savings basis.

3.3.1.2 Data Tracking Recommendations

Based on findings from the impact evaluation, the study team offers the following data tracking recommendations:

- **Consideration DT-2:** The 2026 NH TRM peak demand savings algorithm requires the COP and capacity of the installed heat pump unit at 5°F. The study team recommends collecting and tracking these parameters for future projects to enable use of the primary peak demand savings algorithm.
- **Consideration DT-3:** Specify in the tracking system data fields whether efficiency values reflect the 1.0 or 2.0 efficiency parameter rating system. The utility tracking databases currently do not indicate whether the tracked heat pump efficiency parameters reflect the 1.0 or 2.0 version of the rating system (i.e., HSPF/SEER/EER or HSPF2/SEER2/EER2). The NH utilities have confirmed that the tracked values consistently use the version 2.0 rating system, despite the variables being labeled as HSPF, SEER, and EER.

[53] Note that the efficiency baseline does not provide any cooling baseline metrics for the retrofit – resistance scenario (BC measure ID EA3b031).

3.3.2 Impact Findings

This section presents the baseline, NTG ratio, USR, DUR, and TRM benchmarking review findings for ductless mini-split ASHPs offered through the ES Products Program.

3.3.2.1 Calculation Verification

NMR reviewed 2025 tracking data from each of the four electric utilities to assess whether heat pump TRM algorithms were applied correctly and consistently. While not necessarily applicable to all four utilities, the following inconsistencies were the most notable findings from our verification:

- **No clear displacement type in tracking database.** Since the NH TRM specifies separate EFLH values for partial and full displacement mini-split ASHPs, NMR needed to confirm with each utility if the incented lost opportunity mini-split ASHPs should be considered as partial- or full-displacement units. The utilities collectively confirmed that partial-displacement is the default for lost opportunity mini-split ASHPs.
- **Inconsistencies in efficiency rating standard.** The utility databases did not clearly indicate which rating system (1.0 or 2.0) was being applied to the unit efficiency values (e.g., SEER or SEER2 and HSPF or HSPF2).
- **EFLH misapplication**. For one utility, calculations for approximately 10% of reported mini-split ASHP measures incorrectly used the specific EFLH heating and cooling values from the central ASHP TRM section (1,020 and 280 hours, respectively) rather than the ductless mini-split ASHP section (535 [partial displacement] and 280 hours).
- **Missing efficient unit capacity and efficiency values.** In a handful of cases, the team found that the utility databases were missing unit capacity and efficiency values, resulting in reported savings of zero.
- **Lack of reported capacity and COP at 5°F.** None of the utility databases provided included data on unit capacity and COP at 5°F, required to apply the peak heating demand algorithm. Instead, most utilities quantified a seasonal demand savings using the difference of baseline and installed unit HSPF. Since winter peak demand is not currently an input into the utilities benefit-cost modeling, this finding does not impede accurate impact accounting.

At the time of this report, NMR had provided all four utilities with a workbook containing verified calculations appended to their tracking databases, along with a summary of calculation verification findings. Two of the four utilities corrected the calculation inconsistencies noted in the findings summary, including the four issues bulleted above, and confirmed the corrections to NMR. The other two utilities acknowledged that they were taking NMR's findings into consideration but did not confirm whether they had made corrections to their tracking databases. In the Data Tracking Recommendations section above, the study team summarized two recommendations resulting from the calculation verification task.

3.3.2.2 Baseline

The study findings regarding heat pump baselines are presented in Appendix E. The EM&V Working Group and study team reached a consensus decision to maintain the current baseline definition for the 2027 program year and apply the NTG ratio as estimated under the current

baseline framework. The baseline definition for 2028 onward is pending decisions related to program design and/or further research informed by these study results.

3.3.2.3 Net-to-Gross

Note About NTG Results: The EM&V Working Group and study team came to a consensus decision to apply the evaluated NTG ratio described below (68%) in 2027. The NTG ratio to be applied in 2028 onward is pending decisions related to program design changes and/or further research informed by these study results. If the heat pump offer undergoes a substantial redesign, the evaluators recommend re-evaluating NTG as soon as practicable after implementation. In the absence of such further action, the estimate should continue to be applied until replaced by the results of a new evaluation.

Existing NTG ratio: The NH 2026 TRM does not define an NTG ratio for ductless mini-split ASHPs because this factor has never been evaluated.

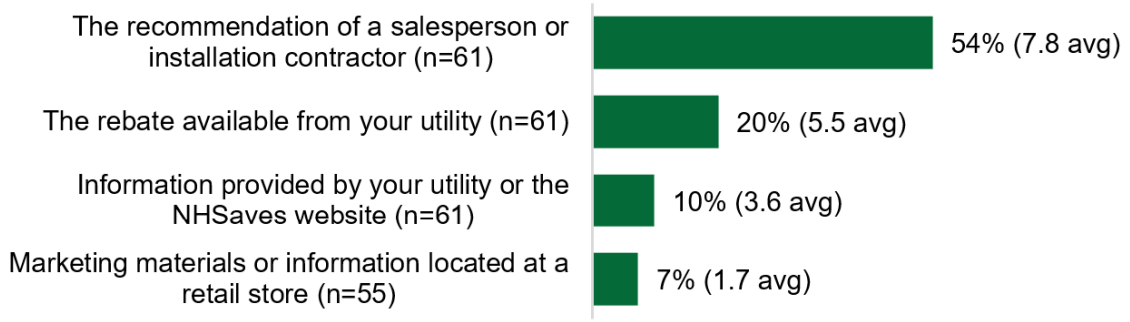
Recommended NTG ratio for 2027 TRM: Ductless mini-split ASHPs received a FR score of 48% and SO of 16%, resulting in a NTG value of 68%. The FR results indicate a relatively high likelihood that participants would have purchased and installed the same efficiency level and quantity of ductless mini-split ASHP, at the same time, in the absence of the rebate. Respondents reported strong intent related to efficiency level, purchase timing, and quantity installed. Specifically, 86% of respondents reported they would have been somewhat or very likely to purchase the heat pump at the same time (i.e., they would not have delayed the purchase) and 87% of respondents who installed multiple heat pumps stated they would have installed the same quantity. Among respondents who reported some likelihood of purchasing a mini-split ASHP without the NHSaves or utility rebate at the same time, 89% indicated they would have selected the same efficiency level. Overall, 88% of all respondents would have selected the same efficiency level.

These likelihoods are balanced by the influence score, which captures the role of the program, the NHSaves website, marketing materials, and contractor recommendations in respondents' decisions. The average influence score was 8.4 on a 0 to 10 scale and reflects the highest influence rating reported across the individual components for each respondent, where higher values indicate greater program influence and correspondingly lower FR.

Among these components, respondents rated contractor recommendations as the most influential factor in their decision to purchase a ductless mini-split ASHP, with 54% indicating a very influential role (9 or 10 rating; with an overall average of 7.8). The rebate was the next most influential component, with 20% of respondents rating it as very influential (5.5 average rating). See Figure 5 for details.

Figure 5: Respondents Rating Influence on Ductless Mini-split ASHP Purchase

"On a scale of 0 to 10, where 0 is "not at all influential" and 10 is "very influential", how influential were the elements listed below on your decision to purchase the ductless mini-split heat pump?"
Respondents providing a rating of 9 or 10



Spillover: The SO score reflects participants' reports that NHSaves influenced their decisions to install additional energy efficiency measures, which included tune-ups and insulation, without program incentives. SO savings are relatively large for ductless mini-split ASHPs because program savings for the ductless mini-split ASHP are modest due to use of a less-efficient heat pump baseline.[54] These assumptions result in a smaller program savings denominator relative to the achieved SO savings. Note that all claimed SO savings are electric only, as the program does not claim savings from fuel-switching.

3.3.2.4 Contractor Perspectives

Contractor interview questions referred to all ASHPs, not exclusively central or ductless systems. Contractor perspectives on heat pumps overall are presented within the Central ASHP NTG findings in Section 3.2.2.3 of this report.

3.3.2.5 Non-Energy Impacts

In the literature review, the study team identified NEIs in the MA TRM, CT PSD, and RI TRM.[55]

- The MA TRM[56] lists an NEI of $4.21 per unit annually in the ductless mini-split ASHP measure section. However, while the MA TRM provides this NEI value, the Massachusetts Program Administrators (PAs) do not claim any NEIs for the ductless mini-splits. Instead, these NEIs are incorporated into the fuel displacement claims for heat pump measures.
- The CT PSD[57] claims $437.70 in NEIs per average participant that installed ductless mini-split ASHPs. The CT PSD breaks down the NEIs as follows:
    - Appearance of the home: $58.54
    - Comfort during summer: $65.79
    - Comfort during winter: $87.29

[54] Heat pump savings are calculated based on the current baseline assumption that, in the absence of participation, respondents would have installed a lower-efficiency heat pump. This assumption results in modest savings.
[55] Because the New Hampshire cost-effectiveness tests do not utilize measure-level NEI values, this data is for informational purposes only.
[56] Massachusetts 2025-2027 Three Year Plan TRM. https://ma-eeac.org/wp-content/uploads/Appendix-L-2025-2027-Three-Year-Plan-TRM.pdf#page=91&zoom=100,68,96
[57] Connecticut's 2026 Program Savings Document

  - Equipment maintenance: $26.64
  - Equipment noise: $72.13
  - Equipment reliability: $40.91
  - Frequency of fuel deliveries: $23.94
  - Home safety: $51.53
  - Other Impacts: $10.92
- The RI TRM[58] claims a NEI of $5.41 per unit or $5.11 per ton of ductless mini-split ASHPs.

[58] Rhode Island 2026 Technical Reference Manual https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2025-10/25-37-EE%202026%20Rhode%20Island%20Technical%20Reference%20Manual%20-10-15-2025.pdf

3.3.2.6 TRM Benchmarking Results

Table 15 summarizes the findings of the TRM and literature review for ductless mini-split ASHPs. This table includes effective useful measure life (EUL) for informational purposes.

Table 15: Comparison of NH Factors to Peer State TRMs, Ductless Mini-Split ASHP*

Factor	2026 NH	NH Recommendation	MA	CT	RI	VT	ME	NY	IL
Baseline Condition	Federal code minimum SEER2 14.3 / HSPF2 7.5	No change recommended for 2027 TRM. Alternatives for later TRM updates are currently under analysis.	Varies by displaced system	A working, less-efficient electric heating system (for mini-split displacing fossil fuel - deemed fuel optimization savings)	Federal code minimum SEER2 14.3 / HSPF2 7.5	Federal code minimum SEER2 14.3 / HSPF2 7.5	Existing heating system and partial displacement heat pump HSPF 8.2 and SEER 14.0	Determined by the type of equipment that would have been installed without the influence of the program supporting the installation	Federal code minimum SEER2 14.3 / HSPF2 7.5
Efficient Condition	ES v6.1 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	Exceeds new unit efficiency baseline for lost opportunity; Exceeds existing unit efficiency for early replacement	19.7 SEER and 11.2 HSPF (for savings calculations)	"Energy efficient" ductless mini-split ASHP	19.7 SEER and 11.2 HSPF (for savings calculations)	ES v6.1 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2	Tier 1: HSPF>=12.0 (single-zone), 10.0 (multi-zone); Tier 2: HSPF>=12.5.	Must meet the Northeast Energy Efficiency Partnerships (NEEP) Cold Climate Air Source Heat Pump (ccASHP) Specification (Version 4.0) effective January 1, 2023.	ES v6.2 Cold Climate ≥15.2 SEER2, ≥8.1 HSPF2
NTG	1.00	0.68	0.88 (Guidehouse, 2021)	N/A	1.00	1.00	FR=0.42, SO=0.11	N/A	N/A
ISR	100%	100%	100%	100%	100%	100%	100%	100%	100%

Factor	2026 NH	NH Recommendation	MA	CT	RI	VT	ME	NY	IL
EUL (Years)	18 (GDS Associates, 2007)	17 (Michaels Energy, 2022)	18 (GDS Associates, 2007)	17 (Michaels Energy, 2022)	15 (RTF, 2023)	15 (CPUC, 2008)	18 (GDS Associates, 2007)	23 (DNV, 2024)	16

*Sourced from current or recent state-wide TRMs, unless noted otherwise.

3.3.3 Process Findings

This section describes the process findings specific to ductless mini-split ASHPs. Process results for the overall program are in Section 4.2 and findings for the downstream rebate pathway are in Section 4.3.

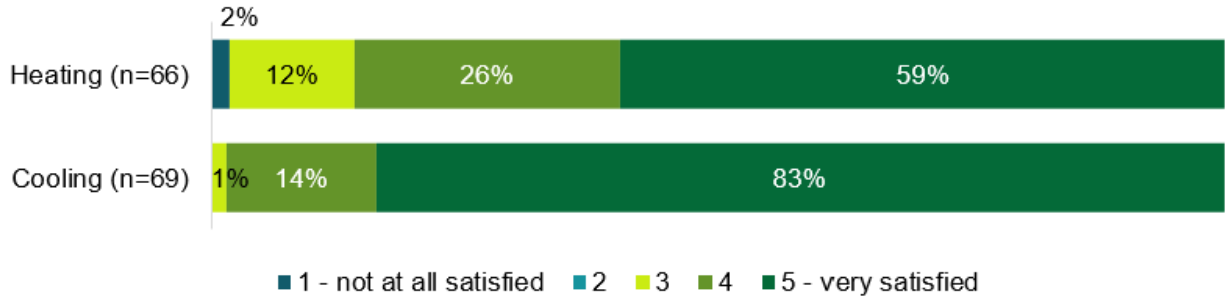
3.3.3.1 Participant Satisfaction

Most respondents who installed a mini-split heat pump reported satisfaction with its heating performance, and nearly all were satisfied with how well it cools their home. When asked to rate satisfaction on a scale of 1 to 5 (where 1 is "not at all satisfied" and 5 is "very satisfied"), 84% of respondents reported being satisfied (rating of 4 or 5) with how well the heat pump heats their home, while 97% reported satisfaction with its cooling performance (Figure 6).

Respondents who were not fully satisfied with their mini-split heat pump's performance most often cited high electric bills (4), insufficient heating in winter (3), and lower comfort compared to fossil fuel systems.

Figure 6: Participant Satisfaction with Mini-Split ASHP Performance

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with how well the heat pump is working for heating/cooling your home?)

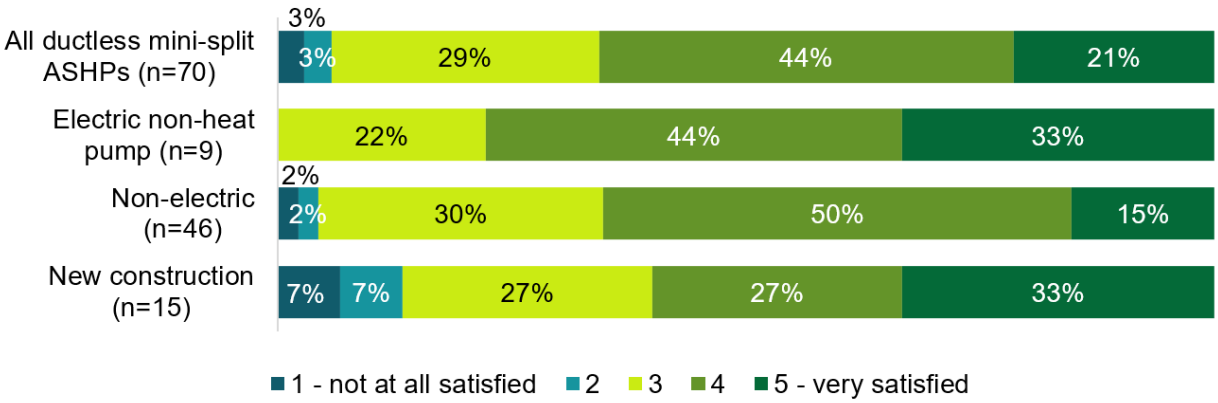


Respondents were less satisfied with changes to their energy bills, citing increases in overall costs and limited energy savings; however, satisfaction was higher among those replacing electric heating systems, including electric baseboard heat, electric furnaces, and space heaters. Fewer than two-thirds (65%) of respondents said they were satisfied with the changes to their energy bill after installing the new equipment (Figure 7). Satisfaction was highest among respondents who replaced an electric heating system, including electric baseboard heat, electric furnaces, and space heaters (77%). Respondents who replaced a non-electric heating system, the most common prior heating fuel type, reported satisfaction levels consistent with the overall average (65%). Satisfaction was lowest among participants who installed the heat pump in a new construction context.

Respondents who were less than satisfied most often reported experiencing higher energy bills or challenges with high electricity rates (48%) and expecting greater savings or seeing only small savings (22%). See Section 3.1.2 for a recommendation to address satisfaction issues and see Section 4.2.1 for a comparison of participant satisfaction with changes to their energy bills across measure types.

Figure 7: Mini-split ASHP Participant Satisfaction with Changes to Energy Bill by Prior Heating Fuel Type

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with the changes to your energy bill after installing the new equipment?)



[1] Electric non-heat pump equipemnt include electric baseboard (7), furnace (1), and space heater (1).

3.3.3.2 Participating Installation Contractor Perspectives

Participating contractor interview questions referred to all ASHPs, not exclusively central or ductless systems. Contractor perspectives on heat pumps overall are presented within the Central ASHP process findings in Section 3.2.3 of this report.

3.4 NATURAL GAS FURNACES

This measure is titled "HVAC Furnace" in New Hampshire's 2026 TRM and involves the installation of a new high-efficiency space heating furnace and an electronically communicated motor for its fan. For the ES Products Program, furnaces are treated as a blended retrofit / lost opportunity measure with deemed savings sourced from the MA 2019–2021 TRM (Mass Save, 2018). The following two BC measure IDs represent the two natural gas furnace efficiency tiers offered through the ES Products Program:

- GA3b008 (95%+ AFUE)
- GA3b009 (97%+ AFUE)

3.4.1 Recommendations

This section details recommended impact updates and overall improvements for furnace measures in the ES Products Program. The most impactful changes to gas furnace impacts include application of the estimated NTG ratio of 0.63 and increased savings for the top efficiency tier (97% AFUE).

3.4.1.1 Recommended Impact Updates

Per the work plan, the study team evaluated the **measure baseline** and measured the **NTG ratio** for natural gas furnaces offered through the ES Products Program. Table 16 summarizes the existing and recommended values for evaluated factors. The table also includes two additional factors not researched in this study, but relevant to the recommended gross deemed savings impacts presented below: efficient condition and ISR. The evaluators also reviewed the CFs for furnace fan savings and determined no changes were needed.

Table 16: Factor Summary, Natural Gas Furnace

Factor	Existing (2026 TRM)	Recommended
Baseline Condition (Blended Condensing and Non-Condensing)	85% AFUE (LO) 83% AFUE (ER) 83.2% AFUE (Blended LO-ER)	86.9% AFUE (LO) 87.4% AFUE (ER) 87.0% AFUE (Blended LO-ER)
NTG Ratio*	Not included	63%
Efficient Condition	95% AFUE (GA3b008) 97% AFUE (GA3b009)	95% AFUE (GA3b008) [59] 97% AFUE (GA3b009)
ISR **	100%	N/A
CF**	0.00 (summer) 0.45 (winter)	N/A

* Table 22 presents separate NTG values for non-condensing and condensing furnaces and boilers.

**Research not in scope for factor. Recommended values defaulted to 100%.

[59] ENERGY STAR v5.0 specification for gas furnaces in the US North effective 7/31/26 on July 31, 2026 (ENERGY STAR, 2025) specifies minimum efficiency of 97% AFUE, making the 95% AFUE tier obsolete if the NH utilities wish to adopt the new ENERGY STAR specification for program eligibility. Note that efficient condition updates are a program design decision, at the discretion of the NH utilities, with the only requirement being that the efficient condition efficiency exceed the baseline. The evaluation team understands that the 95% AFUE tier is still included in the 2027 TRM.

Table 17 summarizes the recommended natural gas furnace TRM and benefit-cost model inputs. This summary includes a comparison of deemed savings values presented in the current, 2026 NH TRM with the recommended values.[60] The recommended deemed MMBTU savings is calculated using the baseline AFUE of 87.0%, reflecting a blended furnace type (condensing vs non-condensing) and replacement scenario (LO vs ER).

Table 17: Recommended TRM Inputs, Natural Gas Furnace

BC Measure ID	Factor	Existing (2026 TRM)	Recommended[61]	% Change[24]
GA3b008 (95% AFUE)	MMBTU (deemed)	9.8	11.1	+ 13%
	kWh (deemed)	104.2	154.0	+ 48%
	kW (deemed)[62]	0.07	0.104	+ 48%
	NTG*	Not included	0.63	-
	ISR**	100%	100%	0%
	CF_{SP}**	0.00	0.00	0%
	CF_{WP}**	0.45	0.45	0%
GA3b009 (97% AFUE)	MMBTU (deemed)	10.3	13.1	+ 27%
	kWh (deemed)	104.2	154.0	+ 48%
	kW (deemed)[43]	0.07	0.104	+ 48%
	NTG*	Not included	0.63	-
	ISR**	100%	100%	0%
	CF_{SP}**	0.00	0.00	0%
	CF_{WP}**	0.45	0.45	0%

* Table 22 presents separate NTG values for non-condensing and condensing furnaces and boilers.
** Research not in scope for factor. Recommended values defaulted to existing (2026 NH) TRM values.

The study team also recommends an update to the TRM entry text to clarify it for users:

- **Recommendation TRM-12: Include a table showing the recommended deemed savings for both BC measure IDs.** While the HVAC Furnace section in the 2026 NH TRM references the 2019–2021 MA calculations workbook (Mass Save, 2018) that the deemed savings for the ES Products BC measure IDs are sourced from, the 2026 TRM section does not list the deemed savings values themselves.

[60] The percentage change metric is for informational purposes only and is not intended to inform a realization rate. Should the NH utilities adopt the recommended values, the realization rates will be 100%.
[61] The evaluation team understands that the 95% AFUE tier is included in the 2027 TRM and incorporates the recommended values. If the NH utilities wish to enforce the ENERGY STAR v5.0 specification for gas furnaces for a future TRM, then the evaluation team recommends removing the 95% tier and its associated savings.
[62] Consistent with the 2026 NH TRM representation of kW for natural gas furnaces, this deemed kW represents average demand and does not include a winter or summer peak CF.

3.4.2 Impact Findings

This section presents the baseline, evaluated gross deemed savings, NTG ratio, NEI, and TRM benchmarking findings for natural gas furnaces offered through the ES Products Program.

3.4.2.1 Baseline

Existing Baseline Definition: The current baseline for both furnace BC measure IDs is a blended retrofit/lost opportunity AFUE of 83.2%, using an 83% AFUE rated furnace (Itron, 2020) to represent early replacement and an 85% value based on a negotiated value from the MA 2019–2021 TRM. The blended value is calculated from weights used in the 2019–2021 MA TRM calculations workbook, informed from MA participation breakdown for early replacement (61%) versus lost opportunity (39%).

Recommended Baseline Definition: The evaluators surveyed natural gas furnace participants about their previous system venting type and recommend adopting the updated blended condensing and non-condensing baselines or adopting a bifurcated baseline. Table 18 and Table 19 show the venting type and replacement type shares derived from survey responses. Table 20 displays a summary of recommended baselines, including condensing and non-condensing separately, as well as a blended baseline that combines condensing and non-condensing values using the shares in Table 18 as weights. The blended condensing and non-condensing values are used to derive the recommended deemed savings for this measure since existing system type is not always collected by the program. All blended Lost Opportunity-Early Replacement (LO-ER) values use the breakdown shares in Table 19 as weights.

Table 18: Furnace Type Breakdown based on Vent Type Survey Responses

% Condensing (n=16)	% Non-Condensing (n=16)[63]
50%	50%

Table 19: Furnace Replacement Type Breakdown based on Event Type Survey Responses

% Early Replacement (n=5)	% Lost Opportunity (n=30)
14%	86%

Table 20: Natural Gas Furnace Recommended Baselines

Factor	Recommended	Reasoning
Baseline Condition (Non-Condensing)	80.0% AFUE (LO) 81.0% AFUE (ER) 80.1% AFUE (Blended LO-ER)	• For LO, used current federal minimum of 80% AFUE (DOE, 2015) to represent non-condensing furnace. • For ER, used value of 81.0% AFUE recommended in 2023 NH Baseline Practices Final Report for non-condensing furnaces (NMR Group, 2023).

[63] The team coded "don't know" responses to non-condensing when developing the percent shares of condensing versus non-condensing natural gas furnaces.

Factor	Recommended	Reasoning
Baseline Condition (Condensing)	93.4% AFUE (Blended LO and ER)	• For both LO and ER, used value of 93.4% AFUE from 2023 NH Baseline Practices Final Report (NMR Group, 2023) for condensing furnace.
Baseline Condition (Blended Non-Condensing and Condensing)	86.9% AFUE (LO) 87.4% AFUE (ER) 87.0% AFUE (Blended LO-ER)	• Blended condensing and non-condensing values using furnace type breakdown % from Table 18.

3.4.2.2 Evaluated Gross Deemed Savings

The recommended gross deemed MMBTU, kWh, and kW values shown in Table 17 above deviate from the existing (2026) NH TRM deemed values for the following reasons. Refer to the workbook titled "NH ES Products Impact Calcs 15May26.xlsx" (provided with this report) for the detailed calculations.

1. **Calculation approach:** The evaluators used current New York State TRM algorithms (NYS Joint Utilities, 2026) to calculate the recommended deemed savings using a Concord, NH-specific $EFLH_h$ (1,484 hours) and the recommended blended baseline (87.0% AFUE), resulting in different values from those in the 2026 NH TRM (sourced from a linked calculator in the 2019-2021 MA TRM that used a MA-specific annual heating load of 583.5 therms). Using the NYS TRM algorithms allowed us to incorporate NH-specific EFLH and create traceable calculations.
2. **Baseline condition:** Applied recommended blended non-condensing and condensing baseline AFUE for a blended ER-LO scenario (87.0% AFUE) using replacement type rates informed by this study's survey to blend ER and LO (14% and 86%, respectively).

In addition to the blended deemed MMBTU savings presented in Table 17 above, the evaluators developed deemed savings specific to non-condensing and condensing furnace baselines (80.1% and 93.4% AFUE, respectively). Table 21 displays the deemed MMBTU savings values for non-condensing and condensing baseline types, blended using the same replacement scenario weights (Table 19). While these values are not recommended TRM inputs for the ENERGY STAR Products Program because they do not align with the current TRM baseline framework, they can be used to support a bifurcated baseline for non-condensing and condensing units if the utilities decide to implement one in the future.

Table 21. Deemed MMBTU Savings by Baseline Type

BC Measure ID	Non-Condensing MMBTU (deemed)	Condensing MMBTU (deemed)
GA3b008 (95% AFUE)	21.5	2.6
GA3b009 (97% AFUE)	23.7	4.5

3.4.2.3 Net-to-Gross

Existing NTG ratio: The NH 2026 TRM does not define an NTG ratio for natural gas furnaces because this factor had never been evaluated.

Recommended NTG ratio: Under the program's current offering, which allows customers to receive a rebate for replacing an existing non-condensing or condensing furnace or boiler, natural gas boilers and furnaces received a combined FR score of 40% and SO of 3%, resulting in a NTG ratio of 63%.[64]

The FR score is driven by respondent intent to purchase and install a natural gas boiler or furnace in the absence of the program, as reflected in reported likelihoods related to purchase timing and equipment efficiency. Most furnace and boiler respondents installed only one unit, indicating that equipment quantity had minimal influence on purchase intent. Overall, 78% of respondents reported they would have been somewhat or very likely to purchase the boiler or furnace at the same time without the program. Among respondents who reported some likelihood of purchasing a boiler or furnace without the NHSaves or utility rebate at the same time, 82% indicated they would have selected the same efficiency level (76% of all respondents).

These likelihoods are balanced by the influence score, which captures the role of the program, the NHSaves website, marketing materials, and contractor recommendations in respondents' decisions. Figure 8 shows the factors comprising the influence score and the associated survey results. The average influence score was 8.8 on a 0 to 10 scale, where higher values indicate greater program influence and correspondingly lower FR, therefore somewhat offsetting the higher participant intent values.

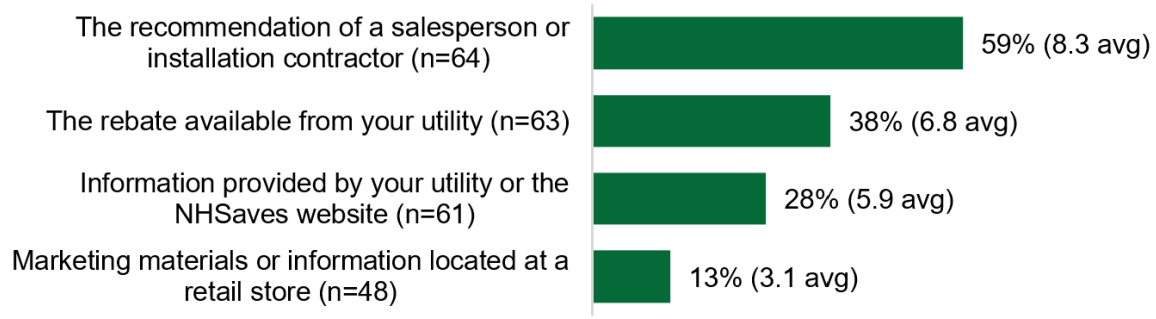
Among these components, respondents rated contractor recommendations as the most influential factor in their decision to purchase a natural gas boiler or furnace, with 59% indicating a very influential role (9 or 10 rating) and an 8.3 average rating overall. The rebate was the next most influential factor, with 38% of respondents rating it as very influential (6.8 average rating).

When the evaluators asked installation contractors to rate the influence of the program rebate on persuading customers to select a high-efficiency condensing furnace or boiler on a scale of 1 to 5, where five means "very influential," all three contractors who responded assigned a rating of 4 out of 5. This suggests contractors perceive that the program has a strong influence on customers' decision to install a higher efficiency furnace or boiler. Considering the measured FR value, this suggests that customers may attribute their decision more to the contractor's role in guiding them to the rebate than with the value of the rebate itself.

[64] The evaluators also present separate FR and NTG values for non-condensing and condensing existing equipment types below; these values are informational only under the current baseline framework but may be useful to the utilities if they choose to revise the offering in the future.

Figure 8: Respondent Ratings of Influence on Natural Gas Boiler and Furnace Purchase

(On a scale of 0 to 10, where 0 is “not at all influential" and 10 is “very influential”, how influential were the elements listed below on your decision to purchase the natural gas boiler/furnace?
9 or 10 rating)



The SO score captures participants’ reports that NHSaves influenced their decisions to install additional energy efficiency measures without program incentives, including Wi-Fi thermostats, dehumidifiers, window replacements, and insulation.

Free-Ridership and NTG by Existing Equipment Type: The evaluators also calculated separate FR values for respondents who reported having a non-condensing furnace prior to installing the program-rebated unit and those who reported that their prior system was a condensing furnace.[65] As shown in Table 22, this analysis found somewhat lower FR values for those who reported replacing a non-condensing furnace but this difference is not statistically significant. The evaluators do not recommend that the utilities apply these values in results reporting, but the values may be informative for program planning and design purposes.

Table 22: Free-Ridership by Existing System Type

Product	Pre-Existing System Type	n	FR	NTG*
Furnace and boiler (all, original values)	All	67	0.40	0.63
Furnace and boiler (replaced existing equipment)	All	51	0.39	0.64
Furnace and boiler	Condensing	23	0.42	0.61
	Non-condensing	28	0.36	0.67
Furnace	Condensing	16	0.45	0.58
	Non-condensing	16	0.36	0.67
Boiler	Condensing	12	0.39	0.64
	Non-condensing	7	0.35	0.68

* NTG values include measured SO of 0.03.

[65] Based on response to question about how they prior system vented, as discussed in Section **Error! Reference s ource not found.** above.

3.4.2.4 Non-Energy Impacts

In the literature review, the study team identified an NEI impact of $374.48 per year claimed by Rhode Island's TRM.[66] Based on the tables in appendix B of the RI TRM, the NEI value is from factors including thermal comfort, home durability, reduced equipment maintenance costs, and health benefits. [67]

[66] 2026 Rhode Island Technical Reference Manual. https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2025-10/25-37-EE%202026%20Rhode%20Island%20Technical%20Reference%20Manual%20-10-15-2025.pdf

[67] Because the New Hampshire cost-effectiveness tests do not utilize measure-level NEI values, this data is for informational purposes only.

3.4.2.5 TRM Benchmarking Results

Table 23 summarizes the findings of the TRM and literature review for natural gas furnaces. This table includes effective useful measure life (EUL) for informational purposes.

Table 23: Comparison of NH Factors to Peer State TRMs, Natural Gas Furnace*

Factor	2026 NH	NH Recommendation	MA	CT	RI	ME	NY	PA
Baseline Condition	85% AFUE (LO) 83% AFUE (ER) 83.2 AFUE (Blended LO-ER)	Blended Non-Condensing and Condensing: 86.9% AFUE (LO) 87.4% AFUE (ER) 87.0% AFUE (Blended LO-ER)	89.4 AFUE (Guidehouse, 2023)	AFUE Varies by equipment. 87.0% (>120 kBtu/h, unknown) 96.0% (>120 kBtu/h, existing condensing) 80.0% (>120 kBtu/h, existing non-condensing) 85.0% (<120 kBtu/h)	95% AFUE (furnace with ECM, income eligible only)	87% AFUE (measure inactive as of 2024)	80% AFUE	89.1% AFUE (NMR Group, 2023)
Efficient Condition	95% AFUE (GA3b008) 97% AFUE (GA3b009)	95% AFUE (GA3b008) 97% AFUE (GA3b009)	N/A	N/A	N/A	N/A	N/A	N/A
NTG	N/A	0.63	0.86 (95% AFUE ID) 0.92 (97% AFUE ID)	Applied via program-level FR/SO	Applied via program-level NTG formula	0.75 (EMT TRM v2020, midstream) Prior: 0.71 (WHEC, 2019)	Not applied (NY TRM reports gross savings only)	N/A
ISR	100%	N/A	100%	N/A	100%	100%	N/A	N/A
EUL (Years)	17 (Guidehouse, 2021)	17 (Guidehouse, 2021)	17 (Guidehouse, 2021)	20 (CPUC, 2008)	17 (Guidehouse, 2021)	25 (GDS Associates, 2007)	30 (DNV, 2024)	N/A

*Sourced from current or recent state-wide TRMs, unless noted otherwise.

3.4.3 Process Findings

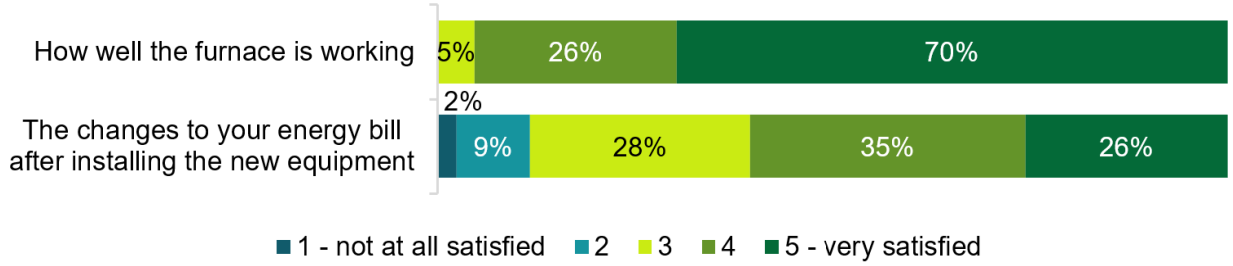
This section describes the process findings specific to furnaces. Process results for the program are in Section 4.2 and for the downstream rebate pathway in Section 4.3.

3.4.3.1 Participant Satisfaction

Nearly all respondents who installed a gas furnace were satisfied with its performance. When asked to rate satisfaction on a scale of 1 to 5 (where 1 is "not at all satisfied" and 5 is "very satisfied"), 95% of respondents reported being satisfied (rating of 4 or 5) with how well the gas furnace heats their home (Figure 9).

Figure 9: Participant Satisfaction with Furnace Performance

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with…; n=43)



Respondents expressed lower satisfaction with changes to their energy bills, citing limited energy savings. Fewer than two-thirds (61%) of respondents said they were satisfied with the changes to their energy bill after installing the new equipment. Of the 16 respondents who were less than satisfied, 10 reported expecting greater savings or seeing only little to no savings and three reported experiencing higher energy bills or challenges with high gas rates. See Section 3.1.1 for a recommendation to address satisfaction issues and see Section 4.2.1 for a comparison of participant satisfaction with changes to their energy bills across measure types.

3.4.3.2 Participating Installation Contractor Perspectives

Of the 15 program-participating contractors interviewed, seven reported installing gas heating equipment (boilers and/or furnaces). All seven of these contractors reported being full-service HVAC contractors, meaning they offer both heat pumps and combustion-based heating options. These contractors are more likely to encounter customers choosing between heat pumps and gas systems, providing valuable perspective on customer decision-making and market dynamics. The interviewed contractors were based in the southern half of the state, consistent with the areas served by the natural gas system.

Note that the contractor interview questions asked about furnaces and boilers together, and many responses apply to both measures.

Contractors reported that customers tend to replace furnaces and boilers like-for-like at the equipment's end of life and fuel conversions, primarily oil to gas, occur at a low level. Contractors reported that there is a strong tendency for customers to install furnaces and boilers on a like-for-like basis, i.e., customers with an existing furnace replace it with another furnace,

and likewise for boilers. The majority of furnace and boiler installations (approximately 70–90%) occur in response to equipment failure or imminent failure. Early replacement is relatively uncommon; contractors consistently estimate early replacement at between 10% and 30% of installations. New construction and renovation projects represent a smaller share of the market. Contractors told the evaluators that fuel switching does occur but is not widespread; conversions from oil to gas account for roughly 5% to 30% of installations and are generally motivated by cost savings and cleaner operation.

High-efficiency furnaces and boilers appear to be the standard among participating contractors. Interviewed contractors reported that between 70% and 95% of the furnaces and boilers they install meet program-qualifying efficiency thresholds. According to these contractors, NHSaves rebates play a key role in encouraging adoption by helping offset upfront cost differences between standard and high-efficiency models. Three of the contractors rated the influence of NHSaves rebates as 4 out of 5, indicating that they view the rebates as fairly influential in encouraging customers to select high-efficiency condensing furnaces or boilers rather than less efficient models. In boiler installations, contractors almost always include new circulator pumps (95%–100% of cases), though the adoption of ECM (electronically commutated motor) pumps varies widely (15%–100%). Half of the interviewed contractors reported installing ECM pumps 90%–100% of the time, while the other half indicated they only include them in some cases to help minimize the overall system cost.

Contractors reported that their practices around recommending a heat pump as a replacement for a furnace or boiler vary considerably. Contracting firms that specialize in heat pumps report always or nearly always steering furnace and boiler customers toward heat pumps, while firms that provide general HVAC services were split: Half said they always mention heat pumps as an option, while the other half said they only mention heat pumps in certain situations, such as when the customer is looking for both heating and cooling and has existing ductwork or is looking to add cooling or supplemental heating. One contractor said they never recommend heat pumps over gas equipment, though they will suggest them to propane and oil customers. Central heat pumps are more commonly presented as an alternative for furnace installations, where there is lower cost and complexity for converting to a ducted heat pump leveraging the home's existing ductwork. Heat pumps are less frequently discussed for boiler systems unless the customer also expresses interest in cooling. For boiler customers the heat pump typically supplements rather than replaces the boiler, serving as a secondary heating source and the primary cooling system.

3.5 Natural Gas Boilers

This measure is titled "HVAC Boiler" in the 2026 NH TRM and involves the installation of a new high-efficiency forced hot water boiler for space heating. For the ES Products Program, boilers are treated as a blended retrofit/lost opportunity measure in the 2026 TRM, with deemed savings sourced from the MA 2019–2021 TRM (Mass Save, 2018). The following two BC measure IDs represent the two natural gas boiler efficiency tiers offered through the ES Products Program:

- GA3b006 (90%+ AFUE)
- GA3b007 (95%+ AFUE)

3.5.1 Recommendations

This section details recommended impact updates and process improvements for boiler measures in the ES Products Program. The most impactful changes to gas boiler impacts include application of the estimated NTG ratio of 0.63 and increased savings for the top efficiency tier (95% AFUE).

3.5.1.1 Recommended Impact Updates

Per the work plan, the study team evaluated the **measure baseline** and measured the **NTG ratio** for natural gas boilers offered through the ES Products Program. Table 24 summarizes the existing and recommended values for both evaluated factors. The table also includes two additional factors not researched in this study, but relevant to the recommended gross deemed savings impacts presented below: efficient condition and ISR.

Table 24: Factor Summary, Natural Gas Boiler

Factor	Existing (2026 TRM)	Recommended
Baseline Condition (Blended Condensing and Non-Condensing)	84% AFUE (ER) 85% AFUE (LO)	85.7% AFUE (ER) 87.0% AFUE (LO) 86.7% AFUE (Blended ER-LO)
NTG Ratio*	Not included	63%
Efficient Condition	90% AFUE (GA3b006) 95% AFUE (GA3b007)	No change
ISR**	100%	N/A

* Section 3.4.2.3 presents separate NTG values for non-condensing and condensing boilers and furnaces.
** Research not in scope for factor. Recommended values defaulted to 100%.

Table 25 summarizes the recommended natural gas boiler TRM and benefit-cost model inputs. This summary includes a comparison of deemed savings values in the 2026 NH TRM with the recommended values.[68] The recommended deemed MMBTU savings is calculated using

[68] The % change metric is for informational purposes only and is not intended to inform a realization rate. Should the NH utilities adopt the recommended values, the realization rates will be 100%.

the baseline AFUE of 86.7%, reflecting a blended furnace type (condensing vs non-condensing) and replacement scenario (LO vs ER).

Table 25: Recommended TRM Inputs, Natural Gas Boiler

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change[41]
GA3b006 (90% AFUE)	MMBTU (deemed)	12.1	11.4	- 6%
	NTG*	Not included	0.63	-
	ISR**	N/A	100%	0%
GA3b007 (95% AFUE)	MMBTU (deemed)	14.8	17.6	+ 19%
	NTG*	Not included	0.63	-
	ISR**	N/A	100%	0%

* Section 3.4.2.3 presents separate NTG values for non-condensing and condensing boilers and furnaces.
**Research not in scope for factor. Recommended values defaulted to 100%.

The study team also recommends two updates to the TRM entry text to clarify it for users:

- **Recommendation TRM-13: Edit the high-efficiency case language to mention the 90% AFUE BC measure ID.** The HVAC Boiler section in the 2026 NH TRM describes the efficient case as "a boiler with an AFUE rating of 95% or greater," implying that the ES Products Program offers only one high-efficiency boiler (95% AFUE). The TRM description should align with the program's offering of two separate BC measure IDs (GA3b006 for 90% AFUE and GA3b007 for 95% AFUE).
- **Recommendation TRM-14: Add the two boiler BC measure IDs to the table for clarity on the impact factors.** The two ES Products BC measure IDs for boilers are not listed in the "Impact Factors for Calculating Adjusted Gross Savings" table in the 2026 NH TRM section.

3.5.2 Impact Findings

This section presents the baseline, evaluated gross deemed savings, NTG ratio, NEI, and TRM benchmarking findings for natural gas furnaces offered through the ES Products Program.

3.5.2.1 Baseline

Existing Baseline Definition: The current baseline for both BC measure IDs is a blended retrofit/ lost opportunity scenario using an 84% AFUE rated boiler (Itron, 2020) to represent early replacement and an 85% value based on a negotiated value from the MA 2019–2021 TRM. The blended value is calculated from weights used in the 2019–2021 MA TRM calculations workbook, informed by MA participation for early replacement (53%) versus lost opportunity (47%).

Recommended Baseline Definition: The evaluators surveyed natural gas boiler participants about their previous system venting type and recommend adopting the updated blended condensing and non-condensing baselines or adopting a bifurcated baseline. Table 26 and Table 27 show the venting type and replacement type shares derived from survey responses. Table 28 displays a summary of recommended baselines, including condensing and non-condensing

separately as well as a blended baseline that combines condensing and non-condensing values using the shares in Table 26 as weights. The blended condensing and non-condensing values are used to derive the recommended deemed savings for this measure since existing system type is not always collected by the program. All blended LO-ER values use the breakdown shares in Table 27 as weights.

Table 26: Boiler Type Breakdown based on Vent Type Survey Responses

% Condensing (n=12)	% Non-Condensing (n=7)[69]
63.2%	36.8%

Table 27: Boiler Replacement Type Breakdown based on Event Type Survey Responses

% Early Replacement (n=5)	% Lost Opportunity (n=30)
26%	74%

Table 28: Natural Gas Boiler Recommended Baselines

Factor	Recommended	Reasoning
Baseline Condition (Non-Condensing)	80.4% AFUE (ER) 84.0% AFUE (LO) 83.1% AFUE (Blended ER-LO)	• For ER, used value of 80.4% AFUE from 2023 NH Baseline Practices Final Report for non-condensing furnaces (NMR Group, 2023). • For LO, used current federal minimum of 84% AFUE (DOE, 2015) to represent non-condensing furnace.
Baseline Condition (Condensing)	88.8% AFUE (ER and LO)	• For both ER and LO, used value of 88.8% AFUE from 2023 NH Baseline Practices Final Report (NMR Group, 2023) for condensing furnace.
Baseline Condition (Blended Condensing and Non-Condensing)	85.7% AFUE (ER) 87.0% AFUE (LO) 86.7% AFUE (Blended ER-LO)	• Blended condensing and non-condensing values using boiler type breakdown % from Table 26.

3.5.2.2 Evaluated Gross Deemed Savings

The recommended gross deemed MMBTU values shown in Table 25 above deviate from the existing (2026) NH TRM deemed values for the following reasons. Refer to the titled "NH ES Products Impact Calcs 15May26.xlsx" (provided with this report) for the detailed calculations.

1. **Calculation approach:** The evaluators used current New York State TRM algorithms (NYS Joint Utilities, 2026) to calculate recommended deemed savings using a Concord, NH-specific $EFLH_h$ (1,484 hours) and the recommended blended baseline (86.7 AFUE), resulting in different values from those in the 2026 NH TRM (sourced from a linked calculator in the 2019-2021 MA TRM that used a MA-specific heating load of 583.5

[69] The team coded "don't know" responses to non-condensing when developing the % shares of condensing vs non-condensing natural gas boilers. This assumption represents a conservative condensing furnace share estimate that is similar to the MA value from the 2023 RBUECS (Guidehouse, 2023).

therms). Using the NYS TRM algorithms allowed us to incorporate NH-specific EFLH and create traceable calculations.

2. **Baseline condition:** Applied recommended blended non-condensing and condensing baseline AFUE for a blended ER-LO scenario (86.7% AFUE) using replacement type rates informed by this study's survey to blend ER and LO (26% and 74%, respectively).

In addition to the blended deemed MMBTU savings presented in Table 25 above, the evaluators developed deemed savings specific to non-condensing and condensing boiler baselines (83.1% and 88.8% AFUE, respectively). Table 29 displays the deemed non-condensing and condensing baseline type MMBTU values, blended using the same replacement scenario weights. While these values are not recommended TRM inputs for the ENERGY STAR Products Program due to the current TRM baseline framework, they can be used to support a bifurcated baseline for non-condensing and condensing units if the utilities decide to implement one in the future.

Table 29: Deemed MMBTU Savings by Baseline Type

BC Measure ID	Non-Condensing MMBTU (deemed)	Condensing MMBTU (deemed)
GA3b006 (90% AFUE)	19.8	6.9
GA3b007 (95% AFUE)	26.2	12.8

3.5.2.3 Net-to-Gross

Existing NTG ratio: The NH 2026 TRM does not define a NTG ratio for natural gas boilers because this factor has never been evaluated.

Recommended NTG ratio: Natural gas boilers and furnaces received a combined FR score of 40% and SO of 3%, resulting in an NTG ratio of 63%. See Section 3.4.2.3 for discussion of these results.

3.5.2.4 Non-Energy Impacts

In the literature review, the study team found that of the TRMs surveyed, only Rhode Island claims NEIs for boilers ($374.48 per year).[70]

[70] Because the New Hampshire cost-effectiveness tests do not utilize measure-level NEI values, this data is for informational purposes only.

3.5.2.5 TRM Benchmarking Results

Table 30 summarizes the findings of the TRM and literature review for natural gas boilers. This table includes effective useful measure life (EUL) for informational purposes.

Table 30: Comparison of NH Factors to Peer State TRMs, Natural Gas Boiler*

Factor	2026 NH	NH Recommendation	MA	CT	RI	ME	NY	PA
Baseline Condition	84% AFUE (ER) 85% AFUE (LO)	Blended Condensing and Non-Condensing: 85.7% AFUE (ER) 87.0% AFUE (LO) 86.7% AFUE (Blended ER-LO)	88.0% AFUE (Guidehouse, 2023)	0.832 (non-condensing) 0.944 (condensing)	Actual existing (Retrofit only)	87% AFUE (NC/ROB) 84% AFUE existing (Retrofit) (measure inactive as of 2024)	84% AFUE	85.4% AFUE (NMR Group, 2023)
Efficient Condition	90% AFUE (GA3b006) 95% AFUE (GA3b007)	90% AFUE (GA3b006) 95% AFUE (GA3b007)	New efficient boiler	Energy efficient boiler (90% AFUE ENERGY STAR)	Higher efficiency replacement system	Exceeds federal minimum efficiency	Exceeds baseline efficiency	N/A
NTG	N/A	0.63	0.84 (90% AFUE ID) 0.88 (95% AFUE ID)	Applied via program-level FR/SO	Applied via program-level NTG formula	0.75 (EMT TRM v2020, midstream) Prior: 0.71 (WHEC, 2019)	Not applied (NY TRM reports gross savings only)	N/A
ISR	N/A	100%	100%	N/A	100%	100%	N/A	N/A
EUL (Years)	19 (GDS Associates, 2007)	23 (Guidehouse, 2021)	23 (Guidehouse, 2021)	20 (CPUC, 2008)	23 (Guidehouse, 2021)	25 (GDS Associates, 2007)	30 (DNV, 2024)	N/A

*Sourced from current or recent state-wide TRMs unless noted otherwise.

3.5.3 Process Findings

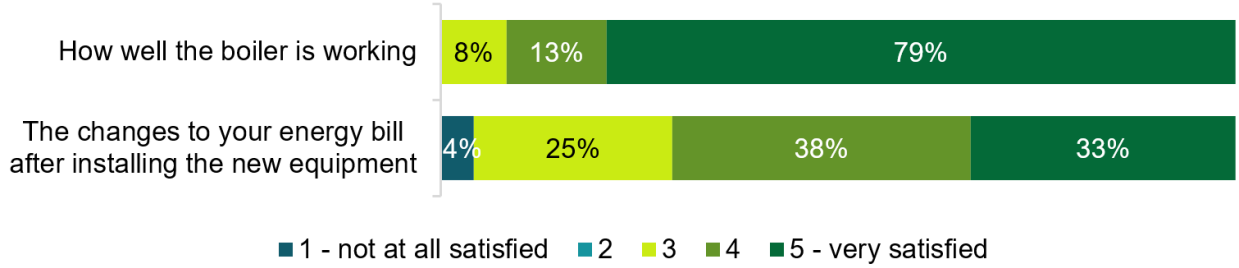
This section describes the process findings specific to boilers. Process results for the program as a whole are in Section 4.2 and for the downstream rebate pathway in Section 4.3.

3.5.3.1 Participant Satisfaction

Most respondents who installed a gas boiler reported satisfaction with its performance. When asked to rate satisfaction on a scale of 1 to 5 (where 1 is "not at all satisfied" and 5 is "very satisfied"), 92% of respondents reported being satisfied (rating of 4 or 5) with how well the gas boiler is working. (Figure 10) Two respondents cited lower-than-expected warmth and efficiency from their new boiler.

Figure 10: Participant Satisfaction with Boiler Performance

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with…; n=24)



Respondents expressed lower satisfaction with changes to their energy bills, citing limited energy savings. Seven in ten (71%) respondents said they were satisfied with the changes to their energy bill after installing the new equipment. Five of the seven respondents who were less than satisfied reported expecting greater savings or seeing only little to no savings. See Section 3.1.1 for a recommendation to address satisfaction issues and see Section 4.2.1 for a comparison of participant satisfaction with changes to their energy bills across measure types.

3.5.3.2 Participating Installation Contractor Perspectives

Note that the contractor interview questions grouped furnaces and boilers together, so responses apply to both measures. For contractor installation perspectives relevant to boilers, please refer to Section 3.4.3.2.

3.6 GAS WI-FI THERMOSTATS

This measure is titled "HVAC Thermostat – Wi-Fi Communicating" in the 2026 NH TRM. The measure covers communicating Wi-Fi thermostats allowing set point adjustment and control via remote application and requires use of an outdoor air temperature algorithm in the control logic. This measure is treated as a retrofit and savings are deemed based on statewide data on saturation of residential cooling equipment and heating fuel types. There are three BC measure IDs for Wi-Fi thermostats, but, per the study's scope of work, the team only examined the participation associated with the thermostats that yielded natural gas savings.[71] Therefore, the results presented in this section apply only to the two gas BC measure IDs:

- GA3b019 (heating only; must have natural gas heating)
- GA3b020 (heating and cooling; must have natural gas heating)

3.6.1 Recommendations

This section details recommended impact updates and process improvements for Wi-Fi thermostats in the ES Products Program. The most significant change to gas Wi-Fi thermostat impacts is the first-time estimation of an in-service rate (88%).

3.6.1.1 Recommended Impact Updates

Per the work plan, the study team evaluated the **baseline** and measured the **ISR** for Wi-Fi thermostats offered through the ES Products Program. Table 31 summarizes the existing and recommended values for both evaluated factors.

Table 31: Factor Summary, Gas Wi-Fi Thermostat

Factor	Existing (2026 TRM)	Recommended
Baseline Condition	A manual or programmable thermostat	No change.
Efficient Condition	Wi-Fi Thermostat	A Wi-Fi communicating thermostat that adheres to ENERGY STAR v1.0 specifications
ISR	100%	88%

Table 32 summarizes the recommended Wi-Fi thermostat TRM and benefit-cost model inputs. This summary includes a comparison of deemed savings values in the 2026 NH TRM with the recommended values.[72]

Table 32: Recommended TRM Inputs, Gas Wi-Fi Thermostat

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change
GA3b019	MMBTU (deemed)	3.35	3.01	- 10%

[71] The electric Wi-Fi thermostat is only available to customers installing a program-qualifying ASHP.
[72] The % change metric is for informational purposes only and is not intended to inform a realization rate. Should the NH utilities adopt the recommended values, the realization rates will be 100%.

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change
GA3b020	ISR	100%	88%	- 12%
	MMBTU (deemed)	3.35	3.01	- 10%
	ISR	100%	88%	- 12%

3.6.2 Impact Findings

This section presents the baseline, ISR, evaluated gross deemed savings, NEI, and TRM benchmarking findings for natural gas Wi-Fi thermostats offered through the ES Products Program.

3.6.2.1 Baseline

Gas Wi-Fi Thermostat—Existing Baseline Definition: The baseline case is an HVAC system with a manual or programmable thermostat.

Gas Wi-Fi Thermostat—Recommended Baseline Definition: The study team proposes specifying that the thermostat adhere to Energy Star v1.0 specifications, which will serve as a source to clarify the detailed criteria for Wi-Fi thermostat functionality.

3.6.2.2 In-Service Rate

The 2026 NH TRM assumes a deemed ISR of 100% for Wi-Fi thermostats. Based on the primary data collected through the participant survey, the evaluators recommend an **88% ISR**. This is the proportion of rebated thermostats (n=105) that are currently installed (88%). Among the rebated thermostats not currently in use (n=9), three reported installation or connection issues such as those relating to the necessary C-wire[73] and another three respondents reported that their units had stopped working.

3.6.2.3 Evaluated Gross Savings

The evaluators recommend updating from an older Massachusetts source (Navigant 2018) to a more recent Massachusetts study source (Guidehouse 2021). Using the same heating load adjustment ratio as applied in the 2026 NH TRM, the deemed gas savings change from 3.35 MMBtu to 3.01 MMBtu per thermostat.

3.6.2.4 Non-Energy Impacts

In the literature review, the study team identified no NEIs in any of the relevant sources.

[73] The NHSaves online marketplace site notes that customers should confirm system compatibility before ordering and includes a link to a compatibility checker tool for each thermostat model.

3.6.2.5 TRM Benchmarking Results

Table 33 summarizes the findings of the TRM and literature review for Wi-Fi thermostats. This table includes effective useful measure life (EUL) for informational purposes.

Table 33: Comparison of NH Factors to Peer State TRMs, Natural Gas Wi-Fi Thermostat*

Factor	2026 NH	NH Recommendation	MA	CT	VT	ME	NY	PA
Baseline Condition	Existing manual or programmable thermostat	Existing manual or programmable thermostat	Existing manual or programmable residential thermostat	Existing manual or programmable residential thermostat	Existing manual or programmable residential thermostat	Existing manual thermostat	Existing non-connected programmable thermostat	Existing manual or programmable residential thermostat
Efficient Condition	A Wi-Fi thermostat	A Wi-Fi communicating thermostat that adheres to ENERGY STAR v1.0 specifications	A Wi-Fi thermostat	ENERGY STAR qualified smart thermostat	A thermostat with the ability for two-way communication	Wi-Fi enabled thermostat	ENERGY STAR qualified connected thermostat	ENERGY STAR certified connected thermostat
NTG	N/A	N/A	0.87	Applied via program-level FR/SO	Applied via program-level NTG formula	N/A	Not applied (NY TRM reports gross savings only)	N/A
ISR	100%	88%	79%	96%	N/A	100%	N/A	N/A
EUL (Years)	15	N/A	15	15	10	10	11	9

*Sourced from current or recent state-wide TRMs unless noted otherwise.

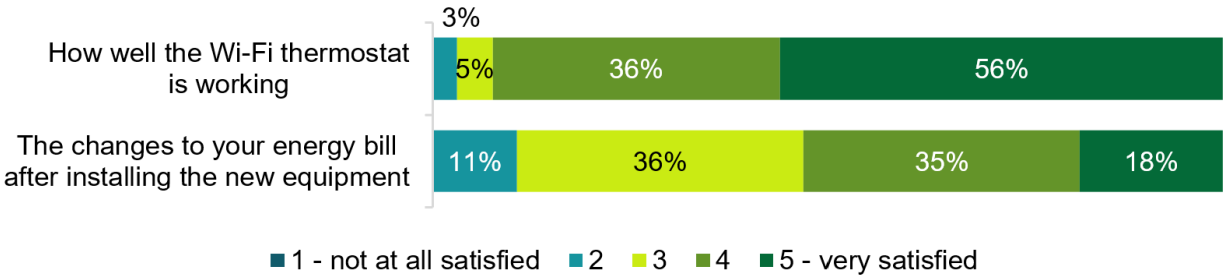
3.6.3 Process Findings

This section describes the process findings specific to Wi-Fi thermostats, which are offered through both the downstream rebate and online marketplace pathways. Process results for the program are in Section 4.2, for the downstream rebate pathway in Section 4.3, and for the online marketplace in Section 4.5.

More than nine in ten participating customer respondents who installed a Wi-Fi thermostat reported satisfaction with its performance. When asked to rate satisfaction on a scale of 1 to 5 (where 1 is "not at all satisfied" and 5 is "very satisfied"), 92% of respondents reported being satisfied (rating of 4 or 5) with the thermostat's performance (Figure 11).

Figure 11: Participant Satisfaction with Wi-Fi Thermostats

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with…; n=66)



Respondents reported being less satisfied with changes to their energy bills. Just over one-half (53%) of respondents said they were satisfied with the changes to their energy bill after installing the new thermostat. Respondents who were less than satisfied most frequently cited a lack of realized savings (70%), while another 17% said they could not detect bill savings due to rising electricity or gas rates. See Section 3.1.1 for a recommendation to address satisfaction issues and see Section 4.2.1 for a comparison of participant satisfaction with changes to their energy bills across measure types.

3.7 HEAT PUMP WATER HEATERS

This measure is titled "Hot Water Heat Pump Water Heater" in New Hampshire's 2026 TRM (NH Saves, 2026) and involves the installation of an ENERGY STAR-certified heat pump storage water heater (HPWH) as a lost opportunity retail offering through the ES Products Program. HPWH measures are offered through both downstream and midstream pathways. This study addressed only downstream HPWH measures. Deemed savings are provided for kWh, summer kW, winter kW, and fuel MMBTU, each representing a blended baseline of electric, propane, and oil baselines using weights from 2023 NHSaves retail program data (0.71 electric, 0.13 propane/gas, 0.16 oil). The following four BC measure IDs comprise the HPWHs offered through the ES Products Program:

- EA3b007 (Energy Star Integrated HPWH, 55 gallons or less)
- EA3b008 (Energy Star Integrated HPWH, greater than 55 gallon)
- EA3b038 (Energy Star Integrated HPWH, 120V, Split System 55 gallons or less)
- EA3b039 (Energy Star Integrated HPWH, 120V, greater than 55 gallon)

3.7.1 Recommendations

This section details recommended impact updates and process improvements for HPWHs in the ES Products Program. The most impactful changes to HPWH impacts include application of the estimated NTG ratio of 0.67 and sizable but mixed energy savings changes for the four HPWH measures.

3.7.1.1 Recommended Impact Updates

Per the work plan, the study team evaluated the **measure baseline** and measured the **NTG ratio** for HPWHs incentivized through the downstream pathway. Table 34 and Table 35 summarize the existing and recommended values for these factors for smaller-capacity (≤55 gallons) and higher-capacity (>55 gallons) HPWHs. These factor summary tables include three additional factors that were not in scope for this study but are relevant to the recommended gross deemed savings impacts presented below: efficient condition, demand CF, and ISR.

The recommended baseline applies to both large- and small-capacity units because the team adopted the Massachusetts HPWH study[74] methodology, which used data from the 2023 MA baseline study to characterize baseline UEF across the full range of baseline water heaters. As a result, the recommended baseline UEF is the same for both unit sizes. Because the baseline UEF values are now identical, and all other inputs to the savings calculation were also the same for both HPWH sizes per the existing NH HPWH calculator[75], estimated savings are also identical regardless of unit size.

[74] Guidehouse, *Heat Pump Water Heater Impact Study Report (MA25R03-E-HPWHI)*, March 27, 2026, Electric and Gas Program Administrators of Massachusetts. https://ma-eeac.org/wp-content/uploads/Heat-Pump-Water-Heater-Impact-Study-Report-FINAL-2026-03-27.pdf

[75] The existing HPWH calculator updated by the team to develop recommended savings values in Table 36 is titled *2025 HPWH wkbk.xlsx* and is linked as endnote 6 in the residential Heat Pump Water Heater section of the 2026 NH TRM.

Table 34: Factor Summary, Heat Pump Water Heaters ≤55 gal (inc. 120V units)

Factor	Existing (2026 TRM)	Recommended
Baseline Condition	0.93 UEF (electric) 0.77 UEF (propane) 0.65 UEF (oil)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)
NTG Ratio	Not included	0.67 (FR: 0.33, SO: <0.01)
Efficient Condition	HPWH meeting or exceeding ENERGY STAR v5.0 specs For 120V units, program req of 2.8 UEF	No change
ISR *	100%	No change
CF*	0.41 (summer) 0.74 (winter)	No change

*Research not in scope for factor. Recommended values defaulted to existing, 2026 NH TRM values.

Table 35: Factor Summary, Heat Pump Water Heaters >55 gal

Factor	Existing (2026 TRM)	Recommended
Baseline Condition	2.03 UEF (electric) 0.77 UEF (propane) 0.65 UEF (oil)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)
NTG Ratio	Not included	0.67 (FR: 0.33, SO: <0.01)
Efficient Condition	HPWH meeting or exceeding ENERGY STAR v5.0 specs For 120V units, program req of 2.8 UEF	No change
ISR *	100%	No change
CF*	0.41 (summer) 0.74 (winter)	No change

*Research not in scope for factor. Recommended values defaulted to existing, 2026 NH TRM values.

Table 36 summarizes the recommended HPWH TRM and benefit-cost model inputs. This summary includes a comparison of deemed savings values in the 2026 NH TRM with the recommended values.[76]

[76] The % change metric is for informational purposes only and is not intended to inform a realization rate. Should the NH utilities adopt the recommended values, the realization rates will be 100%.

Table 36: Recommended TRM Inputs, Heat Pump Water Heaters

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change[33]
EA3b007 (≤ 55 gal)	kWh (deemed)	1,236	602	- 51%
	Summer kW (deemed)	0.191	0.118	- 38%
	Winter kW (deemed)	0.171	0.087	- 49%
	MMBTU (deemed)	3.98	5.80	+ 46%
	NTG	Not included	0.67	N/A
	ISR*	100%	100%	0%
	CF_{SP}*	0.41	0.41	0%
	CF_{WP}*	0.74	0.74	0%
EA3b008 (> 55 gal)	kWh (deemed)	163	602	+ 269%
	Summer kW (deemed)	0.019	0.118	+ 521%
	Winter kW (deemed)	0.017	0.087	+ 412%
	MMBTU (deemed)	3.98	5.80	+ 46%
	NTG	Not included	0.67	N/A
	ISR*	100%	100%	0%
	CF_{SP}*	0.41	0.41	0%
	CF_{WP}*	0.74	0.74	0%
EA3b038 (≤ 55 gal, 120V)	kWh (deemed)	1,418	434	- 69%
	Summer kW (deemed)	0.169	0.094	- 44%
	Winter kW (deemed)	0.151	0.068	- 55%
	MMBTU (deemed)	3.98	5.80	+ 46%
	NTG	Not included	0.67	N/A
	ISR*	100%	100%	0%
	CF_{SP}*	0.41	0.41	0%
	CF_{WP}*	0.74	0.74	0%
EA3b039 (> 55 gal, 120V)	kWh (deemed)	-25.23	434	N/A
	Summer kW (deemed)	-0.003	0.094	N/A
	Winter kW (deemed)	-0.003	0.068	N/A
	MMBTU (deemed)	3.98	5.80	+ 46%
	NTG	Not included	0.67	N/A
	ISR*	100%	100%	0%
	CF_{SP}*	0.41	0.41	0%
	CF_{WP}*	0.74	0.74	0%

*Research not in scope for factor. Recommended values defaulted to existing, 2026 NH TRM values.

The study team also has three recommendations for clarifying the TRM entry text:

- **Recommendation TRM-15: Ensure that default propane and oil UEF_{base} values are portrayed correctly in the TRM.** The Lost Opportunity Baseline table in the 2026 NH TRM incorrectly lists the default propane UEF_{base} values under the oil column and the default oil UEF_{base} values under the propane column.
- **Recommendation TRM-16: Correct the BC measure ID from *EA3038* to *EA3b038*.** The BC measure ID for *Energy Star Integrated HPWH, 120V, Split System 55 gallons or less* contains a typo in the impact summary table of the 2026 NH TRM.
- **Recommendation TRM-17: During the next (2028) TRM update, determine whether hot water consumption assumptions should vary by HPWH tank size.** The HPWH calculator cited in the 2026 NH TRM savings assumes identical hot water heater consumption for both size tiers.

The following sections provide detailed results related to each evaluated factor as well as a summary of literature and TRM review findings.

3.7.2 Impact Findings

This section presents the baseline, NTG ratio, evaluated gross and net savings, NEI, and TRM benchmarking findings for natural gas Wi-Fi thermostats offered through the ES Products Program.

3.7.2.1 Baseline

HPWH ≤55 Gallons—Existing Baseline Definition: For HPWHs under 55 gallons, the 2026 TRM defines a blended fuel type baseline with the following components: 0.93 UEF (electric), 0.77 UEF (propane), 0.65 UEF (oil). Blended baseline of electric, propane, and oil developed in the 2026 NH TRM calculations using weights from 2023 NHSaves retail program data (0.71 electric, 0.13 propane/gas, 0.16 oil).

HPWH ≤55 Gallons—Recommended Baseline Definition: Drawing upon the recently completed HPWH study in MA (Guidehouse, 2026), the study team recommends updating baseline UEF values in NH to align with the MA study. The values summarized in the MA study are sourced from Guidehouse analysis on collected data from the 2023 MA Massachusetts Residential Building Use and Equipment Characterization Study (Guidehouse, 2023) and provide a more up-to-date regional source for UEFs than the current 2026 NH TRM values sourced from a 2018 HPWH impact evaluation in CT (WHEC, 2018).

The team also analyzed survey responses to develop updated baseline water heating fuel type weights shown in Table 37. The updated weights represent a significant decrease in the electric value (0.56 vs 0.71) with most of the decrease being realized as an increase in the propane/gas weight (0.27 vs 0.13). **These fuel type weighting differences lead to a significant decrease in deemed electric savings, while increasing deemed MMBTU savings, for all HPWH BC measure IDs.**

HPWH >55 Gallons—Existing Baseline Definition: For HPWHs over 55 gallons, the 2026 TRM defines a blended fuel type baseline with the following components: 2.03 UEF (electric), 0.77 UEF (propane), 0.65 UEF (oil). Blended baseline of electric, propane, and oil developed in the 2026 NH TRM calculations using weights from 2023 NHSaves retail program data (0.71 electric, 0.13 propane/gas, 0.16 oil).

HPWH >55 Gallons—Recommended Baseline Definition: Similarly to the ≤55-gallon units, the study team recommends updating baseline UEF values in NH to align with the MA study and updating the baseline water heating fuel type weights shown in Table 37.

A key difference for >55-gallon units is the large shift that the recommended baseline UEF value represents over the existing value. In the 2026 NH TRM, the baseline UEF value for >55 units is specified as 2.03, which roughly corresponds to the federal minimum UEF for electric storage tank water heaters over 55 gallons, whereas the recommended value from the MA study is 1.02.

While the MA study does not provide a discussion into this change, the team determined that the study recommended value of 1.02 generally corresponds to industry standard practice for electric resistance storage tank water heater replacements >55 gallons. A recent HPWH market progress study for the Northwest Energy Efficiency Alliance (NEEA), found that only one in ten installers surveyed said their typical replacement strategy for >55-gallon electric resistance storage tank water was a HPWH (NMR Group, 2026). Most installers indicated that their typical replacement strategy for these >55-gallon units was either a small commercial electric resistance storage water heater or a smaller residential electric resistance storage tank water heater. Understanding that either small commercial or ≤55-gallon electric resistance water heaters on the market are likely rated closely to the current federal minimum of 0.93 UEF, **the team finds 1.02 UEF to be an appropriate industry standard practice baseline for lost opportunity HPWH installations.**

Table 37: Fuel Type Breakdowns based on Baseline Survey Responses (n=57)

% Electric	% Propane or Natural Gas	% Fuel Oil
56%	27%	17%

As an additional comparison point, the study team analyzed 2023–2025 midstream installer and instant rebate HPWH sales data provided by the NH utilities (n=1,329 records) alongside the baseline survey responses informing the fuel type breakdown in Table 37. The aggregate electric fuel shares are similar across sources (59.1% from midstream sales data versus 55.8% from the survey), though the midstream data shows a notably higher oil share and lower propane share. However, due to differences between the midstream and downstream channels evaluated in this study, NMR recommends that the NH utilities apply the survey-based fuel type shares for downstream water heating baselines found in this study.[77]

[77] Differences between the channels may partly reflect the nature of installations through them: midstream channels may capture more emergency replacements, where the contractor or distributor drives the equipment decision, and serve broader, often more rural areas of NH with higher shares of electric resistance and oil water heating. Downstream participants may be more likely to make deliberate fuel-switching decisions that shift the observed fuel mix.

3.7.2.2 Net-to-Gross

Existing NTG ratio: The 2026 NH TRM does not define a NTG ratio for downstream HPWHs because this factor has never been evaluated.

Recommended NTG ratio: HPWHs received a FR score of 33% and SO of less than 1%, resulting in a NTG ratio of 67%. The FR score is driven by respondent intent to purchase and install a heat pump water in the absence of the program, as reflected in reported likelihoods related to purchase timing and equipment efficiency. Every respondent only installed one unit through the program, indicating that equipment quantity had no influence on purchase intent. Overall, 59% of respondents reported they would have been somewhat or very likely to purchase the HPWH at the same time without the program. Of the respondents who indicated they were at least somewhat likely to purchase a HPWH absent the rebate at the same time, 77% indicated they would have selected the same efficiency level (61% of all respondents).

The program appears to have had a stronger influence on heat pump water heaters than on heat pumps for space conditioning, as evidenced by statistical comparisons of intent scores across these measures.[78] The HPWH timing component is statistically significantly lower (indicating a greater program influence) than those observed for both central and ductless mini-split ASHPs. Likewise, the intent to obtain higher efficiency equipment without the program is also statistically significantly lower for HPWHs than for ductless mini-split ASHPs.

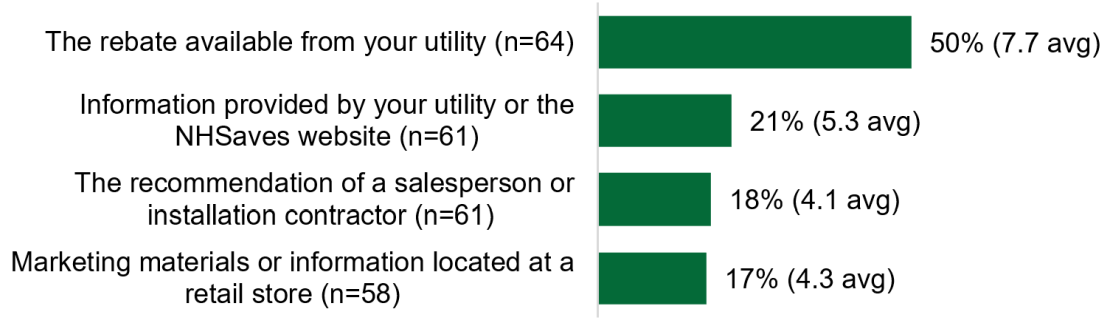
The intent score is partially offset by the influence score, which captures the role of the program, the NHSaves website, marketing materials, and contractor recommendations in shaping respondents' decisions. The average influence score was 8.4 on a 0 to 10 scale, where higher values indicate greater program influence and correspond to lower FR.

The rebate appears to have a stronger influence on HPWH purchases than space conditioning heat pumps, consistent with the rebate accounting for a higher percentage of HPWHs' incremental cost. Among the four influence components, respondents rated the rebate as the most influential component in their decision to purchase a HPWH, with 50% (7.7 average rating) indicating a very influential role (9 or 10 rating). Information provided by their utility or the NHSaves website was the next most influential, with 21% of respondents rating the provided information as very influential (5.3 average rating). Interestingly, contractor or salesperson recommendation was rated highly by fewer HPWH respondents than for space conditioning heat pumps. See Figure 12 for details.

[78] Because the survey found relatively high spillover for space conditioning heat pumps, the resulting NTG ratios are similar despite the lower FR for HPWHs.

Figure 12: Respondent Ratings of Influences on Heat Pump Water Heater Purchase Decision

(On a scale of 0 to 10, where 0 is “not at all influential" and 10 is “very influential”, how influential were the elements listed below on your decision to purchase the heat pump water heater?
9 or 10 rating)



SO associated with HPWH was minimal. Only one respondent reported installing an ENERGY STAR refrigerator without receiving program incentives.

3.7.2.3 Evaluated Gross and Net Savings

The recommended adjustments to gross savings are based on the following findings. Refer to the attached workbook titled “NH ES Products Impact Calcs 15May26.xlsx” for details.

1. **Baseline condition:** Existing 2026 NH TRM HPWH calculations updated per baseline UEF recommendations described above.
2. **Efficient condition:** No updates recommended. ENERGY STAR HPWH v5.0 is the current specification (ENERGY STAR, 2022).
3. **Calculation corrections**: Removed erroneously applied extra use adjustment factors when updating the existing 2026 NH TRM HPWH calculations (errors present in the TRM savings calculator *except for* EA3b007 kWh). The extra use adjustment factors are sourced from a 2018 HPWH impact evaluation in CT (WHEC, 2018) and intended to account for added kWh load resulting from fossil fuel baselines. This factor was misapplied to the electric base replacement types in the 2026 NH TRM calculations. The corrections are highlighted in the updated HPWH calculations in the attached workbook titled “NH ES Products Impact Calcs 15May26.xlsx.”
4. **Baseline fuel type weights**: Updated blended kWh, kW, and MMBTU deemed savings based on the baseline fuel type weights informed from the survey responses in this study (Table 37 above).

3.7.2.4 Non-Energy Impacts

In the literature review, the study team identified NEIs in the MA TRM, CT PSD, and RI TRM for HPWHs.[79]

[79] Because the New Hampshire cost-effectiveness tests do not utilize measure-level NEI values, this data is for informational purposes only.

The MA TRM[80] claims $0.70 per unit annually in NEIs for a HPWH.

- The CT PSD[81] claims $219.80 in NEIs per average participant that installed HPWHs. The CT PSD breaks down the NEIs as follows:
  - Appearance of the home: $32.71
  - Comfort during summer: $111.24
  - Equipment maintenance: $17.90
  - Equipment noise: -$69.25
  - Equipment reliability: $16.45
  - Frequency of fuel deliveries: $44.67
  - Home safety: $26.94
  - Other Impacts: $39.14
- The RI TRM[82] claims $5.68 per unit annually in NEIs for a HPWH.

[80] Massachusetts 2025-2027 Three Year Plan TRM https://ma-eeac.org/wp-content/uploads/Appendix-L-2025-2027-Three-Year-Plan-TRM.pdf#page=91&zoom=100,68,96

[81] Connecticut's 2024 Program Savings Document. https://www.energizect.com/sites/default/files/documents/2024%20CT%20Program%20Savings%20Document%20104_2023.pdf

[82] Rhode Island 2026 Technical Reference Manual https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2025-10/25-37-EE%202026%20Rhode%20Island%20Technical%20Reference%20Manual%20-10-15-2025.pdf

3.7.2.5 TRM Benchmarking Results

Table 38 summarizes the findings of the TRM and literature review for downstream HPWHs. This table includes EULs and NEIs for informational purposes.

Table 38: Comparison of NH Factors to Peer State TRMs, Heat Pump Water Heater*

Factor	2026 NH	NH Recommended	MA	CT	RI	VT	ME	NY	PA (2023 baseline study)
Baseline Condition	0.93 UEF for ≤55gal, 2.03 UEF for >55 gal (electric) 0.77 UEF (propane) 0.65 UEF (oil)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)	Electric: new baseline code electric resistance WH Oil: weighted avg of oil tankless coil WH (75%) and baseline code standard oil tank WH (25%) Propane: baseline code propane ST[1] WH (UEF 0.62) Natural Gas: baseline code natural gas ST WH (UEF 0.62)	>= 20 gal & <= 55 gal: 50 gal 0.93 UEF > 55 gal & <= 120 gal: 80 gal 2 UEF (blended mix of ER and minimally compliant HPWH)	New, standard efficiency electric resistance WH	The baseline condition for a market opportunity HPWH is assumed to be a new water heater that uses the same fuel as the home's existing water heater and follows the current Federal Standard for residential water heaters	Blend of pre-existing water heaters and new water heaters that meet federal minimum standards	Replace On Burnout: A minimally code compliant system of the same type as the existing equipment. New Construction: Minimally code compliant electric resistance water heater compliant with requirements of ECCCNYS 2025 R403.5 ER: Based on App M algorithm.	Fossil Fuel ST: 0.62 UEF Electric ST: 0.92 UEF Indirect w/ ST: 0.80 EF
Efficient Condition	ENERGY STAR v5.0 specs For 120v units, program req of 2.8 UEF	ENERGY STAR v5.0 specs For 120v units, program req of 2.8 UEF	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Factor	2026 NH	NH Recommended	MA	CT	RI	VT	ME	NY	PA (2023 baseline study)
NTG	N/A	0.67 (FR: 0.33, SO: <0.01)	0.91 (gas displacement) 0.82 (all other fuel displacement) (Guidehouse, 2021)	N/A	0.93 (Guidehouse, 2021)	FR: 1.00 SO: 1.10	N/A	N/A	N/A
ISR	100%	100%	100%	100%	100%	N/A	100%	N/A	N/A
EUL (Years)	15 (Michaels Energy, 2022)	15 (Michaels Energy, 2022)	13 (Guidehouse, 2021)	15 (Michaels Energy, 2022)	15 (Michaels Energy, 2022)	12 (NREL, 2025)	13 (NREL, 2025)	20 (DNV, 2024)	N/A

*Sourced from current or recent state-wide TRMs, unless noted otherwise.

[1] ST = storage tank, WH = water heater

3.7.3 Process Findings

This section describes the process findings specific to HPWHs. Process results for the program as a whole are in Section 4.2 and for the downstream rebate pathway in Section 4.3. Midstream pathway process results can be found in Section 4.4.

3.7.3.1 Participant Satisfaction

Nearly nine in ten respondents who installed a HPWH reported satisfaction with its performance. When asked to rate satisfaction on a scale of 1 to 5 (where 1 is "not at all satisfied" and 5 is "very satisfied"), 87% of respondents reported satisfaction (rating of 4 or 5) with how well the HPWH works (Figure 13).

Respondents who were not fully satisfied with their HPWH most often cited slow recovery (3). One respondent each also cited noise, connectivity issues, frequent repairs and maintenance, high operating costs, and a lack of noticeable savings.

Respondents expressed lower satisfaction with changes to their energy bills, citing limited energy savings or increases in overall costs; however, satisfaction was higher among those replacing electric and non-electric water heaters. While just over one-half (55%) of respondents said they were satisfied with the changes to their energy bill after installing the new equipment, satisfaction was notably higher among those who replaced an electric resistance water heater with a heat pump water heater (73%), most of whom reported being very satisfied (Figure 14). Respondents who replaced a non-electric water heater also reported relatively high satisfaction (67%). In contrast, respondents who purchased a heat pump water heater for a new construction home reported lower satisfaction (48%), contributing to the lower overall satisfaction rate.

Respondents who were less than satisfied most often reported expecting greater savings or seeing only little to modest savings (36%), followed by experiencing higher energy bills or challenges with high electricity rates (23%). See Section 3.1.1 for a recommendation to address satisfaction issues and see Section 4.2.1 for a comparison of participant satisfaction with changes to their energy bills across measure types.

Figure 13: Participant Satisfaction with Heat Pump Water Heater Performance

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with…)

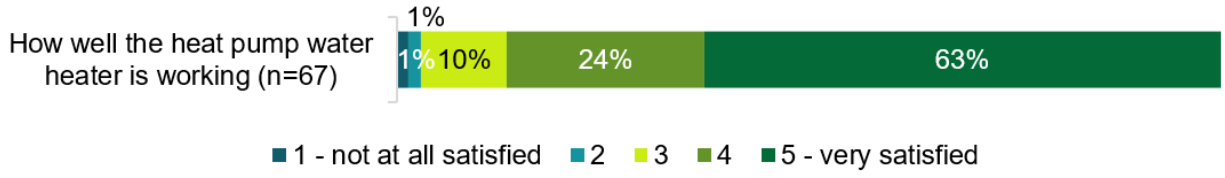
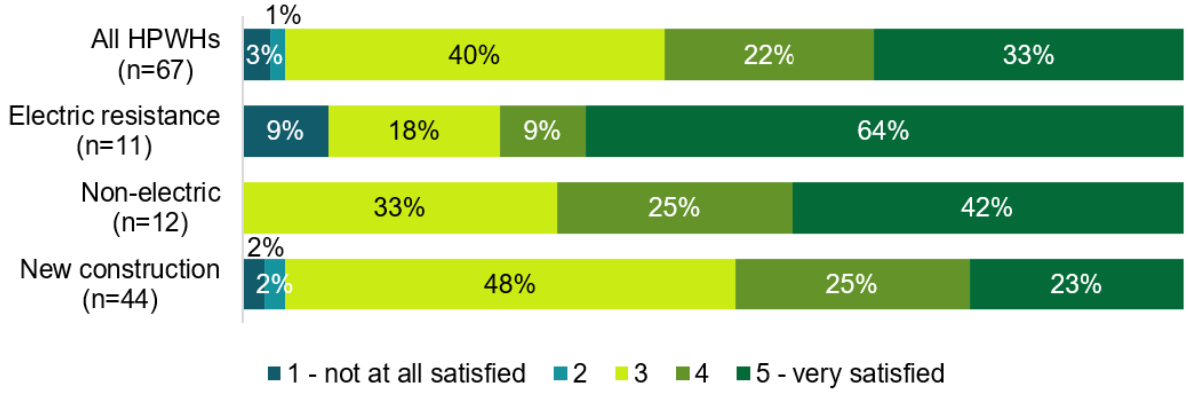


Figure 14: Heat Pump Water Heater Participant Satisfaction with Changes to Energy by Prior Heating Fuel Type

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with the changes to your energy bill after installing the new equipment?)



3.7.3.2 Participating Installation Contractor Perspectives

Of the 15 contractors interviewed for this study, 12 told us they install HPWHs. Among contractors based in the southern part of New Hampshire close to the Massachusetts border, six of seven respondents (86%) reported installing HPWHs. In contrast, neither of the two respondents in northern New Hampshire (0%) reported installing HPWHs, despite both installing ductless heat pumps and one also installing ducted heat pumps. All six respondents (100%) based in the central portion of the state reported that they install HPWHs.

Participating contractors reported that customer awareness of and requests for HPWHs remains relatively low. Most contractors estimated that between 10% and 30% of customers in the market for a new water heater request a HPWH. Several contractors noted that many of their customers are unaware of HPWHs, whereas the one interviewed contractor that focuses on new homes suggested that new construction is a different case, with approximately 75% requesting HPWHs.

Because upfront cost has been the primary barrier to HPWH adoption, the ability to stack NHSaves rebates with incentives from the NEHPA and HEAR programs should support higher adoption rates going forward. Contractors reported that adoption rates have been modest, with most contractors reporting that 10% to 30% of customers in the market for a new water heater proceed with HPWH installation, while some reported rates as low as 1% to 10%. Contractors cited the higher upfront cost of HPWHs as the primary barrier, with some contractors noting that higher-income customers are more likely to adopt the technology. When asked what drives customers to install HPWHs over other water heating options, six out of nine contractors specifically mentioned rebates as influential. Additional motivations include energy efficiency, long-term operating cost savings, and increased awareness of HPWH technology. One contractor

noted that, starting this year, the combination of NHSaves and New England Heat Pump Accelerator[83] incentives actually makes HPWHs less expensive than other options.

Contractor opinions about the influence of rebates were somewhat polarized but positive on average. Contractors were asked to assess the influence of rebates on HPWH adoption using a scale from one to five, where 1 indicates "not at all influential" and 5 indicates "very influential." Overall, responses suggest a mixed but generally positive impact, with an average rating of approximately 3.4 out of 5. However, opinions were polarized, with six contractors rating rebates as highly influential (i.e., ratings of 4 or 5) and others indicating minimal impact. Many contractors emphasized that the rebate amounts are substantial and can meaningfully improve adoption rates.

Contractor tendencies to recommend HPWHs vary. Contractors report variable practices for recommending HPWHs to their customers, with contractors reporting their practices ranging from "never" to 100% of the time if the project conditions are appropriate. Key factors influencing recommendations include upfront cost, along with available installation space, unit size and performance, installation environment conditions, and overall customer budget and interest. As a result, HPWH recommendations are highly situational, based on the customer's preferences and needs, installation location, and contractor preference.

According to contractors, installed HPWH systems are almost always ENERGY STAR-certified. Eight out of nine contractors reporting rates near 100%. This likely reflects the fact that most available HPWH models are ENERGY STAR-certified.[84]

Contractor practices around HPWH sizing are mixed, with some always upsizing and others sizing the unit according to the installation conditions. Approaches to HPWH sizing vary among contractors, with some contractors reporting they always recommend larger HPWH units and others doing so only in high-demand situations such as homes with large families or homes with several bathrooms. Contractors said that when they recommend upsizing relative to the existing water heater, customers almost always follow that guidance. Most contractors who install smaller HPWH units report no significant performance complaints with smaller tank models (55 gallons or less). Mixing valves are universally installed in accordance with New Hampshire code requirements, with typical configurations including outlet temperatures of 120°F–125°F and tank temperatures of 130°F–140°F.

Contractors who reported having experience with the midstream pathway said their experiences with it had been mostly positive. Most contractors reported relying on the downstream pathway, with four out of nine reporting having used the midstream approach. Those who had used the midstream pathway highlighted several advantages, including reduced administrative burden, fewer customer questions, and the ability to provide an immediate discount at the point of sale. This immediate savings makes it easier to close sales and removes the barrier of customers needing to wait for reimbursement. However, one contractor reported challenges

[83] As described in Section 1.1.2, the New England Heat Pump Accelerator program is supported by federal funding and is intended to reduce upfront costs and expand access to heat pumps and heat pump water heaters in NH and other participating New England states. The Accelerator launched in early 2026. https://www.nehpa.org/

[84] Air Conditioning, Heating, and Refrigeration Institute. "Directory of Certified Product Performance," https://ahridirectory.org/

with distributor coordination and another opined that the downstream approach is more transparent.

3.8 Natural Gas Integrated Water Heaters

The section encompassing integrated water heaters in New Hampshire's 2026 TRM is under the general water heating measure titled "Hot Water – Water Heater." The measure is broadly described as the "Installation of a new high-efficiency natural gas tankless and storage water heaters," but the specific gas integrated water heater measure is described as a water heater integrated with a condensing boiler. The measure within the ES Products Program is classified as lost opportunity and savings are deemed based on study results. This measure has two separate BC Measure IDs for water heaters integrated with a boiler greater than or equal to 85% AFUE and greater than or equal to 90% AFUE respectively.

- GA3b013 (integrated with 90+ AFUE boiler)
- GA3b014 (integrated with 95+ AFUE boiler)

3.8.1 Recommendations

This section details recommended impact updates and process improvements for gas integrated water heaters in the ES Products Program. There are no recommended changes to measure impacts.

3.8.1.1 Recommended Impact Updates

Per the work plan, the study team evaluated the **measure baseline** for gas integrated water heaters offered through the ES Products Program. As shown in Table 39, there are no updates recommended for gross impacts.

Table 39: Recommended TRM Inputs, Gas Integrated Water Heater

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change
GA3b013 (90% AFUE)	MMBTU (deemed)	8.4	8.4	0%
	ISR*	100%	100%	0%
GA3b014 (95% AFUE)	MMBTU (deemed)	12.8	12.8	0%
	ISR*	100%	100%	0%

*Research not in scope for factor. Recommended values defaulted to existing, 2026 NH TRM values

3.8.2 Impact Findings

This section presents the baseline, NEI, and TRM benchmarking findings for natural gas Wi-Fi thermostats offered through the ES Products Program.

3.8.2.1 Baseline

Gas Integrated Water Heaters—Existing Baseline Definition: For a water heater integrated with a condensing boiler, the lost opportunity baseline case is an 85% AFUE boiler (79.3% AFUE actual) with a 0.60 UEF water heater.

Gas Integrated Water Heaters—Recommended Baseline Definition: No updates recommended for either the baseline or lost opportunity case. The current AFUE of 85% is

informed from a negotiated value in MA and exceeds the current federal standard of 84% AFUE. The current 0.60 UEF assumption for baseline, gas storage-tank water heater, is in line with current federal standards. **The baseline will need to be considered for an update when a new standard goes into effect, currently scheduled for 5/6/2029.**

3.8.2.2 Non-Energy Impacts

In the literature review, the study team identified NEIs in both the RI and CT TRMs.[85]

- RI: The NEI savings range from $0.832–$1.536 depending on the draw pattern and efficiency of the baseline water heater. The NEIs for this measure stem from thermal comfort, home durability, reduced equipment maintenance costs, and health benefits.
- MA: MA TRM claims $0.70 annual per year, $0.36 per therm, and $0.08 once per therm. Appendix B in the MA TRM breaks down NEIs and attributes water heating savings to home durability.[86]

[85] Because the New Hampshire cost-effectiveness tests do not utilize measure-level NEI values, this data is for informational purposes only.
[86] Massachusetts Technical Reference Manual for Estimating Savings from Energy Efficiency Measures 2025-2027 Three-Year Plan Version https://ma-eeac.org/wp-content/uploads/Appendix-L-2025-2027-Three-Year-Plan-TRM.pdf#page=91&zoom=100,68,96

3.8.2.3 TRM Benchmarking Results

Table 40 summarizes the findings from the TRM review for gas integrated water heaters. This table includes EUL and NEI values for informational purposes.

Table 40: Comparison of NH Factors to Peer State TRMs, Gas Integrated Water Heaters*

Factor	2026 NH	NH Recommended	MA	RI	NY	PA
Baseline Condition	85% AFUE Boiler 0.6 UEF storage tank water heater	85% AFUE Boiler 0.6 UEF storage tank water heater	N/A	ER only for boiler Medium draw WH: 0.58 UEF High-draw WH: 0.63 UEF	84% AFUE UEF depends on size and draw pattern	85.4% AFUE 0.62 UEF
Efficient Condition	Water heater integrated with a 90% or 95% AFUE condensing boiler	Water heater integrated with a 90% or 95% AFUE condensing boiler	N/A	Indirect water heater attached to an ENERGY STAR® rated forced hot water gas boiler.	The compliance condition is an indirect fossil fuel-fired water heating system with efficiency meeting or exceeding 0.85 AFUE.	N/A
EUL (Years)	19 (EPA, 2009)	19 (EPA, 2009)	20 (GDS Associates, 2009)	19 (EPA, 2009)	22 (DOE, 2015)	N/A
NTG	N/A	N/A	N/A	0.76	Not applied (NY TRM reports gross savings only)	N/A
ISR	100%	100%	100%	N/A	N/A	N/A
NEIs	N/A	N/A	NEI savings (home durability) are quantified as $0.70 per unit per year, $0.36 per therm, and $0.08 one-time per therm.	NEI benefits (thermal comfort, home durability, reduced equipment maintenance, health benefits) range from $0.832 to $1.536 depending on the baseline water heater UEF.	N/A	N/A

* The Connecticut, Vermont, and Maine TRMs did not contain an equivalent measure and are therefore excluded from the table.

3.8.3 Process Findings

This section describes the process findings specific to gas integrated water heaters.

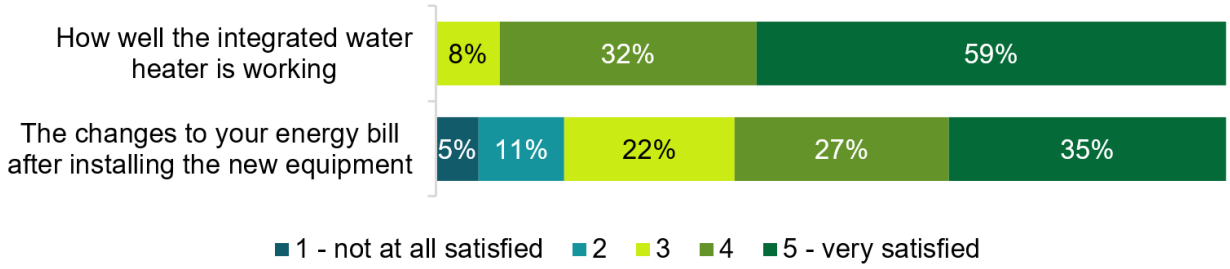
3.8.3.1 Process

More than nine in ten responding participants who installed a gas integrated water heater reported satisfaction with its performance. When asked to rate satisfaction on a scale of 1 to 5 (where 1 is "not at all satisfied" and 5 is "very satisfied"), 92% of respondents reported satisfaction (rating of 4 or 5) with the gas integrated water heater's performance (Figure 15).

Respondents expressed lower satisfaction with changes to their energy bills. Approximately six in ten respondents (62%) said they were satisfied with the changes to their energy bill after installing the new equipment. Two respondents who gave a lower rating reported seeing little to no change in their bill. See Section 3.1.1 for a recommendation to address satisfaction issues and see Section 4.2.1 for a comparison of participant satisfaction with changes to their energy bills across measure types.

Figure 15: Participant Satisfaction with Gas Integrated Water Heater Performance

(Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with…; n=37)



3.9 POOL PUMPS

This measure is titled "Motors and Drives Pool Pump" in the NH TRM and involves the installation of a variable-speed drive pool pump that is 0.5 HP or larger in size. It is a lost opportunity measure and the savings come from running the pool pump for longer periods of time at a lower wattage. The utilities calculate reported program savings using a spreadsheet-based pool pump calculator tool originally developed in Massachusetts and adapted to New Hampshire. There is only one BC measure ID for the ES Products pool pump measure: EA3b024.

3.9.1 Recommendations

This section details recommended impact updates and process improvements for pool pumps in the ES Products Program. The most impactful change to pool pump impacts is application of the estimated NTG ratio of 0.88.

3.9.1.1 Recommended Impact Updates

Per the work plan, the study team evaluated the **measure baseline** and measured the **NTG ratio, ISR,** and **demand usage ratio** for pool pumps offered through the ES Products Program. Table 41 summarizes the existing and recommended values for evaluated factors.

Table 41: Factor Summary, Pool Pump

Factor	Existing (2026 TRM)	Recommended
Baseline Condition	Pool Pump meeting the July 2021 Federal Standard 10 CFR part 431	No change
NTG Ratio	Not included	88%
ISR	100%	99%
CF	0.55 (summer) 0.00 (winter)	0.88 (summer)[1] 0.00 (winter)
Efficient Condition	ENERGY STAR rated pool pump from version 2.0, effective in July 2019[2]	ENERGY STAR rated pool pump from version 3.1, effective in July 2021[3]

[1] Recommended demand factors do not reflect a true peak demand CF, but rather a ratio informed by participant responses to usage during the summer (1pm-5pm on weekdays from July-Aug) peak period.
[2] The 2026 TRM lists the efficient case as an ENERGY STAR rated pool pump version 2.0, effective in January 2019. However, in reviewing the literature and the provided pool-pump savings spreadsheet, it appears that this stated efficient case is an error. Instead, the 2026 TRM savings assume the efficient case to be an ENERGY STAR rated pool pump from version 3.1
[3] This is a text reference change only: Savings calculations already reflect the recommended efficient definition.

Table 42 summarizes the recommended pool pump TRM and benefit-cost model inputs. The evaluation produced a new NTG ratio, ISR, and adjusted the CF_{SP} factor; there is no recommended change to the deemed savings or CF_{WP}.

Table 42: Recommended TRM Inputs, Pool Pump

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change
EA3b024	kWh (deemed)	157.62	157.62	0%

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change
	kW (deemed)	0.17	0.18	+ 6%
	NTG	Not included	0.88	-
	ISR	100%	99%	- 1%
	CF_{SP}	0.55	0.88	+ 60%
	CF_{WP}	0.00	0.00	0%

The study team also recommends an update to the TRM entry text to clarify it for users:

- **Recommendation TRM-18:** Clarify whether the deemed kW value shown represents summer peak coincident demand (as understood by the evaluators) or overall average demand savings for pool pumps.

The following sections provide detailed results related to each evaluated factor as well as a summary of literature and TRM review findings.

3.9.2 Impact Findings

This section presents the baseline, demand impacts, ISR, NTG ratio, NEI, and TRM benchmarking findings for pool pumps offered through the ES Products Program.

3.9.2.1 Baseline

Existing Baseline Definition: The 2026 TRM baseline case is a pump that meets the July 2021 federal standard 10 CFR part 431. This baseline is in line with the assumptions of peer TRMs.

Recommended Baseline Definition: The evaluators recommend that the TRM retain the current baseline.

3.9.2.2 Demand

Existing Efficient Definition (Demand): The 2026 TRM lists a 55% summer demand CF, noting that the estimate was developed based on a methodology described in a 2018 Massachusetts demand impact model.[87] However, the listed deemed demand savings of 0.17 kW appear to have been calculated using a combination of data from the 2018 Navigant study, a more recent 2023 Massachusetts demand impact model developed by Guidehouse (Guidehouse, 2023), and the pool pump savings spreadsheet (see Table 43). If this assumption is correct, then the current 2026 TRM assumes a summer demand CF of 82%.

Table 43: Assumed 2026 TRM Calculation of Deemed Pool Pump Demand Savings

Row	Input / Factor	Source	Value
A	Per unit savings	Savings spreadsheet	157.62 kWh

[87] Navigant. 2018. *Res 1 Baseline Load Shape Study*. https://ma-eeac.org/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf.

Row	Input / Factor	Source	Value
B	EFLH	2018 Navigant	755 h
C	CF	2023 Guidehouse	0.82
D	Peak Demand	Rows A ÷ B × C	0.17 kW

Recommended Efficient Definition (Demand): The evaluators recalculated peak summer demand using the peak summer usage factor of 88%, resulting in a new value of 0.18.[88] The participant survey fielded for the current study asked respondents if they typically run their pool pumps in June, July, and August between 1:00 pm and 5:00 pm. Eighty-eight percent (88%) of respondents indicated that they do use their pool pumps at this time. This percentage is similar to the summer peak demand CF of 82% from the recent value developed by Guidehouse for Massachusetts in 2023. Given that the Massachusetts value (82%) was derived from onsite metering and is in line with the New Hampshire survey peak summer usage factor estimate (88%), the study recommends that the TRM update the CF reference to 88% for pool pumps (from 55%).

3.9.2.3 In-Service Rate

The 2026 TRM assumes a deemed ISR of 100% for pool pumps. The participant survey collected primary data on pool pump installations and found an ISR of 99%.

3.9.2.4 Net-to-Gross

Existing NTG ratio: The NH 2026 TRM does not define a NTG ratio for pool pumps because this factor had never been evaluated.

Recommended NTG ratio: The survey results indicate a pool pump NTG ratio of 88%. The FR score was 24%, and the SO score was 13%. The study recommends applying the NTG ratio of 88% to both energy and demand savings for pool pumps.

3.9.2.5 Non-Energy Impacts

In the literature review, the study team identified no NEI impacts in the reviewed sources.

[88] See pool pump demand calculations in the attached workbook titled “NH ES Products Impact Calcs 15May26.xlsx.”

3.9.2.6 Benchmarking Results

Table 44 summarizes the findings of the TRM and literature review for pool pumps. This table includes effective useful measure life (EUL) for informational purposes.

Table 44: Comparison of NH Factors to Peer State TRMs, Pool Pumps

Factor	2026 NH	NH Recommended	MA	CT	RI	NY	PA
Baseline Condition	July 2021 federal standard[1]	July 2021 federal standard	July 2021 federal standard	July 2021 federal standard	A single-speed pump	N/A	July 2021 federal standard
Efficient Condition	ENERGY STAR rated pool pump (v2.0)[2]	ENERGY STAR rated pump (v3.1)[3]	ENERGY STAR rated pump (v3.1)	ENERGY STAR rated pump (v3.1)	A 2-speed or variable speed pump	N/A	ENERGY STAR rated pump (v3.1)
EUL (Years)	6 (Guidehouse 2021)	6 (Guidehouse 2021)	6 (Guidehouse 2021)	6 (DEER 2014)	6 (Guidehouse 2021)	N/A	10 (DEER 2019)
ISR	100%	99%	100%	N/A	100%	N/A	N/A
CF (Summer)	55%[4]	82%[5]	82%	N/A	N/A	N/A	N/A
CF (Winter)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NTG	N/A	88%	84%[6]	87%[7]	89%[8]	N/A	N/A

[1] https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-431/subpart-Y/section-431.465
[2] http://www.energystar.gov/sites/default/files/ENERGY STAR Final Version 2.0 Pool Pumps Specification.pdf
[3] https://www.energystar.gov/sites/default/files/ENERGY STAR Version 3.1 Pool Pumps Final Specification_0.pdf
[4] https://ma-eeac.org/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf
[5] https://api-plus.anbetrack.com/etrm-gateway/etrm/api/v1/etrm/documents/6669ac493d3fd20e770699fd/view?authToken=8617f53d3927dae1659fe63639648fff6f8eb850243d97bb15fe732f6510c59743a5dce94751a8c8cc29262337d6aa1a1461372a689b2956093cc38b769986cc8c27033470987f.
[6] https://ma-eeac.org/wp-content/uploads/MA20X04-E-PRODNTG_Res-Products-NTG-Report_FINAL_2021.06.08.pdf.
[7] https://www.energizect.com/media/31441/download?inline=
[8]https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2024-10/24-39-EE%20Rhode%20Island%20Technical%20Reference%20Manual%20%E2%80%93%202025%20Program%20Year.pdf#page=156&zoom=100,92,96

3.10 Room Air Purifiers

This measure is titled "HVAC Room Air Purifier" in the 2026 NH TRM and involves the installation of a room air purifier exceeding the minimum qualifying efficiency standards established as ENERGY STAR. It is a lost opportunity measure with only one BC measure ID corresponding to the ES Products Program: EA3b025.

3.10.1 Recommendations

This section details recommended impact updates and process improvements for room air purifiers in the ES Products Program.

3.10.1.1 Recommended Impact Updates

Per the work plan, the study team evaluated the **measure baseline** and measured the **ISR** and **demand usage ratio** for room air purifiers offered through the ES Products Program. Table 45 summarizes the existing and recommended values for the evaluated factors.

Table 45: Factor Summary, Room Air Purifier

Factor	Existing (2026 TRM)	Recommended
Baseline Condition	1.0 CADR/ W	1.9 CADR/W (10-100 CADR) 2.4 CADR/W (100-150 CADR) 2.9 CADR/W (≥150 CADR)
ISR	97%	88%
CF	1.00 (summer) 1.00 (winter)	0.59 (summer)* 0.67 (winter)*
Efficient Condition	4.4 CADR/W (30-100 CADR) 5.4 CADR/W (100-150 CADR 5.6 CADR/W (≥150 CADR)	4.4 CADR/W (30-100 CADR) 5.4 CADR/W (100-150 CADR 5.6 CADR/W (≥150 CADR)

*Recommended CFs do not reflect a true peak coincident demand factor, but rather a ratio informed by participant responses to usage during the summer (1pm-5pm on weekdays from July-Aug) and winter peak periods (5pm-7pm on weekdays from Dec-Jan).

Table 46 **summarizes the recommended central ASHP TRM and benefit-cost model inputs**. This summary includes a comparison of deemed savings values in the 2026 NH TRM with the recommended values.

Table 46: Recommended TRM Inputs, Room Air Purifier

BC Measure ID	Factor	Existing (2026 TRM)	Recommended	% Change
EA3b025	kWh (deemed)	713.00	250.11	- 65%
	kW (deemed)	0.080	0.035	- 56%
	ISR	97%	88%	- 9%
	CF_{SP}	1.00	0.59*	- 41%
	CF_{WP}	1.00	0.67*	- 33%

* Recommended CFs do not reflect a true peak coincidence demand factor, but rather a ratio informed by participant responses to usage during the summer (1pm-5pm on weekdays from July-Aug) and winter peak periods (5pm-7pm on weekdays from Dec-Jan).

3.10.2 Impact Findings

This section presents the baseline, demand impacts, ISR, evaluated gross savings, NEI, and TRM benchmarking findings for room air purifiers offered through the ES Products Program.

3.10.2.1 Baseline

Existing Baseline Definition: The baseline condition in the NH 2026 TRM is a room air purifier unit with 1.0 CADR/$Watt_{dust}$.

Recommended Baseline Definition: No federal standard was in effect before December 31, 2023; therefore, NMR proposes to align baseline assumptions with the federal standard (effective December 31, 2025) that provides minimum efficiencies by clean air delivery rate (CADR) (DOE, 2025).

3.10.2.2 In-Service Rate

NMR proposes an updated ISR of 88% based on survey responses, a decrease of about 9% relative to the 97% previously cited in the TRM.

3.10.2.3 Demand

The summer and winter peak usage ratios of 0.59 and 0.67, respectively, are informed from the study's survey for participants who indicated if they have their air purifier turned on between 1pm and 5pm on an average weekday in June, July, and August (summer peak) and between 5pm and 7pm on an average weekday in December and January (winter peak).

3.10.2.4 Evaluated Gross Savings

The key drivers for the recommended change to deemed savings are the recently updated federal standards and updated ENERGY STAR specifications. Current 2026 NH TRM unit savings are sourced from the 2021 Massachusetts TRM Review. There has been significant movement in federal standards and ENERGY STAR since that time. The recommended deemed savings are based on updated CADR bin calculations with current federal standards and ENERGY STAR QPL data. NMR applied the same weights referenced in the 2026 NH TRM, which were based on 2019–2020 National Grid Massachusetts program data. See room air purifier calculations in the attached workbook titled "NH ES Products Impact Calcs 15May26.xlsx."

3.10.2.5 Non-Energy Impacts

In the literature review, the study team identified no NEI impacts in the reviewed studies.

3.10.2.6 Benchmarking Results

Table 47 summarizes the findings of the TRM and literature review for downstream Room Air Purifiers.

Table 47: Comparison of NH Factors to Peer State TRMs, Room Air Purifiers*

Factor	NH 2018 Products Eval	NH Recommended	MA	CT	RI	VT	ME	NY	IL
Baseline Condition	N/A	1.9 CADR/W (10-100 CADR) 2.4 CADR/W (100-150 CADR) 2.9 CADR/W (≥150 CADR)	1.9 CADR/W (10-100 CADR) 2.4 CADR/W (100-150 CADR) 2.9 CADR/W (≥150 CADR)	N/A	2.0 CADR/W	N/A	Non-ENERGY STAR existing unit	N/A	1.9 CADR/W (10-100 CADR) 2.4 CADR/W (100-150 CADR) 2.9 CADR/W (≥150 CADR) [2]
Efficient Condition	N/A	4.4 CADR/W (30-100 CADR) 5.4 CADR/W (100-150 CADR 5.6 CADR/W (≥150 CADR)	4.4 CADR/W (30-100 CADR) 5.4 CADR/W (100-150 CADR) 5.6 CADR/W (≥150 CADR)	ENERGY STAR qualified unit	Mean of CADR/W on ENERGY STAR QPL	2024 ENERGY STAR Most Efficient	ENERGY STAR qualified unit	N/A	Mean of CADR/W on ENERGY STAR QPL
EUL	N/A	N/A	9 (Guidehouse 2021)	9 (DEER 2014)	9 (EPA 2018)	9 (DEER 2017)	9 (EPA ES 1998)	N/A	9
ISR	100%	88%	93%	N/A	97%	N/A	100%	N/A	N/A
NTG	N/A	N/A	66%	N/A	58%	N/A	N/A	N/A	72%
CF (Winter)	1	0.67	0.63	N/A	N/A	0.667	0.667	0.667	0.667
CF (Summer)	0.92	0.59	0.56	N/A	N/A	0.667	0.667	0.667	0.667

*Sourced from current or recent state-wide TRMs, unless noted otherwise.

3.11 REFRIGERATOR RECYCLING

The refrigerator recycling measure falls under the Appliances Recycling entry in the 2026 NH TRM and covers "the retirement of old, inefficient refrigerators… thereby eliminating the consumption associated with that equipment."[89] This measure has separate BC Measure IDs for primary (EA3b027) and secondary (EA3b028) refrigerators. The measure is classified as retrofit and savings in the 2026 TRM are deemed based on MA study results.

3.11.1 Recommendations

The most impactful changes to refrigerator recycling impacts are first-time application of the estimated part-use factor (PUF) of 87% and NTG ratio of 0.38, which together result in a 67% decrease in net claimable savings. The utilities should apply the factors shown in Table 48. The recommended factors blend primary and secondary refrigerators and should be applied to both BCR IDs.

- **Consideration DT-4:** Track the following factors that contribute to accurate energy savings calculation:
    a. door configuration (top or bottom freezer, single or double doors).
    b. whether the customer designated the refrigerator as the primary or secondary unit for the home during the year prior to recycling.
    c. nameplate information or model number (when available) to more accurately track appliance size, rather than defaulting to the program maximum size.
- **Consideration TRM-19:** Combine primary and secondary refrigerator recycling into a single measure, as the UMP savings algorithm accounts for primary and secondary use, resulting in a blended UEC.

Table 48: Refrigerator Recycling - Key Results

BCR ID	Factor	Existing (2026 TRM)	Recommended
EA3b027	Gross Savings (UEC)	1,005 kWh	998 kWh
EA3b028	Realization Rate (Part-use Factor [PUF])	100%	87%
	Deemed Gross Savings (UEC * PUF)	1,005 kWh	868 kWh
	NTG Ratio (n = 99)	Not applied	38%

3.11.2 Impact Findings

This section presents the unit energy use, part-use factor, TRM review, NTG, and TRM benchmarking findings for refrigerators recycled through the ES Products Program.

3.11.2.1 Unit Energy Use and Part-Use Factor

[89] New Hampshire 2026 TRM. https://nhsaves.com/wp-content/uploads/2025/10/2026-TRM-FINAL_8.29.2025Updates.pdf.

This study used program tracking data, a literature review, the customer survey, and weather data to determine the UEC, and used the customer survey to calculate the part-use factor (PUF) for refrigerators recycled through the program in 2024.[90]

The evaluators used the literature review value of 19 cubic feet[91] for unit size instead of the program tracking average of 25 cubic feet. The evaluators chose to use the literature review value for unit size because 30 cubic feet was the most frequently listed unit size in the tracking data but is also the maximum program size, suggesting the tracking data may not be accurate. The evaluators opted to apply the literature review value of 19 cubic feet as it is a more reasonable size for the typical home refrigerator, particularly for recycled units, which tend to be equal to or smaller than new units.[92] Using the literature review-derived refrigerator unit size, the ex-post UEC is 998 kWh; using the program tracking value, it would be 1,145 kWh.

The study estimated the PUF by asking respondents how many months they used the refrigerator in the year prior to recycling. Their responses indicated that the recycled refrigerators were used an average of 87% of the year.

3.11.2.2 TRM Review

The current NH TRM has separate BC Measure IDs for primary and secondary refrigerators, but the evaluators found that not all the TRMs in the review make this distinction. Additionally, the UMP algorithm includes a variable that accounts for primary and secondary use. This study followed the UMP algorithm in calculating deemed kWh savings and used those results to estimated deemed kW savings. Therefore, recommended deemed kWh and kW savings are the same for both primary and secondary refrigerators. For this reason, combining the two measures should be considered.

Appliance recycling programs yield NEIs related to carbon emissions reduction, refrigerant capture, and the recycling of plastics and metals. Such impacts could be quantified for NH and incorporated into future benefit-cost models.

3.11.2.3 Net-to-Gross

The NTG ratio for this measure, as for the other appliance recycling measures, was calculated based on survey responses about what respondents would have done with the unit had they not recycled it with the program. The NTG ratio calculation followed the algorithm outlined in Table 65 and Figure 28. As explained in Section A.2.1, the algorithm includes a partial free-rider value that equals the difference in UEC (delta kWh) for the average recycled versus newly

[90] The utilities provided recycling program data for 2023 through early 2025. However, only some from 2024 and the handful of records from 2025 contained sufficient detail to calculate UEC savings and to include participants in the customer survey.

[91] The refrigerator sizes as reported in studies from Massachusetts and Connecticut center around this value. See MA19R01-E Appliance Recycling Report, March 26, 2019. https://ma-eeac.org/wp-content/uploads/MA19R01-E-ApplianceRecycleReport-Final-2019.03.26.pdf, and Appliance Recycling Net Savings Update (MA20X03-E-ARNTG), July 23, 2021 https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf and R2120 Appliance Recycling Incentives Memo, October 6, 2021. https://www.energizect.com/sites/default/files/documents/R2120-Appliance.Recycling.Incentives-Research.Memo_FINAL_26OCT2021.pdf.

[92] The size of home refrigerators has increased over time, but recycled refrigerators tend to be older and, therefore, smaller than those purchased more recently.

manufactured unit. Table 49 shows the percentage of respondents whose answers led them to be assigned (directly or via the algorithm) as full free riders, partial free riders, or non-free riders. The table lists the unit savings and weighted savings associated with each type of FR and sums these to equal the net savings (334 kWh). Dividing the net savings by the PUF Adjusted UEC yields the NTG ratio of 38%. This result is driven by respondents indicating that, without the program, they would have gotten rid of the refrigerator in a manner that would likely have resulted in its being recycled (see Appendix D.4.1.1). Note that the survey instrument and algorithm do not incorporate the timing of the unit being recycled.

Table 49: Refrigerator Recycling – NTG Calculation

(n=99; results subject to rounding error)

Free Rider (FR) Assignment	% of Respondents (A)	Assigned Savings (B)	Weighted avg savings (A x B)
Pure FR	46%	0	0
FR from algorithm	10%	0	0
Pure non-FR (PUF adjusted UEC)	13%	868	114
Non-FR from algorithm	20%	868	175
Partial FR (delta kWh of PUF adjusted UEC and newly manufactured unit)	10%	438	44
Net Savings			**334**
PUF Adjusted UEC			**868**
NTG Ratio			**38%**

3.11.2.4 Benchmarking Study Results

Benchmarking the study results against recent results in nearby states shows the study results are within the range of typical regional values. Table 50 shows the evaluated UEC and PUF align closely with recent studies in Massachusetts and Connecticut, while the NTG factor is somewhat lower than Massachusetts and in line with Connecticut.

Table 50: Comparison of NH Factors to Peer State TRMs, Refrigerator Recycling

Source	UEC (kWh)	PUF	NTG Factor
MA 2019[93]	1,027	88%	44%
MA 2021[94]	1,005	90%	46%
CT 2021[95]	932	90%*	37%
NH 2026 TRM[96]	1,005**	100%	Not measured
Evaluated (this study)	**998**	**87%**	**38%**

* Connecticut study used PUF from Massachusetts 2021 study.
** 2026 New Hampshire TRM used UEC from Massachusetts 2021 study.

[93] NMR, MA19R01-E Appliance Recycling Report, March 26, 2019. https://ma-eeac.org/wp-content/uploads/MA19R01-E-ApplianceRecycleReport-Final-2019.03.26.pdf
[94] Guidehouse, Appliance Recycling 2019 Impact Evaluation, September 1, 2021. https://ma-eeac.org/wp-content/uploads/MA21R33-E-ARI-Appliance-Recycling-2019-Impact-Report_FINAL_01Sep2021.pdf and NMR, Appliance Recycling Net Savings Update (MA20X03-E-ARNTG), July 23, 2021, https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf
[95] NMR, 2021 R2120 Appliance Recycling Incentives Memo, October 6, 2021. https://www.energizect.com/sites/default/files/documents/R2120-Appliance.Recycling.Incentives-Research.Memo_FINAL_26OCT2021.pdf
[96] New Hampshire 2026 TRM. https://nhsaves.com/wp-content/uploads/2025/10/2026-TRM-FINAL_8.29.2025Updates.pdf

3.12 FREEZER RECYCLING

The freezer recycling measure falls under the Appliances Recycling entry in the 2026 NH TRM and covers "the retirement of old, inefficient…freezers…thereby eliminating the consumption associated with that equipment."[97] This measure has one BC Measure ID (EA3b029) that covers secondary freezer recycling. The measure is classified as retrofit and savings in the 2026 TRM are deemed based on MA study results.

3.12.1 Recommendations

The most impactful changes to freezer recycling impacts are first-time application of the estimated part-use factor (PUF) of 79% and NTG ratio of 0.39, which together result in a 67% decrease in net claimable savings. The utilities should apply the factors shown in Table 51.

- **Consideration DT-5:** Use nameplate information or model number (when available) to more accurately track appliance size, rather than defaulting to the program maximum size.

Table 51: Freezer Recycling - Key Results

BCR ID	Factor	Existing (2026 TRM)	Recommended
EA3b029	Gross Savings (UEC)	753 kWh	795 kWh
	Realization Rate (PUF)	100%	79%
	Deemed Gross Savings (UEC * PUF)	753 kWh	628 kWh
	NTG Ratio (n = 61)	Not applied	39%

3.12.2 Impact Findings

This section presents the unit energy use, part-use factor, TRM review, NTG, and TRM benchmarking findings for freezers recycled through the ES Products Program.

3.12.2.1 Unit Energy Use and Part-Use Factor

This study used program tracking data, a literature review, the customer survey, and weather data to determine the UEC, and used the customer survey to calculate the PUF for freezers recycled through the program in 2024.[98]

For unit size, the study used the literature value of 19 cubic feet[99] for unit size instead of the program tracking average of 25 cubic feet. The evaluators chose to use the literature review value

[97] New Hampshire 2026 TRM. https://nhsaves.com/wp-content/uploads/2025/10/2026-TRM-FINAL_8.29.2025Updates.pdf.

[98] The utilities provided recycling program data for 2023 through early 2025. However, only some from 2024 and the few records from 2025 contained sufficient detail to calculate UEC savings and to include participants in the survey.

[99] The freezer sizes as reported in studies from Massachusetts and Connecticut center around this value. See MA19R01-E Appliance Recycling Report, March 26, 2019. https://ma-eeac.org/wp-content/uploads/MA19R01-E-ApplianceRecycleReport-Final-2019.03.26.pdf, Appliance Recycling Net Savings Update (MA20X03-E-ARNTG), July 23, 2021 https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf, and R2120 Appliance Recycling Incentives Memo, October 6, 2021. https://www.energizect.com/sites/default/files/documents/R2120-Appliance.Recycling.Incentives-Research.Memo_FINAL_26OCT2021.pdf.

for unit size because 30 cubic feet was the most listed unit size in the tracking data but is also the maximum program size, suggesting the tracking data may not be accurate. The evaluators opted to apply the literature review value of 19 cubic feet as it is a more reasonable size for the typical home freezer. Using the literature review-derived freezer unit size, the ex post UEC is 795 kWh; using the program tracking value, it would be 1,025 kWh.

The study estimated the PUF by asking respondents how many months they used the freezer in the year prior to recycling. Responses indicated that units were used 79% of the year on average.

3.12.2.2 TRM Review

The TRM review did not yield suggested changes for the freezer recycling measure.

Appliance recycling programs yield NEIs related to carbon emissions reduction, refrigerant capture, and the recycling of plastics and metals. Such impacts could be quantified for NH and incorporated into future benefit-cost models.

3.12.2.3 Net-to-Gross

The NTG ratio for this measure, as for the other appliance recycling measures, was calculated based on survey responses about what respondents would have done with the unit had they not recycled it with the program. The NTG ratio calculation followed the algorithm outlined in Table 65 and Figure 28. As explained in Section A.2.1, the algorithm includes a partial free-rider value that equals the difference in UEC (delta kWh) for the average recycled versus newly manufactured unit. Table 52 shows the percentage of respondents whose answers led them to be assigned (directly or via the algorithm) as full free riders, partial free riders, or non-free riders. The table lists the unit savings and weighted savings associated with each type of FR and sums these to equal the net savings (248 kWh). Dividing the net savings by the PUF Adjusted UEC yields the NTG ratio of 39%. This result is driven by respondents indicating that, without the program, they would have gotten rid of the freezer in a manner that would likely have resulted in its being recycled (see Appendix D.4.1.1).

Table 52: Freezer Recycling – NTG Calculation

(n=61; results subject to rounding error)

Free Rider (FR) Assignment	% of Respondents (A)	Assigned Savings (B)	Weighted avg savings (A x B)
Pure FR	46%	0	0
FR from algorithm	9%	0	0
Pure non-FR (PUF adjusted UEC)	16%	628	103
Non-FR from algorithm	19%	628	118
Partial FR (delta kWh of PUF adjusted UEC and newly manufactured unit)	9%	282	27
Net Savings			**248**

Free Rider (FR) Assignment	% of Respondents (A)	Assigned Savings (B)	Weighted avg savings (A x B)
PUF Adjusted UEC			**628**
NTG Ratio			**39%**

3.12.2.4 Benchmarking Results

Benchmarking the study results against recent results in nearby states shows the study results are within the range of typical regional values. Table 53 shows the evaluated UEC and PUF are in line with recent results from the region. The NTG ratio is somewhat lower than Massachusetts and in line with Connecticut.

Table 53: Comparison of NH Factors to Peer State TRMs, Freezer Recycling

Source	UEC (kWh)	PUF	NTG Factor
MA 2019[100]	769	68%	56%
MA 2021[101]	753	83%	50%
CT 2021[102]	760	83%*	38%
NH 2026 TRM[103]	753	100%	Not measured
Evaluated (this study)	**753**	**79%**	**39%**

* Connecticut study used PUF from Massachusetts 2021 study.
** New Hampshire TRM used UEC from Massachusetts 2021 study.

[100] NMR, MA19R01-E Appliance Recycling Report, March 26, 2019. https://ma-eeac.org/wp-content/uploads/MA19R01-E-ApplianceRecycleReport-Final-2019.03.26.pdf
[101] Guidehouse, Appliance Recycling 2019 Impact Evaluation, September 1, 2021. https://ma-eeac.org/wp-content/uploads/MA21R33-E-ARI-Appliance-Recycling-2019-Impact-Report_FINAL_01Sep2021.pdf and NMR, Appliance Recycling Net Savings Update (MA20X03-E-ARNTG), July 23, 2021, https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf
[102] NMR, 2021 R2120 Appliance Recycling Incentives Memo. https://www.energizect.com/sites/default/files/documents/R2120-Appliance.Recycling.Incentives-Research.Memo_FINAL_26OCT2021.pdf
[103] New Hampshire 2026 TRM. https://nhsaves.com/wp-content/uploads/2025/10/2026-TRM-FINAL_8.29.2025Updates.pdf.

3.13 DEHUMIDIFIER RECYCLING

The dehumidifier recycling measure falls under the Appliances Recycling section of the 2026 NH TRM entry and covers "the retirement of old, inefficient…dehumidifiers…thereby eliminating the consumption associated with that equipment."[104] This measure has one BC Measure ID (EA3b037). The measure is categorized as retrofit and savings are deemed.

3.13.1 Recommendations

The most impactful changes to dehumidifier recycling impacts are a 104% increase in the UEC and first-time application of the estimated NTG ratio of 0.38, which together result in a 39% decrease in net claimable savings. The utilities should apply the factors shown in Table 54.

- **Consideration DT-6:** Track the capacity of recycled dehumidifiers in either pints/day or liters/day to allow for the development of a NH-specific deemed savings estimate.

Table 54: Dehumidifier Recycling - Key Results

BCR ID	Factor	Existing (2026 TRM)	Recommended
EA3b037	Gross Savings (UEC)	500 kWh	1,020 kWh
	Realization Rate (PUF)	100%	100%*
	Deemed Gross Savings (UEC * PUF)	500 kWh	1,020 kWh
	NTG Ratio (n = 83)	Not applied	30%

* This gross savings estimate accounts for frequency of use prior to recycling.

3.13.2 Impact Findings

This section presents the unit energy use, part-use factor, TRM review, NTG, and TRM benchmarking findings for dehumidifiers recycled through the ES Products Program. It also includes an assessment of dual dehumidifier rebate usage.

3.13.2.1 Unit Energy Use and Part-Use Factor

This study used the literature and TRM review to determine the size and capacity data for dehumidifiers recycled through the program in 2024. The NH TRM cites a 2019 Massachusetts appliance recycling impact study as a source for the 500 kWh value, but we cannot trace this value to the study. The 2019 Massachusetts study value is 1,020 kWh based on average dehumidification load (pints/year capacity) of dehumidifiers in MA.[105] Lacking NH-specific data or more recent data from other areas, the study suggests using the current Massachusetts TRM UEC of 1,020 kWh.

The estimated UEC incorporates hours of operation, so the PUF is 100%.

[104] New Hampshire 2026 TRM. https://nhsaves.com/wp-content/uploads/2025/10/2026-TRM-FINAL_8.29.2025Updates.pdf.
[105] Guidehouse, Appliance Recycling 2019 Impact Evaluation, September 1, 2021.https://ma-eeac.org/wp-content/uploads/MA21R33-E-ARI-Appliance-Recycling-2019-Impact-Report_FINAL_01Sep2021.pdf

3.13.2.2 TRM Review

The TRM review did not yield suggested changes for the dehumidifier recycling measure.

Appliance recycling programs yield NEIs related to carbon emissions reduction, refrigerant capture, and the recycling of plastics and metals.

3.13.2.3 Net-to-Gross

The NTG ratio for this measure, as for the other appliance recycling measures, was calculated based on survey responses about what respondents would have done with the unit had they not recycled it with the program. The NTG ratio calculation followed the algorithm outlined in Table 65 and Figure 28. As explained in Section A.2.1, the algorithm includes a partial free-rider value that equals the difference in UEC (delta kWh) for the average recycled versus newly manufactured unit. Table 55 shows the percentage of respondents whose answers led them to be assigned (directly or via the algorithm) as full free riders, partial free riders, or non-free riders. The table lists the unit savings and weighted savings associated with each type of FR and sums these to equal the net savings (307 kWh). Dividing the net savings by the PUF Adjusted UEC yields the NTG ratio of 30%. This result is driven by respondents indicating that, without the program, they would have gotten rid of the dehumidifier in a manner that would likely have resulted in its being recycled (see Appendix D.4.3.1).

Table 55: Dehumidifier Recycling – NTG Calculation

(n=83; results subject to rounding error)

Free Rider (FR) Assignment	% of Respondents (A)	Assigned Savings (B)	Weighted avg savings (A x B)
Pure FR	64%	0	0
FR from algorithm	4%	0	0
Pure non-FR (PUF adjusted UEC)	20%	1,020	209
Non-FR from algorithm	8%	1,020	80
Partial FR (delta kWh of PUF adjusted UEC and newly manufactured unit)	4%	477	19
Net Savings			**307**
PUF Adjusted UEC			**1,020**
NTG Ratio			**30%**

3.13.2.4 Dual Dehumidifier Rebate Usage

In addition to recycling incentives, the ES Products Program promotes the adoption of new, ENERGY STAR qualified dehumidifiers with rebates. The 2026 NH TRM does not adjust savings for either recycling an old dehumidifier or buying a new ENERGY STAR qualified dehumidifier. The appliance recycling NTG algorithm focuses on what would have happened to the recycled

unit had the program not existed, but it is possible that the existence of both rebates could have induced participants to either recycle an old unit or buy a new efficient unit earlier than they would have without the rebates.

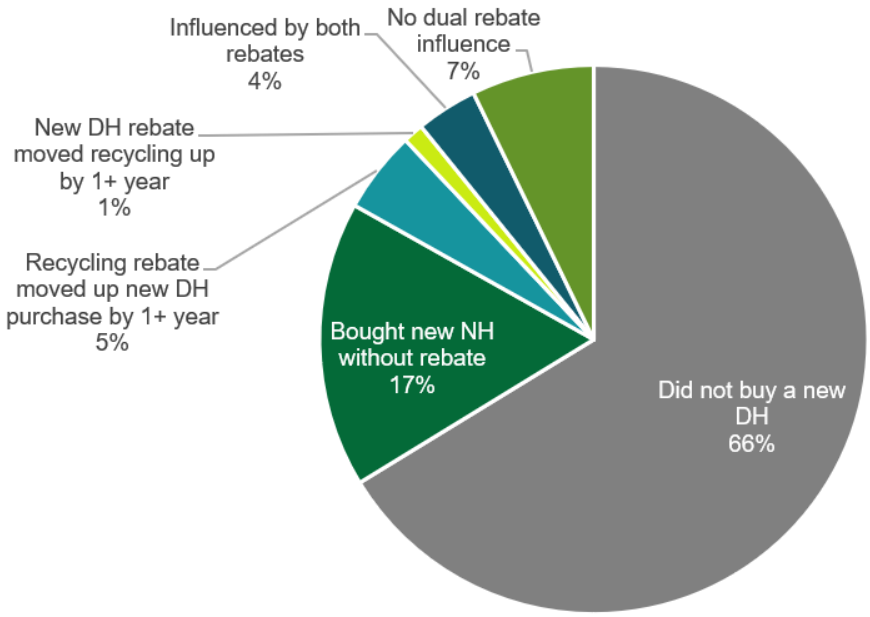
The study examined whether the NH TRM should account for the dual rebates and concluded that no adjustment was needed due to the limited overlap of rebate use and even less influence of the rebates on either the recycling or purchase decision.[106] The program data inconsistently reported customer account and contact information for all dehumidifier recyclers, so the study could not definitively identify dehumidifier dual rebate users. Therefore, to identify dual rebate users, the survey asked all dehumidifier recyclers not immediately classified as full free riders (as there would be no concern about double-counting of savings) if they had purchased a new dehumidifier in the past three years. Those who answered "yes" were then asked if they used an NHSaves rebate for the purchase of the new appliance. The survey then asked dual rebate users about the impact of each rebate on the timing of the recycling or purchase of a dehumidifier and the decision to buy a new dehumidifier.

While 34% (28 respondents) of dehumidifier recycling respondents had bought a new dehumidifier within the past three years, only 17% (14 respondents or one-half of purchasers) used an NHSaves rebate for the purchase (Figure 16). Eight respondents indicated that the dual rebates influenced the timing of their actions by one year or more: four moved up the timing of their purchase, one the recycling of the old dehumidifier, and three moved up both. In a related question seven respondents said they would have been *very likely* to buy the same level of efficient dehumidifier even if the recycling incentive had not been available. This implies little overlapping influence between the decisions to recycle an old or buy a new efficient dehumidifier and no need to adjust for such overlap in the savings calculations for either measure.

[106] A similar analysis was conducted in Massachusetts in 2020 – 2021. See NMR, July 23, 2021. Appliance Recycling Net Savings Update (MA20X03-E-ARNTG). https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf.

Figure 16: Dual Dehumidifier Rebate Influence

(Source: Participant survey, results subject to rounding error)



3.13.2.5 Benchmarking Results

The literature review identified only two reports on UEC and NTG for recycled dehumidifiers. Both reports addressed impact and NTG research conducted in Massachusetts in 2021 (Table 56). This study recommends adopting the Massachusetts UEC value of 1,020 kWh. The current NH study estimated a lower NTG ratio for dehumidifiers than found in the MA 2021. The UEC is adjusted for partial use, so the studies did not report a separate PUF.

Table 56: Comparison of NH Factors to Peer State TRMs, Dehumidifier Recycling

Source	UEC (kWh)	NTG Factor
MA 2019[107]	NA	NA
MA 2021[108]	1,020	41%
NH 2026 TRM[109]	500	NA
Evaluated (this study)	**1,020**	**30%**

[107] NMR, MA19R01-E Appliance Recycling Report, March 26, 2019. https://ma-eeac.org/wp-content/uploads/MA19R01-E-ApplianceRecycleReport-Final-2019.03.26.pdf

[108] Guidehouse, Appliance Recycling 2019 Impact Evaluation, September 1, 2021. https://ma-eeac.org/wp-content/uploads/MA21R33-E-ARI-Appliance-Recycling-2019-Impact-Report_FINAL_01Sep2021.pdf and NMR, Appliance Recycling Net Savings Update (MA20X03-E-ARNTG), July 23, 2021, https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf.

[109]New Hampshire 2026 TRM. https://nhsaves.com/wp-content/uploads/2025/10/2026-TRM-FINAL_8.29.2025Updates.pdf.

3.14 Room Air Conditioner Recycling

The room air conditioner recycling measure falls under the Appliances Recycling entry in the 2026 NH TRM and covers "the retirement of old, inefficient…room air conditioners…thereby eliminating the consumption associated with that equipment."[110] This measure has the BC Measure ID of EA3b030. The measure is classified as retrofit and savings in the 2026 TRM are deemed based on MA study results.

3.14.1 Recommendations

The most impactful changes to room air conditioner recycling impacts are a 117% increase in unit energy savings and first-time application of the estimated NTG ratio of 0.35 (retrospective) / 0.36 (prospective), which together result in a 22% decrease in net claimable savings.

- **Recommendation TRM-20:** The utilities should apply the factors shown in Table 57, using the retrospective factors for all units recycled before May 26, 2026, and the prospective factors for units recycled on or after May 26, 2026. This differentiation reflects a change in the ENERGY STAR version for new room air conditioners, and the efficiency of newly manufactured units plays a part in the NTG algorithm.
- **Consideration DT-7:** Track the capacity and efficiency of recycled units and calculate UEC based on the formula shown in Section 3.14.2.1 (below), adapted from the Pennsylvania TRM and used in this report for gross savings assumptions.

The Room Air Conditioner recycling measure claims annual and peak electric savings for room air conditioning units recycled through the program.

These units are assumed to be removed from the grid and thus their total peak and annual usage is claimed as savings, by comparison to the counterfactual scenario, in which the unit remains in use by the participating customer or by another customer who purchases it secondhand.

Table 57: Room AC Recycling - Key Results

BCR ID	Factor	Existing (2026 TRM)	Recommended Retrospective*	Recommended Prospective*
EA3b030	Gross Savings (UEC)	113 kWh	245 kWh	245 kWh
	Realization Rate (PUF)	100%	100%**	100%**
	Deemed Gross Savings (UEC * PUF)	500 kWh	245 kWh	245 kWh
	NTG Ratio (n = 90)	Not applied	35%	36%

* Due to the implementation of new ENERGY STAR version, the retrospective values should be applied to units recycled prior to May 26, 2026, and the prospective values to those recycled on or after May 26, 2026.
** This gross savings estimate accounts for frequency of use prior to recycling.

[110] New Hampshire 2026 TRM. https://nhsaves.com/wp-content/uploads/2025/10/2026-TRM-FINAL_8.29.2025Updates.pdf.

3.14.2 Impact Findings

This section presents the unit energy use, part-use factor, TRM review, NTG, and TRM benchmarking findings for room air conditioners recycled through the ES Products Program.

3.14.2.1 Unit Energy Use and Part-Use Factor

The current New Hampshire TRM applies a deemed gross UEC value of 113 kWh, derived from a 2015 study[111] of low-income multifamily housing in Massachusetts. The NHSaves program serves customers across all income levels and building types, so this current study revised the estimate of UEC using more recent efficiency and usage assumptions across residential customer types and New Hampshire-specific weather data. The formula used in this study is drawn from the equivalent measure (2.2.8 Room AC [RAC] Retirement) in the 2026 Pennsylvania TRM.[112] While stated differently, the equation is functionally equivalent to that used in the 2015 study currently referenced in the 2026 TRM.

$$\Delta kWh = \left(\frac{CAPY}{EER_{RetRAC}}\right) \times EFLH_{RAC}$$

Where:

ΔkWh = Annual electrical savings, kWh

CAPY = Rated cooling capacity (size) of the RAC unit, kBTU/Hour

EER_{RetRAC} = The Energy Efficiency Ratio of the unit being recycled, BTU/Watt-hour

$EFLH_{RAC}$ = Equivalent Full Load Hours of operation, Hours/Year

The evaluators assumed a cooling capacity (CAPY) of 7 kbtu/h, from the most recent baseline results in Massachusetts and Pennsylvania. Efficiency (EER_{RetRAC}) of retired room air conditioning units was assumed to be 11 CEER, aligned with federal standards for window units of this capacity effective from June 1, 2014, until May 26, 2026. The calculation of Effective Full Load Hours ($EFLH_{RAC}$) used weather, sizing, and usage assumptions detailed in the attached workbook titled "NH EFLH calculator 14Apr26.xlsx," yielding a Room AC EFLH of 388. This yields a UEC of 245 kWh (accounting for slight rounding error).

3.14.2.2 TRM Review

Three other Northeast states currently offer an equivalent measure: Vermont, Rhode Island, and Pennsylvania.

New Hampshire, Pennsylvania, and Vermont calculate the UEC from the efficiency and capacity of the recycled unit and the effective full load hours. Rhode Island uses a deemed universal value. This study has adopted the equation used in the Pennsylvania TRM. States with comparable

[111] October 2015, Cadmus Group, Navigant, NMR Group, Tetra Tech, and DNV, *Massachusetts Low-Income Multifamily Initiative Impact Evaluation,* https://ma-eeac.org/wp-content/uploads/Low-Income-Multifamily-Impact-Evaluation-1.pdf

[112] September 2024, Pennsylvania Public Utilities Commission, *State of Pennsylvania Technical Reference Manual, Vol.2: Residential Measures*, https://www.puc.pa.gov/pcdocs/1848563.pdf

programs and calculations also apply a PUF (or realization rate or ISR) of 100%, as the UEC calculation (or deemed savings) accounts for usage.

3.14.2.3 Net-to-Gross

The NTG ratio for this measure, as for the other appliance recycling measures, was calculated based on survey responses about what respondents would have done with the unit had they not recycled it with the program. The NTG ratio calculation followed the algorithm outlined in Table 65 and Figure 28. Due to a change in the ENERGY STAR qualifications for room air conditioners, the evaluation team calculated two NTG ratios based on the algorithm described in Section A.2.1. One NTG ratio (35%) is for retrospective application to units recycled prior to May 26, 2026, and the second (36%) is for prospective application to units recycled on or after May 26, 2026. Table 58 lists the unit savings and weighted savings associated with each type of FR for both the retrospective and prospective NTG ratios. As the table shows in the row shaded dark gray, the difference between the two NTG ratios reflects variation in the delta kWh between a recycled unit and a newly manufactured unit because of this update to the ENERGY STAR qualifications. Both NTG ratios are driven by respondents indicating that, without the program, they would have gotten rid of the room air conditioner in a manner that would likely have resulted in its being recycled (see Appendix D.4.4.1).

Table 58: Room Air Conditioner Recycling – NTG Calculation

(n=90; results subject to rounding error)

Free Rider (FR) Assignment	% of Respondents (A)	Retrospective		Prospective	
		Assigned Savings (B)	Weighted avg savings (A x B)	Assigned Savings (C)	Weighted avg savings (A x C)
Pure FR	51%	0	0	0	0
FR from algorithm	7%	0	0	0	0
Pure non-FR (PUF adjusted UEC)	20%	245	49	245	49
Non-FR from algorithm	14%	245	35	245	35
Partial FR (delta kWh of PUF adjusted UEC and newly manufactured unit)	7%	25	2	47	3
Net Savings			**86**		**88**
PUF Adjusted UEC			**245**		**245**
NTG Ratio			**35%**		**36%**

3.14.2.4 Benchmarking Results

Benchmarking the study results against the three peer TRMs that include room AC recycling measures shows the evaluated UEC is in line with Rhode Island, while the NTG ratio is somewhat lower. In contrast, the UEC for Vermont is considerably lower than the evaluated UEC for NH. Table 59 summarizes the findings.

Table 59. Comparison of NH Factors to Peer State TRMs, Room AC Recycling

Source	UEC (kWh)	PUF	NTG Factor
VT (2024 TRM)	74	100%	N/A
RI (2025 TRM)	278	100%	46%
PA	Calculated with actual, retired unit EER	100%	N/A
Evaluated (this study)	**245**	**100%**	**35% (Retrospective)** **36% (Prospective)**

* Connecticut study used PUF from Massachusetts 2021 study.
** New Hampshire TRM used UEC from Massachusetts 2021 study

4

Section 4 Program- and Pathway-Level Findings

This section presents program- and pathway-level process findings. The section begins with 4.1 Key Process Findings and recommendations, followed by 4.2 Overall Program Process Findings. Topics addressed include participant awareness of and attitudes about the program, contractor perspectives, and strategies to minimize FR. The section also provides detailed findings for each pathway: 4.3 Downstream Rebate Pathway, 4.4 Midstream Pathway, 4.5 Online Marketplace Pathway, 4.6 In-Store Instant Rebate Pathway, and 4.7 Appliance Recycling Pathway. For each pathway, we describe how the program operates and report on participation satisfaction, barriers to participation, opportunities to reduce FR, and best practices from other New England states.

The process evaluation objectives included:

1. Describe the current program design, delivery channels, and processes used to deliver the program.
2. Measure participant satisfaction with key aspects of the program, including the participation process, incentives, and equipment quality, and identify opportunities for improvement.
3. Determine how customers learn about the program's offerings, by program pathway.
4. Identify any barriers to participation experienced by customers, by program pathway.
5. Explore contractor experiences with the midstream program pathway.
6. Investigate how the utilities can most effectively target customers who are not free riders.
7. Compare findings and recommendations from the most recent process evaluation of the Program and from the most recent evaluations of similar programs in New England for benchmarking and best practices.

4.1 Key Process Findings and Recommendations

This section summarizes the key findings of the process evaluation and the recommendations emerging from those findings. Also see Section 3.1 for recommendations relevant to specific measures.

4.1.1 Key Process Findings

NHSaves Awareness and Attitudes

Awareness of the ES Products program is moderate and participants report being more inclined to support energy efficiency than the general New Hampshire population. The program can work to increase awareness more broadly through its participating contractors, in-store promotions, and general marketing activities. Cross-promoting ES Products offerings to participants in other NHSaves programs would also help increase the program's reach.

- **Program participants who responded to the survey reported moderate awareness of NHSaves programs.** About two out of three respondents (64%) rated their awareness

of NHSaves offerings a 4 or 5 on a scale of 1 to 5.[113] Respondents reported learning about NHSaves most commonly through the NHSaves website (48%), their contractor (32%), and bill inserts or online bills (29%). Nearly two-thirds of respondents (65%) said that participating in the appliance recycling offering moderately or significantly increased their awareness of other NHSaves energy-saving opportunities.

- **ES Products participants who responded to this survey voiced stronger support for energy efficiency than the general New Hampshire population.** To gauge how similar ES Products Program participants are to the general population, the study team selected four questions from the recent *New Hampshire Energy Consumers Survey*[114] to include in the installed measures participant survey (Appendix C.1). Participants reported significantly more supportive attitudes than the general population for three of the four metrics.

Overall Program Feedback

Overall program satisfaction varies by participation pathway, with the recycling pathway receiving high marks and the downstream rebate pathway receiving mixed feedback: while about 40% of participants were very satisfied with their experience, others reported that the rebate process was time-consuming, complex, and/or long. Some of that feedback was likely related to a transition period between rebate processing vendors that has since been resolved. The program can support future customer satisfaction and achieve its goals by simplifying and providing more support for the application process, providing support for contractors, and considering expanding its midstream, online marketplace, and in-store instant rebate offerings.

- **Most respondents were satisfied with their experiences with the ES Products Program.** The recycling pathway drew the most favorable responses from responding participants (98% would recommend to a friend), while the downstream rebate offering had the lowest satisfaction ratings (76% satisfied).
- **Overall satisfaction was somewhat lower than it was in the prior program evaluation of 2016 participants, but several factors make the results difficult to compare.** Survey respondents who participated in the downstream, in-store instant rebate, or online marketplace pathways in 2022–2024 were asked to rate their satisfaction with their overall experience with the experience. Overall, 76% of participants in those pathways reported being satisfied (4 or 5 rating on a scale of 1 to 5, where 1 meant "not at all satisfied" and 5 meant "very satisfied") (90% CI: 72%–80; see Figure 20).[115] While the survey of recycling participants did not include a closely analogous question about satisfaction, 98% of participating recycling respondents reported they would recommend the recycling offering to a friend (90% CI: 97%–99%).

[113] Unless otherwise noted, the scaled process evaluation questions relied on a one-to-five point scale, with one indicating the "negative" anchor of the scale (strongly disagree, not at all aware, etc.) and 5 indicating the "positive" anchor of the scale (strongly agree, very aware, etc.).
[114] Market Decisions Research. 2023. *The State of New Hampshire Energy Consumers Survey Research Report.* Prepared for the State of New Hampshire Department of Energy. https://www.energy.nh.gov/sites/g/files/ehbemt551/files/documents/energy-efficiency-consumer-survey-2023.pdf.
[115] Program pathway was self-reported by survey respondents because program tracking data did not include this information.

  - In contrast, the 2016 ES Products evaluation found that approximately 84% of respondents rated their overall experience with the New Hampshire ENERGY STAR Products program favorably (4 or 5 rating on a scale of 1 to 5, where 1 meant "unacceptable" and 5 meant "outstanding") (90% CI: 80%–88%)."[116]
  - The difference between the current and 2016 values is statistically significant. However, this change may be due in small or large part to differences in the program offerings, participant populations, and survey questions between the two study periods. Notably, the in-store instant rebate pathway was not offered in 2016, and appliance recycling participants represented only four of the 214 respondents included in the 2016 satisfaction estimate. Therefore, the study team recommends interpreting comparisons between the two studies with considerable caution.
- **Challenges in the rebate process were the main driver of lower overall satisfaction with the downstream rebate pathway.**[117] Consistent with this hypothesis, respondents who had received downstream or in-store rebates reported lower satisfaction with both the purchasing experience and rebate value compared to online marketplace customers. Those respondents cited a time-consuming process that required too much paperwork and back-and-forth, multiple rejections, navigation difficulties.
- **Some of the conditions that led to lower satisfaction for the rebate pathway seem to have improved, though the process remains complex for some participants.** It is important to note that the program changed to a different rebate processing vendor in 2024—after the survey respondents participated in the program. Participating contractors reported observing improvements in rebate processing (i.e., fewer delays and unwarranted rejections) since that transition, though they report that the current rebate process continues to prove complex for some customers.
- **Participating installation contractors value the program highly and noted improvements made in recent years.** Interviewed contractors credited the program rebates for making it easier to sell high-efficiency equipment and helping to reduce customer costs. They highlighted on-call customer support as a strength, and mentioned heat pump Qualified Products List (QPL) as a valuable tool for identifying eligible equipment. Contractors reported observing improvements in the NHSaves website, more consistent funding availability throughout the year, and recently, improved rebate processing.
- **Contractors also highlighted several opportunities to improve program delivery.** Some suggestions included expanding instant or midstream rebate options and offering more direct engagement opportunities for contractors with the program, including face-to-face outreach, partnerships, dedicated program assistance, and additional training events. Two-thirds of interviewed contractors recommended increasing rebate amounts across multiple measures, particularly for heat pumps.

[116] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

[117] Twenty-four percent of respondents were less than satisfied with their overall experience with the downstream rebate pathway.

- **Current economic conditions pose challenges for contractors selling projects through the program.** Contractors overwhelmingly reported (85%) that rising equipment costs are significantly impacting customer behavior, with customers delaying projects, opting to repair existing systems, and showing greater interest in financing options.
- **The study team identified several strategies the program could use to minimize free-ridership in the future.** Some applicable strategies for minimizing FR include raising incentives, creating tiered incentives, targeting specific sections of the market, and raising qualifying equipment thresholds.

Barriers to Participation

- **Contractors and customers pointed to the rebate application process as a barrier**, with some customers struggling to provide the required technical details and documentation requirements.
- **Contractors overwhelmingly reported (85%) that rising equipment costs are significantly impacting customer behavior**, with customers delaying projects, opting to repair existing systems, and showing greater interest in financing options.
- **There are relatively minor barriers to participation in the online marketplace, in-store instant rebate, and recycling pathways**, mainly related to customers needing to provide their account number and transportation logistics for the recycling pathway.

Minimizing Free-Ridership

- **As specified by the study scope, the evaluators identified strategies for the ES Products Program to consider using to minimize free-ridership.** Some applicable strategies for minimizing FR include raising incentives, creating tiered incentives, targeting specific sections of the market, and raising qualifying equipment thresholds. Section 4.2.3 details these strategies.

Satisfaction and Process Highlights by Program Pathway

- **Downstream Rebate Pathway:** Most responding participants (76%) reported satisfaction with the overall rebate process, although there is room for improvement. The most common reasons for feeling less than satisfied centered around the process being time-consuming, cumbersome, and long. Eleven out of 15 contractors also identified the complexity of rebate paperwork as a challenge with the rebate pathway, citing the need to provide technical information such as model numbers and capacity as intimidating or confusing for some customers.
    - Downstream rebate respondents reported lower satisfaction with both the participation process and rebate value compared to online marketplace and recycling customers.
- **Midstream Pathway:** Relative to the downstream rebate process, HPWH installation contractors generally reported finding the midstream pathway considerably easier to manage because it involves less paperwork, coordination, and risk of rebate applications being rejected.
- **Online Marketplace Pathway:** Nearly nine in ten (88%) respondents who purchased a gas Wi-Fi thermostat through the online marketplace were satisfied with both their overall

purchasing experience and the prices offered. Fewer respondents (62%) were satisfied with the range and selection of products available on the online marketplace.

- **Instant In-Store Rebate Pathway:** Most respondents who reported purchasing a product with an in-store rebate said they were satisfied with both their overall rebate experience (14 of 17) and the time to receive the rebate (14 of 17).
- **Recycling Pathway:** Nearly all respondents (98%) said they would recommend the appliance recycling offering to a friend and 95% said it was easy to participate in the program. Satisfaction with the scheduling process and promptness also were high at 95%, while the time it took to receive the rebate received the least 'satisfied' ratings (85% satisfied).

4.1.2 Process Recommendations and Considerations

The evaluators offer the following recommendations and considerations to support the future success of the ES Products Program:

- **Recommendation P-1:** Review current education and engagement opportunities for participating HVAC and water heating contractors and identify ways to expand them, such as through partnerships with HVAC companies, dedicated program representatives, and training events. Consider seeking feedback from contractors about what they would find valuable and identify activities with benefits both for contractors and for the program. Note that this recommendation supports high-priority recommendations for ASHPs (see Appendix F.4). *(Priority: High)*
- **Recommendation P-2:** Undertake a comprehensive review of program application and documentation requirements. Remove requirements and questions that are not essential or valuable to the program and provide additional guidance on where and how to find the required information (e.g., consider including videos and/or visual examples of how to find AHRI reference and model numbers, calculate tonnage, etc.). Thereafter, perform an annual review to ensure each required component remains valuable. Also, continue to offer paper applications to support program accessibility, and consider specifying that by participating, the customer agrees to allow access and/or share their data for evaluation purposes. *(Priority: High)*
- **Recommendation P-3:** Continue to review the rebate amount for each measure at least annually and raise incentive levels where cost-effective and necessary to drive adoption. Higher incentives tend to decrease FR rates and drive participation and program satisfaction.[118] As part of this process, undertake a review of rebate amounts and processes across the NH utilities and either create alignment or document the reason(s) for ongoing inconsistencies. The evaluators note that the program proactively increased rebate levels for several measures in 2026, in alignment with this recommendation. *(Priority: Moderate)*

[118] This statement applies to measures early in their adoption cycle when incentives reduce barriers, making them more appealing to a wider range of consumers. When a market matures, higher incentives have little impact on adoption and can increase FR rates. See Rogers, E.M. 2003. *Diffusion of Innovations*. 236 to 238. Fifth Edition. Free Press: New York.

- **Recommendation P-4:** Increase awareness of and participation in NHSaves and the ES Products Program by promoting them through multiple channels. Revisit existing plans for communications to participating contractors, in-store promotions, and general brand and program marketing activities and identify activities that can be increased within the approved budget. Cross-promote ES Products offerings to participants in other NHSaves programs to help increase the program's reach: For example, include or increase Products promotions in email communications to current and recent participants in the Home Energy Assistance and Home Energy Performance programs. *(Priority: Low)*
- **Recommendation P-5:** Cross-promote weatherization through the Home Energy Performance and Home Energy Assistance programs with installation of heating and/or cooling measures such as heat pumps, furnaces, and boilers. Promote the benefits of weatherizing their homes first (e.g., saving additional energy and reducing equipment costs by reducing heating and cooling loads) to customers visiting the NHSaves website heating and cooling pages and in other customer-facing promotions and communications. Train installation contractors to encourage their heating and cooling customers to pursue weatherization to help them save additional energy while promoting cross-program participation.[119] *(Priority: Low)*
- **Recommendation P-6:** Tout the careful vetting process and ease of selection as reasons to purchase efficient products from the online marketplace in communications to customers and participants, emphasizing that the limited number of product options on the marketplace is a strength. Additionally, review the offered products and product categories at least annually and consider adding additional types of measures, such as new types of "smart" home technologies, as they become viable. *(Priority: Low)*
- **Consideration P-7:** Investigate the feasibility of enabling participants and/or contractors to easily track or look up their application status.
- **Consideration P-8:** Consider expanding instant and/or midstream rebate offerings for measures with low-to-moderate FR rates to reduce administrative burden and improve customer and contractor experience. Also consider adding measures to the online marketplace where feasible.
- **Consideration P-9:** Consider expanding the existing NHSaves financing options to include ES Products measures and offering loan amounts sufficient for customers to undertake major measures such as heat pumps.

4.2 Overall Process Findings for the ES Products Program

This section describes the process findings at the program level, including awareness of the NHSaves programs and attitudes related to energy efficiency among participants, participating installation contractor experiences, and strategies for the program to minimize FR.

Except where indicated, "participants" refers to customers who installed a measure through the ES Products Program. Participants who recycled an appliance through the program are referenced separately. "Respondents" refers to participating customers who answered the survey.

[119] The evaluators note that the utilities included a similar strategy in their proposed NHSaves 2027–2029 Plan.

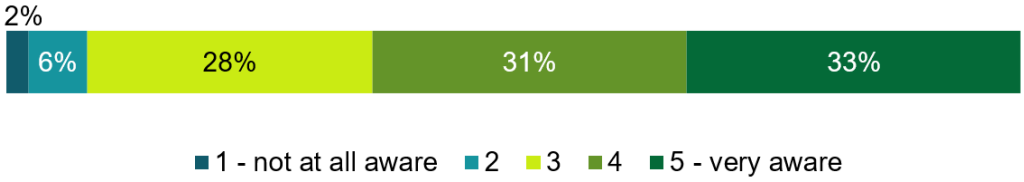
4.2.1 Program Awareness, Attitudes, and Satisfaction Among Participating Customers

The participating customer survey investigated awareness of the NHSaves programs among customers who had received an incentive for an installed measure through the ES Products Program. When asked if they had heard of the NHSaves energy efficiency programs before the survey, almost all respondents (95%) answered that they had. Out of the remaining 5%, 2% had not heard of the program before the survey, and 3% answered "not sure."

About two out of three respondents report high awareness of NHSaves offerings. When asked to rate the extent of their awareness of NHSaves offerings, almost two-thirds (64%) of all respondents gave a rating of either 4 or 5 on a scale of 1 to 5, where 1 means "not at all aware" and 5 is "very aware." The team found similar levels of awareness of rebates, discounts, and other offerings across respondents who installed all measure types. Figure 17 presents aggregated findings from all respondents.

Figure 17: Awareness of NHSaves Offerings

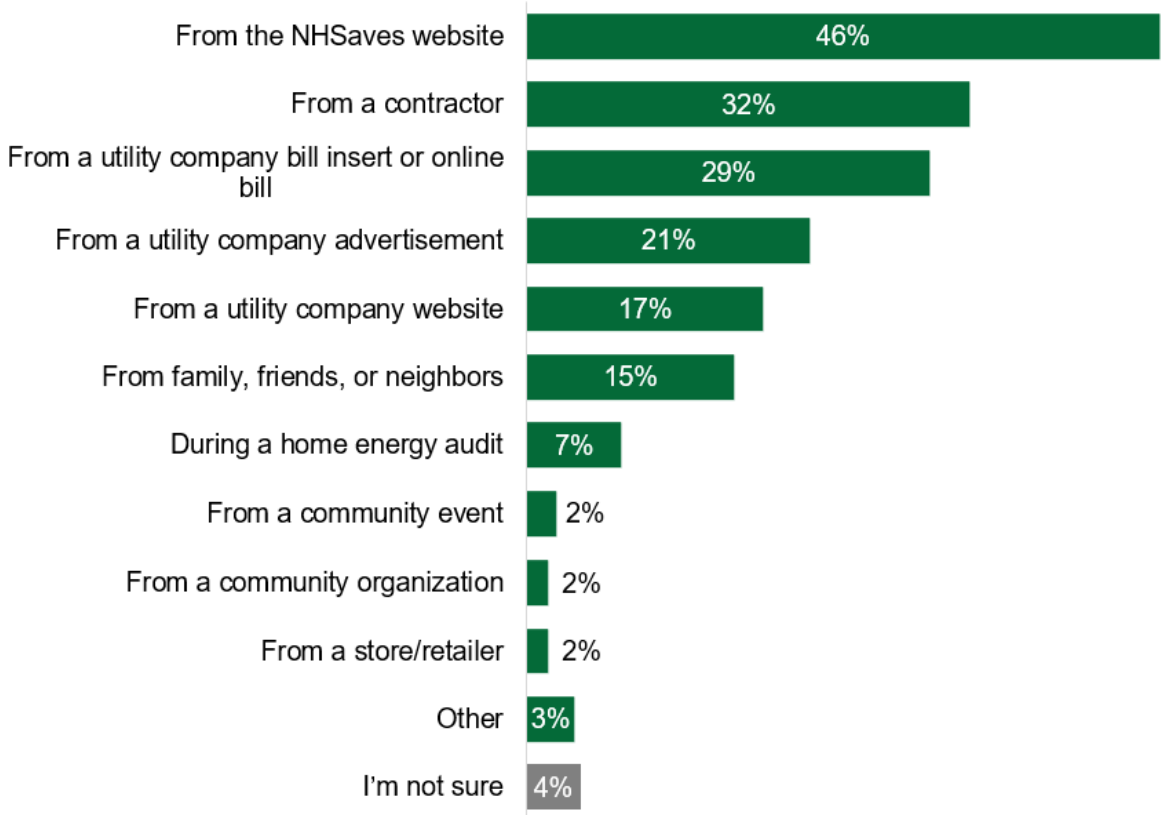
(On a scale of 1 to 5, where 1 means "not at all aware" and 5 is "very aware," how aware are you of the rebates, discounts, and other offerings available through the NHSaves energy efficiency programs?; n=377)



The team also asked respondents how they learned about the discounts and rebates offered by NHSaves and its utility partners. Almost one-half (46%) answered that they learned about NHSaves from the NHSaves website, and almost one-third (32%) answered that they learned about it from a contractor. Respondents also commonly mentioned learning about NHSaves from a utility company bill insert or online bill (29%), from a utility company advertisement (21%) or website (17%), or from family, friends, or neighbors (15%) (Figure 18).

Figure 18: How Respondents Learned about NHSaves

(How did you learn that NHSaves and its utility partners offered discounts and rebates on energy-saving products? Please select all that apply.; n=377)



Contractors report wide variation in awareness levels for their customer bases. According to the contractors interviewed, awareness of NHSaves rebates among their customer bases varies widely, ranging from approximately 10% to 100%, with an average of around 50%. Contractors reported observing that customers typically learn about these programs through word of mouth, online research (especially the NHSaves website), contractor guidance, utility communications, and less commonly, newspaper articles highlighting the program.

Respondents to this survey voice stronger support for energy-efficiency than the general New Hampshire population. The team explored the possibility that NHSaves participants held different attitudes about energy efficiency compared to the broader New Hampshire population. Using language from *The State of New Hampshire Energy Consumers Survey*,[120] the participant survey asked responding program participants to rate their agreement with four statements on a scale of 1 to 5, where 1 means "strongly disagree" and 5 means "strongly agree." Table 60 compares the results across the two surveys. For three of the four questions, ES Products Survey respondents gave more "pro-efficiency" ratings than the New Hampshire Energy Consumers

[120] Market Decisions Research. 2023. *The State of New Hampshire Energy Consumers Survey Research Report.* Prepared for the State of New Hampshire Department of Energy. https://www.energy.nh.gov/sites/g/files/ehbemt551/files/documents/energy-efficiency-consumer-survey-2023.pdf.

Survey respondents. The two sets of respondents voiced similar levels of agreement with the statement "When home, I take actions to be energy efficient and conserve energy."

Table 60: Comparison of Energy Efficiency Attitudes Between ES Products and New Hampshire Energy Consumer Surveys

(Many factors influence our decisions when it comes to using energy. On a scale of 1 to 5, where 1 is "strongly disagree" and 5 is "strongly agree," how strongly do you agree or disagree with the following statements?)

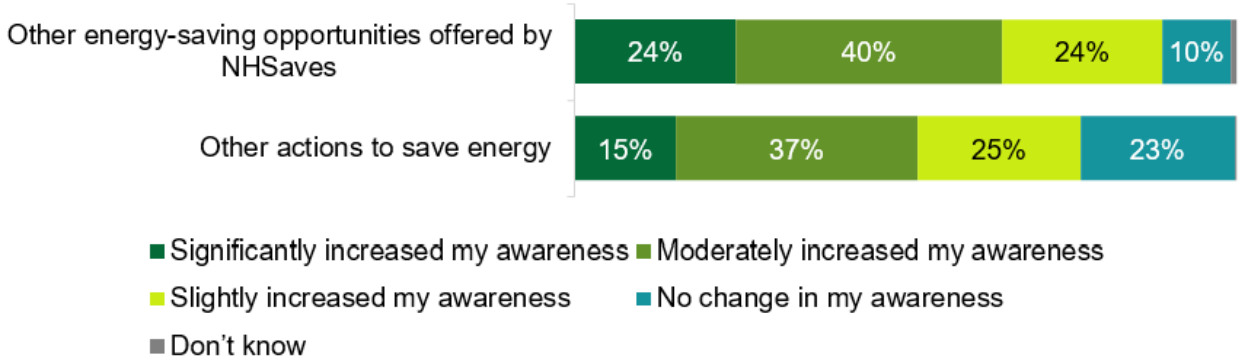
Question	ES Products Survey		NH Energy Consumers Survey	
	n	% Somewhat or Strongly Agree	n	% Somewhat or Strongly Agree
I'm too busy to be concerned with my energy usage.	377	3%	1,176	8%*
When home, I take actions to be energy efficient and conserve energy.	377	84%	1,178	86%
I am not willing to be energy efficient or conserve energy at home if that comes at any cost to my comfort.	377	8%	1,157	18%*
I like to encourage people to save energy.	377	72%	1,164	59%*

* Statistically different than this study's survey of ES Products survey participants at the 90% confidence level.

Most responding appliance recycling participants (89%) reported increased awareness of other NHSaves opportunities after participating in the recycling offering. Nearly two-thirds of respondents (65%) reported that participation in the appliance recycling offering moderately or significantly increased their awareness of other NHSaves energy-saving opportunities, while an additional 24% reported a slight increase (Figure 19). More than three-quarters of respondents (77%) indicated their participation in the program increased their awareness of other actions they can take to save energy.

Figure 19: Awareness of NHSaves Opportunities and Other Energy-Saving Actions Following Appliance Recycling Participation

(To what extent did participating in the Appliance Recycling Program increase your awareness of other energy-saving opportunities offered by NHSaves?
To what extent did participating in the Appliance Recycling Program increase your awareness of other actions you can take to save energy?; n=330)



The average satisfaction rating for non-recycling respondents appears to be somewhat lower than that found in the prior (2016) program evaluation. When responding participants who had participated in the downstream, in-store instant rebate, or online marketplace pathways were asked to rate their "overall experience with the rebate process" (or "process of buying discounted products through the NHSaves or utility partner online store"), 76% reported their experience was favorable (4 or 5 rating on a scale of 1 to 5, where 1 meant "not at all satisfied" and 5 meant "very satisfied") (90% CI: 72%–80; see Figure 20), with an average rating of 3.8 out of 5. This is in contrast to the prior (2016) study, in which 84% of respondents reported their experience to be favorable (4 or 5 rating on a scale of 1 to 5, where 1 meant "unacceptable" and 5 meant "outstanding") (90% CI: 80%–88%), with an average rating of 4.2 out of 5.[121] Although the difference is statistically significant, conclusions should be drawn with considerable caution due to notable differences in the questions, response scales, and program design and delivery, including the 2016 program's greater emphasis on lighting measures as well as differences in program implementation. For example, the in-store instant rebate pathway was not offered in 2016, and appliance recycling participants represented only four of the 214 respondents included in the 2016 satisfaction estimate.

Respondents who had received downstream rebates reported lower satisfaction with both the purchasing experience and rebate value compared to online marketplace customers, suggesting challenges in the rebate process at the time of their participation (2022–2024) may have driven lower overall satisfaction. When survey respondents rated their satisfaction on a scale of 1 to 5, where 1 indicates "not at all satisfied" and 5 indicates "very satisfied," 87% of respondents who purchased their discounted product through the NHSaves online marketplace reported being satisfied (a rating of 4 or 5) with their overall purchasing experience, and 88%

[121] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

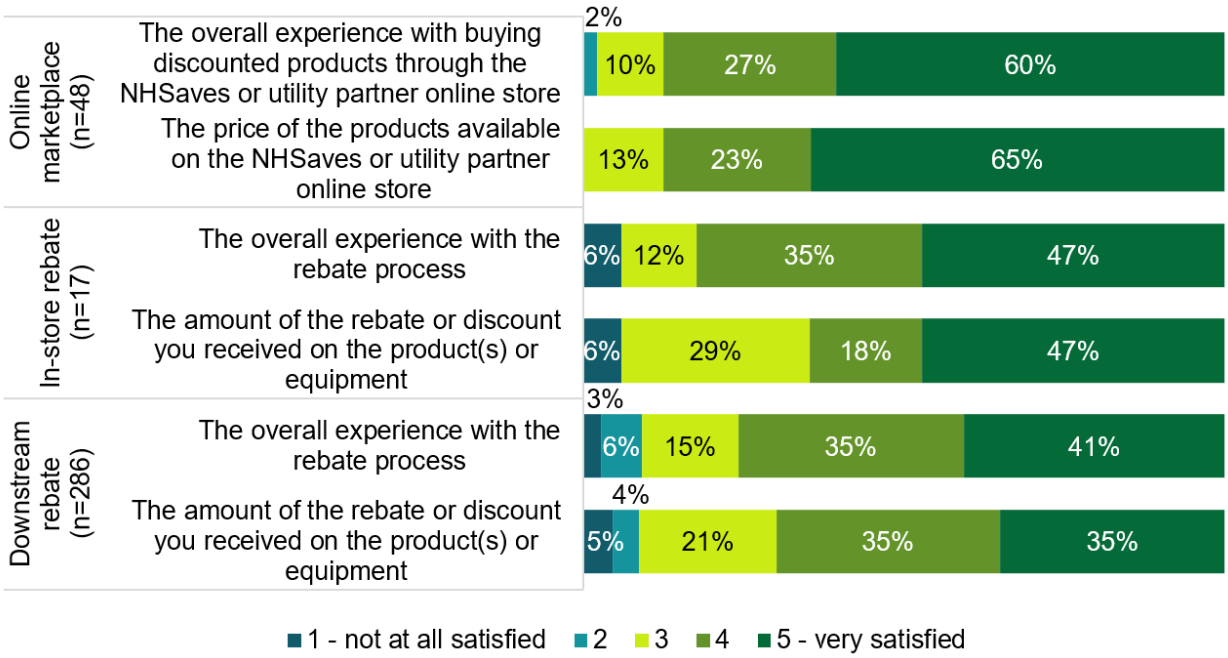
were satisfied with the price of the products available. Respondents who reported using the in-store instant rebate pathway also reported high satisfaction, with 82% satisfied with the overall process and 65% satisfied with the rebate amount. Respondents who purchased a product through the downstream rebate pathway and applied for a rebate reported the lowest levels of satisfaction, with 76% satisfied with the overall rebate process and 70% satisfied with the amount of the rebate received (Figure 20).

Higher satisfaction among online marketplace and in-store rebate participants may reflect the streamlined point-of-sale experience, which avoids many of the equipment eligibility verification, application forms, contractor coordination, supporting documentation, and rebate processing delays associated with downstream rebates. While some measures, such as HPWHs, are available through both pathways, the downstream pathway also includes more complex measures, such as heat pumps, boilers, and furnaces, and generally offers larger incentive amounts. As a result, lower satisfaction among downstream rebate participants may reflect both the greater complexity of these projects and the additional effort required to obtain the rebate.

It is also important to note that the program changed to a different rebate processing vendor in 2024. Respondents who participated during the vendor transition period may have had an especially challenging experience, and this result may not reflect current participant experiences with downstream rebates.

Figure 20: Overall Program Satisfaction[1]

(Please tell us how satisfied you were with the following elements of your participation in the ENERGY STAR Products Program. Please use a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied.")



[1] Program pathway (online marketplace / in-store rebate / downstream rebate) was self-reported by survey respondents because this information was not recorded in the program tracking data.

Participant satisfaction with the changes to their energy bills following equipment installation was generally moderate, suggesting that the program should work to help

participants know what to expect. As shown in Figure 21, the highest satisfaction levels were found among participants who replaced electric baseboard heating with ductless mini-split ASHPs (77%), replaced non-electric heating systems with central ASHPs (73%), replaced a non-heat pump water heater with a HPWH (73%), or installed an efficient boiler (71%).[122] Satisfaction was somewhat lower among participants who replaced a non-electric water heater with a HPWH (67%), those who replaced a non-electric heating system with a ductless mini-split ASHP (65%), and participants who installed a gas integrated water heater (62%) or gas furnace (61%). Satisfaction was lowest among gas Wi-Fi thermostat participants (53%). Results exclude respondents who indicated they purchased equipment for new construction projects, a group that was particularly common among HPWH participants. For full results, including new construction participants, see the measure-level process findings in Section 3 Measure-Level Findings.

Overall satisfaction with changes in energy bills was 66% among central ASHP participants and 67% among ductless mini-split ASHP participants. These results are consistent with findings from the 2024 *Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS / CT R2246)*,[123] which found that 63% of respondents were either moderately or extremely satisfied with the cost of operating their heat pump(s).

Respondents reporting lower satisfaction often cited modest or no noticeable bill impact. Respondents who were less than satisfied with changes to their energy bill after installing ASHPs or HPWHs most often reported that their electric bills increased or were difficult to manage due to higher electric rates, or that any savings were small or modest. This pattern is consistent with findings from the 2024 Massachusetts and Connecticut Heat Pump Metering Study, which found that 54% of participants reported electric bills that were about what they expected, while 37% reported bills that were higher than expected and only 6% reported bills that were lower than expected. The study also found that dissatisfaction was frequently driven by participants perceiving the cost of operating their heat pump to be higher than the cost of operating their previous heating system.

For gas boilers, furnaces, and integrated water heaters, respondents similarly noted only small or modest savings, or no observable savings at all. Among thermostat participants, the most common feedback was that they did not notice any change or savings in their energy bill.

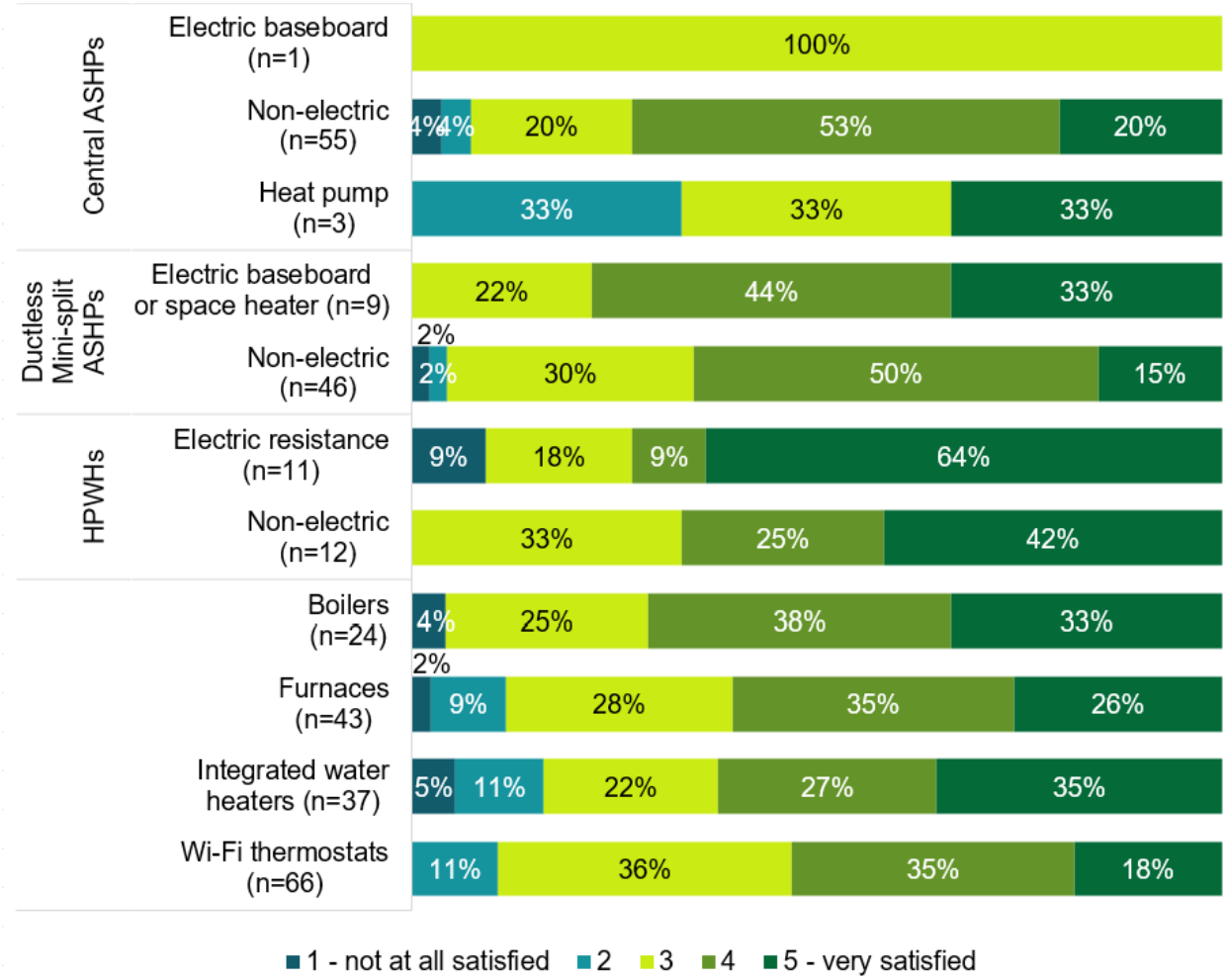
[122] Note the low numbers of participants replacing electric resistance heating or an existing heat pump with a central ASHP.

[123] Guidehouse. 2024. *Massachusetts and Connecticut Heat Pump Metering Study: Final Report*. Prepared for the Massachusetts Energy Efficiency Advisory Council and Connecticut Program Administrators. August 2024. https://ma-eeac.org/wp-content/uploads/MA-HPMS-CT-R2246-Heat-Pump-Metering-Study-Final-Report_August_2024.pdf

Figure 21: Participant Satisfaction with Changes to Their Energy Bill[1]

(Please tell us how satisfied you were with the following elements of your participation in the ENERGY STAR Products Program. Please use a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied."

The changes to your energy bill after installing the new equipment)



[1] This figure reports results for existing homes only (excluding new construction), with ASHPs and HPWHs segmented by replacement fuel type (electric vs. non-electric). Full survey responses are provided in the corresponding process findings in Section 3.

4.2.2 Participating Installation Contractor Perspectives

Contractors overwhelmingly reported that rising equipment costs are currently impacting customer behavior, with 85% indicating a substantial effect. These cost increases, driven in part by tariffs and inflation, have led to greater customer hesitation when considering new installations. Some contractors estimated a decline in project follow-through of up to 25%, with customers choosing more often to repair existing systems rather than replace them and showing greater interest in financing options to manage upfront costs. Additionally, some customers are delaying purchasing decisions altogether while waiting for energy costs to stabilize.

Contractors expressed appreciation for several aspects of the program and noted several recent improvements. A majority of the interviewed contractors (80%) reported viewing rebates as a key business driver, helping reduce customer costs and making it easier to sell high-efficiency equipment. The contractors also highlighted customer support, particularly the availability of on-call support from program staff. Additionally, the Qualified Products List (QPL) was mentioned as a valuable tool for quickly identifying eligible equipment. Contractors reported observing several improvements in the program in recent years, including a more user-friendly website, more consistent funding availability throughout the year, and improved rebate processing following earlier disruptions.

Contractors offered their ideas about opportunities to improve program delivery. Expanding instant or midstream rebate options could reduce administrative burden and improve customer experience. Contractors also voiced a desire for more direct engagement with the program, including face-to-face outreach, partnerships, dedicated program representatives, and training events. Additional recommendations included simplifying rebate processes and developing a vetted contractor list similar to Mass Save. Many contractors recommended increasing rebate amounts across multiple measures, with particularly strong emphasis on heat pumps; approximately two-thirds (67%) specifically called for higher heat pump incentives. Additional suggestions included enhancing rebates for smart thermostats, natural gas furnaces, and central air conditioning systems. Two contractors also recommended implementing a financing program similar to the Mass Save HEAT loan. Other suggestions were for the utilities to address discrepancies in rebate levels across utilities and expand incentives to support advanced home energy technologies.

4.2.3 Minimizing Free-Ridership

Identifying strategies for the program to minimize FR was an objective of this evaluation. The evaluators incorporated this objective into all data collection tasks. Several themes emerged from the data, as described in the following list of suggested practices for minimizing FR. Note that the appropriate modifications depend on the measure's market adoption stage, cost, and other factors.

1. **Increase incentives.** The program incentives for certain measures were too low to convince customers who were not already motivated to install efficient equipment to take action[124]. This is consistent with Rogers' diffusion of innovation theory, which describes how new practices and technologies spread, progressing from innovators to early adopters to the early and late majority.[125] Incentives are the program's primary mechanism for driving adoption among early adopters and the early majority. The evaluators acknowledge that ES Products Program staff raised incentive levels for several measures in 2026 and expect this change to drive down FR rates where the increase was sufficiently large.

[124] Note that this is not the exact objective of heat pump incentives, which are designed to motivate customers who plan to install a heat pump to select a more efficient model than they would otherwise.
[125] Rogers, E.M. 2003. *Diffusion of Innovations.* Fifth Edition. Free Press: New York.

2. **Consider tiered incentives:** Differentiating the rebate amount by efficiency level, customer characteristics, or other criteria may help drive action among non-free riders more efficiently than a flat rate of higher incentives.
3. **Target specific sections of the market:** The program can design incentives, qualifying criteria, and outreach strategies to reach customers who are less likely to be free riders. Documenting the program theory and logic could help the program tailor these interventions more precisely. One example might be to offer higher incentives to customers with non-condensing furnaces to move to a condensing furnace, or to limit incentives to only those with existing non-condensing equipment.
4. **Raise qualifying equipment thresholds:** FR can increase when the common practice in the market moves towards specifications similar to the incentivized equipment. Raising the qualifying efficiency threshold can combat this effect, pushing customers to install higher-performing equipment than they would by following the market.

4.2.4 Customer Interest in Additional Measures After Installation

The evaluators asked contractors whether their customers tend to express interest in additional ways of saving energy after installing measures through the ES Products Program. Contractors gave mixed reports about customer interest in installing additional energy-saving measures, with 62% of contractors reporting that customers tend to express some interest in other measures. Common areas of interest include weatherization measures, smart thermostats, energy audits, and solar panels. Some contractors also observed cross-interest between heat pumps and HPWHs. However, a notable portion of contractors (38%) reported limited engagement beyond the initial installation.

4.3 Downstream Rebate Pathway

This section describes the current processes comprising the downstream rebate pathway, satisfaction levels and barriers encountered by participants, contractor experiences with the pathway, and updates on the findings and recommendations from the prior evaluation of the program.

4.3.1 Downstream Rebate Pathway Description

The downstream pathway offers rebates for eligible appliances and HVAC equipment, including ASHPs, furnaces, boilers, water heaters, air purifiers, central air conditioners, thermostats, pool pumps, room air conditioners, dehumidifiers, clothes washers and dryers, heat recovery ventilators, and refrigerators. Customers can apply for rebates via an online portal or mail-in rebate form. In addition to filling out the rebate form, customers must provide a dated sales receipt and/or invoice. The specific requirements for the rebate form and supporting documentation vary by measure, but typically require information such as the installing contractor, manufacturer, model number(s), installation address, and installed cost.

Utilities promote program offerings through in-store signage, social media, newsletters, radio, and local newspapers. HVAC rebates are promoted seasonally and emails are used for bigger events.

A field vendor supplements these efforts by training retail associates and managers during routine visits and events.

Quality control occurs in multiple stages. The rebate vendor conducts an initial documentation review and performs batch data scrubs to identify inconsistencies. Duplicate rebates are mitigated by linking customer account numbers across channels and flagging potential duplicate submissions for review. Once the rebate vendor exports the data to utility tracking systems, utility program staff perform one final review for duplicate rebates and mismatched account numbers.

4.3.2 Rebate Pathway Participant Satisfaction and Barriers to Participation

Most participants reported being satisfied with the overall rebate process and the instructions provided, though there is room for improvement. When survey respondents rated their satisfaction on a scale of 1 to 5, where 1 indicates "not at all satisfied" and 5 indicates "very satisfied," 76% reported being satisfied (a rating of 4 or 5) with their overall experience with the rebate process, while 78% were satisfied with the instructions provided on how to apply for the rebate (Figure 22).

Among the 24% of respondents (65 customers) who were less than satisfied with their overall experience with the rebate process, the top five reasons were: The process was too time consuming (25%), required too much information or paperwork (20%), was difficult to navigate (18%), involved back-and-forth and multiple rejections (18%), and took too long to receive the rebate (12%). Several respondents suggested adding the ability to easily track or look up their application status.[126]

Of the 23% (58 respondents) who reported being less than satisfied with the rebate application instructions, over half (55%) described the instructions as confusing, unclear, or overly complex, while 14% noted issues with repeated back-and-forth and rejections.

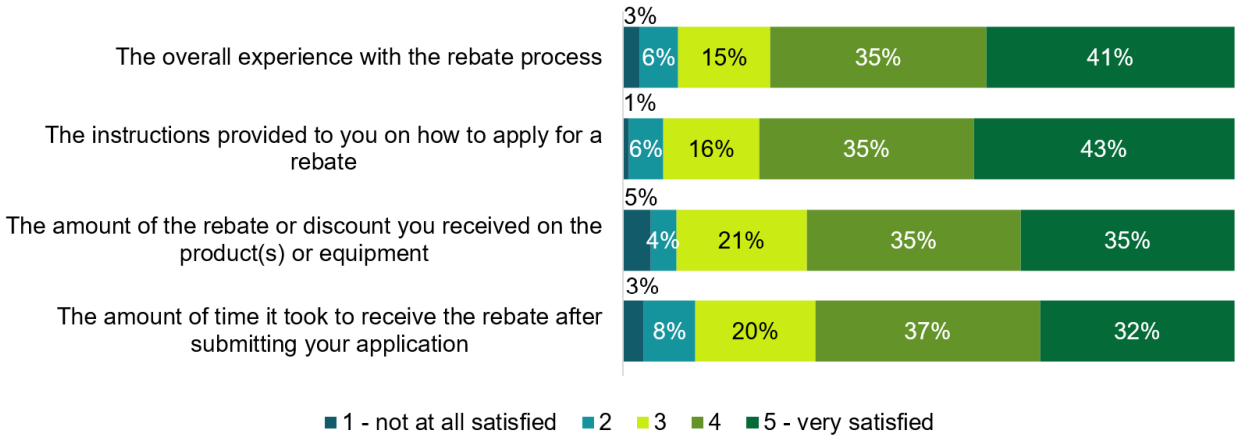
Respondents reported similar levels of satisfaction with the amount of the rebate (70%) and the amount of time it took to receive the rebate (69%). Among the 31% (54 respondents) who were not fully satisfied with the amount of time it took to receive the rebate, most (67%) said that it took longer than expected or too long to arrive, while 19% noted issues with repeated back-and-forth and rejections and 13% said it was difficult to track their application status.

Recommendations P-2 and P-3 and Consideration P-7 in Section 4.1.2 address these concerns.

[126] See Consideration P-7 in Section 4.1.2.

Figure 22: Participant Satisfaction with Downstream Rebate Pathway

(Please tell us how satisfied you were with the following elements of your participation in the ENERGY STAR Products Program. Please use a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied."; Base: Respondents who reported they received post-purchase rebate; n=286)



4.3.3 Participating Contractor Experiences with the Rebate Pathway

Contractors noted improvements in rebate processing since 2024 and cited some ongoing concerns and suggestions for rebate applications. Approximately three-quarters of contractors (11 of 15) identified the complexity of rebate paperwork as a challenge with the program, noting that it can be confusing for customers and increases reliance on contractor assistance. Contractors pointed to requirements for technical details as the most problematic elements for customers. For example, for customers installing a heat pump, identifying indoor and outdoor unit model numbers, AHRI reference numbers, capacities (in BTUs and tons), and the calculation of the incentive based on tonnage as points of confusion for customers installing heat pumps. One contractor described an issue with part number inconsistencies between suppliers and manufacturers further complicating rebate eligibility verification. The 2024 transition to a new processing company also introduced temporary issues, including delays and increased rebate denials, though conditions have since improved. Maintaining paper applications was noted as important for accessibility, especially for older customers. Recommendation P-2 in Section 4.1.2 addresses these concerns.

Half of interviewed contractors reported no issues with customer service through the rebate pathway, while half described one or more challenges. Six contractors described support for the rebate process as generally easy or responsive, while six others reported challenges such as a need for repeated follow-up calls, difficulty reaching the right person, unclear handoffs between phone and email support, or delays and denials in getting rebate issues resolved. Two contractors also noted that they would like to see more savings opportunities for propane- and oil-heated homes; however, this does not fit into the NHSaves model, in which incentive options for the electric program focus on electric savings and the natural gas programs specifically deliver incentives for gas saving measures.

4.3.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations

This section reviews the key findings and recommendations for the downstream rebate pathway from the prior (2018) evaluation of this program.[127] The evaluators found that the New Hampshire utilities have largely implemented the recommendations from that study. Table 61 shows the findings and recommendations that remain relevant for the ES Products Program in 2026.

Table 61: Prior ES Products Study Findings and Recommendations

Finding	Recommendation	Status
Communication and collaboration among utilities was effective and positive, and perceived by implementers as a key factor in the program's success	Continue to work together effectively and consider additional interaction with retailer and contractor partners	This strength has been maintained by the program.
Retailer and contractor partners play an important role in educating customers and driving program participation; they would be better equipped to succeed with more support from program representatives in the form of regular communications and training.	Consider working with implementation staff to establish connections with contractor partners and retail managers. For retailers, investigate the possibility of incorporating program education into store-wide training.	Some training and support are in place but some contractors said they want more linkages with training and partnerships.
Customers and vendors (retail and contractor) would appreciate a simpler and quicker rebate application process. Gaps in program offerings tend to confuse and frustrate customers and program partners.	Work with implementation staff to explore possible online rebate assistance and tracking tools to assist customers and improve the transparency of the rebate eligibility requirements and process.	Program staff make ongoing efforts to balance the need for verification and data collection with simplicity for customers and contractors. Online rebates are in place and successful, but rebate tracking is not.
Customers and vendors (retail and contractor) would appreciate a simpler and quicker rebate application process. Gaps in program offerings tend to confuse and frustrate customers and program partners.	Consider developing a rebate path for customers that is independent of contractor participation.	Customer self-install is an option through the program.

[127] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

Finding	Recommendation	Status
Notable differences exist between the ENERGY STAR Products Program offered in New Hampshire relative to similar programs offered in neighboring jurisdictions.	Consider offering early replacement versions of HVAC measure offerings, including central air conditioners, central ASHPs, and furnaces with ECMs. Consider including efficient shower fixtures as a program offering.	Early replacement is not in place and efficient shower fixtures are not offered in the program.
Over half of online survey participants reported that they removed or replaced working equipment to install the new equipment incentivized through the program.	Consider additional research to determine the rate at which program incented products are replacing working equipment as well as the age and efficiency of the equipment replaced.	Although early replacement was not a focus area for this study, the participant survey did collect limited data on early replacement for selected installed measures. For example, see Table 10598 and Table 10699.

4.4 MIDSTREAM PATHWAY

This section describes the current processes comprising the midstream pathway, satisfaction levels and barriers encountered by participants, contractor experiences with the pathway, and relevant findings and recommendations from evaluation of a peer program in the region.

4.4.1 Description

The midstream offering was introduced in 2023 as a second delivery pathway for HPWHs. All four utilities continue to offer HPWHs through the pathway, and Eversource added an ECM circulating pump offering in 2024. The midstream vendor provides participating distributors with qualified product lists, sales staff training, and performance feedback. Distributors mark down equipment prices for contractors, who are required to pass the savings on to customers. Utilities market the program directly to customers via postcards.

Incentives are advertised as instant rebates, with required invoice line items to ensure transparency and pass-through to contractors and customers. Distributors upload rebate data and supporting documentation to an online platform and receive a stipend to compensate them for their time. To prevent customers or contractors from receiving multiple rebates for the same unit (i.e., double-dipping), the downstream rebate processing vendor cross-checks midstream rebate data against downstream applications. However, interview data indicated that distributors do not regularly adhere to the 45-day requirement for reporting equipment sales, which undermines double-dipping prevention efforts.

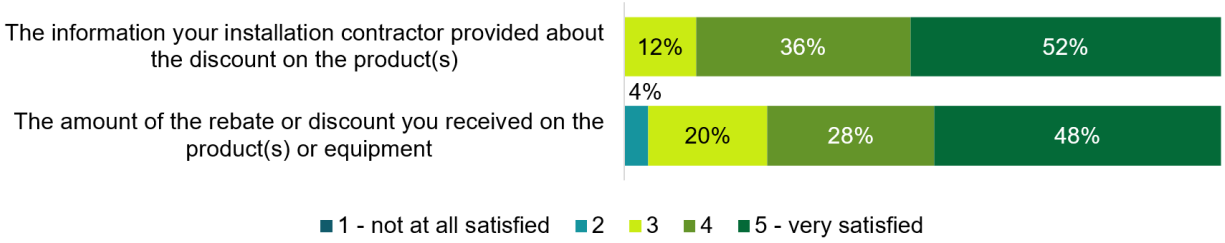
4.4.2 Midstream Pathway Participant Satisfaction and Barriers to Participation

Most participants reported being satisfied with the information provided by the installation contractor about the discount. When survey respondents rated their satisfaction on a scale of 1 to 5, where 1 indicates “not at all satisfied” and 5 indicates “very satisfied,” 88% of respondents who purchased their product through an installation contractor reported being satisfied (a rating

of 4 or 5) with the information provided about the product discount. Respondents were less satisfied with the rebate amount, with 78% reporting satisfaction with the rebate or discount they received (Figure 23).

Figure 23: Participant Satisfaction with Midstream Rebate Pathway

(Please tell us how satisfied you were with the following elements of your participation in the ENERGY STAR Products Program. Please use a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied."; Base: Respondents who reported they received rebate through an installation contractor; n=25)



4.4.3 Contractor Experiences with the Midstream Pathway

Six of the contractors we spoke with installed HPWHs and of these, three had experience with both the downstream and midstream pathways. These contractors reported finding the midstream pathway considerably easier to manage (relative to downstream rebates for the same equipment) because it involves less paperwork, coordination, and risk of rebate applications being rejected. However, one contractor opined that downstream rebates are more effective for motivating customers because they are more transparent. Another contractor said they had experienced issues with distributors not knowing how to manage the process. See Consideration P-8 in Section 4.1.2.

4.4.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations

The prior evaluation of the ES Products Program did not include a midstream assessment because the pathway was not in place at the time of that study (2018).[128]

The evaluators identified one recent residential midstream process evaluation from the Northeast. [129] This study of Connecticut's midstream HPWH offering found that the program was running well overall. The two key findings and their accompanying recommendations were

1. Contractors would like more engagement with the program

[128] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

[129]West Hill Energy and Computing. 2018. *CT HVAC and Water Heater Process and Impact Evaluation and CT Heat Pump Water Heater Impact Evaluation (R1614/R1613).* Available at: https://www.energizect.com/sites/default/files/R1614-1613_ResHVAC_Report_Final_8.29.18.pdf [130] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

   a. Recommended Program Action: Provide additional, targeted technical training for contractors
2. Contractors expressed concerns about finding replacement parts
   a. Recommended Program Action: Ensure distributors are stocking replacement parts

Of these two key findings, Finding 1 was echoed by installation contractors of the NHSaves ES Products Program whereas nothing related to Finding 2 emerged. Contractors expressed a desire for more direct engagement and support.

4.5 Online Marketplace Pathway

This section describes the current processes comprising the online marketplace pathway, satisfaction levels, and barriers encountered by participants.

4.5.1 Online Marketplace Pathway Description

The NHSaves online marketplace allows customers to purchase thermostats, dehumidifiers, air purifiers, room air conditioners, advanced power strips, and other products at discounted prices. The marketplace currently offers 19 models of Wi-Fi thermostat and four models of learning thermostat, with several new models added in 2026. Customers can purchase the equipment from https://www.poweredbyefi.org/nhsaves/ after validating their utility account. Utilities market the program to customers via the NHSaves website, email campaigns, flyers, and social media. There are seasonal promotions and manufacturer discounts are leveraged to promote participation. The online marketplace vendor provides utilities with a dashboard for tracking sales and rebate data, which the utilities review for accuracy.

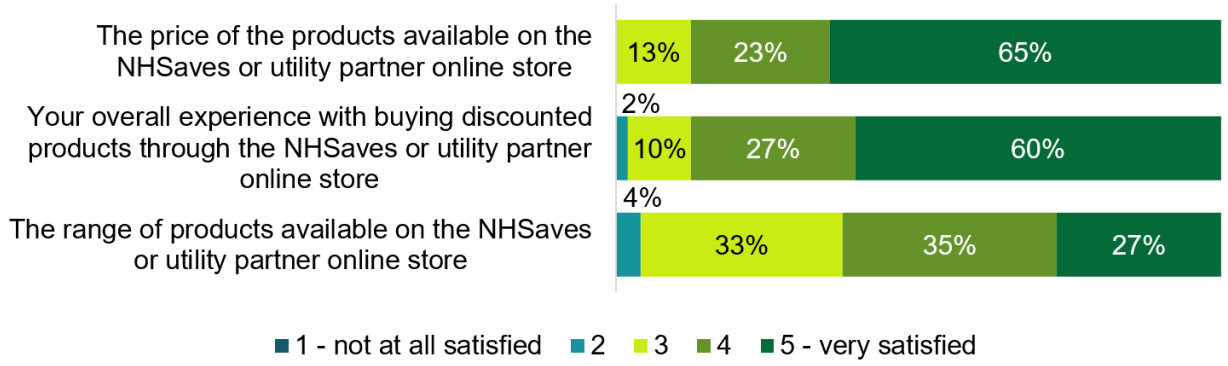
4.5.2 Participant Satisfaction with the Online Marketplace Pathway

Nearly nine in ten participants who purchased a gas Wi-Fi thermostat through the online marketplace reported being satisfied with both their overall purchasing experience and the prices offered. When respondents rated their satisfaction on a scale of 1 to 5, where 1 indicates "not at all satisfied" and 5 indicates "very satisfied," 88% reported being satisfied (a rating of 4 or 5) with their overall purchasing experience and 87% with the prices of products offered through the NHSaves or utility partner online store (Figure 24).

Respondents expressed lower satisfaction with the range of products available. About two-thirds (63%) indicated they were satisfied with the product range. Among those who were not satisfied, the most common concern was a limited selection, cited by 14 out of 17 respondents. Other reasons include prices not being low enough (one), lack of appliances (one), and a lack of "smart" devices (one). Respondents with low satisfaction with the overall experience cited limited product selection (two), concerns about product quality (one), and lack of Wi-Fi thermostats for new homes (one). Among those dissatisfied with product pricing, most (four of five) said prices were too high or not competitive.

Figure 24: Participant Satisfaction with Online Marketplace Pathway – Gas Wi-Fi Thermostats

(Please tell us how satisfied you were with the following elements of your participation in the ENERGY STAR Products Program. Please use a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied."; Base: Respondents who reported purchasing a Wi-Fi thermostat(s) through the Online Marketplace; n=48)



4.5.3 Barriers to Participating in the Online Marketplace Pathway

Program staff reported that delays in sending updated customer eligibility files between utilities and the online marketplace vendor can pose a barrier to new customers of the utility attempting to validate their accounts online soon after moving into a new home.

4.5.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations

The previous New Hampshire ES Products evaluation did not include any findings or recommendations related to the online marketplace pathway. At the time of that study, the program had moved away from offering products through an online catalog to focus instead on lighting markdowns.[130]

The evaluators identified no recent process evaluations for similar peer programs in the region.

4.6 In-Store Instant Rebate Pathway

This section describes the current processes comprising the in-store instant rebate pathway, satisfaction levels, and barriers encountered by participants.

4.6.1 In-Store Instant Rebate Pathway Description

The in-store instant rebate pathway provides customers with point-of-purchase discounts at participating retailers for dehumidifiers, room air conditioners, air purifiers, and HPWHs. Customers must first validate their utility account through an online instant rebate portal and

[130] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

obtain a bar code to present at the register in-store, or a discount code to apply to their cart if purchasing online. Eversource, the only utility currently offering this pathway to its customers, markets it with in-store materials, social media, and emails.[131] The downstream rebate vendor manages the instant rebate portal, and the field vendor provides training to store associates.

NHEC, Liberty, and Unitil discontinued the in-store instant rebate pathway due to low performance relative to costs but would like to reinstate it if feasible.

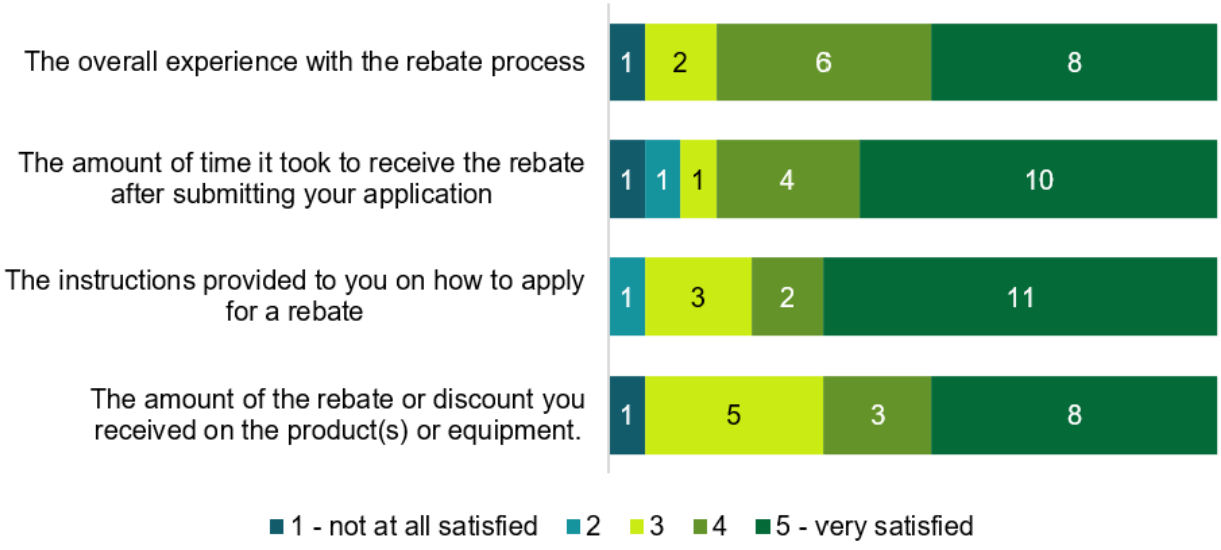
4.6.2 Participant Satisfaction with the In-Store Rebate Pathway

Most participants who reported purchasing a product with an in-store rebate said they were satisfied with both their overall rebate experience and the time to receive the rebate. When the 17 respondents rated their satisfaction on a scale of 1 to 5, where 1 indicates "not at all satisfied" and 5 indicates "very satisfied," 14 (82%) reported being satisfied (a rating of 4 or 5) with their overall rebate experience, 14 (82%) were satisfied with the time it took to receive the rebate, 13 (76%) were satisfied with the instructions for applying for a rebate, and 11 (69%) were satisfied with the amount of the rebate (Figure 25).

Two respondents reported that they were dissatisfied with the rebate application instructions because they encountered difficulty getting the retailer to accept in-store rebates due to confusing or conflicting information on the rebate form.

Figure 25: Participant Satisfaction with In-Store Rebate – Heat Pump Water Heater

(Please tell us how satisfied you were with the following elements of your participation in the ENERGY STAR Products Program. Please use a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied."; Base: Respondents who reported purchasing a heat pump water heater with an in-store rebate; n=17)



[131] This pathway launched in mid-2021 and was discontinued by Unitil, Liberty, and NHEC in early 2025.

4.6.3 Barriers to Participation in the In-Store Rebate Pathway

Program staff and vendors reported that the requirement for customers to provide their utility account numbers to receive the bar code is a barrier, particularly for in-store shoppers who do not have their account number with them. Staff reported that customers sometimes encounter technical issues with the account lookup tool and that some store associates choose not to promote the instant rebates due to these complications.

4.6.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations

The previous evaluation of the program did not include any key findings or recommendations related to in-store instant rebate processes. Additionally, the evaluators identified no recent process evaluation results for a similar peer program.

4.7 Appliance Recycling Pathway

This section describes the current processes comprising the appliance recycling pathway, participant satisfaction levels and barriers encountered, updates on the findings and recommendations from the prior evaluation of the program, and discussion of a relevant recommendation from an evaluation of a peer program.

4.7.1 Appliance Recycling Pathway Description

The appliance recycling pathway provides customers with the opportunity to recycle old, working appliances including refrigerators, freezers, room air conditioners, and dehumidifiers. Customers can schedule free pick-up of a refrigerator or freezer via an online form, phone, or email. They may also recycle a dehumidifier or air conditioner in combination with a refrigerator or freezer pick-up. Turn-in events provide customers with another way to recycle dehumidifiers and room air conditioners. Customers can complete an online rebate form in advance of the event or submit a mail-in rebate form after dropping off the appliance. The utilities market the appliance recycling pathway through flyers, emails, and retail staff word of mouth. Customers receive rebate checks six to eight weeks after applying for them.

The vendor that manages at-home pickups handles customer scheduling, contractor coordination, rebate processing, and monthly data uploads to utilities. Contractors record appliance data on paper during pickups, then input it electronically. The vendor consolidates this data into a master spreadsheet and performs data quality checks before manually uploading the data to each utility.

Turn-in events are primarily drive-up events held typically at Home Depot and Lowe's parking lots. The vendor that manages turn-in events regularly visits retail stores to educate store associates and distribute marketing materials.

4.7.2 Participant Satisfaction with the Recycling Pathway

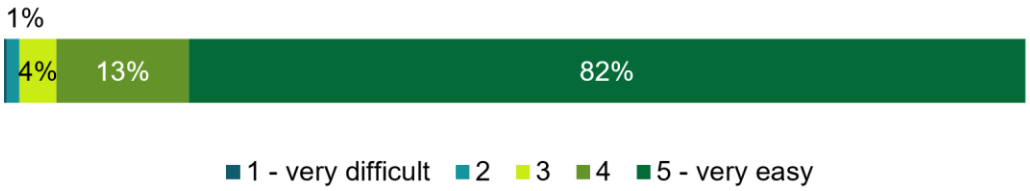
Nearly all participants said they would recommend the appliance recycling offering to a friend. When respondents rated their satisfaction on a scale of 0 to 10, where 0 indicates "extremely unlikely" and 10 indicates "extremely likely," nearly all respondents (98%) said they

would recommend the program to a friend (a rating of 9 or 10). Respondents most often cited proper recycling of the appliance (40%) and the rebate (33%) as their reasons for recommending the program, followed by environmental benefits (31%), free appliance removal (31%), and ease of participation (28%).

Most participants said that it was easy to participate in the appliance recycling offering. When respondents rated the ease of participating in the program on a scale of 1 to 5, where 1 indicates "very difficult" and 5 indicates "very easy," 95% said the program was easy to participate in (a rating of 4 or 5) (Figure 26).

Figure 26: Ease of Participating in the Program

(Using a scale of 1 to 5, where 1 is "very difficult" and 5 is "very easy," how easy was it to participate in the NHSaves Appliance Recycling Program?; n=332)



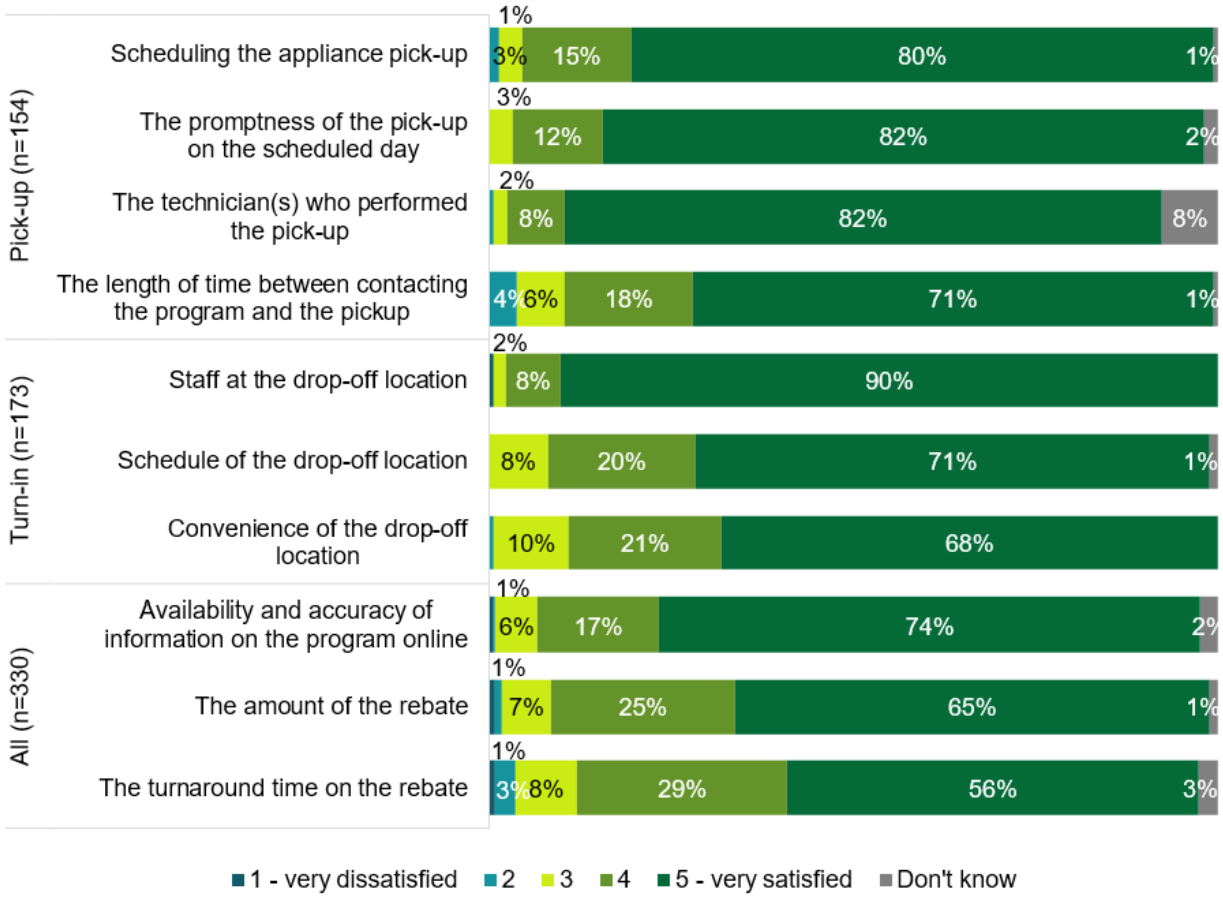
More than nine out of ten appliance recycling participants reported being satisfied with the process. When respondents rated their satisfaction on a scale of 1 to 5, where 1 indicates "not at all satisfied" and 5 indicates "very satisfied," 95% of those who scheduled a refrigerator and/or freezer pickup said they were satisfied (a rating of 4 or 5) with both scheduling and the promptness of the pick-up on the scheduled day. In addition, 90% said they were satisfied with the technician who performed the pick-up, and 89% were satisfied with the time between initial contact and pick-up (Figure 27). On average, respondents reported waiting 13.1 days between initial contact and pickup.

Among respondents who attended a turn-in event for dehumidifiers and/or room air conditioners, nearly all (98%) were satisfied with the staff at the drop-off location. Slightly fewer respondents expressed satisfaction with the convenience of the drop-off location (89%).

Overall, about nine in ten respondents expressed satisfaction with the program's online information (91%) and the rebate amount (90%). Among those who were less satisfied with the rebate amount, a few cited issues with receiving the expected value, including four who felt the rebate was too low for a working refrigerator/freezer and two who said they never received a rebate. Satisfaction was lowest for the time it took to receive the rebate, though a majority (85%) still reported being satisfied; respondents who were less satisfied with rebate timing reported waiting an average of 6.5 months to receive their rebate.

Figure 27: Participant Satisfaction

(Using a scale of 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied", please tell us how satisfied you were with the following aspects of the program:)



4.7.3 Barriers to Participating in the Recycling Pathway

Program and vendor staff identified minor barriers to participation in the recycling pathway:

- Customers that do not have a means of driving themselves to turn-in events are unable to participate. These customers can have their item picked up from their home if they are also recycling a refrigerator or freezer.
- Rural communities tend to have longer lead times in scheduling because of the logistics of remote pick-ups. The wait time may deter some people from participating. Due to these constraints, it is important that the program clearly communicate expectations for pick-up timing.
- The requirement that appliances be in working condition can be confusing or frustrating for some customers.

4.7.4 Update on Recommendations from the Previous Program Evaluation and Comparison to Peer Program Evaluations

At the time of the previous evaluation[132] of the NH ES Products Program, the appliance recycling component was well-established with solid demand for its services. That study found the following points regarding the recycling offering:

- The New Hampshire program was the only one in the region to offer room air conditioner recycling, which remains the case today.
- There was potential for the program to expand into additional product recycling options, such as dehumidifiers. The utilities have since implemented that measure.
- The appliance recycling contractor identified remoteness and weather as the primary challenges faced by the program; these continue to complicate delivery today.

The Connecticut R2120 Appliance Recycling Incentives memo[133] included a recommendation to incorporate special recycling offers at higher incentive levels to drive participation and limit FR. The New Hampshire ES Products Program offers a relatively robust incentive for recycling measures and periodically uses special offers, consistent with this recommendation.

[132] Cadmus, "New Hampshire ENERGY STAR® Products Program 2016 EVALUATION REPORT," prepared for New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018, https://www.energy.nh.gov/sites/g/files/ehbemt551/files/inline-documents/sonh/9-nh-energy-star-products-prog-2016-eval-report.pdf.

[133] NMR. 2021. *Appliance Recycling Incentives Research (R2120).* https://www.energizect.com/sites/default/files/documents/R2120-Appliance.Recycling.Incentives-Research.Memo_FINAL_26OCT2021.pdf

Appendix A Detailed Methodology

This appendix includes methodological details for the two participant surveys administered as part of this study.

A.1 Installed Measures Survey

This section details the methodology of the Installed Measures Survey, including survey sample frame development, sampling and recruiting, and achieved targets and precision. The following subsection presents the methodology for A.1.1 Net-to-Gross Analysis and A.1.2 In-Service Rates.

Survey sample frame development: To develop the sample frame for the installed measures survey, the study team obtained program tracking data from the utilities for customers who installed measures through the ES Products Program in 2022 through 2024.[134] The dataset included participant names, physical addresses, measures installed through the program, year of participation, and contact information fields. However, the tracking data did not contain phone numbers or email addresses for all participating customers.

The tracking data from the four utilities reflected inconsistencies in variable and measure naming conventions. Therefore, we standardized the variables of interest across utility datasets to enable consolidation into a single analytical file. The dataset was cleaned to only include measures relevant to the study and restructured from equipment level records to one record per customer to support sampling. Dummy variables were created to identify whether each customer received each measure, allowing the team to characterize measure combinations and restrict the sampling frame to single-installation customers (i.e., customers who installed only one measure through the program). This restriction was applied to reduce respondent confusion and ensure that survey questions clearly referred to a single, identifiable product installation. The measures most impacted by this design were heating systems (including ductless mini-split ASHPs) and Wi-Fi thermostats, likely reflecting a tendency for customers installing a heating system to replace their thermostat at the same time. Overall, 7% of unique participants were excluded from the survey because they installed more than one measure. Table 62 shows the quantities of measures excluded by measure type. Attrition due to lack of contact information ranged from approximately 5% to 15%, depending on the measure, with no apparent systematic bias.

For select measures with smaller participant counts, the study team conducted a census outreach, attempting to contact all eligible customers who installed those measures through the program. For the remaining measures, the sample was stratified by measure to ensure proportional representation, and post stratification weights were applied for survey analysis.

Sampling and Recruiting: The sample for the installed measures survey comprised 6,412 randomly selected customers with valid mailing or e-mail addresses out of a sample frame of 11,780 unique single-installation participants, as shown in Table 62 and Table 63. The study team recruited survey respondents via postcards and email messages sent to customers with available

[134] The evaluators and EM&V Working Group decided to survey 2023 and 2024 participants to gather the most recent possible feedback and incorporated 2022 participants only where needed to bolster the sample size.

email addresses. The study team conducted the survey in three waves in March and April 2026, reaching 5,096 participants in the first wave, 1,077 in the second wave, 239 in the third wave. We offered a $25 e-gift card as an incentive for completing the survey. The team sent out follow-up reminder postcards to customers in Wave 1, as well as reminder emails to any unfinished respondents who were still eligible for the survey at the time. Respondents were screened out of the survey if the target had already been reached for the measure they installed. As a final outreach effort to reach the target for furnace and boiler customers, the study team called available phone numbers for 78 participants.

Achieved Targets and Precision: Through postcard, email, and phone outreach, we met targets for all products except gas integrated water heaters. Overall, we achieved 511 completes, falling 14 short of the target of 525 (see Table 63). This resulted in a 9.5% response rate. We designed the survey to meet a precision target of 90/10 and achieved this target for each individual product category except gas integrated water heaters, with an overall absolute precision of 4.7%.

Table 62: Installed Measures Participant Counts

Product	Total Population of Participants[1]	Single-Installation Participant Population	Single-Installation Participants with Valid Email and/or Address
Central ASHP	644	641	580
Ductless mini-split ASHP	6,984	4,986	4,709
Gas furnaces and boilers	1,502	1,032	903
HPWH	1,357	1,318	1,136
Pool pumps	815	803	768
Room air purifier	2,623	2,056	1,925
Gas Wi-Fi thermostat	2,696	1,328	1,193
Gas integrated water heater	671	663	566
Total	**17,292**	**12,827**	**11,780**

Table 63: Installed Measures Target Survey Completes

Product	Sample	Target Completes	Final Completes	Sampling Error 90% (Absolute Precision)
Central ASHP	580	70	70	9.3%
Ductless mini-split ASHP	1,102	70	70	9.8%
Gas furnaces and boilers	903	65	66	9.9%
HPWH	650	65	67	9.9%
Pool pumps	768	65	66	9.8%

Product	Sample	Target Completes	Final Completes	Sampling Error 90% (Absolute Precision)
Room air purifier	650	65	69	9.4%
Gas Wi-Fi thermostat	1,193	65	66	10.0%
Gas integrated water heater	566	60	37	13.5%
Total	**6,412**	**525**	**511**	**4.7%**

Program Pathway. The study analyzes process results by program and pathway. The installed measure survey asked respondents where they purchased the program product, whether they recalled receiving a rebate or discount, and the type of rebate or discount received. Because program pathway information is self-reported, results may be subject to respondent recall or reporting error. Table 64 presents the number of respondents by product and the self-reported program pathway through which they participated. Downstream participation was the most common program pathway, representing 76% of participants.

Table 64: Self-Reported Program Participation Pathways by Product Type [1]

Product	Number of Respondents	Downstream	Midstream	Online Market Place	In-store rebate
Central ASHP	70	94%	0%	--	--
Ductless mini-split ASHPs	70	94%	6%	--	--
Natural gas furnace or boiler	66	89%	11%	--	--
Heat pump water heater	67	72%	3%	--	25%
Natural gas integrated water heaters	37	89%	11%	--	--
Gas Wi-Fi thermostats	66	21%	6%	73%	--
Pathway total	**376**	**286**	**21**	**48**	**17**

[1] Responses were reviewed and recoded, where necessary, to align with product-specific program pathways. Product pathway classifications are based on respondent self-report and may be subject to recall error.

A.1.1 Net-to-Gross Analysis

The study team applied the Massachusetts Residential Self-Report Net-to-Gross[135] methodology to calculate participant FR, SO, and resulting NTG ratios by product. The estimation of the FR and SO scores departs from the Massachusetts methodology in two ways. First, scores are based on a labeled affective magnitude (LAM) scale. Second, rather than assigning a value of 0.5 to "don't know" respondents, the analysis assigns the average value of observed responses.

Free-ridership. To calculate the FR score for each respondent, we applied the established FR algorithm by taking the minimum of the timing, quantity, and efficiency response scores to derive the participant *intent* score. We then averaged the participant intent score with the *influence* score, which reflects the highest score reported for factors that influenced the participants' decision making, including the program, information provided by utility or NHSaves, marketing materials or information located at a retail store, and the recommendation of a salesperson or installation contractor, to get the individual FR values.

Spillover. To estimate SO, the study team applied the established SO algorithm. The team calculated an *importance* score reflecting the role of the NHSaves program in the participant's decision to make an additional, non-incentivized purchase or upgrade, and a *likelihood* score reflecting how likely the participant would have made that purchase or upgrade without program participation. We combined these two scores using the following formula:

$$\boldsymbol{Spillover\ score} = [\boldsymbol{Importance\ score} - (\mathbf{10} - \boldsymbol{Likelihood\ Score})]/\mathbf{2}$$

When the SO score is greater than 5, the study team classifies the purchase or upgrade as SO. To calculate percent SO, we divided the savings associated with the purchase or upgrade by the savings associated with the product that the participant installed through the ES Products Program.

Weighting. The study team then calculated the average FR and SO as the weighted average of individual FR scores and percent SO, using measure level savings from the program tracking data as weights.

NTG Ratio. Using the calculated average FR and SO, we calculated product-level NTG ratios using the following formula:

$$\boldsymbol{Net - to - gross\ ratio} = \mathbf{1} - \boldsymbol{Participant\ Free - ridership} + \boldsymbol{Participant\ Spillover}$$

A.1.2 In-Service Rates

The study team applied the methodology used in Connecticut to calculate ISR by product.[136] The survey asked respondents to report the number of products that were currently installed, installed but removed, or never installed.

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[135] Massachusetts Energy Efficiency Advisory Council. *Residential Self-Reported Net-to-Gross Methodology Update and Sensitivity Analysis (MA21X22-B-RSRNTGUP)*. Boston: Massachusetts Energy Efficiency Advisory Council, May 24, 2022. https://ma-eeac.org/wp-content/uploads/MA21X22-B-RSRNTGUP_Res-SR-NTG-Method-Update_Final-Report_2022.05.24.pdf.

[136] Energize Connecticut. *Final Report: R2218+ Residential Program High-Efficiency Systems (HES) and HES-Integrated Energy (HES-IE) Non-Market Research*. Hartford, CT: Energize Connecticut, November 25, 2025. https://www.energizect.com/sites/default/files/documents/2025-11-25_Final%20Report_R2218%2B_Res_Pro_HES%2CHES-IE_NMR.docx.

For each product, the ISR is calculated using the following formula:

$$In - service\ Rate = \frac{Remain\ installed}{(Remain\ installed + Removed + Never\ installed)}$$

For installations where respondents indicated that the product had been removed but also reported seasonal or as-needed use (such as air purifiers and pool pumps), we recategorized these cases as "remain installed."

A.2 RECYCLING MEASURES SURVEY

This section details the methodology of the Recycling Measures Survey, including survey sample frame development, sampling and recruiting, and achieved targets and precision. Section A.2.1 presents the methodology for gross and net savings analysis.

Survey sample frame development: To develop the sample frame for the Recycling Measures survey, the study team obtained program tracking data from the utilities for customers who participated in the program. The dataset included participant names, physical addresses, measures recycled through the program, year of participation, pick-up or drop off status, number of units recycled, and contact information fields including email addresses. The team cleaned the data to include only recycling measures with sufficient data for the purpose of surveying and restructured the dataset from measure-level records to one record per customer to support sampling.

We asked customers about just one measure, even if they recycled multiple measure types through the program. If a customer had more than one record in the original dataset (i.e., the customer recycled multiple measure types), the study team used a prioritization procedure to determine the measure of interest for each customer: We first created columns of dummy variables to track each measure a customer recycled, then assigned the survey measure of interest in order of priority. (Due to their limited population size, we first prioritized surveying customers about freezers, followed by refrigerators, and then dehumidifiers and room air conditioners.) For freezers, the study team conducted a census outreach, attempting to contact all eligible customers. For the remaining measures, we stratified the sample by measure to ensure proportional representation and applied post-stratification weights for survey analysis.

Sampling and Recruiting: The sample for the recycling survey comprised 2,205 randomly selected customers from the four product strata (refrigerators, freezers, room air conditioners, and dehumidifiers) with valid email addresses out of a sample frame of 3,294 unique participants, as shown in Table 65. The study team conducted the survey in a single wave between December 2025 and January 2026. We offered a $25 e-gift card as an incentive for completing the survey. We also sent reminders to specific strata where we were falling short on reaching the target.

Achieved Targets and Precision: The initial overall target for the study was 300 completed surveys. Outreach exceeded product-specific targets for dehumidifiers and room air conditioners by 19 and 18 completes, respectively, while targets for freezers and refrigerators were not fully met, falling short by seven and two completes respectively (see Table 65). Overall, this resulted in 328 valid completes and a 15% response rate. We designed the survey to meet an overall

precision target of 90/10 and achieved this target for each individual product category, with an overall absolute precision of 5%.

Table 65: Recycling Participant Counts and Target Survey Completes by Measure

Product	Population	Participants with Valid Emails	Sample	Target Completes	Final Completes	Sampling Error 90% (Absolute Precision)
Air conditioner	2,951	1,318	667	70	89	8.6%
Dehumidifier	1,915	1,054	633	65	83	8.9%
Freezer	294	170	170	65	58	9.8%
Refrigerator	1,420	752	735	100	98	8.1%
Total	**6,580**	**3,294**	**2,205**	**300**	**328**	**5.0%**

A.2.1 Gross and Net Savings Analysis

NMR calculated gross and net savings of recycling measures using a combination of data sources (Table 66). The analysis followed guidance and algorithms developed for the Uniform Methods Project (UMP) for refrigerator and freezer recycling,[137] using inputs from the program tracking database, literature review, and the participant survey. NMR derived gross savings estimates for dehumidifiers and room air conditioners through a literature review and adapted the UMP protocol to calculate net savings for dehumidifiers and room air conditioners.

Program data: Program data provided by the utilities for refrigerators and freezers yielded data on appliance age in years, appliance size in cubic feet, and the percentage of refrigerators and freezers manufactured before 1990. The program data did not include the variables needed to estimate savings for recycled dehumidifiers and room air conditioners.

Survey data: Survey data provided information on whether a recycled refrigerator had been a primary or secondary unit in the home, how often participants used the appliances during the year prior to recycling, and whether refrigerator and freezers were installed in conditioned spaces in the summer and winter. NTG calculations utilized survey responses regarding what the participant would have done with the appliance in the absence of the program.

Weather data: The NTG ratio also included two updated interaction effects that incorporated Heating Degree Days (HDDs) and Cooling Degree Days (CDDs) multiplied by the proportion of refrigerators or freezers located in a conditioned space in winter and summer, respectively. We updated HDDs and CDDs with new Typical Meteorological Year, extended (TMYx) weather data[138] by weighting based on climate region and total population for that climate region using census data from Berlin, Concord, and Nashua.

[137] Bruchs, D. and J. Keeling. 2018. "Chapter 7: Refrigerator Recycling Evaluation Protocol. "The *Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures.* National Renewable Energy Lab. Available at https://www.energy.gov/documents/53827-7pdf-1.
[138] One Building. *Climate.OneBuilding.org*. Accessed February 25, 2026. https://climate.onebuilding.org/.

ENERGY STAR Appliance Savings Calculator: Although no longer available on the ENERGY STAR website, NMR has retained a copy of the ENERGY STAR appliances savings calculator. While the calculator was last updated by ENERGY STAR in 2016, both the current federal standard and the ENERGY STAR specifications for refrigerators and freezers have been in place since 2014. Therefore, the savings estimates from the calculator reflect current conditions.[139]

Residential Energy Consumption Survey (RECS): NMR used the RECS surveys from 2005, 2009, 2015, and 2020[140] to estimate the percentage of primary refrigerators with through-the-door ice.

ENERGY STAR Shipment Data: NMR used the 2023 ENERGY STAR shipment reports[141] for estimating the proportion of appliances currently sold that are ENERGY STAR qualified. This information is used to calculate the average energy use of a new appliance, a key component of the NTG algorithm.

Literature Review: NMR conducted a literature review to determine proportions of single door configuration and side-by-side door configuration for refrigerators. The literature review also served as the primary source of gross savings for dehumidifiers and room air conditioners, as described in the next section.

Peer TRM Review: NMR also examined peer TRMs to gain insights into the gross savings for dehumidifiers and room air conditioners. For room air conditioners, NMR leveraged an engineering algorithm from the 2026 Pennsylvania TRM[142] to develop an updated UEC value. The program data did not include necessary information on size and capacity to calculate the UEC for these measures. While the participant survey included questions about some characteristics and prior usage of recycled units, the study did not ask respondents about size and capacity, characteristics prior owners are unlikely to know.

[139] New federal standards for both products were approved in 2024 with implementation dates in 2029 and 2030.
[140] Department of Energy, Energy Information Administration. Various. *Residential Energy Consumption Survey.* https://www.eia.gov/consumption/residential/.
[141] Environmental Protection Agency. 2026. *Unit Shipment and Sales Data Archives.* Accessed June 2, 2026. https://www.energystar.gov/partner-resources/products_partner_resources/brand-owner/unit-shipment-data/archives. These data have not been updated since 2023.
[142] Pennsylvania Public Utility Commission, Annual Report on Act 129 Energy Efficiency and Conservation Program (Harrisburg, PA: Pennsylvania Public Utility Commission, 2024). https://www.puc.pa.gov/pcdocs/1848563.pdf.

Table 66: Recycling Savings Data Sources

Algorithm Inputs	Savings Type	Data Source
UMP Regression Inputs – Refrigerators (RF) and Freezers (FZ)		
Appliance Age	Gross	Program Tracking
Manufactured before 1990	Gross	Program Tracking
Appliance Size	Gross	Program Tracking / Literature
Door Configuration	Gross	Literature Review (refrigerators)
Chest/Upright Configuration	Gross	Program Tracking (freezers)
Primary / Secondary (Refrigerator Only)	Gross	Participant Survey (full time use in kitchen)
Location in unconditioned Space	Gross	Participant Survey
Cooling and Heating Degree Days	Gross	Weather Data (TMYx)
Gross Savings – Dehumidifiers (DH) and Room Air Conditioners (RAC)		
UEC	Gross	Literature and TRM Review
Post Adjustments Following UMP Guidance – All Recycled Appliance Types		
PUF	Adjusted Gross	Participant Survey
NTG Ratio	Net	Participant Survey and Literature Review

Free-Ridership: NMR followed the free rider scheme discussed in the Massachusetts Appliance Recycling Net Savings Update.[143] The study explored three free rider scenarios:

- The household would have kept the unit or given it directly to a close acquaintance (signifies not a free rider)
- The unit would have been transferred directly or indirectly to another customer (other than a close acquaintance) for continued use (case-by-case or partial free rider)
- The unit would have been discarded by a method that would lead to its permanent removal from service (signifies FR)

For participants who said that, without the program, they would have sold or given the unit to an appliance retailer (typically upon delivery of a new unit), NMR followed an algorithm previously used in Massachusetts.[144] In this algorithm, for those participants who said they would have sold or given the unit away directly (e.g., through online classified ads or to a friend) and those who would have provided units with useful remaining life to retailers, we assigned full savings to one-half of the units and full FR to one-quarter of the units. We assigned the remaining quarter of the units the difference in savings (delta kWh) between the original unit and an average newly manufactured model. The inclusion of this delta kWh (treated as partial FR) reflects the possibility

[143] NMR. 2021. *Appliance Recycling Net Savings Update (MA20X03-E-ARNTG).* Available at https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf.
[144] NMR. 2021. *Appliance Recycling Net Savings Update (MA20X03-E-ARNTG).* Available at https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf.

that the removal of the recycled unit from the secondary appliance market forces a shopper to buy a newly manufactured unit instead.

The estimate of the energy usage for an average newly manufactured model differed across appliances. The ideal calculation involves determining the usage of a new unit with similar characteristics as the recycled unit (e.g., capacity, configuration, etc.). However, the program tracking data only provided this information for freezers. Therefore, the evaluators relied on the literature and TRM reviews to update new unit savings for refrigerators, dehumidifiers, and room air conditioners but calculated new usage for freezers.

Refrigerators: The program tracking data did not list the door configuration or the presence of through-the-door ice for refrigerators recycled through the program. The evaluators also concluded that the capacity data (in cubic feet) were inflated (see Section 3.11.2.1). Therefore, the evaluators used the distribution of door configurations from the 2021 Massachusetts study[145] and obtained the percentage of through-the-door ice from RECS 2005, 2009, 2015, and 2020. NMR applied the most recent estimate of the portion of refrigerators sold that are ENERGY STAR qualified. The evaluators then calculated a weighted average of usage of a newly manufactured refrigerator based on the combination of all these characteristics.

Freezers: The program tracking data included data on upright and chest configuration for freezers but lacked information on manual or automatic defrost. Like refrigerators, the evaluators also believed that the freezer capacity data (in cubic feet) were inflated (see Section 3.12.2.1). Therefore, NMR used the size and defrost-type distribution from the 2021 Massachusetts study[146] and the chest and upright distributions from the program tracking data in the calculation of new freezer energy use. NMR applied the proportion of units that are ENERGY STAR qualified per ENERGY STAR shipment data. The evaluators then calculated a weighted average of usage of a newly manufactured freezer based on the combination of all these characteristics.

Dehumidifiers: The program tracking data did not contain any information on capacity or configuration for dehumidifiers. Therefore, the evaluators used the new unit usage estimate from the 2021 Massachusetts study.[147]

Room Air Conditioners: The evaluation team calculated new room air conditioner UEC based on an algorithm listed in the Pennsylvania TRM.[148] Because the federal standard changed on May 26, 2026, NMR calculated a retrospective new unit usage using the prior federal standard and ENERGY STAR criteria and a prospective new unit usage based on the new federal standard, which is equivalent to the current ENERGY STAR criteria. NMR details the calculation in the attached workbook titled *NH ES Products Impact Calcs 15May26.xlsx*.

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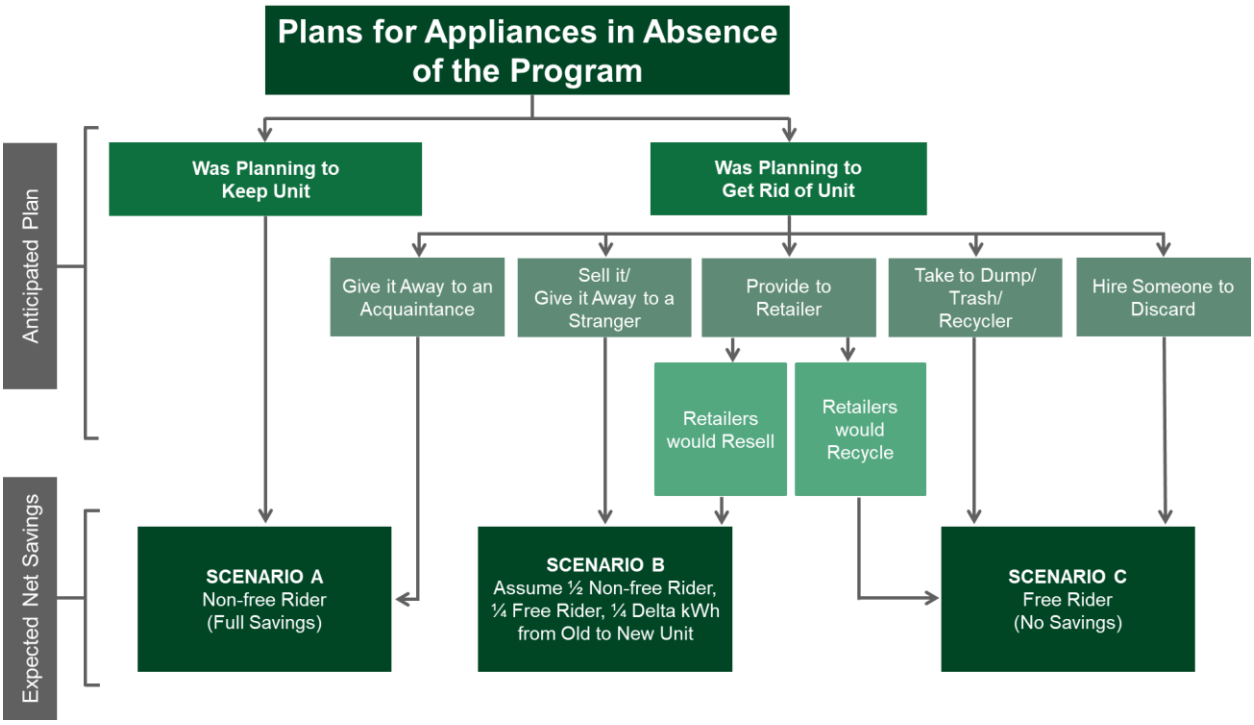
[145] NMR. 2021. *Appliance Recycling Net Savings Update (MA20X03-E-ARNTG).* Available at https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf.
[146] NMR. 2021. *Appliance Recycling Net Savings Update (MA20X03-E-ARNTG).* Available at https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf.
[147] NMR. 2021. *Appliance Recycling Net Savings Update (MA20X03-E-ARNTG).* Available at https://ma-eeac.org/wp-content/uploads/MA-20X03-E-Appliance-Recycling-NTGReport_FINAL_2021.07.23-clean.pdf.
[148] September 2024, Pennsylvania Public Utilities Commission, *State of Pennsylvania Technical Reference Manual, Vol.2: Residential Measures*, https://www.puc.pa.gov/pcdocs/1848563.pdf

After determining the FR status of each participant, we assigned the percentage of free rider, non-free rider, and partial free riders according to the scheme in Table 67 and Figure 28 and calculated the weighted average net savings. We divided the net savings by the adjusted gross savings to obtain the NTG ratio.

Table 67: Recycling Measure Free-Ridership Scoring Scheme

Self-reported Disposition in the Absence of the Program	Decision	Credited Proportion of Adjusted Gross Savings
Kept by the household	Not a free rider	100%
Given away for free to an acquaintance	Not a free rider	100%
Sold/given to charity, classified ads, internet, etc.	Assigned via algorithm	0% to 50%
Provided to retailer (new or used) or	If older than 10 years (8 years for dehumidifier), free rider	0%
	If 10 years (8 years for dehumidifier) or younger, see algorithm	0% to 50%
Surrendered to municipality / hired a hauler	Free rider	0%
Other dispositions	Treated on case-by-case basis per survey responses	Varies

Figure 28: Appliance Recycling Algorithm Flow Chart



Appendix B Interview Guides

B.1 Program Staff Interview Guide

This guide was used to interview utility implementation and vendor staff about the ES Products Program. Completed interviews are described in Table 68. All organizations targeted for interviews responded to the request and participated in an interview. Additionally, all interviewees responded to a later request for follow-up information via email.

Table 68: Completed Program Staff and Vendor Interviews

Organization/Program Role	Individuals Interviewed	Date
Liberty Program Manager	1	August 27, 2025
Unitil Program Manager	1	August 27, 2025
Eversource Program Managers	2	August 28, 2025
New Hampshire Electric Cooperative	1	October 2, 2025
Recycling Pick-Up Vendor	1	September 17, 2025
Recycling Drop-Off / In-Store Rebate / Field Marketing Vendor	2	September 18, 2025
Rebate Processing Vendor	1	September 22, 2025
Online Marketplace Vendor	1	September 24, 2025
Midstream Vendor	2	October 27, 2025

B.1.1 Introduction and Roles and Responsibilities

Thank you for taking the time to talk with us today. NMR Group is conducting impact and process evaluations for the ES Products Program on behalf of the NH EM&V Working Group. We appreciate you helping us understand the inner workings of the program and its successes and challenges. We also want to hear about changes you are considering for the program, and what you would like to learn from this evaluation.

We'd like to record this interview so we can refer back to it later. Is that okay with you? Nothing you share will be directly attributed to you or your company.

Do you have any questions for us before we begin?

1. First, can you tell us about your role with the program and how long have you been involved with it?
2. Who else works on this program with you, either internal to your company or at a vendor or other utilities? Is the program fully staffed at this time?
3. How do you communicate and collaborate with the wider group to manage the program? How are communication and collaboration working overall for managing the program?

B.1.2 Successes and Challenges

4. What has been going well with the program in the past two to three years? What are some recent successes?
5. What are the program's "official" goals? What are your unofficial goals for the program?
6. How has the program done against those official and unofficial goals in the past two to three years?
7. What are the main challenges faced by the program and by implementers such as yourself? [For example: Meeting goals, driving participation, maintaining cost-effectiveness]
8. What ideas do you have for addressing those challenges or resource constraints?
9. Do you have plans or ideas for big-picture changes to the program? If so, please explain.
10. Are there any measures for which you would change incentive levels upward or downward? Are there any measures you would add to the program or remove from the program?
11. Are there current issues with having sufficient resources for the program? [e.g., budget, internal staffing, vendor staffing, workforce, or training]
12. What are the potential impacts on the program if ENERGY STAR is discontinued by the federal government? Has the period of uncertainty already had any effects?
13. Have economic changes or uncertainty had any impacts on equipment costs or other program costs in the past year or two? [probe on inflation and tariffs] If so, has this had an impact on incentive effectiveness?
14. Next I have a few questions about your implementation practices for HPWHs and any customer or contractor feedback you have received. Specifically:
    a. What do you recommend for mixing valves and set temperatures?
    b. How often do you tend to recommend that customers size up to a larger model? [Probe: Do customers/contractors tend to choose the larger model when recommended? Have you considered offering an instant rebate for the larger model?]
    c. What feedback have you received from customers and/or contractors on smaller models (55 gallons or less) being able to meet hot water needs?

B.1.3 Customer Experience, Channels & Measures

Ask this set of questions for each of the following program channels:

A. Mail-in and online rebates
B. Midstream
C. Recycling pickup and events
D. Online marketplace

E. In-store instant rebates (Are these still offered? If not, what was the effect of discontinuing them?)

15. *[skip for vendors]* Who is the vendor?
16. *[for program staff]* How do you communicate with the vendor regarding program offerings and incentive levels? How often do you do that?* *[for vendors]* Is the program information you receive from the utilities sufficient, or would additional information be helpful? If the latter, what kind of additional information would you like to receive?
17. How is the channel marketed by your company and statewide? What benefits or features do you promote?* What have you found to be most and least effective?
18. What frequency do you use for educational outreach efforts? *[for channel E only]* If there is store-wide training, do you incorporate program education into it?*
19. How do customers typically become aware of the channel's offerings?
20. How do participants enroll or apply?
21. What are the most popular measures and why do you think that is?
22. *[for channel A only]* Are all of the rebates available online, or are some mail-in only? Why is that?*
23. *[for channel A only]* Is there an option to receive an incentive without using a contractor? Why is that?*
24. What does the channel do for customers? Are there changes you would like to make to better meet customers' needs?
25. What are the most common issues or questions that customers reach out about?
26. How are the participant's contact information and installed measure data tracked? For example, does the vendor maintain their own database or spreadsheet and upload an extract to Compass? Are there any gaps in data tracking or reporting?
27. What kind of QC is performed for projects through this channel?
28. What are the implementation or program design challenges associated with this pathway?
29. What are the barriers to participation? How does the channel try to overcome these barriers?
30. How has the channel evolved over time? What, if anything, has changed recently with the channel's design or implementation?
31. How do you try to target customers who would not have installed the measure without the incentive (that is, how do you try to avoid free-riders)?
32. Do you think there are certain types of customers that aren't being reached by this channel? If yes, who? What do you think the obstacles are?
33. What is the impact of the channel in terms of the percentage it contributes to overall savings? Does it have other less quantifiable benefits and if so, what are they?

34. *[skip for vendors]* What should we ask the vendor about when we interview them? Is there anyone specific we should speak with?

B.1.4 General Implementation Topics

35. *[skip for vendors]* At the overall program level, how does the program make customers aware of its offerings and engage with them? What have you found to be most effective? Least effective?
36. How well are communication and collaboration going among the program's team members? Is there anyone you would like to collaborate with more or add to the group?*
37. Do you have any additional ideas or plans for ways to help customers, such as additional energy-saving measure opportunities, ideas for simplification, or partnerships? Are you familiar with any related offerings in other states that would be a good addition for New Hampshire? Which of these ideas would you prioritize?
38. *[may need to ask different staff contact]* Have you considered offering early replacement versions of HVAC measure offerings, including central air conditioners, central heat pumps, and furnaces with ECMs?* Have you done research to look at the rate at which program-incented products are replacing working equipment as well as the age and efficiency of the equipment replaced?*

B.1.5 Conclusion

39. That is the end of my questions. Do you have anything you would like to add?

Thank you for your time. If anything else should come to mind, feel free to call or email!

* Questions followed by an asterisk correspond to a recommendation from the previous ES Products evaluation.

B.2 PARTICIPATING CONTRACTOR INTERVIEW GUIDE

The team used this guide to interview contractors about their experiences with the ENERGY STAR® (ES) Products Program with a focus on ASHPs, furnaces, boilers, and midstream HPWHs. Contractors were contacted in six waves, as detailed in Table 69. Recruitment was strong initially but became more challenging in late April and early May as contractors became busier. The response disposition is reported in Table 70.

Table 69: Contractor Interviews Outreach Details

Wave	Emails	Incentive	Completed Interviews	Details
1	112	$150	6	Initial email (3.26.26) and follow-up email (4.1.2026) from NMR
2	100	$150	0	Initial email (4.6.2026) and follow-up email (4.14.2026) from NMR
3	100	$150	2	Initial email (4.13.2026) and follow-up email (4.20.2026) from NMR
4	200	$150	3	Initial email (4.23.2026) and follow-up email (4.30.2026) from NMR
5	150	$200	1	Initial email from NMR (5.4.2026), follow-up email from utility
6	150	$200	3	Initial email (5.12.2026) and follow-up email (5.26.2026) from NMR

Table 70: Contractor Interview Responses

Group	Email Count
Interviewed	15
No response	723
Email bounce back	55
Interview canceled/no show	5
Opt-out	14
Not a contractor	1
Suggested alternative contact	1
Uncontacted[1]	1,299
Total	**2,113**

B.2.1 Introduction

Thank you for taking the time to talk with us today. I work for NMR Group, an independent research firm, and we are evaluating the NHSaves ENERGY STAR Products Program on behalf of the NHSaves utility partners. We appreciate you helping us learn about contractors'

experiences with installing heating, cooling, and water heating equipment through the program and the program's successes and challenges. Nothing you share will be directly linked to you or your company.

We'd like to record this interview so we can refer back to it later and check our notes. Is that okay with you?

Do you have any questions before we begin?

B.2.2 Role and Measures Installed

1. First, I'd like to make sure that you have installed efficient heating, cooling, and/or water heating equipment for customers that received a rebate through the NHSaves ENERGY STAR Products Program. Can you please confirm that?
2. Can you please tell me about your role and how long you have been with your company?
    a. What services and equipment types does your company offer?
3. How long have you been helping your customers install eligible equipment and receive rebates through the NHSaves ENERGY STAR Products Program?
4. I'm going to read a list of equipment types. Please let me know which ones you install for customers with a "yes" or "no." [Record Y or N]
    a. Ducted air source heat pumps
    b. Ductless air source heat pumps
    c. Heat pump water heaters
    d. Natural gas boilers
    e. Natural gas furnaces
    f. Other rebated measures (central AC, other water heater types, thermostats, appliances) [record response]
5. Generally speaking, about what percentage of the time do you recommend high-efficiency equipment that is eligible for a rebate through the program (instead of standard-efficiency equipment)?
    a. Why is that?

B.2.3 Heat Pumps

[skip section if contractor does not install heat pumps for heating or cooling]

Now I'd like to ask you some questions regarding heat pumps. Please think about **all** your customers, not only the ones that apply for a rebate through the NHSaves program.

6. For customers looking to install **heating** equipment, about what percentage specifically request a heat pump from the start?
    a. A furnace?
    b. A boiler?

7. For customers that start out asking for a heat pump for **heating**, about what percentage wind up installing a heat pump? [If <90%] Why do some customers wind up installing something other than a heat pump?
8. About what percentage of the time do you recommend a heat pump for **heating** if the customer did not request one? In what situations would you recommend a heat pump if the customer did not request one?
9. For customers looking to install **cooling** equipment, about what percentage specifically request a heat pump from the start? What percentage request a central air or other system type?
10. For customers that start out asking for a heat pump for **cooling**, about what percentage wind up installing a heat pump? [If <90%] Why do some customers wind up installing something other than a heat pump?
11. About what percentage of the time do you recommend a heat pump for **cooling** if the customer did not request one? Why is that?
12. Next I'm going to ask you to estimate the percentage of customers that are installing heat pumps for six different purposes. About what percentage of customers installing a heat pump would you say are looking to: [ask one at a time and record answer]
    a. Use it mostly for cooling?
    b. Use it to reduce or replace fossil fuel usage for heating? (Fossil fuels include natural gas, propane, fuel oil, kerosene, and coal.)
    c. Use it to reduce or replace wood usage for heating?
    d. Use it to reduce or replace electric resistance heat?
    e. Use it to reduce or replace an existing heat pump?
    f. Install the unit in a new construction or renovation/addition context?
13. What are the main reasons customers choose to install a heat pump system instead of a different heating and/or cooling system?
    a. Are the reasons different for customers that come to you asking for a heat pump versus customers that you recommend a heat pump to? [If yes] How are the reasons different?
14. For customers that are already interested in installing heat pumps, about what percentage would you say are aware of rebates available through NHSaves? Do you have a sense of how customers typically learn about the program? [If needed, prompt with (online, word of mouth, the news, mailers)]
15. What are the main reasons customers have for not choosing a heat pump?
16. About what percentage of the time do customers install both a ducted and ductless heat pump system, and why?

17. About what percentage of the heat pumps you install are ENERGY STAR certified systems that would qualify for a rebate through NHSaves?

For the next few questions, please think specifically about customers that apply for a rebate through NHSaves for their heat pump, either directly or through you.

18. On average, what percentage of their existing heating load do customers displace with program-incentivized heat pumps?
19. On a scale of 1 to 5, where 1 means "not at all influential" and 5 means "very influential," how influential are the NHSaves program rebates in getting the average customer to…
    a. Choose a heat pump for **heating** needs?
    b. Choose a heat pump for **cooling** needs?
    c. Select a more efficient heat pump than they would otherwise?
    d. Replace their entire existing system with heat pumps, as opposed to integrating a heat pump into their existing system?
20. If the NHSaves rebates were not available, about what percentage of the time would you recommend an ENERGY STAR-certified heat pump?
    a. And if the NHSaves rebates were not available, about what percentage of the time do you think customers would choose to install an ENERGY STAR heat pump?
21. Now for this last question about heat pumps, please think about all your customers who are interested in heat pumps. How can NHSaves best reach customers intending to purchase a heat pump and motivate them to install a high-efficiency ENERGY STAR system?

B.2.4 Heat Pump Water Heaters

[skip section if contractor does not install heat pump water heaters]

Now I would like to ask you some questions about heat pump water heaters. Please think about **all** your customers, not only the ones that apply for a rebate through the NHSaves program.

22. For customers looking to install a water heater, about what percentage request a heat pump water heater?
23. How often do you recommend a heat pump water heater?
24. About what percentage of your water heating customers ultimately choose to install a heat pump water heater?
25. Of the heat pump water heaters you install, about what percentage are ENERGY STAR rated?
26. What drives customers to install heat pump water heaters over other water heating options?

27. On a scale of 1 to 5, where 1 means “not at all influential” and 5 means “very influential,” how influential are the program rebates for getting the average customer to select a heat pump water heater instead of another type of water heater?
28. Next, I have a few questions about your installation practices for heat pump water heaters:
    a. What feedback have you received from customers who installed a smaller model (55 gallons or less) about the HPWH being able to meet their hot water needs?
    b. About what percentage of the time do you tend to recommend that customers size up to a larger model?
    c. How often do customers tend to choose the larger model when recommended?
    d. What do you typically recommend regarding the use of mixing valves?
    e. What do you typically recommend customers use as their set temperature?

These next few questions are about your experience with the NHSaves program specifically.

29. Have you participated in the NHSaves midstream heat pump water heater offering, which provides a rebate to the contractor upon purchasing the unit from a distributor? Have you also helped customers receive a rebate through the downstream pathway, which requires the customer or contractor to submit a rebate application?
30. [If yes to both in Q29] What do you see as the advantages of the new midstream pathway (that is, offering the rebate through the distributor)? Disadvantages?
31. Between the upstream and downstream pathway, which way of delivering the rebate is more effective in convincing the customer to install a heat pump water heater in your opinion? Why?

B.2.5 Furnaces and Boilers

[skip if contractor does not install furnaces or boilers]

Now I’d like to ask you some questions about natural gas furnace and boiler projects. For the first few questions, please think about **all** your customers, not only the ones that apply for a rebate through the NHSaves program.

32. About what percentage of your customers that are installing a new heating system choose to install gas furnaces? Gas boilers?
33. About what percentage of the furnaces and boilers you install are high-efficiency systems (furnaces: 95%+ AFUE, boilers: 90%+ AFUE) that would qualify for a rebate through NHSaves?
34. When installing a new or replacement gas boiler, about what percentage of the time do you also install a new circulator pump at the same time? When you do install a new pump, how often does it include an ECM (engine control module)?
35. For customers who request a gas furnace or boiler, how often do you mention heat pumps as an alternative?

36. Now please think about your customers that apply for a NHSaves rebate for their new gas furnace or boiler. Approximately what percentage of these customers are…
    a. Replacing a unit that has failed or is close to failure?
    b. Replacing a unit early?
    c. Installing the unit in a new construction or renovation/addition context?
    d. Switching from a non-condensing to a condensing unit?
    e. Switching fuels (for example, from oil to gas)?
37. On a scale of 1 to 5, where 5 means "very influential," how influential are the NHSaves program rebates in getting the average customer to select a high-efficiency condensing furnace or boiler instead of a less efficient model?

B.2.6 General Implementation Topics

For the remaining questions, I'd like you to think about **all** the measures offered through the ENERGY STAR Products Program, not only HVAC and water heating equipment.

[If interviewee is unsure which other measures are offered by this program, offer the following list: central AC, other water heater types, thermostats, appliances.]

38. What do you most appreciate about the NHSaves ENERGY STAR Products Program? Again, please think about all measures, not only HVAC and water heating equipment.
39. What are the main challenges you or your customers have faced with the program, if any?
40. [If Q3>1, i.e., contractor has a multi-year history with the program] Have you noticed changes in the program over the time you have interacted with it? [If yes] What changes have been positive? Negative?
41. For which measures, if any, would you increase or decrease rebate levels? Are there any measures you would add to or remove from the program? Again, please think about all measures, not only HVAC and water heating equipment.
42. Are there any other improvements you would recommend for the program?
43. Have economic changes or uncertainty, such as inflation or tariffs, impacted equipment costs or other program costs in the past year or two? [If yes] How has this affected customers' willingness to install efficient equipment?
44. In your experience, have customers expressed interest in additional ways of saving energy after installing an efficient piece of equipment through the program? [If yes] How often would you say that's the case? What types of improvements do they pursue?
45. How often do you help your customers navigate the program participation process, including filling out the rebate form? Do you have any suggestions for revising the process overall, or making the rebate fulfillment process easier to navigate?

46. How do you typically get information about the program? For example, have you used the NHSaves website, communicated with program staff, received emails, or gotten information through distributors, trade publications, or colleagues?
47. Was it easy to get the answers or help you needed? [if no] What would have made it easier to get that help?
48. Are there any additional types of information about the program that you would like to receive from NHSaves? [If yes] What would you like to know more about and how would you like to receive the information?

B.2.7 Conclusion

49. That is the end of my questions. Are there any other thoughts or ideas for improvement you would like to share, or do you have any questions for me?
50. Before we go, I just need to go over the gift card.
    a. First I'd like to confirm the email address we should send your gift card to. [confirm whether the same address used for correspondence]
    b. The gift card will arrive in the next two weeks in an email from go.tangocard.com and you can redeem it for gift cards from many major retailers.
    c. If you don't see the email, check your spam folder.
    d. If you prefer, we can make a donation on your behalf to the New Hampshire Food Bank or connect you with other donation options.

Thank you for your time. If anything else should come to mind, feel free to call or email!

[If needed] If you would like someone from the program staff to follow up with you about any issues you raised, we would be happy to share your contact info with them.

Appendix C Survey Instruments

C.1 ENERGY STAR Products Program Installed Measures Survey

January 2026

This survey addressed baselines, ISRs, demand coincidence, NTG, and process topics for select products offered through the NHSaves ENERGY STAR® Products Program. All topics were also addressed in in-depth interviews with program staff. For some topics, the survey complemented literature reviews (baseline and demand) and market actor interviews (process). The NMR team benchmarked results to earlier NH research and other jurisdictions when possible.

Based on discussion with the Working Group, the evaluation team examined baseline through the survey for heat pump technologies, for which baselines are not well established in New Hampshire, and to develop an estimate of pre-existing furnace and boiler technologies for furnace and boiler replacements. The evaluation team conducted literature reviews to assess current baselines for other measures.

Table 71: Relevant Program Pathways and Survey Topics by Measure

Product	Delivery Methods	Baseline	ISR	Demand	NTG	Process
Heat Pump (ducted, ductless)	Rebate (Online, Mail)	Yes	Yes	Yes	Yes	Yes
Gas Furnace and Boiler	Rebate (Online, Mail)	Lit Rev	No	No	Yes	Yes
Heat Pump Water Heater, Downstream	Rebate (Online, Mail, Instant)	Yes	No	No	Yes	Yes
Gas Integrated Water Heater	Rebate (Online, Mail)	Lit Rev	No	No	No	Yes
Pool Pump	Rebate (Online, Mail)	Lit Rev	Yes	Yes	Yes	No
Room Air Purifier	Rebate (Online, Mail, Instant) Marketplace	Lit Rev	Yes	Yes	No	No
Gas Wi-Fi Thermostat	Rebate (Online, Mail) Marketplace	Lit Rev	Yes	No	No	Yes

Table 72: Survey Question Mapping by Topic

Topic	Questions
Screening and Misc.	S1 to S16
Process	P1 through P13
Event Type	ET1 through ET5, BL12, BL13, BL17, BL18

Topic	Questions
Baseline for central ASHP, ductless mini-split ASHP, HPWH	BL1 to BL24
ISR	M1 through M3, M11
Demand	M4 through M10, M12, M13
NTG	FR1 through FR8, SO1 through SO16
Demographics	D1 through D14

The program tracking data did not have the information needed to determine the delivery mode and rebate format through which each participant received program support. Therefore, the screening questions served both to confirm eligibility and to determine which questions respondents would receive.

C.1.1 Introduction

Thank you for agreeing to provide feedback on your experience with the NHSaves® ENERGY STAR® Products Program. This survey should take 10–15 minutes and you will receive an incentive of $25 within two weeks after completing it. All your responses will be kept confidential.

Please have the person who made the decision to participate in the recycling program complete the survey. Answer the questions to the best of your ability.

NMR Group is conducting this research on behalf of the NHSaves utility partners: Eversource, Liberty, New Hampshire Electric Cooperative, and Unitil.

Questions?

- If you have any technical questions about the survey, or you wish to receive the survey link at a different email address, please contact [analyst] at NMR Group.
- If you have other questions or want to make sure the survey is valid, please contact Kiersten Williams, Senior Energy Efficiency Analyst at Eversource, at 603-634-3034 or kiersten.williams@eversource.com.

C.1.2 Screening

S1. Do you recall purchasing the following product(s) in the past few years? [CREATE TABLE OF PRODUCTS LISTED FROM READ-IN FILE WITH THE FOLLOWING RESPONSES]

1. Yes
2. No
98. I'm not sure

[CONTINUE FOR ANY PRODUCT S1 = 1. DROP ALL ANY PRODUCT S1 > 1]

[IF ALL S1 > 1 DISPLAY "Unfortunately, you do not qualify for this survey; thank you for your time." TERMINATE.]

The next few questions ask about how many items you purchased.

S2. [IF MSHP] How many indoor units make up your mini split heat pump system? Please indicate the number, using 98 if you are not sure. [Pop-up definition: The indoor unit is usually white, rectangular, hangs on a wall, and blows hot or cold air.] [REQUIRE NUMERIC ENTRY, 98 for Not sure]

[IF S2 > 0, CREATE MSHP_NUMC = S2; IF S2 = 0 THEN DROP MEASURE]

S3. [IF ASHP] How many indoor units make up your air source heat pump system? Please indicate the number, using 98 if you are not sure. [Pop-up definition: Most air source heat pumps have an indoor air handler unit located in an attic or closet.] [REQUIRE NUMERIC ENTRY, 98 for Not sure]

[IF S3 > 0, CREATE ASHP_NUMC = S3; IF S3 = 0 THEN DROP MEASURE]

S4. [IF MSHP OR ASHP] For what purpose did you buy your new heat pump? (Select only one response)

1. I bought it for cooling
2. I bought it for heating
3. I bought it for both heating and cooling

S5. [IF POOL PUMP] Our records indicate that you purchased [PP_NUM] pool pump(s). Is this correct?

1. Yes, that is correct
2. No, that is not correct.
   a. The actual number was [REQUIRE NUMERIC ENTRY] (Your best guess is fine)

98. I'm not sure how many I purchased.

[IF S5=1, THEN PP_NUMC = PP_NUM; IF S5 2a > 0 < 98, THEN PP_NUMC = S5 2a; IF S5 = 98, THEN PP_NUMC=98; IF S5 2a = 0 THEN DROP MEASURE]

S6. [IF AIR PURIFIER] Our records indicate that you purchased [AP_NUM] air purifier(s). Is this correct?

1. Yes, that is correct
2. No, that is not correct.
   a. The actual number was [REQUIRE NUMERIC ENTRY] (Your best guess is fine)

98. I'm not sure how many I purchased.

[IF S6 =1, THEN AP_NUMC = AP_NUM; IF S6 2a > 0 < 98, THEN AP_NUMC = S6 2a.; S6 = 98, THEN AP_NUMC = 98; IF S6 2a = 0 THEN DROP MEASURE]

S7. [IF TSTAT] Our records indicate that you purchased [TSTAT_NUM] thermostat(s). Is this correct?

1. Yes, that is correct.
2. No, that is not correct.
   a. The actual number was [REQUIRE NUMERIC ENTRY] (Your best guess is fine)
98. I'm not sure how many I purchased.

[IF S7 =1, THEN TSTAT_NUMC = TSTAT_NUM; IF S7 2a > 0 < 98, THEN TSTAT_NUMC = S7 2a.; S7 = 98, THEN TSTAT_NUMC = 98; IF S7 2a = 0 THEN DROP MEASURE]

S8. [IF FURNACE] Our records indicate that you purchased [FURNACE_NUM] furnaces(s). Is this correct?

1. Yes, that is correct
2. No, that is not correct.
   a. The actual number was [REQUIRE NUMERIC ENTRY] (Your best guess is fine)
98. I'm not sure how many I purchased.

[IF S8 = 1, THEN FURNACE_NUMC = FURNACE_NUM; IF S8 2a > 0 < 98, THEN FURNACE_NUMC = S8 2a.; IF S8 = 98, THEN FURNACE_NUMC = 98; IF S8 2a = 0 THEN DROP MEASURE]

S9. [IF BOILER] Our records indicate that you purchased [BOILER_NUM] boiler(s). Is this correct?

1. Yes, that is correct
2. No, that is not correct.
   a. The actual number was [REQUIRE NUMERIC ENTRY] (Your best guess is fine)
98. I'm not sure how many I purchased.

[IF S9 =1, THEN BOILER_NUMC = BOILER_NUM; IF S9 2a > 0 < 98, THEN BOILER_NUMC = S9 2a.; IF S9 = 98, THEN BOILER_NUMC = 98; IF S9 2a = 0 THEN DROP MEASURE]

S10. [IF HPWH] Our records indicate that you purchased [HPWH_NUM] heat pump water heater(s). Is this correct?

1. Yes, that is correct
2. No, that is not correct.
   a. The actual number was [REQUIRE NUMERIC ENTRY] (Your best guess is fine)
98. I'm not sure how many I purchased.

[IF S10 =1, THEN HPWH_NUMC = HPWH_NUM; IF S10 2a > 0 < 98, THEN HPWH_NUMC = S10 2a.; IF S10 = 98; THEN HPWH_NUMC = 98; IF S10 2a = 0 THEN DROP MEASURE]

S11. [IF IWH] Our records indicate that you purchased [IWH_NUM] integrated water heaters(s), also commonly referred to as a "Combi-Boiler." Is this correct?

1. Yes, that is correct
2. No, that is not correct.
   a. The actual number was [REQUIRE NUMERIC ENTRY] (Your best guess is fine)

98. I'm not sure how many I purchased.

[IF S11 =1, THEN IWH_NUMC = IWH_NUM; IF S11 2a > 0 < 98, THEN IWH_NUMC = S11 2a; IF S11 = 09, THEN IWH_NUMC = 98; IF S11 2a = 0 THEN DROP MEASURE]

[IF ALL S2,S3,S5 TO S11 MEASURES DROPPED DISPLAY ""Unfortunately, you do not qualify for this survey; thank you or your time." TERMINATE]

[CONTINUE FOR ALL (product)_NUMC > 0]

The next few questions ask about how you purchased the product(s).

[LOOP S12 TO S14 FOR ALL (product)_NUMC > 0]

[IF (product)_NUMC > 1 < 98 DISPLAY, "You said that you purchased more than one [PRODUCT]. If you purchased these on different dates or from different places, please think about the most recent [PRODUCT] purchased in the next few questions.]

S12. [IF (product)_NUMC ≥ 1] Where did you purchase this [PRODUCT]? [ROTATE 1 TO 3]

1. In a retail store
2. Online
3. Through my contractor
4. Somewhere else, specify [REQUIRE TEXT RESPONSE]

98. I'm not sure

S13. [IF S12 = 2] From what type of online site did you purchase the [PRODUCT]? [ROTATE 1 TO 3]

1. An online retailer, such as Amazon
2. Website of a retail store, such as Home Depot
3. NHSaves or a utility partner website

98. I'm not sure

S14. [IF (product)_NUMC = 1 AND (S12 ≠ 2 OR S13 ≠ 3)] Do you recall receiving a rebate or discount for the [PRODUCT]? [ROTATE 1 TO 3]

1. Post-purchase rebate [Pop-up definition: This type of rebate involves filling out a form online or on paper and receiving a check in the mail after the purchase.]
2. In-store rebate [Pop-up definition: This type of rebate, also called an "instant rebate," involves scanning a bar code or going to a website while at the store, verifying eligibility, and presenting an electronic rebate or coupon when checking out.]
3. Discounted price offered by my installation contractor [Pop-up definition: This type of discount involves a contractor reducing the total cost of installing energy-efficient equipment in a home.]
4. I do not recall receiving a rebate or discount.

[IF ALL S14 = 4 AND ALL S13 ≠ 3, DISPLAY "Unfortunately, you do not qualify for this survey; thank you or your time." TERMINATE.]

S15. [IF HPWH_NUMC AND/OR IWH_NUMC >0] Do you know if you have one or more "mixing valves" on your water delivery system? [Pop-up definition: Mixing valves control the balance of hot and cold water to deliver a consistent and safe temperature. Some mixing values balance the whole water delivery system, while others are specific to a single showerhead or faucet.]

1. Yes, I know I have one or more mixing valves
2. No, I know I do **not** have any mixing valves [GO TO PROCESS]
98. I'm not sure if I have any mixing valves. [GO TO PROCESS]

S16. [IF S15 = 1] If you have more than one mixing valve, please think about the most recent mixing valve you installed. Did you install this mixing valve before, at the same time, or after installing the [INSERT HPWH OR IWH]?

1. I installed the mixing valve before installing the water heater.
2. I installed the mixing valve at the same time as the water heater.
3. I installed the mixing valve after the water heater.
98. I'm not sure when I installed the mixing valve.

C.1.3 Process

[DO NOT ASK FOR AIR PURIFIER OR POOL PUMP]

The next few questions ask about your experiences with the ENERGY STAR Products Program offered through NHSaves. This is the program through which the utility partners provide discounts and rebates for energy-saving products.

P1. Before you were asked to participate in this survey, had you heard of the NHSaves energy efficiency programs?

1. Yes
2. No
98. I'm not sure

P2. On a scale of 1 to 5, where 1 means "not at all aware" and 5 is "very aware," how aware are you of the rebates, discounts, and other offerings available through the NHSaves energy efficiency programs?

P3. Many factors influence our decisions when it comes to using energy. On a scale of 1 to 5, where 1 is "strongly disagree" and 5 is "strongly agree," how strongly do you agree or disagree with the following statements? [ROTATE ORDER]

a. I'm too busy to be concerned with my energy usage.
b. When home, I take actions to be energy efficient and conserve energy.
c. I am not willing to be energy efficient or conserve energy at home if that comes at any cost to my comfort.
d. I like to encourage people to save energy.

P4. How did you learn that NHSaves and its utility partners offered discounts and rebates on energy-saving products? Please select all that apply. [ALLOW MULTIPLE RESPONSES; ROTATE 1 THROUGH 9]

1. From the NHSaves website
2. From a utility company website
3. From a utility company bill insert or online bill
4. From a utility company advertisement
5. During a home energy audit
6. From a contractor
7. From family, friends, or neighbors
8. From a community organization
9. From a community event
10. Other; please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

P5. Please tell us how satisfied you were with the following elements of your participation in the ENERGY STAR Products Program. Please use a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied." [ROTATE A TO H]

e. [IF ANY S13 = 3] Your overall experience with buying discounted products through the NHSaves or utility partner online store
f. [IF ANY S13 = 3] The range of products available on the NHSaves or utility partner online store
g. [IF ANY S13 = 3] The price of the products available on the NHSaves or utility partner online store
h. [IF ANY S14 < 3] Your overall experience with the rebate process, including providing the required information, submitting the rebate form, and receiving the rebate
i. [IF ANY S14 < 3] The instructions provided to you on how to apply for a rebate
j. [IF ANY S14 < 3] The amount of time it took to receive the rebate after submitting your application
k. [IF ANY S14 = 3] The information your installation contractor provided about the discount on the product(s)
l. [IF ANY S14 < 4] The amount of the rebate or discount you received on the product(s) or equipment.
m. The changes to your energy bill after installing the new equipment

P6. [DISPLAY FOR ANY ITEM IN P5 WITH A RATING OF < 4] Why did you say you were not fully satisfied with [PIPE IN TEXT]? [REQUIRE TEXT RESPONSE]

P7. Did you find any part of your participation in the ENERGY STAR Products Program to be challenging or difficult?

3. Yes
4. No
99. I'm not sure

P8. [IF P7 = 1] Please describe what you found challenging or difficult. [REQUIRE TEXT RESPONSE]

P9. [IF S4 = 2 OR 3] Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with how well the heat pump is working for **heating** your home? If you do not use the heat pump for **heating**, select "N/A". [DISPLAY 1 TO 5 SCALE WITH N/A OPTION]

P10. [IF S4 = 1 OR 3] Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with how well the heat pump is working for **cooling** your home? If you do not use the heat pump for **cooling**, select "N/A". [DISPLAY 1 TO 5 SCALE WITH N/A OPTION]

P11. [IF P9 AND/OR P10 < 4] Why did you say you are not fully satisfied with how well the heat pump is working [IF BOTH P9 AND P10 < 4 DISPLAY "for heating and cooling your home"; [IF ONLY P9 < 4 DISPLAY "for heating your home"; IF ONLY P10 < 4 DISPLAY "for cooling your home"]? [REQUIRE TEXT RESPONSE]

[LOOP P12 AND P13 FOR FURNACE, BOILER, HPWH, IWH, TSTAT]

P12. Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," how satisfied are you with how well the [PRODUCT] is working?

P13. [IF P13 < 4] Why did you say you are not fully satisfied with the [PRODUCT]? [REQUIRE TEXT RESPONSE]

[END OF LOOP. IF RESPONDENT PURCHASED MORE THAN ONE PRODUCT TYPE INCLUDED IN THIS SECTION, CONTINUE LOOP THROUGH ALL RELEVANT PRODUCTS]

C.1.4 Product Persistence and Demand Coincidence

[IF PRODUCT = FURNACE, BOILER, HPWH, OR IWH, SKIP TO INSTRUCTIONS BEFORE ET1]

[FOR ANY ASHP, MSHP, AP, PP, TSTAT (product)_NUMC = 98, SKIP TO INSTRUCTIONS BEFORE ET1]

M1. Please indicate how many of the following products remain installed, were installed and then removed, or were never installed. [CREATE TABLE FOR MSHP_NUMC, ASHP_NUMC; PP_NUMC, AP_NUMC, AND TSTAT_NUMC. REQUIRE NUMERIC ENTRY IN COLUMNS LABELLED "CURRENTLY INSTALLED", "INSTALLED BUT REMOVED", "NEVER INSTALLED", AND "I'M NOT SURE." TOTAL FOR EACH PRODUCT MUST SUM TO THE CONFIRMED VALUE AS APPROPRIATE]

M2. [IF M1 'INSTALLED BUT REMOVED' OR 'NEVER INSTALLED' > 0] Why is the [PRODUCT] not in use? Check all that apply. [ROTATE OPTIONS 1 - 6]

1. Removed because did not like it
2. Removed because it broke
3. Removed because it did not work properly
4. [ALLOW ONLY IF POOL PUMP OR AIR PURIFIER] Removed temporarily because I only use it when needed
5. Do not need it; keeping it for later use
6. Do not need it; no longer have it
7. Other; specify: [REQUIRE TEXT RESPONSE]

98. I'm not sure

[IF AP SKIP TO INSTRUCTIONS AFTER M6]

[IF ASHP, MSHP, OR TSTAT SKIP TO INSTRUCTIONS AFTER M10]

[ASK M3 TO M6 IF PP AND (M1 'CURRENTLY INSTALLED' > 0 OR M2 = 4 OR 5)] [IF PP_NUMC > 1 < 98 display "For the next few questions, please think about the pool pump you most recently purchased].

M3. Do you remove the pool pump in the winter and reinstall it in the summer, keep it installed all year, or something else?

1. I remove the pool pump in the winter and reinstall it in the summer
2. I keep it installed all year
3. Something else; specify: [REQUIRE TEXT RESPONSE]

98. I'm not sure

M4. On an average weekday in June, July, and August, do you run your pool pump between 1:00 pm and 5:00 pm?

1. Yes
2. No

98. I'm not sure

M5. Is your pool pump able to be connected to Wi-Fi?

1. Yes
2. No

98. I'm not sure [SKIP TO M7]

M6. [IF M5 = 1] Have you connected your pool pump to a Wi-Fi network?

1. Yes
2. No

98. I'm not sure

[ASK M7 TO M10 IF AIR PURIFER AND (M1 'CURRENTLY INSTALLED' > 0 OR M2 = 4 OR 5) UNLESS OTHERWISE DIRECTED]

[IF AP_NUMC > 1 < 98 display "For the next few questions, please think about the air purifier you most recently purchased].

M7. Do you use your air purifier all the time, or do you turn it on and off depending on the situation (for example when someone in my house is sick or has seasonal allergies)?

1. I always have it plugged in and turned on
2. I turn it on and off depending on the situation
3. Something else; specify: [REQUIRE TEXT RESPONSE]
98. I'm not sure

M8. When the air purifier is turned on, how often do you use the "eco" or "energy efficiency" settings?

1. I always use the eco or energy efficiency setting
2. I sometimes use the eco or energy efficiency setting
3. I never use the eco or energy efficiency setting
4. I do not know if my air purifier(s) has an eco or energy efficiency setting
5. My air purifier(s) does not have an eco or energy efficiency setting
6. Something else; specify: [REQUIRE TEXT RESPONSE]
98. I'm not sure

M9. On an average weekday in June, July, and August, do you have your air purifier(s) turned on between 1:00 pm and 5:00 pm?

1. Yes
2. No
98. I'm not sure

M10. On an average weekday in December and January, do you have your air purifier(s) turned on between 5:00 pm and 7:00 pm?

1. Yes
2. No
98. I'm not sure

[ASK M11 FOR MSHP, ASHP, AND TSTAT M1 "INSTALLED BUT REMOVED"]

[IF MORE MSHP, ASHP, AND TSTAT M1 "INSTALLED BUT REMOVED" > 1, display "You indicated removing more than one [PRODUCT]. Please answer the next question for the most recently removed [PRODUCT]"]

M11. On average, about how long after it was installed was the [PRODUCT] removed? Please give your answer in years and months. For example, if you removed it three months after installation, you would enter 0 for years and 3 for months. If you removed it 15 months after installation, you would enter 1 for years and 3 for months. Your best estimate is fine. YEARS ____ [DROP DOWN 0-3]
MONTHS ____ [DROP DOWN 0-11]

[IF TSTAT SKIP TO INSTRUCTIONS BEFORE ET1]

M12. [IF S4 = 1 OR 3] On an average weekday in June, July, and August, do you use your heat pump between 1:00 pm and 5:00 pm?

1. Yes
2. No
98. I'm not sure

M13. [IF S4 = 2 OR 3] On an average weekday in December and January, do you use your heat pump between 5:00 pm and 7:00 pm?

1. Yes
2. No
98. I'm not sure

C.1.5 Event Type

[IF AP SKIP TO ET3]

[IF PP SKIP TO ET2]

ET1. Was the [PRODUCT] purchased as part of a new construction or major renovation project?

1. Yes [GO TO INSTRUCTIONS AFTER ET5]
2. No
98. I'm not sure

[IF ASHP OR MSHP GO TO INSTRUCTIONS BEFORE FR1]

ET2. [IF PP] Was the pool pump purchased for a new or existing pool?

1. New [GO TO INSTRUCTIONS AFTER ET5]
2. Existing
99. I'm not sure

ET3. [IF AP OR IF ET1 OR ET2 ≠ 1] Did the high-efficiency [PRODUCT] you purchased replace any existing [PRODUCT] or was it a new type of equipment that you did not have in your home before?

1. Replaced existing equipment
2. New equipment [GO TO INSTRUCTION AFTER ET5]
98. I'm not sure

ET4. [IF ET3 ≠ 2] Which of the following best describes the condition of your old equipment?

1. The old equipment was working with no need for repair
2. The old equipment was working with need of minor repair
3. The old equipment was working with need of major repair
4. The old equipment was no longer working
98. I'm not sure

ET5. [IF ET4 = 1, 2, OR 98] Do you think your old equipment would have lasted another two years? (select one)

1. Yes
2. No
98. I'm not sure

[IF BOILER, FURNACE, OR POOL PUMP, GO TO INSTRUCTIONS BEFORE FR1]

[IF AIR PURIFIER, IWH, OR TSTAT GO TO D1]

C.1.6 Free Ridership

[ASK IF ASHP_NUMC > 0 <98, BOILER_NUMC > 0 <98, FURNACE_NUMC > 0 <98, MSHP_NUMC_ > 0 <98 OR PP_NUMC > 0 <98].

The next set of questions asks about your decision to purchase a high-efficiency [PRODUCT].

FR1. If there had been no rebate available through NHSaves or your utility, how likely is it that you would have purchased any type of [PRODUCT] at the same time?

1. Not at all likely [SKIP TO FR6]
2. Slightly likely
3. Somewhat likely
4. Very likely [SKIP TO FR3]
98. I'm not sure [SKIP TO FR3]

FR2. [FR1 = 2 OR 3] If there had been no rebate available through NHSaves or your utility, when do you think you would have moved forward with the purchase of the [PRODUCT]?

1. Within 6 months of when you did
2. Between 6 months and 12 months after you did
3. More than 1 year after you did
98. I'm not sure

[IF (prod)_NUMC = 1, GO TO FR5]

FR3. [IF (prod)_NUMC > 1 < 98] If there had been no rebate available through NHSaves or your utility, how likely is it that you would have purchased the exact same number of [IF PRODUCT = MSHP OR ASHP DISPLAY "heat pumps"; IF PRODUCT = BOILER DISPLAY "boilers", IF PRODUCT = FURNANCE DISPLAY "furnaces"; IF PRODUCT = HPWH DISPLAY "heat pump water heaters"; IF PRODUCT = PP DISPLAY "pool pumps"]?

1. Not at all likely [SKIP TO FR5]
2. Slightly likely
3. Somewhat likely
4. Very likely [SKIP TO FR5]
98. I'm not sure [SKIP TO FR5]

FR4. [IF FR3 = 2 OR 3] You estimated that you purchased [IF PRODUCT = MSHP OR ASHP DISPLAY [MSHP_NUMC OR ASHP_NUMC] 'heat pump(s)'; IF PRODUCT = BOILER DISPLAY [BOILER_NUMC] 'boiler(s)'; IF PRODUCT = FURNACE DISPLAY [FURNACE_NUMC] 'furnace(s)'; IF PRODUCT = HPWH DISPLAY [HPWH_NUMC] 'heat

pump water heater(s)'; IF PRODUCT = PP DISPLAY [PP_NUMC] 'pool pump(s)';]. If there had been no rebate available from NHSaves or your utility, how many of the [IF PRODUCT = MSHP OR ASHP DISPLAY "heat pumps"; IF PRODUCT = BOILER DISPLAY "boilers", IF PRODUCT = FURNANCE DISPLAY "furnaces"; IF PRODUCT = HPWH DISPLAY "heat pump water heaters"; IF PRODUCT = PP DISPLAY "pool pumps"] would you have purchased? [ALLOW NUMERIC ENTRY UP TO VALUE INDICATED IN NUM_PURCHASED WITH 999 FOR "I'M NOT SURE"].

FR5. If there had been no rebate available through NHSaves or your utility, how likely would have been to purchase the exact same efficiency level of [PRODUCT]?

1 Not at all likely
2 Slightly likely
3 Somewhat likely
4 Very likely
98. I'm not sure

FR6. On a scale of 0 to 10, where 0 is "not at all influential" and 10 is "very influential", how influential were the elements listed below on your decision to purchase the [PRODUCT]? If the element did not apply to your decision, choose N/A. [ROTATE RESPONSES]

a. The rebate available from your utility
b. Information provided by your utility or the NHSaves website
c. Marketing materials or information located at a retail store
d. The recommendation of a salesperson or installation contractor

[ASK FR7 AND FR8 FOR PRODUCT IF (FR1 < 3 AND ALL FR6 < 3) OR (FR1 > 2 <98 AND ALL FR6 > 7)]

FR7. Did you make the decision to purchase the [PRODUCT] before or after you learned of the rebate? (select one)

5 Before
6 After
98. I'm not sure

FR8. [CONSISTENCY QUESTION] Please describe the influence that the program rebate from NHSaves or your utility had on your decision to purchase the [PRODUCT]. [REQUIRE TEXT RESPONSE]

[END OF LOOP. IF RESPONDENT PURCHASED MORE THAN ONE PRODUCT TYPE INCLUDED IN THIS SECTION, CONTINUE LOOP THROUGH ALL RELEVANT PRODUCTS]

C.1.7 Spillover

SO1. Since purchasing the products with support from the NHSaves program and its utility partners, have you made other energy-saving purchases? [POP-UP DEFINITION: Other energy-saving purchases might include cooling or heating systems, water heating equipment, thermostats, windows, insulation, major appliances, LED light bulbs, or small appliances such as dehumidifiers or air purifiers.]

1. Yes
2. No [SKIP TO D1]
98. I'm not sure [SKIP TO D1]

SO2. [IF SO1 = 1] Did your experience with the NHSaves program influence your decision to make these energy-saving purchases? [POP-UP DEFINITION: Other energy-saving purchases might include cooling or heating systems, water heating equipment, thermostats, windows, insulation, major appliances, LED light bulbs, or small appliances such as dehumidifiers or air purifiers.]

1. Yes
2. No [SKIP TO D1]
98. I'm not sure [SKIP TO D1]

SO3. [IF SO2= 1] What energy-saving purchases did you make after buying the products with support from NHSaves? [ALLOW MULTIPLE RESPONSES]

1. Central air conditioning system
2. Window or room air conditioner
3. Air source heat pump
4. Minisplit heat pump
5. Ground source heat pump
6. Furnace
7. Boiler
8. Other heating or cooling system; specify: [REQUIRE TEXT RESPONSE]
9. Heating or cooling system tune-up/maintenance
10. Thermostat
11. Clothes washer
12. Clothes dryer
13. Dishwasher
14. Refrigerator
15. Freezer
16. Dehumidifier
17. Air purifier
18. Water heater
19. Heat pump water heater
20. Window replacement
21. Insulation
22. Light bulbs (such as LEDs) [IF NO OTHER SO3 SELECTED, SKIP TO D1]
23. Some other upgrade; specify**:** [REQUIRE TEXT RESPONSE]

SO4. For each product listed below, please indicate if you used any of the following forms of support or discounts. [CREATE A MATRIX WITH THE PRODUCTS LISTED IN SO3]

1. Received a rebate from NHSaves
2. Bought it through the NHSaves / utility partner online store
3. Obtained it through another NHSaves Program
4. I did not use any of these forms of support
98. I'm not sure

SO5. [SKIP IF PP, AP, OR TSTAT] For each product listed below, did you apply (or plan to apply) for a federal tax credit?

1. Yes
2. No
98. I'm not sure

[FOR EACH PRODUCT IN SO3, IF SO4 ≠ 4, SKIP TO D1.]

SO6. [DISPLAY FOR EACH PRODUCT IN SO4 > 3] How many of each of these products did you purchase? [REQUIRE NUMERIC ENTRY FROM 0 TO 99, I'M NOT SURE = 999]

SO7. [DISPLAY FOR EACH PRODUCT IN SO4 >3] How do you know this purchase or change is energy-efficient? Select all that apply. [ALLOW MULTIPLE RESPONSES]

1. ENERGY STAR® label
2. EnergyGuide label [Pop-up definition: A bright yellow label on appliances that provides information about energy consumption.]
3. Salesperson in store [SKIP TO SO15]
4. Purchase contractor
5. In-store signage
6. Information on website where I made the purchase
7. Product manual
8. Researched product beforehand
9. Advertisement
10. Other, specify: [REQUIRE TEXT RESPONSE]
98. I'm not sure

SO8. [IF SO3 = 11 THROUGH 17, SO4 >3, AND SO7 ≠ 1 OR 98] For each product listed below, please indicate whether it was ENERGY STAR-certified. [DISPLAY TABLE WITH EACH OPTION SELECTED FROM SO3 = 11 THROUGH 17]

1. Yes
2. No
98. I'm not sure

SO9. [IF SO3 = 10, SO4 >3, AND SO7 ≠ 1 OR 98] Was the thermostat(s) you purchased "smart" or Wi-Fi-enabled?

1. Yes
2. No
98. I'm not sure

SO10. [IF SO3 = 1 OR 2, SO4 >3, AND SO7 ≠ 1 OR 98] What is the EER2 or SEER2 (Seasonal Energy Efficiency Rating) for your equipment? Most SEER ratings range from 13 to 21. [DISPLAY TABLE FOR EACH PIECE OF EQUIPMENT IN SO3 = 1 THROUGH 2; REQUIRE NUMERIC ENTRY FROM 0 TO 99; I'M NOT SURE = 999]

SO11. [IF SO3 = 3 THROUGH 5, SO4 >3, AND SO7 ≠ 1 OR 98] What is the EER2 or SEER2 (Seasonal Energy Efficiency Rating) for your equipment? Most SEER ratings for heat pumps range from 14 to 22. [DISPLAY TABLE FOR EACH PIECE OF EQUIPMENT IN SO3 = 3 THROUGH 5; REQUIRE NUMERIC ENTRY FROM 0 TO 99; I'M NOT SURE = 999]

SO12. [IF SO3 = 3 THROUGH 5SO4 >3, AND SO7 ≠ 1 OR 98] What is the HSPF2 (Heating Season Performance Factor) for your heat pump? Most HSPF ratings range from 8.2 to 12. [DISPLAY TABLE FOR EACH PIECE OF EQUIPMENT IN SO3 = 3 THROUGH 5; REQUIRE NUMERIC ENTRY FROM 0 TO 99; I'M NOT SURE = 999]

SO13. [IF SO3 = 6 THROUGH 7, SO4 >3, AND SO7 ≠ 1 OR 98] What is the AFUE (Annual Fuel Utilization Efficiency) rating for your equipment? Most AFUE ratings range from 80 to 98.5. [DISPLAY TABLE FOR EACH PIECE OF EQUIPMENT IN SO3 = 6 THROUGH 7; REQUIRE NUMERIC ENTRY FROM 0 TO 99; I'M NOT SURE = 999]

SO14. [IF SO3 = 18 THROUGH 19, SO4 >3, AND SO7 ≠ 1 OR 98] What is the UEF (Uniform Energy Factor) rating for your water heater? Most UEF ratings range from 0.56 to 0.98 (for gas or propane) and 0.92 to 3.6 for electric water heaters. [DISPLAY TABLE FOR EACH PIECE OF EQUIPMENT IN SO3 = 18 THROUGH 19; REQUIRE NUMERIC ENTRY FROM 0 TO 99; I'M NOT SURE = 999]

SO15. How important was your experience with the NHSaves Program to your decision to make the purchase(s) or upgrade(s) that did not receive a rebate or financing through your utility? [DISPLAY TABLE WITH EACH PRODUCT SELECTED IN SO3 AND SO4 > 3]

1. Not at all important
2. Slightly important
3. Somewhat important
4. Very important
5. Not applicable

98. I'm not sure

SO16. [IF ANY SO3 SELECTED AND SO4 > 3] How likely is it that you would still have made this purchase(s) or upgrade(s) if you had <u>not</u> participated in the NHSaves program? [DISPLAY TABLE WITH EACH PRODUCT SELECTED IN SO3]

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
5. Not applicable

98. I'm not sure

C.1.8 Baselines

ASHP and MSHP

[ASK SERIES IF MSHP_NUMC OR ASHP_NUMC > 0 <98].

Earlier in this survey, we asked about the influence of the rebate on your decision to purchase one or more heat pumps. Now we'd like to know what you would have done if you had not bought the heat pump. [IF (product)_NUMC > 1 < 98, display, "For these questions, please think about the heat pump you most recently purchased."

BL1. What space(s) does your new heat pump serve? Check all that apply.

1. Entire home (If yes, please select this response only) [MUTUALLY EXCLUSIVE]
2. Master Bedroom
3. Other Bedroom(s)
4. Living Room, Family Room or Den
5. Kitchen
6. Office
7. Sunroom or three-season space
8. Auxiliary spaces, such as lofts or attics
9. Basement
98. Other, specify [REQUIRE TEXT RESPONSE]

BL2. Was the [PIPE RANDOM SPACE SELECTED FROM BL1] heated and/or cooled before the installation of the new heat pump system? Select only one response.

1. It was heated only
2. It was cooled only
3. It was heated and cooled
4. It is a brand-new space, i.e. installed in an addition or new house
5. It was not heated or cooled
98. I'm not sure

BL3. Before you decided to install your new heat pump, did you or your contractor consider options other than your new heat pump to heat or cool your [PIPE RANDOM SPACE SELECTED FROM BL1]? Select only one response.

1. Yes, I/we considered both heating and cooling options
2. Yes, I/we considered ONLY heating options
3. Yes, I/we considered ONLY cooling options [GO TO INSTRUCTIONS BEFORE BL7]
4. No, I/we did not consider any other options [GO TO BL10]

BL4. [ASK IF BL3 = 1, 2] What other **heating options** were considered for your [PIPE RANDOM SPACE SELECTED FROM BL1]? (Select all that apply)

Note: Furnaces typically use ducts to heat the home. Boilers typically use radiators or baseboards to heat the home. See images below.

1. Oil furnace
2. Oil boiler
3. Natural Gas furnace
4. Natural Gas boiler
5. Gas Space Heater
6. Propane furnace
7. Propane/liquified petroleum gas (LPG) boiler
8. Electric baseboard
9. Electric furnace
10. Electric space heater
11. Woodstove, pellet stove, or fireplace
12. Plug-in wall heater
13. Geothermal or ground-source heat pump (different than the heat pump(s) I purchased)
14. Mini-split heat pump (different than the heat pump(s) I purchased)
15. Central heat pump (different than the heat pump(s) I purchased)
16. Other heat pump (different than the heat pump(s) I purchased)
17. Other, specify [REQUIRE TEXT RESPONSE]
98. I'm not sure

BL5. What, if anything, would you have most likely installed **to heat** the [PIPE RANDOM SPACE SELECTED FROM BL1] if you hadn't installed the heat pump you did?

1. [IF BL4 < 17] PIPE IN RESPONSES FROM BL4 AS SELECTIONS]
2. I would have continued to use my old heating system [GO TO INSTRUCTIONS BEFORE BL7]
3. I wouldn't have installed a heating system (left space unheated) [GO TO INSTRUCTIONS BEFORE BL7]
4. I would have installed a different heating system, please specify [REQUIRE TEXT RESPONSE]
98. I'm not sure [GO TO INSTRUCTIONS BEFORE BL7]

BL6. [IF BL5 ≠ 2, 3, OR 98] You indicated that you likely would have installed a different heating system if you had not installed the heat pump. How likely is it that you would have installed a high-efficiency heating system?

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
98. I'm not sure

[IF BL3 = 1 GO TO BL10]

BL7. [IF BL3 = 2 OR 3] What other cooling options were considered for your [PIPE RANDOM SPACE SELECTED FROM BL1]? (Select all that apply)

Note: Central air conditioning and central heat pumps use ducts and vents to distribute cooled air. See images below.

1. Central air conditioning
2. Room, window, or through-the-wall air conditioning
3. Ductless air conditioner with no heating
4. Central heat pump
5. Portable air conditioner
6. Fan(s)
7. Other geothermal or ground-source heat pump (different than the heat pump(s) I purchased)
8. Other mini‐split heat pump (different than the heat pump(s) I purchased)
9. Other central heat pump (different than the heat pump(s) I purchased)
10. Other, specify [REQUIRE TEXT RESPONSE]
98. I'm not sure

BL8. What, if anything, would you have most likely installed to cool your [PIPE RANDOM SPACE SELECTED FROM BL1] if you hadn't installed the heat pump you did?

1. [PIPE IN RESPONSES FROM BL7 AS SELECTIONS]
2. I would have continued to use my old cooling system
3. I wouldn't have installed a cooling system (left space uncooled)
4. I would have installed a different cooling system, please specify [REQUIRE TEXT RESPONSE]
98. I'm not sure

BL9. [IF BL8 ≠ 2, 3, OR 98] You indicated that you likely would have installed a different cooling system if you had not installed the heat pump. How likely is it that you would have installed a high-efficiency cooling system?

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
98. I'm not sure

[IF BL2 = 2, GO TO INSTRUCTIONS AFTER BL15; BL2 > 3, GO TO D1]

Now we would like to understand how your space **was heated** before the new heat pump was installed.

BL10. [ASK IF BL2 = 1, 3] What was the primary system that heated your [PIPE RANDOM SPACE SELECTED FROM BL1] before the new heat pump was installed? (Select only one response)

Note: Furnaces typically use ducts to heat the home. Boilers typically use radiators or baseboards to heat the home. See images below.

1. Oil furnace
2. Oil boiler
3. Propane/liquified petroleum gas (LPG) furnace
4. Propane/LPG boiler
5. Electric baseboard
6. Electric furnace
7. Natural gas furnace
8. Natural gas boiler
9. Electric space heater
10. Woodstove, pellet stove, or fireplace
11. Other geothermal or ground-source heat pump (outside of the heat pump(s) I purchased)
12. Other mini‐split heat pump (outside of the heat pump(s) I purchased)
13. Other central heat pump (outside of the heat pump(s) I purchased)
98. I'm not sure

BL11. [IF BL10= 1, 2, 3, 4, 6, 7] Which way did your previous [BL10 RESPONSE] vent? [ROTATE]?

1. [PICTURE OF CHIMNEY]
2. [PICTURE OF PVC PIPE]
3. Other, specify [REQUIRE TEXT RESPONE]
98. I'm not sure

BL12. [ASK IF BL2 = 1, 3] Which of the following best describes the condition of your old **heating** equipment in the [PIPE RANDOM SPACE SELECTED FROM BL1]?

1. The old equipment was working with no need for repair
2. The old equipment was working with need of minor repair
3. The old equipment was working with need of major repair
4. The old equipment was no longer working
98. I'm not sure

BL13. [ASK IF BL12 ≠ 4] Do you think your old **heating** equipment would have lasted another two years? (select one)

1. Yes
2. No
98. I'm not sure

BL14. [ASK IF BL2 = 1, 3] When the new heat pump was installed, was the previous heating system removed or disconnected, or is it still installed? Please select from the options below

1. The previous system was removed or disconnected and not replaced
2. The previous system was removed and replaced with a new piece of equipment of the same type
3. The previous system is still installed and operating
4. The previous system is still installed but is no longer operating

98. I'm not sure

BL15. [ASK IF BL14 = 2 OR 3] How often do you use this other **heating** system (not the heat pump you purchased through the program)?

1. Only in emergencies/ extreme temperatures
2. < 5 times per winter
3. 5 - 15 times per winter
4. 15 + times per winter
5. Very frequently/ Every day

98. I'm not sure

[IF BL2 = 1, GO TO D1]

Now we would like to understand how your space was **cooled** before the new heat pump was installed.

BL16. [IF BL2 = 2 OR 3] What was the primary system that cooled the [PIPE RANDOM SPACE SELECTED FROM BL1] before the new heat pump was installed? (Select all that apply)

Note: Central air conditioning and central heat pumps use ducts and vents to distribute cooled air.

1. Central air conditioning
2. Room, window, or through-the-wall air conditioning
3. Portable air conditioner
4. Only used fans
5. Other geothermal or ground-source heat pump (outside of the heat pump(s) I purchased)
6. Other mini - split heat pump (outside of the heat pump(s) I purchased)
7. Other central heat pump (outside of the heat pump(s) I purchased)
8. Other, specify [REQUIRE TEXT RESPONSE]
9. I'm not sure

BL17. [ASK IF BL2 = 2, 3] Which of the following best describes the condition of your old **cooling** equipment?

1. The old equipment was working with no need for repair
2. The old equipment was working with need of minor repair
3. The old equipment was working with need of major repair
4. The old equipment was no longer working

98. I'm not sure

BL18. [ASK IF BL17 ≠ 4] Do you think your old **cooling** equipment would have lasted another two years? (select one)

1. Yes
2. No

98. I'm not sure

BL19. [ASK IF BL2 = 2, 3] When the heat pump was installed, was the previous cooling system removed or disconnected, or is it still installed? Please select from the options below. (Select only one response)

1. The previous system was removed or disconnected and not replaced
2. The previous system was removed and replaced with a new piece of equipment of the same type
3. The previous system is still installed and operating
4. The previous system is still installed but is no longer working

98. Don't Know

[IF ASHP OR MSHP GO TO D1]

HPWH

[ASK IF HPWH_NUMC > 0 <98].

Earlier in this survey, we asked about the influence of the rebate on your decision to purchase one or more heat pump water heaters. Now we'd like to know what you would have done if you had not bought the heat pump water heater. [IF (product)_NUMC > 1 < 98, display, "For these questions, please think about the heat pump water heater you most recently purchased."

BL20. Before you decided to install your new heat pump water heater, did you or your contractor consider any other water heating system options?

1. Yes
2. No

BL21. What other water heating options did you consider? Select all that apply.

Note: **A storage water heater** is a single unit that heats and stores water**. An indirect water heater** is connected to a boiler that heats water stored in a separate tank. An **integrated water heater** is also called a combi-boiler, a single contained unit that provides space heating and on-demand hot water. A **tankless water heater** is a separate unit that heats water instantaneously without the use of a storage tank. **A tankless coil** uses a heat exchanger

installed inside the boiler to provide hot water on demand without a separate storage tank. See images below.

1. Electric storage water heater
2. Natural gas indirect water heater
3. Natural gas integrated or “combi” water heater
4. Natural gas storage water heater
5. Natural gas on-demand tankless water heater
6. Natural gas tankless coil on the boiler
7. Fuel-oil indirect storage water heater
8. Fuel-oil storage water heater
9. Fuel-oil tankless coil on the boiler
10. Fuel-oil on-demand tankless water heater
11. Propane / liquid petroleum gas (LPG) indirect storage water heater
12. Propane / liquid petroleum gas (LPG) storage water heater
13. Propane / liquid petroleum gas (LPG) tankless coil on the boiler
14. Propane / liquid petroleum gas (LPG) on-demand tankless water heater
15. Heat pump water heater [different than the heat pump water heater(s) I purchased through the program]
16. Other, specify [REQUIRE TEXT RESPONSE]
98. I’m not sure

BL22. What, if anything, would you most likely have installed to heat water if you had not installed the heat pump water heater?

1. [PIPE IN RESPONSES FROM BL21 AS SELECTIONS]
2. I would have continued to use my old water heating system
3. I would have installed a different water heating system, please specify [REQUIRE TEXT RESPONSE]
98. I’m not sure

BL23. [IF BL22 ≠ 2 OR 98] You indicated that you likely would have installed a different water heater if you had not installed the one you did. How likely is it that you would have selected a high-efficiency version of the water heater?

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
98. I’m not sure

BL24. [IF HPWH ET3 = 1] What type of water heating system did your heat pump water heater replace? If your new water heater replaced more than one type of water heating system, please select the prior system you used the most.

Note: **Storage water heaters** are a single unit that heats and stores water**. Indirect water heaters** are connected to a boiler that heats water stored in a separate tank. **Integrated water heaters** are commonly referred to as a Combi-Boiler, a single contained unit that provides space heating and on-demand hot water. **Tankless water heaters** are a single unit that heats water instantaneously without the use of a storage tank. **Tankless coils** use a heat exchanger installed inside the boiler to provide hot water on demand without a separate storage tank. See images below.

1. Electric storage water heater
2. Natural gas indirect water heater
3. Natural gas storage water heater
4. Natural gas tankless coil on the boiler
5. Natural gas on-demand tankless water heater
6. Fuel-oil indirect storage water heater
7. Fuel-oil storage water heater
8. Fuel-oil tankless coil on the boiler
9. Fuel-oil on-demand tankless water heater
10. Propane/liquid petroleum gas (LPG) indirect storage water heater
11. Propane/ liquid petroleum gas (LPG) storage water heater
12. Propane/ liquid petroleum gas (LPG) tankless coil on the boiler
13. Propane/ liquid petroleum gas (LPG) on-demand tankless water heater
14. Heat pump water heater (outside of the heat pump water heaters I purchased through the program)
15. Other, specify [REQUIRE TEXT RESPONSE]
98. I'm not sure

Boilers and Furnaces

[ASK SERIES IF BOILER_NUMC OR FURNACE_NUMC > 0 <98].

BL25. [IF BOILER, FURNACE ET3 = 1] What type of heating system did your [PRODUCT] replace? If your new equipment replaced more than one type of heating system, please select only the prior heating system you used the most.

Note: Furnaces typically use ducts to heat the home. Boilers typically use radiators or baseboards to heat the home. See images below.

1. Oil furnace
2. Oil boiler
3. Natural Gas furnace
4. Natural Gas boiler
5. Gas space heater
6. Propane furnace
7. Propane/liquified petroleum gas (LPG) boiler
8. Electric baseboard
9. Electric furnace
10. Electric space heater
11. Woodstove, pellet stove, or fireplace
12. Plug-in wall heater
13. Geothermal or ground-source heat pump
14. Mini - split heat pump
15. Central heat pump
16. Other heat pump
17. Other, specify [REQUIRE TEXT RESPONSE]
98. I'm not sure

BL26. [IF BL25 = 1, 2, 3, 4, 6, 7] Which way did your previous [BL25 RESPONSE] vent? [ROTATE]?

1. [PICTURE OF CHIMNEY]
2. [PICTURE OF PVC PIPE]
3. Other, specify [REQUIRE TEXT RESPONE]
98. I'm not sure

C.1.9 Demographic/Economic Factors

These last questions are about your home and household. Please remember that all your responses will be kept completely confidential. No one will be able to trace your responses back to you personally.

D1. Do you own or rent your home?

1. Own
2. Rent
3. Other; please specify: [REQUIRE TEXT RESPONSE]
98. I'm not sure

D2. What do you consider to be your home's primary **space** heating fuel? This is the fuel that provides most of the heat for your home in the winter. [ROTATE 1 TO 8]

1. Electric baseboard
2. Electric heat pump
3. Natural gas
4. Liquid propane gas
5. Fuel oil
6. Cord wood
7. Wood pellets
8. Coal
9. Something else [REQUIRE TEXT ENTRY]

98. I'm not sure

D3. What do you consider to be your home's primary **water** heating fuel? This is the main fuel that heats the hot water that flows from faucets and showerheads. [ROTATE 1 TO 4]

1. Electricity
2. Natural gas
3. Liquid propane gas
4. Fuel oil
5. Something else [REQUIRE TEXT ENTRY]

99. I'm not sure

D4. Who is responsible for paying the utility bill for the electricity used in your home?

1. I am (or someone else in my household)
2. Electricity is included in my rent or condo fee
3. Someone else

98. I'm not sure

D5. [IF D2 > 2] Who is responsible for paying for the primary heating fuel used in your home? [Pop-up definition: The primary heating fuel is the one you use the most to keep your home warm during the winter.]

1. I am (or someone else in my household)
2. It is included in my rent or condo fee
3. Someone else

98. I'm not sure

D6. Which of the following best describes your home or building? Please select one.

1. Single-family house detached from any other house
2. Single-family house attached to one or more other houses (for example: duplex, row house, or townhouse)
3. Mobile or manufactured home
4. Apartment in a building with 2 to 4 units
5. Apartment in a building with 5 or more units
6. Other, please specify: [REQUIRE TEXT ENTRY]

98. I'm not sure

D7. Counting yourself, in 2024, how many individuals lived in this home in each of the following age categories? Please enter a number for each category; enter "0" if there are no individuals of that age living in the home.

1. Under 18: [REQUIRE NUMERIC TEXT ENTRY 0-19]
2. Age 18 to 64: [REQUIRE NUMERIC TEXT ENTRY 0-19]
3. Age 65 and older: [REQUIRE NUMERIC TEXT ENTRY 0-19]

99. I'd rather not say

[COMPUTE SUM D7 RESPONSES ACROSS 1 TO 3]

D8. EDUCATION. What is the highest level of education that you have completed so far?

1. Less than ninth grade
2. Ninth to twelfth grade, no diploma
3. High school graduate (includes GED)
4. Some college, no degree
5. Associates or technical school degree
6. Bachelor's degree
7. Graduate or professional degree

99. I'd rather not say

D9. [IF D7 ≠ 99 OR SUM D7 > 0] Which of these categories best describes your total household income in 2024 before taxes—counting everyone living in your household?

1. Under [MODERATE INCOME AMOUNT FROM TABLE BELOW]
2. Over [MODERATE INCOME AMOUNT FROM TABLE BELOW]

99. I'd rather not say

# of occupants (Sum D1)	Moderate income[149]
1	$45,733
2	$59,805
3	$73,877
4	$87,949
5	$102,020
6	$116,092
7	$118,732

[149] https://www.energy.nh.gov/consumers/help-energy-and-utility-bills/assistance-programs-eligibility

8 or more	$121,369

D10. Before taxes, what was your total household income in 2024?

1. Less than $10,000
2. $10,000 to $19,999
3. $20,000 to $29,999
4. $30,000 to $39,999
5. $40,000 to $49,999
6. $50,000 to $59,999
7. $60,000 to $74,999
8. $75,000 to $99,999
9. $100,000 to $124,999
10. $125,000 to $149,999
11. $150,000 to $199,999
12. $200,000 or more
99. I'd rather not say

D11. How would you describe yourself? Please select all that apply. [ALLOW MULTIPLE RESPONSE]

1. Black or African American
2. Hispanic or Latino/Latina
3. American Indian or Alaska Native
4. Asian
5. Middle Eastern or North African
6. Native Hawaiian or Other Pacific Islander
7. White
8. Not listed; please specify: [REQUIRE TEXT ENTRY]
99. I'd rather not say

D12. When at home, does your household always speak English, usually speak English, usually speak a language or languages other than English, or speak English and another language equally?

1 Always speak English
2 Usually speak English
3 Usually speak language(s) other than English
4 Speak English and (an)other language(s) equally
98 I'd rather not say

D13. [D13 > 1 < 98] What other language(s) do you speak at home? Select all that apply. [ALLOW MULTIPLE RESPONSE]

1 Spanish
2 French
3 Portuguese
4 Mandarin
5 Cantonese
6 Vietnamese

7 Russian
8 Arabic
9 Italian
10 Khmer
11 Other [SPECIFY_____]
98 I'd rather not say

D14. ENG_COMF. [IF D12 > 1 < 98] How comfortable are you interacting with primary English speakers in English?

1 Very comfortable
2 Comfortable
3 Not very comfortable
4 Not at all
98 I'd rather not say

C.1.10 Closing

C1. These are all the questions we have for you today. Do you have any other comments that you'd like to share? [OPTIONAL TEXT ENTRY WITH A "NO THANK YOU" OPTION]

Thank you for your participation in this survey. Please enter an email address to receive your $25 gift card. [OPEN END; SHOW OPTIONS FOR DECLINING GIFT CARD:] If you wish to decline your gift card, please check here: [CHECK BOX]

Thank you for taking the time to share your feedback with the NHSaves utility partners.

C.2 NEW HAMPSHIRE ENERGY STAR® PRODUCTS RECYCLING MEASURE PARTICIPANT WEB SURVEY

Survey Purposes:

- Update unit energy consumption (UEC) for recycled refrigerators, freezers, dehumidifiers, and room air conditioners
- Estimate realization rates
- Estimate free ridership (FR) values. The primary purpose of these FR estimates was to inform any needed changes to program design. When the results are in-hand, the EM&V Working Group would assess the extent to which FR was or was not addressable through program design.
- Base approach on the Uniform Methods Project for refrigerators and freezers, modifying the approach for inclusion of dehumidifiers and room air conditioners

Topic	Questions
Screening and verifying product counts and types	V1 to V3
Impact Factors	RF, FZ, DH, AC Series
Free-ridership	RFR, FFR, DFR, AFR Series
Program Information and Satisfaction	P Series
Demographics	D Series

KEY

[ ] = instructions for programmer

C.2.1 Introduction

[NOTE TO PROGRAMMER: WE NEED AT LEAST xx REFRIGERATOR RESPONDERS, xx FREEZER RESPONDERS, xx DEHUMIDIFIER RESPONDERS, AND xx ROOM AIR CONDITIONER RESPONSES. WE CAN ACCEPT COMPLETIONS BEYOND THOSE QUOTAS.]

Thank you for agreeing to provide feedback on your experience with the NHSaves® Appliance Recycling Program. Please have the person who made the decision to participate in the recycling program complete the survey.

This survey should take 10–15 minutes. You can stop the survey at any time and return to it later. Your earlier responses will be saved. We will send an e-gift card of $XX to the email address you provide within two weeks after you finish the survey. All your responses will be kept confidential.

NMR Group is doing this research on behalf of the NHSaves utility partners: Eversource, Liberty, New Hampshire Electric Cooperative, and Unitil.

Questions?

- If you have any technical questions about the survey, or you wish to receive the survey link at a different email address, please contact [analyst] at NMR Group.

- If you have other questions or want to make sure the survey is valid, please contact Kiersten Williams, Senior Energy Efficiency Analyst at Eversource, at 603-634-3034 or kiersten.williams@eversource.com.

C.2.2 Verification and Recall

V1. Just to confirm, are you the person who made the decision to recycle the appliance(s)?
1. Yes **[GO TO V2]**
2. No **[TERMINATE]**
98. Don't know **[TERMINATE]**

V2. Our records indicate that your household recycled an appliance through NHSaves in **[DATE]**.
[IF MODE=PICK-UP] Someone would have come to your home and picked up your old refrigerator or freezer to recycle it**.** They may also have removed an old dehumidifier or room air conditioner. You would have received a rebate for each appliance you recycled.
[IF MODE=TURN-IN] You dropped off your old dehumidifier or room air conditioner at a turn-in event. You would have received a rebate for each unit you recycled.

Our records indicate that you recycled:

[READ IN NUM.RF] refrigerator(s)

[READ IN NUM.FZ] freezer(s)

[READ IN NUM.DH] dehumidifier(s)

[READ IN NUM.RAC] room air conditioner(s)

Is this correct?

1. Yes **[IF APPTYPE1 = REFRIGERATOR, GO TO RF SERIES; IF APPTYPE1 = FREEZER GO TO FZ SERIES; IF APPTYPE1 = DEHUMIDIFIER, GO TO DH SERIES; IF APPTYPE1 = AIRCONDITIONER, GO TO AC SERIES]**
2. No, I do not recall participating. **[THANK AND TERMINATE]**
3. No, the appliance type or quantity is incorrect. **[GO TO V3]**
98. Don't know **[THANK AND TERMINATE]**

V3. **[IF V2 = 3 AND MODE=PICK-UP]** Thinking only about any appliances that were picked up through NHSaves, please enter the number of refrigerators, freezers, dehumidifiers, and room air conditioners you recycled. Enter zero if you did not recycle the appliance.

[IF V2 = 3 AND MODE=TURN-IN] Thinking only about the dehumidifiers and room air conditioners you dropped off at a turn-in event, please enter the number of dehumidifiers and room air conditioners you recycled. Enter zero if you did not recycle the appliance.

1. **[IF V2=3 AND MODE=PICK-UP]** Refrigerators **[ENTER QUANTITY, MUST BE ZERO OR GREATER]**
2. **[IF V2=3 AND MODE=PICK-UP]** Freezers **[ENTER QUANTITY, MUST BE ZERO OR GREATER]**

3. Dehumidifiers **[ENTER QUANTITY, MUST BE ZERO OR GREATER]**
4. Room air conditioners **[ENTER QUANTITY, MUST BE ZERO OR GREATER]**

[IF V3.1=0 AND V3.2=0 AND V3.3=0 AND V3.4=0, TERMINATE]

[REASSIGNMENT APPLIES TO MODE=PICK-UP ONLY]

[IF V3.2 > 0, REASSIGN APPTYPE1 = FREEZER]
[IF V3.1 > 0 AND V3.2 = 0 AND V3.3=0 AND V3.4=0, REASSIGN APPTYPE1 = REFRIGERATOR]
[IF V3.1 = 0 AND V3.2 = 0 AND V3.3 >0 AND V3.4=0, REASSIGN APPTYPE1 = DEHUMIDIFIER]
[IF V3.1 = 0 AND V3.2 = 0 AND V3.4 = 0 AND V3.4 > 0, REASSIGN APPTYPE1 = AIRCONDITIONER
[IF V3.1 AND V3.2 > 0, REASSIGN APPTYPE1 = FREEZER]

[IF APPTYPE1 = REFRIGERATOR, GO TO RF SERIES; IF APPTYPE1 = FREEZER GO TO FZ SERIES; IF APPTYPE1 = DEHUMIDIFIER, GO TO DH SERIES; IF APPTYPE1 = AIRCONDITIONER, GO TO AC SERIES]

C.2.3 Refrigerators (RF SERIES)

[IF V2 = 1 AND NUM.RF = 1 OR IF V3.1 = 1] This next set of questions will ask about the old **refrigerator** that you had removed by the NHSaves Appliance Recycling Program.

[IF V2 = 1 AND NUM.RF > 1 OR IF V3.1>1] We are aware that you had more than one **refrigerator** removed by NHSaves.

For purposes of this survey, please think about the **[IF UNIT.BRAND1<>" " Unit.Brand1]]** refrigerator**.** Please keep only that one refrigerator clearly in your mind as you answer the next few questions.

RF1. Which of the following best describes the condition of your recycled refrigerator?
1. It was working with no need of repair
2. It was working with need of minor repair
3. It was working with need of major repair
4. It was no longer working
98. Don't know

RF2. Thinking about the 12 months before you recycled it, was the refrigerator plugged in…
[ALLOW ONLY ONE RESPONSE]

1. All of the time **[GO TO RF4]**
2. Some of the time
3. Never **[GO TO RF4]**
98. Don't know **[GO TO RF4]**

RF3. **[ASK IF RF2 = 2]** How many months was the refrigerator plugged in the year before you recycled it? **[ALLOW WHOLE NUMBER BETWEEN 0 AND 12]**

RF4. Where was the refrigerator located? **[RANDOMIZE 1-7; ALLOW ONLY ONE RESPONSE]**

1. Kitchen
2. Basement
3. Garage
4. Porch/Patio
5. Laundry room
6. Yard
7. Barn

97. Some other place, please specify: **[OPEN END]**
98. Don't know

RF5. **[IF RF4≠1]** Is the space where the refrigerator was located heated by your heating system in the winter?

1. Yes
2. No

98. Don't know

RF6. Is the space where the refrigerator was located cooled with air conditioning in the summer?

1. Yes
2. No

98. Don't know

C.2.4 Refrigerator Free-Ridership (RFR Series)

[DISPLAY IF NUM.RF > 1 OR IF V3.1>1] Please continue thinking about just that one refrigerator for the next set of questions.

RFR1. Before you heard about the NHSaves Appliance Recycling Program, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the community transfer station/dump or a recycling center yourself? **[ALLOW ONLY ONE RESPONSE]**

1. Yes
2. No

98. Don't know

RFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your refrigerator? **[ALLOW ONLY ONE RESPONSE]**

1. Gotten rid of it
2. Kept it [**GO TO P1]**

98. Don't know [**GO TO P1]**

RFR3. **[ASK IF RFR2 = 1]** If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the refrigerator? **[RANDOMIZE 1-6, ALLOW ONLY ONE RESPONSE]**

1. Sold it **[GO TO RFR4]**
2. Given it away for free **[GO TO RFR5]**
3. Recycled it **[GO TO RFR6]**
4. Taken it to a community transfer station/dump or put it out as trash **[GO TO P1]**
5. Hired a hauler to take it away **[GO TO P1]**
6. Had a retail store come and pick it up **[GO TO P1]**

97. Something else, please specify: **[OPEN END]** **[GO TO P1]**
98. Don't know **[GO TO P1]**

RFR4. **[ASK IF RFR3=1]** Would you have sold the refrigerator to: **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Acquaintance, friend, or family member
2. Stranger (e.g., through an online ad)
3. Used appliance dealer

97. Someone else, please specify: **[OPEN END]**
98. Don't know

RFR5. **[ASK IF RFR3=2]** If you had given the refrigerator away for free, who would you have given it to? **[RANDOMIZE 1-6, ALLOW ONLY ONE RESPONSE]**

1. Given to an acquaintance, friend, or family member
2. Given to a charity
3. Put it on the curb
4. Posted it online for free
5. Taken it to a swap shop or community swap day
6. Taken it to a community transfer station/dump

97. Given it away some other way, please specify: **[OPEN END]**
98. Don't know

RFR6. **[ASK IF RFR7=3]** How would you have recycled the refrigerator? **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Taken it to a community transfer station/dump
2. Put it out for pick-up
3. Hired someone to take it

97. Done something else, please specify: **[OPEN END]**
98. Don't know

[GO TO P1]

C.2.5 Freezers (FZ SERIES)

[ASK IF APPTYPE 1 = FREEZER]

[IF V2 = 1 AND NUM.FREEZERS = 1 OR V3.2 =1] This next set of questions will ask about the old **stand-alone freezer** you had removed through the program.

[IF V2 = 1 AND NUM.FREEZERS > 1 OR V3.2 >1] We are aware you had more than **one stand-alone freezer** removed through the program.

For purposes of this survey, please think about the **[IF UNIT.BRAND1<>" " Unit.Brand1]]** freezer with **[Configuration1]** configuration**.** Please keep only that one freezer clearly in your mind as you answer the next few questions.

FZ1. Which of the following best describes the condition of your recycled freezer?

a. It was working with no need of repair
b. It was working with need of minor repair
c. It was working with need of major repair
It was no longer working
Don't know

FZ2. Thinking about the 12 months before you recycled it, was the freezer plugged in… **[ALLOW ONLY ONE RESPONSE]**

1. All of the time **[GO TO FZ4]**
2. Some of the time
3. Never **[GO TO FZ4]**
98. Don't know **[GO TO FZ4]**

FZ3. **[ASK IF FZ2 = 2]** How many months was the freezer plugged in the year before you recycled it? **[ALLOW WHOLE NUMBER BETWEEN 0 AND 12]**

FZ4. Where was the freezer located? **[RANDOMIZE 1-7; ALLOW ONLY ONE RESPONSE]**

1. Kitchen
2. Basement
3. Garage
4. Porch/Patio
5. Laundry room
6. Yard
7. Barn
97. Some other place **[OPEN END]**
98. Don't know

FZ5. **[IF FZ4≠1]** Is the space where the freezer was located heated by your heating system in the winter? **[ALLOW ONLY ONE RESPONSE]**

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

FZ6. Is the space where the freezer was located cooled with air conditioning in the summer? **[ALLOW ONLY ONE RESPONSE]**

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

C.2.6 Freezer Free-Ridership (FFR Series)

[DISPLAY IF NUM.FREEZERS > 1] Please continue thinking about just that one freezer for the next set of questions.

FFR1. Before you heard about the NHSaves Appliance Recycling Program, had you considered getting rid of the freezer? Meaning, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center yourself? **[ALLOW ONLY ONE RESPONSE]**

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

FFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your freezer? **[ALLOW ONLY ONE RESPONSE]**

1. Gotten rid of it
2. Kept it [**GO TO P1]**
98. Don't know [**GO TO P1]**

FFR3. **[ASK IF FFR2 = 1]** If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the freezer? **[RANDOMIZE 1-6, ALLOW ONLY ONE RESPONSE]**

1. Sold it **[GO TO FFR4]**
2. Given it away for free **[GO TO FFR5]**
3. Recycled it [**GO TO FFR6]**
4. Taken it to a community transfer station/dump or put it out as trash **[GO TO P1]**
5. Hired a hauler to take it away **[GO TO P1]**
6. Had a retail store come and pick it up **[GO TO P1]**
97. Something else, please specify: **[OPEN END] [GO TO P1]**
98. Don't know **[GO TO P1]**

FFR4. **[ASK IF FFR3=1]** Would you have sold the freezer to: **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Acquaintance, friend, or family member
2. Stranger (e.g., through an online ad)
3. Used appliance dealer
97. Someone else, please specify: **[OPEN END]**
98. Don't know

FFR5. **[ASK IF FFR3=2]** If you had given the freezer away for free, who would you have given it to? **[RANDOMIZE 1-6, ALLOW ONLY ONE RESPONSE]**

1. Given to an acquaintance, friend, or family member
2. Given to a charity
3. Put it on the curb
4. Posted it online for free
5. Taken it to a swap shop or community swap day
6. Taken it to a community transfer station/dump

97. Given it away some other way, please specify: **[OPEN END]**
98. Don't know

FFR6. **[ASK IF FFR3=3]** How would you have recycled the freezer? **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Take it to a community transfer station/dump
2. Put it out for pick-up
3. Hired someone to take it

97. Done something else, please specify: **[OPEN END]**
98. Don't know

[GO TO P1]

C.2.7 Dehumidifiers (DH SERIES)

[ASK IF APPTYPE 1 = DEHUMIDIFIER]

[IF V2 = 1 AND NUM.DH = 1 OR V3.2 =1] This next set of questions will ask about the old **dehumidifier** you recycled through the program.

[IF V2 = 1 AND NUM. DH > 1 OR V3.2 >1] We are aware you recycled more than one **dehumidifier** through the program.

For purposes of this survey, please think about the **[IF UNIT.BRAND1<>" " Unit.Brand1]]** dehumidifier. Please keep only that one dehumidifier clearly in your mind as you answer the next few questions.

DH1. Which of the following best describes the condition of your recycled dehumidifier?

a. It was working with no need of repair
b. It was working with need of minor repair
It was working with need of major repair
It was no longer working
Don't know



Source: Ivation Products



Source: GE Appliances

DH2. When you used the recycled dehumidifier, was it continuously draining (picture on the left), or did you have to manually empty the unit (picture on the right)? **[ALLOW ONLY ONE RESPONSE]**

1. The system drained continuously
Needed to manually empty

Don't know

DH3. Thinking about the 12 months before you recycled it, was the dehumidifier turned on at any time in the year? ("Turned on" means it was plugged in and set to either run continuously or to run when the humidity reached a certain level.) **[ALLOW ONLY ONE RESPONSE]**

1. All of the time **[GO TO □]**
2. Some of the time

Never **[GO TO DFR1]**
Don't know **[GO TO DFR1]**

DH4. **[ASK IF DH3 = 2]** How many months in the year was the dehumidifier turned on before you recycled it? **[ALLOW WHOLE NUMBER BETWEEN 0 AND 12]**

When it was turned on, about how many hours in the day did the dehumidifier run on average before you recycled it? **[ALLOW WHOLE NUMBER BETWEEN 0 AND 24]**

DH5. When it was turned on, was your old dehumidifier that you recycled set to dehumidify constantly, or did you set controls that automatically shut it off when the humidity dropped below a certain level? **[ALLOW ONLY ONE RESPONSE]**

1. It was set to dehumidify constantly
   It was set to automatically shut off when humidity dropped below a certain level
98. Don't know

C.2.8 Dehumidifier Free-Ridership (DFR Series)

[DISPLAY IF NUM.DEHUMIDIFIER > 1] Please continue thinking about just that one dehumidifier for the next set of questions.

DFR1. Before you heard about the NHSaves Appliance Recycling Program, had you considered getting rid of the dehumidifier? Meaning, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center yourself? **[ALLOW ONLY ONE RESPONSE]**

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

DFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your dehumidifier? **[ALLOW ONLY ONE RESPONSE]**

1. Gotten rid of it
2. Kept it **[GO TO INSTRUCTIONS BEFORE DFR7]**
98. Don't know **[GO TO INSTRUCTIONS BEFORE DFR7]**

DFR3. **[ASK IF DFR2 =1]** If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the dehumidifier? **[RANDOMIZE 1-6, ALLOW ONLY ONE RESPONSE]**

1. Sold it **[GO TO DFR4]**
2. Given it away for free **[GO TO DFR5]**
3. Recycled it [**GO TO DFR6]**
4. Taken it to a community transfer station/dump or put it out as trash **[GO TO P1]**
5. Hired a hauler to take it away **[GO TO P1]**
97. Something else, please specify: **[OPEN END] [GO TO P1]**
98. Don't know **[GO TO P1]**

DFR4. **[ASK IF DFR3=1]** Would you have sold the dehumidifier to: **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Acquaintance, friend, or family member
2. Stranger (e.g., through an online ad)
3. Used appliance dealer
97. Someone else, please specify: **[OPEN END]**
98. Don't know

DFR5. **[ASK IF DFR3=2]** If you had given the dehumidifier away for free, who would you have given it to? **[RANDOMIZE 1-7, ALLOW ONLY ONE RESPONSE]**

1. Given to an acquaintance, friend, or family member
2. Given to a charity
3. Put it on the curb
4. Posted it online for free
5. Taken to a swap shop
6. Given it to a retail store
7. Taken it to a community transfer station/dump

97. Given it away some other way, please specify: **[OPEN END]**
98. Don't know

DFR6. **[ASK IF DFR3=3]** How would you have recycled the dehumidifier? **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Take it to a community transfer station/dump
2. Put it out for pick-up
3. Hired someone to take it

97. Something else, please specify: **[OPEN END]**
98. Don't know

[IF NEWDH = 0, GO TO P1]

DFR7. **[ASK IF NEWDH = 1]** Our records indicate that you also received at least one $30 rebate from NHSaves to buy a new dehumidifier. Do you recall using a rebate to buy a new dehumidifier? **[ALLOW ONLY ONE RESPONSE]**

1. Yes
2. No **[GO TO P1]**

98. Don't know **[GO TO P1]**

DFR8. **[ASK IF DFR7 = 1]** If there had been no rebate available for recycling your old dehumidifier, how likely is it that you would have purchased any type of new dehumidifier at the same time? **[ALLOW ONLY ONE RESPONSE]**

1. Not at all likely **[GO TO DFR10]**
2. Slightly likely **[GO TO DFR9]**
3. Somewhat likely **[GO TO DFR9]**
4. Very likely **[GO TO DFR10]**

98. Don't know **[GO TO DFR10]**

DFR9. **[ASK IF DFR8= 2 OR 3]** If there had been no rebate available for recycling your old dehumidifier, when do you think you would have purchased a new dehumidifier? Would you say… **[ALLOW ONLY ONE 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

DFR10. **[ASK IF DFR7 = 1]** If there had been no rebate available to buy a new dehumidifier, how likely is it that you would have recycled your old dehumidifier at the same time? **[ALLOW ONLY ONE RESPONSE]**

1. Not at all likely **[GO TO DFR12]**
2. Slightly likely **[GO TO DFR11]**
3. Somewhat likely **[GO TO DFR11]**
4. Very likely **[GO TO DFR12]**

98. Don't know **[GO TO DFR12]**

DFR11. **[ASK IF DFR10 = 2 OR 3]** If there had been no rebate available to buy a new dehumidifier, when do you think you would have gotten rid of your old dehumidifier? Would you say … **[ALLOW ONLY ONE 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
4. I would not have gotten rid of it

98. Don't know **P1**

DFR12. **[ASK IF DFR7 = 1]** If there had been no rebate available for recycling your old dehumidifier, how likely is it that you would have purchased the dehumidifier with the exact same high-efficiency level? **[ALLOW ONLY ONE RESPONSE]**

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

98. Don't know

C.2.9 Room Air Conditioners (AC Series)

[ASK IF APPTYPE1 = AIRCONDITIONER]

[IF V2 = 1 AND NUM.RAC = 1 OR V3.4 = 1] This next set of questions will ask about the old **room air conditioner** you recycled through the program.

[IF V2 = 1 AND NUM.RAC > 1 OR V3.4 > 1] We are aware you recycled more than one **room air conditioner** through the program.

For purposes of this survey, please think about the **[IF UNIT.BRAND1<>" " Unit.Brand1]]** air conditioner. Please keep only that one room air conditioner clearly in your mind as you answer the next few questions.

AC1. Which of the following best describes the condition of your recycled room air conditioner?

a. It was working with no need of repair
b. It was working with need of minor repair
c. It was working with need of major repair

It was no longer working
Don't know

AC2. Thinking about the 12 months before you recycled it, was the room air conditioner ever in use? **[ALLOW ONLY ONE RESPONSE]**

1. All of the time **[GO TO AC5]**
2. Just for cooling season
3. Never **[GO TO AFR1]**

98. Don't know **[GO TO AC5]**

AC3. **[IF AC2 = 2]** For cooling season, what month did you typically start using this room air conditioner?

1. March
2. April
3. May
4. June
5. July

Other, please specify: **[OPEN END]**
Don't know

AC4. **[IF AC2 = 2]** What month did you typically stop using this room air conditioner for the season?

1. August
2. September
3. October
4. November

Other, please specify: **[OPEN END]**
Don't know

AC5. Thinking about the last 12 months before you recycled it and when the room air conditioner was in use, did you run the air conditioner…

1. Every day **[GO TO AC7]**
2. Some days

3. Only on days when the temperature reached a certain level. Please specify the temperature: **[OPEN END, NUMERIC] [GO TO AC7]**

Never **[GO TO AFR1]**
Don't know **[GO TO AC7]**

AC6. **[IF AC5 = 2]** How many days each week did you run the air conditioner on average? **[DROPDOWN MENU]**

1. One
2. Two
3. Three
4. Four
5. Five
6. Six

Seven
Don't know

AC7. Thinking about the last 12 months before you recycled it, on days where you ran the room air conditioner, did you run the air conditioner…

1. The entire day
2. Only when someone was home or using the room
3. Only during daylight hours

Only during the night
98. Don't know

AC8. What mechanism controlled the temperature for this air conditioner?

1. Thermostat **[ASSIGN ACCONTROL = THERMOSTAT]**
2. Manual control such as a dial **[ASSIGN ACCONTROL = DIAL]**
3. Remote control **[ASSIGN ACCONTROL = REMOTE]**
4. Phone App **[ASSIGN ACCONTROL = APP]**

Another mechanism, please specify: **[OPEN END]**
Don't know

AC9. When you were running this air conditioner, how did you typically set the room air conditioner's **[ACCONTROL]**?

1. I set it to a constant temperature.
2. I set it to different temperatures for day and night.
3. I set it to different temperatures when at home and when away from home.

Other, please specify: **[OPEN END]**
Don't know

AC10. **[IF AC9 = 1]** When you were running this room air conditioner, what temperature (°F) was the air conditioner's **[ACCONTROL]** usually set to?

1. **[OPEN END, ALLOW WHOLE NUMBER BETWEEN 60 AND 90]**

Don't know

AC11. **[IF AC9 = 2]** When you were running this room air conditioner during the day, what temperature (°F) was the air conditioner's **[ACCONTROL]** usually set to?
[OPEN END, ALLOW WHOLE NUMBER BETWEEN 60 AND 90]
Don't know

AC12. **[IF AC9 = 2]** When you were running this room air conditioner during the night, what temperature was the air conditioner's **[ACCONTROL]** usually set to?
[OPEN END, ALLOW WHOLE NUMBER BETWEEN 60 AND 90]
Don't know

AC13. **[IF AC9=3]** When you were running this room air conditioner while at home, what temperature (°F) was the air conditioner's **[ACCONTROL]** usually set to?
[OPEN END, ALLOW WHOLE NUMBER BETWEEN 60 AND 90]
Don't know

AC14. **[IF AC9 = 3]** When you were running this room air conditioner while you were away from home, what temperature was the air conditioner's **[ACCONTROL]** usually set to?
[OPEN END, ALLOW WHOLE NUMBER BETWEEN 60 AND 90]
Don't know

AC15. When you used this room air conditioner, what setting did you usually use it on?
1. High cool
2. Low cool
3. Fan setting
4. Automatic
5. Eco or Energy Efficiency Setting

Something else, please specify: **[OPEN END]**
Don't know

AC16. At night, did you set the air conditioner to sleep mode?
1. Yes
2. No

NA – There was no sleep mode
Don't know

AC17. At the time of recycling, how was this room air conditioner used in your home?
1. Main source of air conditioning [Pop-up: "The room air conditioner was used as the air conditioner for a home or as part of a system of multiple air conditioners that were used together as the main cooling system"]
2. Secondary source of air conditioning [Pop-up: "The room air conditioner was used to provide additional cooling when a central air-conditioning system or other room air conditioners were not sufficient"]

Spare source of air conditioning [Pop-up: "The room air conditioner was used as a backup when other air conditioners were broken/not working"]

Don't know

AC18. At the time the room air conditioner was recycled, was it your only AC, or did you have additional units?

1. It was the only unit

I had at least one other unit
Don't know

AC19. In what room was the recycled room air conditioner usually installed? **[RANDOMIZE 1-6, ALLOW ONLY ONE RESPONSE]**

1. Bedroom
2. Living room/family room
3. Office
4. Kitchen
5. Dining room
6. Barn

Something else, please specify: **[OPEN END]**
Don't know

AC20. Does this room have a door?
Yes
No

AC21. **[IF AC18 = 1]** When the room air conditioner was on, did you usually keep the doors to this room open or shut?

1. Keep it shut

Keep it open

98. Don't know

C.2.10 Room Air Conditioner Free-Ridership (AFR Series)

[DISPLAY IF NUM.RAC > 1] Please continue thinking about just that one room air conditioner for the next set of questions.

AFR1. Before you heard about the NHSaves Appliance Recycling Program, had you considered getting rid of the room air conditioner? Meaning, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center yourself? **[ALLOW ONLY ONE RESPONSE]**

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

AFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your room air conditioner? **[ALLOW ONLY ONE RESPONSE]**

1. Gotten rid of it

2. Kept it **[GO TO INSTRUCTIONS BEFORE AFR7]**
98. Don't know **[GO TO INSTRUCTIONS BEFORE AFR7]**

AFR3. **[ASK IF AFR2 = 1]** If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the room air conditioner? **[RANDOMIZE 1-6, ALLOW ONLY ONE RESPONSE]**

1. Sold it **[GO TO AFR4]**
2. Given it away for free **[GO TO AFR5]**
3. Recycled it **[GO TO AFR6]**
4. Take it to a transfer station/dump or put it out as trash **[GO TO P1]**
5. Hired a hauler to take it away **[GO TO P1]**
97. Something else, please specify: **[OPEN END] [GO TO P1]**
98. Don't know **[GO TO P1]**

AFR4. **[ASK IF AFR3 = 1]** Would you have sold the room air conditioner to: **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Acquaintance, friend, or family member
2. Stranger (e.g., through an online ad)
3. Used appliance dealer
97. Someone else, please specify: **[OPEN END]**
98. Don't know

AFR5. **[ASK IF AFR3 = 2]** If you had given the room air conditioner away for free, who would you have given it to? **[RANDOMIZE 1-7, ALLOW ONLY ONE RESPONSE]**

1. Given to an acquaintance, friend, or family member
2. Given to a charity
3. Put it on the curb
4. Posted it online for free
5. Taken to a swap shop
6. Given it to a retail store
7. Taken it to a community transfer station/dump
97. Given it away some other way, please specify: **[OPEN END]**
98. Don't know

AFR6. **[ASK IF AFR3 = 3]** How would you have recycled the room air conditioner? **[RANDOMIZE 1-3, ALLOW ONLY ONE RESPONSE]**

1. Take it to a community transfer station/dump
2. Put it out for pick-up
3. Hired someone to take it
97. Something else, please specify: **[OPEN END]**
98. Don't know

[IF NEWRAC = 0, GO TO P1]

AFR7. **[ASK IF NEWRAC = 1]** Our record indicates that you also received at least one $30 rebate from NHSaves to buy a new room air conditioner. Do you recall using a rebate to buy a new air conditioner? **[ALLOW ONLY ONE RESPONSE]**

1. Yes
2. No **[GO TO P1]**

98. Don't know **[GO TO P1]**

AFR8. **[ASK IF AFR7 = 1]** If there had been no rebate available for recycling your old room air conditioner, how likely is it that you would have purchased any type of new air conditioner at the same time? **[ALLOW ONLY ONE RESPONSE]**

1. Not at all likely **[GO TO AFR10]**
2. Slightly likely **[GO TO AFR9]**
3. Somewhat likely **[GO TO AFR9]**
4. Very likely **[GO TO AFR10]**

98. Don't know **[GO TO AFR10]**

AFR9. **[ASK IF AFR8 = 2 OR 3]** If there had been no rebate available for recycling your old room air conditioner, when do you think you would have purchased a new air conditioner? Would you say… **[ALLOW ONLY ONE RESPONSE]**

1. Within 6 months of when you did
2. Between 6 and 12 months of when you did
3. More than 1 year after when you did

98. Don't know

AFR10. **[ASK IF AFR7 = 1]** If there had been no rebate available to buy a new room air conditioner, how likely is it that you would have recycled your old air conditioner at the same time? **[ALLOW ONLY ONE RESPONSE]**

1. Not at all likely **[GO TO AFR12]**
2. Slightly likely **[GO TO AFR11]**
3. Somewhat likely **[GO TO AFR11]**
4. Very likely **[GO TO AFR12]**

98. Don't know **[GO TO AFR12]**

AFR11. **[ASK IF AFR10 = 2 OR 3]** If there had been no rebate available to buy a new room air conditioner, when do you think you would have gotten rid of your old air conditioner? Would you say… **[ALLOW ONLY ONE RESPONSE]**

1. Within 6 months of when you did
2. Between 6 and 12 months of when you did
3. More than 1 year after when you did
4. I would not have gotten rid of it

98. Don't know

AFR12. **[ASK IF AFR7 = 1]** If there had been no rebate available for recycling your old room air conditioner, how likely is it that you would have purchased the air conditioner with the exact same high-efficiency level? **[ALLOW ONLY ONE RESPONSE]**

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

98. Don't know

C.2.11 Program Satisfaction

P1. Using a scale of 0 to 10, where 0 is "extremely unlikely" and 10 is "extremely likely," how likely are you to recommend the NHSaves Appliance Recycling Program to a friend? **[RECORD A WHOLE # 0-10; DON'T KNOW = 98; REFUSED = 99.]**

P2. **[IF P1 < 3]** Why would you be unlikely to recommend the Appliance Recycling Program? **[OPEN END]**

P3. **[IF P1 > 8]** Why would you be likely to recommend the Appliance Recycling Program? Select all that apply. **[ROTATE 1-4]**

1. The rebate
2. Free removal of appliance
3. Easy to participate
4. Good for the environment
5. Ensures proper recycling of appliance
6. Other, please specify: **[OPEN END]**

P4. Using a scale of 1 to 5, where 1 is "very difficult" and 5 is "very easy," how easy was it to participate in the NHSaves Appliance Recycling Program? **[RECORD A WHOLE # 1 TO 5; DON'T KNOW = 98; REFUSED = 99.]**

P5. **[IF MODE = PICKUP]** From the time you first contacted NHSaves about your **[APPTYPE1]**, about how many days did it take before the appliance was picked up? **[OPEN END, NUMERIC]**

P6. To what extent did participating in the Appliance Recycling Program increase your awareness of other energy-saving opportunities offered by NHSaves?

7. Significantly increased my awareness
8. Moderately increased my awareness
9. Slightly increased my awareness
10. No change in my awareness

98. Don't know

P7. To what extent did participating in the Appliance Recycling Program increase your awareness of other actions you can take to save energy?

1. Significantly increased my awareness
2. Moderately increased my awareness
3. Slightly increased my awareness
4. No change in my awareness

98. Don't know

P8. Using a scale of 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied", please tell us how satisfied you were with the following aspects of the program: **[RANDOMIZE; RECORD A WHOLE # 1 TO 5; DON'T KNOW = 98; REFUSED = 99]**

a. **[IF MODE = PICK-UP]** Scheduling the appliance pick-up
b. **[IF MODE = PICK-UP]** The technician(s) who performed the pick-up
c. **[IF MODE = PICK-UP]** The length of time between contacting the program and the pickup
d. **[IF MODE = PICK-UP]** The promptness of the pick-up on the scheduled day
e. The amount of the rebate
f. The turnaround time on the rebate
g. Availability and accuracy of information on the program online
h. **[IF MODE = TURN-IN]** Convenience of the drop-off location
i. **[IF MODE = TURN-IN]** Schedule of the drop-off location
j. **[IF MODE = TURN-IN]** Staff at the drop-off location

P9. **[IF P8a < 3]** Why were you not satisfied with scheduling the appliance pick-up? **[OPEN END]**

P10. **[IF P8b < 3]** Why were you not satisfied with scheduling the technician(s) who performed the pickup? **[OPEN END]**

P11. **[IF P8c < 3]** Why were you not satisfied with the length of time between contacting the program and the pickup? **[OPEN END]**

P12. **[IF P8d < 3]** Why were you not satisfied with the promptness of the pickup on the scheduled day? **[OPEN END]**

P13. **[IF P8e < 3]** Why were you not satisfied with the amount of the rebate? **[OPEN END]**

P14. **[IF P8g < 3]** Why were you not satisfied with the availability and/or accuracy of information on the program online? **[OPEN END]**

P15. **[IF P8h < 3]** Why were you not satisfied with the convenience of the drop-off location? **[OPEN END]**

P16. **[IF P8i < 3]** Why were you not satisfied with the schedule of the drop-off location? **[OPEN END]**

P17. **[IF P8j < 3]** Why were you not satisfied with the staff at the drop-off location? **[OPEN END]**

P18. **[IF P8f < 3]** How many weeks did it take you to receive the rebate? **[NUMERIC]**

C.2.12 Demographics

We just have a few more questions for you. Please keep your primary address in mind while answering the remaining survey questions.

D1. What type of home do you live in? Please select one.

1. Single-family
2. Duplex
3. Triple-decker (e.g. three-story house with each floor being a separate unit)
4. Apartment/condo in a 2–4-unit building
5. Apartment/condo in a 5+ unit building
6. Townhouse or row house (adjacent walls to another house)
7. Mobile home or trailer

97. Other, please specify: **[OPEN END]**

D2. Do you own or rent this residence?

1. Own
2. Rent

97. Other, please specify: **[OPEN END]**

D3. Counting yourself, in 2024, how many individuals lived in this home in each of the following age categories? Please enter a number for each category; enter "0" if there are no individuals of that age living in the home.

4. Under 18: **[REQUIRE NUMERIC TEXT ENTRY 0-19]**
5. Age 18 to 64: **[REQUIRE NUMERIC TEXT ENTRY 0-19]**
6. Age 65 and older: **[REQUIRE NUMERIC TEXT ENTRY 0-19]**

100. I'd rather not say

[COMPUTE SUM D1 RESPONSES ACROSS 1 TO 3]

D4. What is the highest level of education that you have completed so far?

1. Less than ninth grade
2. Ninth to twelfth grade, no diploma
3. High school graduate (includes GED)
4. Some college, no degree
5. Associate's degree
6. Bachelor's degree
7. Graduate or professional degree

99. Prefer not to answer

D5. Which of the following best describes your age?

1. 18-24
2. 25-29
3. 30-39
4. 40-49
5. 50-59
6. 60-69
7. 70-79
8. 80-89
9. 90 years or older

99. Prefer not to answer

D6. **[IF D1 ≠ 99 OR SUM D1 > 0]** Which of these categories best describes your total household income in 2024 before taxes—counting everyone living in your household?

3. Under [MODERATE INCOME AMOUNT FROM TABLE BELOW]
4. Over [MODERATE INCOME AMOUNT FROM TABLE BELOW]

100. I'd rather not say

# of occupants (Sum D1)	Moderate income[150]
1	$45,733
2	$59,805
3	$73,877
4	$87,949
5	$102,020
6	$116,092
7	$118,732
8 or more	$121,369

[150] https://www.energy.nh.gov/consumers/help-energy-and-utility-bills/assistance-programs-eligibility

D7. Before taxes, what was your total household income in 2024?

13. Less than $10,000
14. $10,000 to $19,999
15. $20,000 to $29,999
16. $30,000 to $39,999
17. $40,000 to $49,999
18. $50,000 to $59,999
19. $60,000 to $74,999
20. $75,000 to $99,999
21. $100,000 to $124,999
22. $125,000 to $149,999
23. $150,000 to $199,999
24. $200,000 or more
100. I'd rather not say

D8. How would you describe yourself? Please select all that apply. **[ALLOW MULTIPLE RESPONSE]**

9. White
10. Black or African American
11. Hispanic or Latino/Latina
12. American Indian or Alaska Native
13. Asian
14. Middle Eastern or North African
15. Native American or Other Pacific Islander
16. Not listed; please specify: **[REQUIRE TEXT ENTRY]**
100. I'd rather not say

[CLOSING]

C2. These are all the questions we have for you today. Do you have any other comments to share? **[OPTIONAL TEXT ENTRY WITH A "NO THANK YOU" OPTION. ALLOW AMPLE CHARACTERS.]**

Thank you for taking the time to share your feedback with the NHSaves utility partners.

Please enter an email address to receive your $25 gift card**. [OPEN END; SHOW OPTIONS FOR DECLINING GIFT CARD:]** If you wish to decline your gift card, please check here: **[CHECK BOX]**

You should receive the gift card within two weeks. If you don't see it in your inbox, please check your spam or junk folder. The email will come from **[insert name that shows up for Tango**].

Appendix D Detailed Results

D.1 Results by Measure: HVAC and Controls Measures

D.1.1 Air Source Heat Pumps

D.1.1.1 Screening

Table 73: S4. For what purpose did you buy your new heat pump?

	Central ASHP (n=63)	Mini-split Heat Pump (n=66)
I bought it for cooling	2%	18%
I bought it for heating	2%	2%
I bought it for both heating and cooling	96%	80%

D.1.1.2 Baseline

Table 74: BL1. What space(s) does your new heat pump serve? Check all that apply.

	Central ASHP (n=63)	Mini-split Heat Pump (n=66)
Entire home	75%	29%
Master bedroom	16%	35%
Other bedroom(s)	13%	23%
Living room, family room, or den	17%	47%
Kitchen	11%	24%
Office	8%	20%
Sunroom or three-season space	5%	3%
Auxiliary spaces, such as lofts or attics	3%	6%
Basement	0%	8%
Entire second floor	2%	0%

Table 75: BL2. Was the space heated and/or cooled before the installation of the new heat pump system? Select only one response.

	Central ASHP (n=63)	Mini-split Heat Pump (n=66)
It was heated only	32%	55%
It was cooled only	2%	0%
It was heated and cooled	62%	29%
It is a brand-new space	3%	8%
It was not heated or cooled	2%	9%

Table 76: BL3. Before you decided to install your new heat pump, did you or your contractor consider options other than your new heat pump to heat or cool your space? Select only one response.

	Central ASHP (n=63)	Mini-split Heat Pump (n=66)
Yes, I/we considered both heating and cooling options	46%	26%
Yes, I/we considered ONLY heating options	6%	8%

	Central ASHP (n=63)	Mini-split Heat Pump (n=66)
Yes, I/we considered ONLY cooling options	5%	11%
No, I/we did not consider any other options	43%	56%

Table 77: BL4. What other heating options were considered for your space? Select all that apply

	Central ASHP (n=33)	Mini-split Heat Pump (n=22)
Oil furnace	9%	32%
Oil boiler	18%	9%
Propane furnace	36%	14%
Propane/liquified petroleum gas (LPG) boiler	15%	5%
Natural gas furnace	15%	9%
Natural gas boiler	9%	14%
Gas space heater	0%	5%
Electric baseboard	9%	5%
Electric furnace	3%	0%
Electric space heater	12%	14%
Plug-in wall heater	9%	9%
Woodstove, pellet stove, or fireplace	21%	14%
Geothermal or ground-source heat pump (different than the heat pump(s) I purchased)	15%	9%
Central heat pump (different than the heat pump(s) I purchased)	6%	9%
Mini-split heat pump (different than the heat pump(s) I purchased)	15%	0%
Other heat pump (different than the heat pump(s) I purchased)	6%	5%
Don't know	0%	5%

Table 78: BL5. What, if anything, would you have most likely installed to heat the space if you hadn't installed the heat pump you did?

	Central ASHP (n=33)	Mini-split Heat Pump (n=22)
I would have continued to use my old heating system	30%	23%
I wouldn't have installed a heating system (left space unheated)	0%	5%
Oil furnace	0%	9%
Oil boiler	9%	5%
Propane furnace	21%	9%
Propane/liquified petroleum gas (LPG) boiler	9%	5%
Natural gas furnace	12%	5%
Natural gas boiler	3%	9%
Gas space heater	0%	5%
Electric baseboard	0%	5%
Electric space heater	3%	5%
Woodstove, pellet stove, or fireplace	3%	9%
Geothermal or ground-source heat pump (different than the heat pump(s) I purchased)	6%	0%
I'm not sure	3%	9%

Table 79: BL6. You indicated that you likely would have installed a different heating system if you had not installed the heat pump. How likely is it that you would have installed a high-efficiency heating system?

	Central ASHP (n=23)	Mini-split Heat Pump (n=16)
Not at all likely	4%	6%

	Central ASHP (n=23)	Mini-split Heat Pump (n=16)
Slightly likely	13%	0%
Somewhat likely	17%	25%
Very likely	61%	56%
I'm not sure	4%	13%

Table 80: BL10. What was the primary system that heated your space before the new heat pump was installed? Select only one response.

	Central ASHP (n=59)	Mini-split Heat Pump (n=22)
Oil furnace	22%	15%
Oil boiler	29%	29%
Propane/liquified petroleum gas (LPG) furnace	20%	4%
Propane/LPG boiler	5%	7%
Natural gas furnace	12%	5%
Natural gas boiler	3%	5%
Electric baseboard	2%	13%
Electric furnace	0%	2%
Woodstove, pellet stove, or fireplace	2%	20%
Other geothermal or ground-source heat pump (outside of the heat pump(s) I purchased)	2%	0%
Other mini - split heat pump (outside of the heat pump(s) I purchased)	3%	0%

Table 81: BL11. Which way did your previous equipment vent?

(Respondents who previously heated their space primarily with a furnace or boiler)

	Central ASHP (n=54)	Mini-split Heat Pump (n=36)
Chimney	39%	61%
PVC pipe	41%	22%
Other	7%	0%
I'm not sure	13%	17%

Table 82: BL12. Which of the following best describes the condition of your old heating equipment in the space?

	Central ASHP (n=59)	Mini-split Heat Pump (n=55)
The old equipment was working with no need for repair	51%	84%
The old equipment was working with need of minor repair	20%	5%
The old equipment was working with need of major repair	15%	2%
The old equipment was no longer working	10%	5%
I'm not sure	3%	4%

Table 83: BL13. Do you think your old heating equipment would have lasted another two years?

	Central ASHP (n=53)	Mini-split heat pump (n=52)
Yes	74%	94%
No	9%	4%
I'm not sure	17%	2%

Table 84: BL14. When the new heat pump was installed, was the previous heating system removed or disconnected, or is it still installed?

	Central ASHP (n=59)	Mini-split Heat Pump (n=55)
The previous system was removed or disconnected and not replaced	27%	7%
The previous system was removed and replaced with a new piece of equipment of the same type	25%	2%
The previous system is still installed and operating	41%	85%
The previous system is still installed but is no longer operating	5%	5%
I'm not sure	2%	0%

Table 85: BL15. How often do you use this other heating system (not the heat pump you purchased through the program)?

(Respondents who reported their previous system was removed and replaced with a new piece of equipment of the same type or the previous system is still installed and operating)

	Central ASHP (n=39)	Mini-split Heat Pump (n=48)
Only in emergencies/ extreme temperatures	33%	17%
< 5 times per winter	5%	0%
5 - 15 times per winter	10%	4%
15 + times per winter	21%	6%
Very frequently/ Every day	26%	73%
I'm not sure	5%	0%

Table 86: BL7. What other cooling options were considered for your space?

(Select all that apply)

	Central ASHP (n=32)	Mini-split Heat Pump (n=24)
Central air conditioning	75%	21%
Central heat pump	13%	13%
Room, window, or through-the-wall air conditioning	16%	38%
Portable air conditioner	9%	21%
Fan(s)	6%	13%
Ductless air conditioner with no heating	3%	13%
Other geothermal or ground-source heat pump (different than	9%	0%
Other central heat pump (different than the heat pump(s) I	6%	4%
Other mini - split heat pump (different than the heat pump(s)	3%	4%
I'm not sure	3%	4%

Table 87: BL8. What, if anything, would you have most likely installed to cool your space if you hadn't installed the heat pump you did?

	Central ASHP (n=32)	Mini-split Heat Pump (n=24)
I would have continued to use my old cooling system	19%	21%
I wouldn't have installed a cooling system (left space uncooled)	0%	4%
I would have installed a different cooling system, please specify	3%	0%
Central air conditioning	53%	8%
Room, window, or through-the-wall air conditioning	6%	29%
Ductless air conditioner with no heating	0%	4%
Central heat pump	0%	4%
Portable air conditioner	3%	13%

	Central ASHP (n=32)	Mini-split Heat Pump (n=24)
Fan(s)	3%	0%
Other geothermal or ground-source heat pump (different than the heat pump(s) I purchased)	6%	0%
Other mini‐split heat pump (different than the heat pump(s) I purchased)	0%	4%
I'm not sure	6%	13%

Table 88: BL9. You indicated that you likely would have installed a different cooling system if you had not installed the heat pump. How likely is it that you would have installed a high-efficiency cooling system?

	Central ASHP (n=24)	Mini-split Heat Pump (n=15)
Not at all likely	0%	20%
Slightly likely	17%	27%
Somewhat likely	29%	27%
Very likely	54%	27%

Table 89: BL16. What was the primary system that cooled the space before the new heat pump was installed?

(Select all that apply)

	Central ASHP (n=40)	Mini-split Heat Pump (n=19)
Central air conditioning	75%	26%
Room, window, or through-the-wall air conditioning	13%	32%
Portable air conditioner	0%	32%
Only used fans	3%	0%
Other central heat pump (different than the heat pump(s) I	8%	0%
Other mini-split heat pump (different than the heat pump(s)	3%	11%

Table 90: BL17. Which of the following best describes the condition of your old cooling equipment?

	Central ASHP (n=40)	Mini-split Heat Pump (n=19)
The old equipment was working with no need for repair	33%	63%
The old equipment was working with need of minor repair	20%	11%
The old equipment was working with need of major repair	20%	21%
The old equipment was no longer working	28%	5%

Table 91: BL18. Do you think your old cooling equipment would have lasted another two years?

	Central ASHP (n=29)	Mini-split Heat Pump (n=18)
Yes	41%	72%
No	31%	11%
I'm not sure	17%	17%

Table 92: BL19. When the heat pump was installed, was the previous cooling system removed or disconnected, or is it still installed?

	Central ASHP (n=40)	Mini-split Heat Pump (n=19)
The previous system was removed or disconnected and not replaced	70%	53%
The previous system was removed and replaced with a new piece of equipment of the same type	25%	21%
The previous system is still installed and operating	0%	26%
I'm not sure	5%	0%

D.1.1.3 In-Service Rate

Table 93: M1. Please indicate how many of the following products remain installed, were installed and then removed, or were never installed

	Central ASHP (n=63)	Mini-split Heat Pump (n=66)
Currently installed	102	161
Installed but removed	0	0
Never installed	0	0
I'm not sure	0	0
Total units purchased	**102**	**161**

D.1.1.4 Demand

Table 94: M12. On an average weekday in June, July, and August, do you use your heat pump between 1:00 pm and 5:00 pm?

	Central ASHP (n=62)	Mini-split Heat Pump (n=65)
Yes	89%	80%
No	5%	15%
I'm not sure	6%	5%

Table 95: M13. On an average weekday in December and January, do you use your heat pump between 5:00 pm and 7:00 pm?

	Central ASHP (n=62)	Mini-split Heat Pump (n=65)
Yes	85%	57%
No	10%	39%
I'm not sure	5%	4%

D.1.1.5 Free-Ridership

Figure 29: FR1. If there had been no rebate available through NHSaves or your utility, how likely is it that you would have purchased any type of heat pump at the same time?

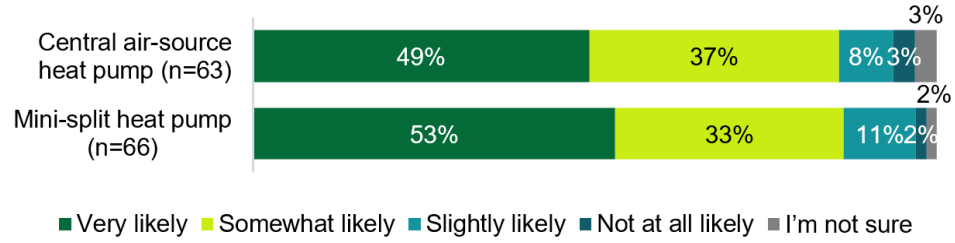


Figure 30: FR2. If there had been no rebate available through NHSaves or your utility, when do you think you would have moved forward with the purchase of the heat pump?

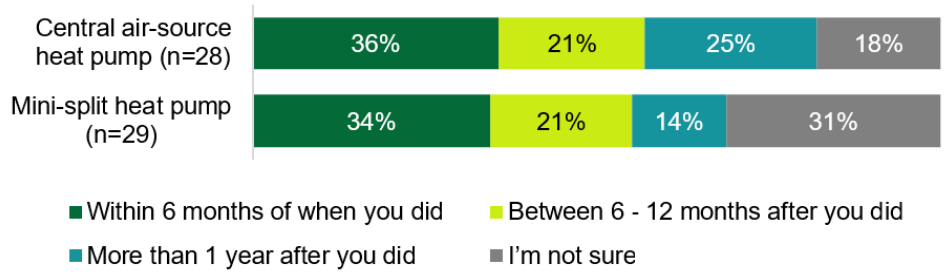


Figure 31: FR3. If there had been no rebate available through NHSaves or your utility, how likely is it that you would have purchased the exact same number of heat pumps?

(Respondents who installed more than one heat pump)

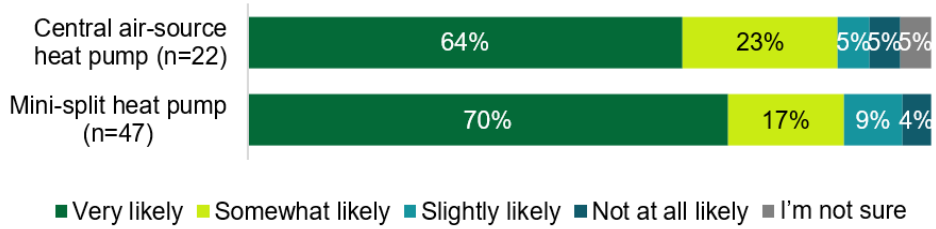


Figure 32: FR5. If there had been no rebate available through NHSaves or your utility, how likely would you have been to purchase the exact same efficiency level for your heat pump?

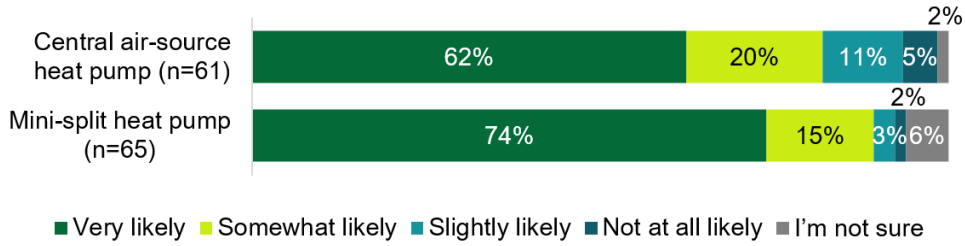
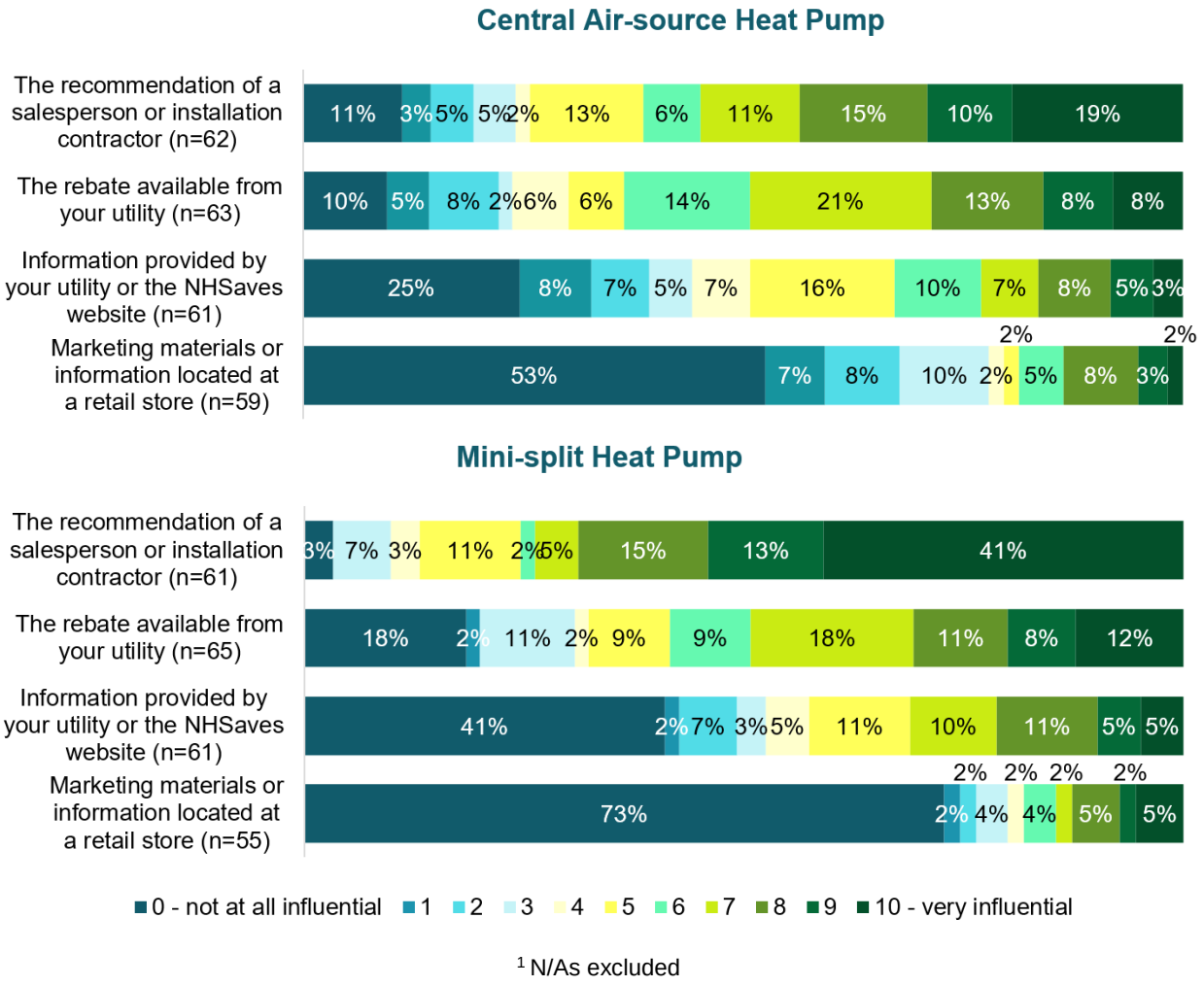


Figure 33: FR6. On a scale of 0 to 10, where 0 is "not at all influential" and 10 is " very influential", how influential were the elements listed below on your decision to purchase the heat pump?[1]



[1] N/As excluded

D.1.1.6 Spillover

Table 96 and Table 97 present qualifying SO measures reported by survey respondents who installed central air source or mini-split heat pumps, respectively. Measures are considered qualifying if they:

- Did not receive utility incentives or financing,
- Were ENERGY STAR® labeled or certified, and
- Were influenced by NHSaves participation (Importance Score, SO15), with a low likelihood of being purchased absent the program (Likelihood Score, SO16).

The combination of these two scores must be 5 or greater for a measure to qualify as SO.

Table 96: Central Air Source Heat Pump Qualifying Spillover Measures (n=3)

Spillover Measure	Quantity	Per Unit kWh Savings	Per Unit MMBtu Savings
Central air conditioner	1	215.53	0
Dehumidifier	1	82.3	0
Insulation	N/A[1]	0	5.28
Water heater	1	-43	3
Wi-Fi thermostat	2	0	3.63

[1] Insulation quantity was not provided; a conservative default of 5.28 MMBtu (half the savings for a 1,200 sq ft home) was applied to avoid excluding insulation impact due to insufficient information.

Table 97: Mini-split Heat Pump Qualifying Spillover Measures (n=4)

Spillover Measure	Quantity	Per Unit kWh Savings	Per Unit MMBtu Savings
Insulation	1200 sq ft	0	10.56
Room air conditioner	1	36.01	0
Tune-up	4	0	2.13

D.1.1.7 Event Type

Table 98: ET1. Was the heat pump purchased as part of a new construction or major renovation project?

	Central ASHP (n=70)	Mini-split Heat Pump (n=70)
Yes	16%	17%
No	83%	81%
I'm not sure	1%	1%

D.1.2 Furnaces and Boilers

D.1.2.1 Baseline

Table 99: BL25. What type of heating system did your furnace/boiler replace? If your new equipment replaced more than one type of heating system, please select only the prior heating system you used the most.

	Furnace (n=33)	Boiler (n=19)
Oil furnace	3%	0%
Oil boiler	0%	5%
Natural gas furnace	94%	5%
Natural gas boiler	0%	89%
I'm not sure	3%	0%

Table 100: BL26. Which way did your previous equipment vent?

(Respondents who previously heated their space primarily with a furnace or boiler)

	Furnace (n=32)	Boiler (n=19)
Chimney	22%	16%
PVC pipe	50%	63%
I'm not sure	28%	21%

D.1.2.2 Free-Ridership

Figure 34: FR1. If there had been no rebate available through NHSaves or your utility, how likely is it that you would have purchased any type of furnace/boiler at the same time?

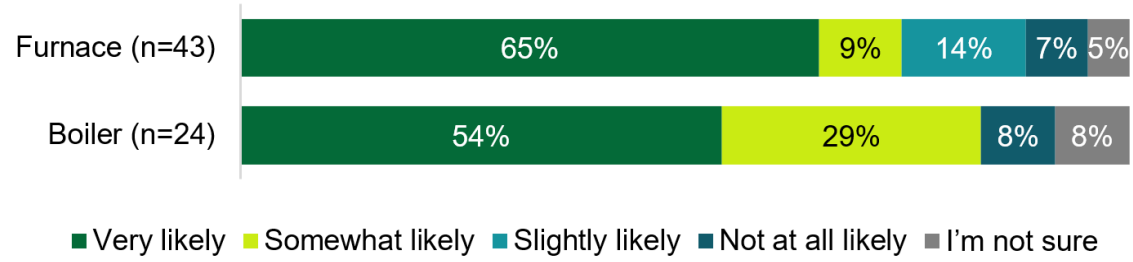


Figure 35: FR2. If there had been no rebate available through NHSaves or your utility, when do you think you would have moved forward with the purchase of the furnace/boiler?

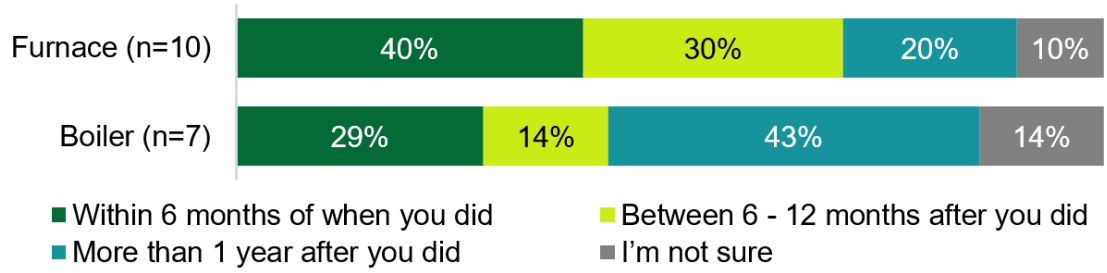


Figure 36: FR5. If there had been no rebate available through NHSaves or your utility, how likely would you have been to purchase the exact same efficiency level for your furnace/boiler?

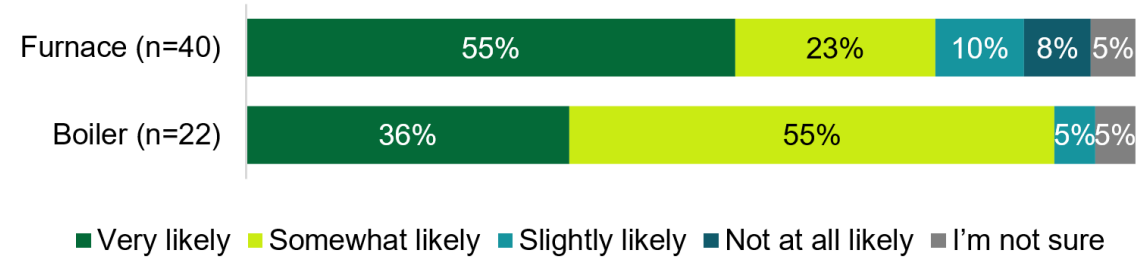
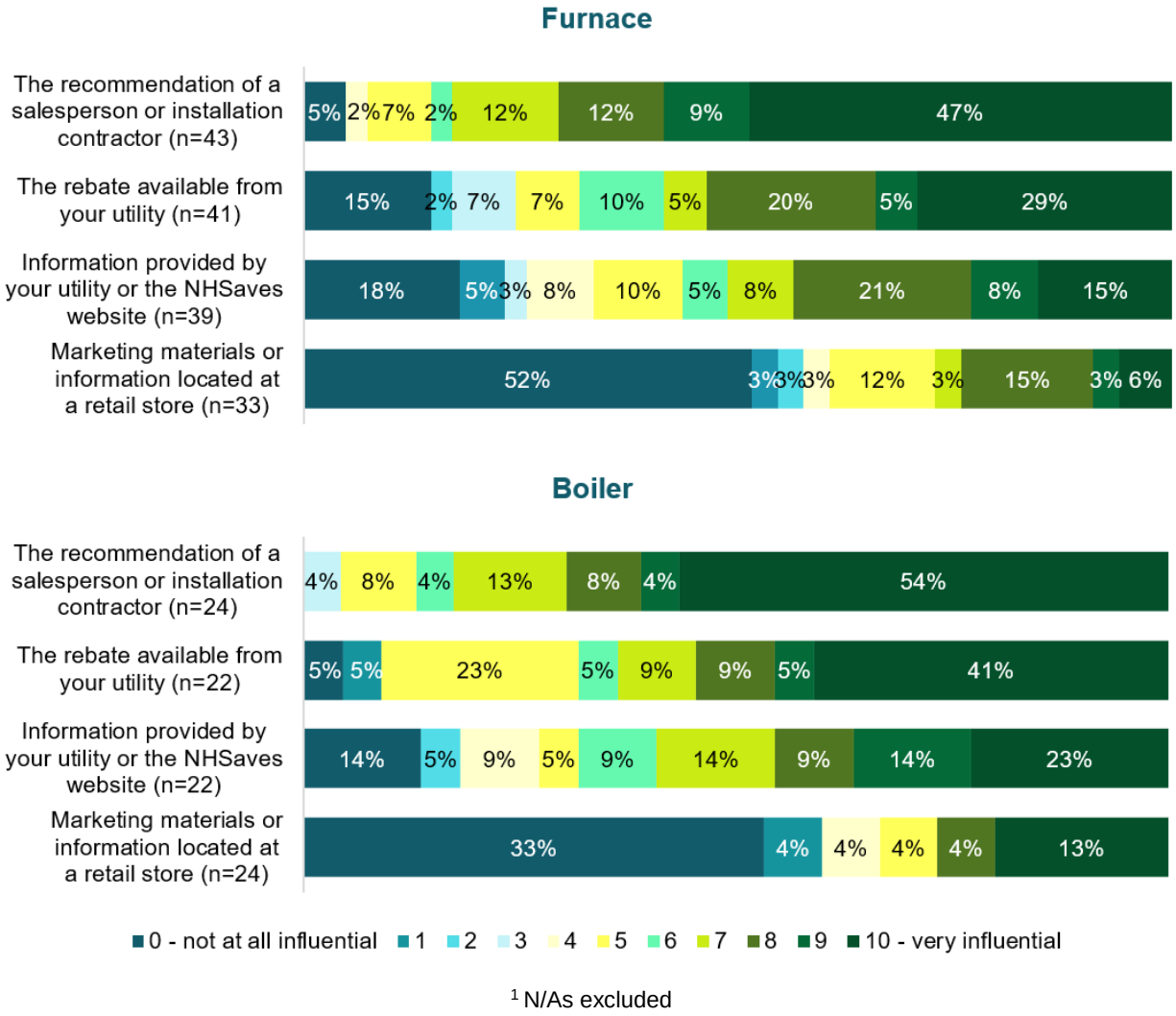


Figure 37: FR6. On a scale of 0 to 10, where 0 is "not at all influential" and 10 is "very influential", how influential were the elements listed below on your decision to purchase the furnace/boiler?[1]



[1] N/As excluded

D.1.2.3 Spillover

Table 101 and Table 102 present qualifying spillover measures reported by survey respondents who installed furnaces and boilers, respectively. Measures are considered qualifying if they:

- Did not receive utility incentives or financing,
- Were ENERGY STAR® labeled or certified, and
- Were influenced by NHSaves participation (Importance Score, SO15), with a low likelihood of being purchased absent the program (Likelihood Score, SO16).

The combination of these two scores needs to be 5 or greater for a measure to qualify as spillover.

Table 101: Furnace Qualifying Spillover Measures (n=2)

Spillover Measure	Quantity	Per Unit kWh Savings	Per Unit MMBtu Savings
Dehumidifier	1	82.3	0
Wi-Fi thermostat	3	0	3.63

Table 102: Boiler Qualifying Spillover Measures (n=1)

Spillover Measure	Quantity	Per Unit kWh Savings	Per Unit MMBtu Savings
Insulation	N/A[1]	0	5.28
Window replacement	12	7	0.6

[1] Insulation quantity was not provided; a conservative default of 5.28 MMBtu (half the savings for a 1,200 sq ft home) was applied to avoid excluding insulation impact due to insufficient information.

D.1.2.4 Event Type

Table 103: ET1. Was the furnace/boiler purchased as part of a new construction or major renovation project?

	Furnace (n=43)	Boiler (n=24)
Yes	16%	17%
No	81%	83%
I'm not sure	2%	0%

Table 104: ET3. Did the high-efficiency furnace/boiler you purchased replace any existing furnace/boiler or was it a new type of equipment that you did not have in your home before?

	Furnace (n=36)	Boiler (n=20)
Replaced existing equipment	94%	95%
New equipment	6%	5%

Table 105: ET4. Which of the following best describes the condition of your old equipment?

	Furnace (n=34)	Boiler (n=19)
The old equipment was working with no need for repair	15%	11%
The old equipment was working with need of minor repair	29%	26%
The old equipment was working with need of major repair	41%	47%
The old equipment was no longer working	12%	16%
I'm not sure	3%	0%

Table 106: ET5. Do you think your old equipment would have lasted another two years?

	Furnace (n=16)	Boiler (n=7)
Yes	5	6
No	3	0
I'm not sure	8	1

D.1.3 Demographics and Economic Factors

Table 107: D1. Do you own or rent your home?

	Central ASHP (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
Own	100%	99%	95%	100%
Rent	0%	0%	2%	0%
Other	0%	0%	2%	0%
I'm not sure	0%	1%	0%	0%

Table 108: D2. What do you consider to be your home's primary space heating fuel?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
Electric baseboard	1%	1%	0%	0%
Electric heat pump	50%	19%	5%	0%
Natural gas	10%	7%	95%	96%
Liquid propane gas	19%	13%	0%	0%
Fuel oil	17%	40%	0%	0%
Cord wood	1%	11%	0%	4%
Wood pellets	1%	7%	0%	0%
Coal	0%	0%	0%	0%
Other	0%	0%	0%	0%
I'm not sure	0%	1%	0%	0%

Table 109: D3. What do you consider to be your home's primary water heating fuel?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
Electricity	31%	27%	17%	8%
Natural gas	13%	11%	81%	88%
Liquid propane gas	27%	24%	0%	0%
Fuel oil	27%	34%	0%	0%
Cord wood	0%	0%	0%	0%
I'm not sure	0%	1%	0%	0%

Table 110: D4. Who is responsible for paying the utility bill for the electricity used in your home?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
I am	100%	99%	100%	100%
Someone else	0%	1%	0%	0%

Table 111: D5. Who is responsible for paying for the primary heating fuel used in your home?

	Central Air-source Heat Pump (n=34)	Mini-split heat pump (n=55)	Furnace (n=40)	Boiler (n=24)
I am	100%	98%	100%	96%
Someone else	0%	2%	0%	4%

Table 112: D6. Which of the following best describes your home or building?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
Single-family house detached from any other house	97%	90%	71%	75%
Single-family house attached to one or more other houses	3%	7%	17%	17%
Mobile or manufactured home	0%	0%	5%	0%
Apartment in a building with 2 to 4 units	0%	0%	0%	8%
Condo	0%	1%	5%	0%
I'm not sure	0%	1%	0%	0%
I'd rather not say	0%	0%	2%	0%

Table 113: D8. What is the highest level of education that you have completed so far?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
High school graduate (includes GED)	1%	1%	2%	4%
Some college, no degree	3%	20%	14%	17%
Associates or technical school degree	4%	9%	12%	25%
Bachelor's degree	33%	31%	36%	21%
Graduate or professional degree	53%	36%	31%	21%
I'd rather not say	6%	3%	5%	13%

Table 114: Low-income Status

(D7. Counting yourself, in 2024, how many individuals lived in this home in each of the following age categories?

D9. Which of these categories best describes your total household income in 2024 before taxes—counting everyone living in your household?)

	Central Air-source Heat Pump (n=67)	Mini-split heat pump (n=66)	Furnace (n=38)	Boiler (n=20)
Low income	1%	8%	11%	10%
Non-low income	87%	70%	71%	75%
I'd rather not say	12%	23%	18%	15%

Table 115: D10. Before taxes, what was your total household income in 2024?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
Less than $10,000	0%	0%	0%	0%
$10,000 to $19,999	0%	0%	0%	0%
$20,000 to $29,999	0%	0%	5%	0%
$30,000 to $39,999	0%	3%	5%	0%
$40,000 to $49,999	1%	0%	0%	4%
$50,000 to $59,999	0%	0%	0%	4%
$60,000 to $74,999	3%	9%	10%	4%
$75,000 to $99,999	3%	10%	7%	4%
$100,000 to $124,999	14%	20%	7%	8%
$125,000 to $149,999	7%	6%	5%	8%
$150,000 to $199,999	13%	9%	21%	17%
$200,000 or more	24%	13%	5%	17%
I'd rather not say	34%	31%	36%	33%

Table 116: D11. How would you describe yourself?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
Hispanic or Latino/Latina	0%	1%	0%	0%
American Indian or Alaska Native	0%	1%	0%	4%
Asian	7%	1%	10%	0%
Middle Eastern or North African	0%	1%	0%	0%
White	79%	87%	79%	79%
I'd rather not say	14%	10%	12%	21%

Table 117: D12. When at home, does your household always speak English, usually speak English, usually speak a language or languages other than English, or speak English and another language equally?

	Central Air-source Heat Pump (n=70)	Mini-split heat pump (n=70)	Furnace (n=42)	Boiler (n=24)
Always speak English	91%	94%	93%	88%
Usually speak English	0%	1%	0%	0%
Usually speak language(s) other than English	3%	0%	0%	0%
Speak English and (an)other language(s) equally	1%	1%	2%	0%
I'd rather not say	4%	3%	5%	13%

D.2 Results by Measure: Water Heating Measures

D.2.1 Heat Pump Water Heaters

D.2.1.1 Screening

Table 118: S15. Do you know if you have one or more "mixing valves" on your water delivery system?

	HPWH (n=67)
Yes, I know I have one or more mixing valves	40%
No, I know I do not have any mixing valves	25%
I'm not sure if I have any mixing valves	34%

Table 119: S16. If you have more than one mixing valve, please think about the most recent mixing valve you installed. Did you install this mixing valve before, at the same time, or after installing the heat pump water heater?

(Respondents with one or more mixing valves)

	HPWH (n=27)
I installed the mixing valve before installing the water heater.	11%
I installed the mixing valve at the same time as the water heater.	78%
I installed the mixing valve after the water heater.	0%
I'm not sure when I installed the mixing valve.	11%

D.2.1.2 Baseline

Table 120: BL20. Before you decided to install your new heat pump water heater, did you or your contractor consider any other water heating system options?

	HPWH (n=67)
Yes	46%
No	54%

Table 121: BL21. What other water heating options did you consider?
(Select all that apply.)

	HPWH (n=31)
Electric storage water heater	55%
Propane / liquid petroleum gas (LPG) storage water heater	13%
Propane / liquid petroleum gas (LPG) on-demand tankless water heater	13%
Natural gas storage water heater	10%
Fuel-oil indirect storage water heater	10%
Fuel-oil on-demand tankless water heater	10%
Fuel-oil storage water heater	6%
Fuel-oil tankless coil on the boiler	6%
Natural gas on-demand tankless water heater	3%
Propane / liquid petroleum gas (LPG) indirect storage water heater	3%
Electric on-demand	3%
I'm not sure	6%

Table 122: BL22. What, if anything, would you most likely have installed to heat water if you had not installed the heat pump water heater?

	HPWH (n=23)
I would have continued to use my old water heating system	46%
Electric storage water heater	25%
Propane / liquid petroleum gas (LPG) storage water heater	4%
Fuel-oil tankless coil on the boiler	3%
Natural gas storage water heater	1%
Fuel-oil storage water heater	1%
Propane / liquid petroleum gas (LPG) indirect storage water heater	1%
Propane / liquid petroleum gas (LPG) on-demand tankless water heater	1%
I'm not sure	15%

Table 123: BL23. You indicated that you likely would have installed a different water heater if you had not installed the one you did. How likely is it that you would have selected a high-efficiency version of the water heater?

	HPWH (n=26)
Not at all likely	12%
Slightly likely	12%
Somewhat likely	27%
Very likely	50%

Table 124: BL24. What type of water heating system did your heat pump water heater replace? If your new water heater replaced more than one type of water heating system, please select the prior system you used the most.

	HPWH (n=23)
Electric storage water heater	10
Fuel-oil tankless coil on the boiler	3
Propane / liquid petroleum gas (LPG) storage water heater	3
Natural gas storage water heater	2
Fuel-oil indirect storage water heater	1
Fuel-oil storage water heater	1
Propane / liquid petroleum gas (LPG) indirect storage water heater	1
Propane/ liquid petroleum gas (LPG) on-demand tankless water heater	1
Heat pump water heater (outside of the heat pump water heaters I purchased through the program)	1

D.2.1.3 Free-Ridership

Figure 38: FR1. If there had been no rebate available through NHSaves or your utility, how likely is it that you would have purchased any type of heat pump water heater at the same time?

(n=66)

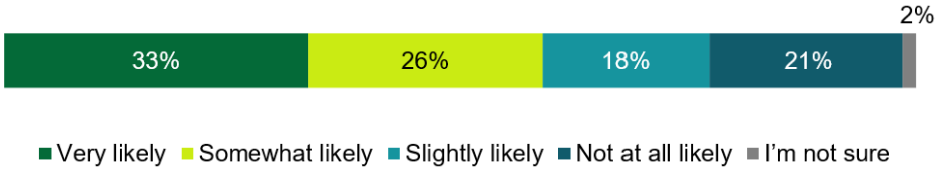


Figure 39: FR2. If there had been no rebate available through NHSaves or your utility, when do you think you would have moved forward with the purchase of the heat pump water heater?

(n=29)

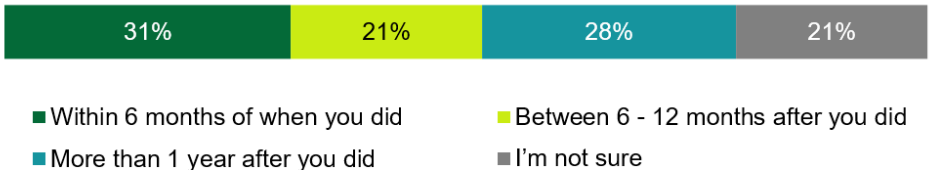


Figure 40: FR5. If there had been no rebate available through NHSaves or your utility, how likely would you have been to purchase the exact same efficiency level for your heat pump water heater?

(n=52)

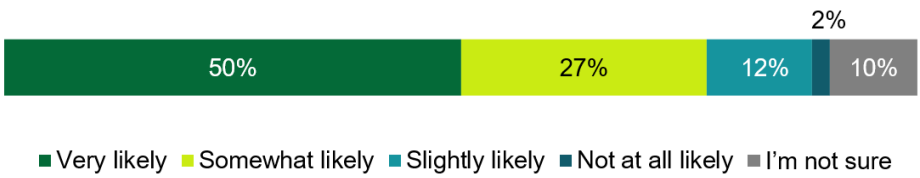
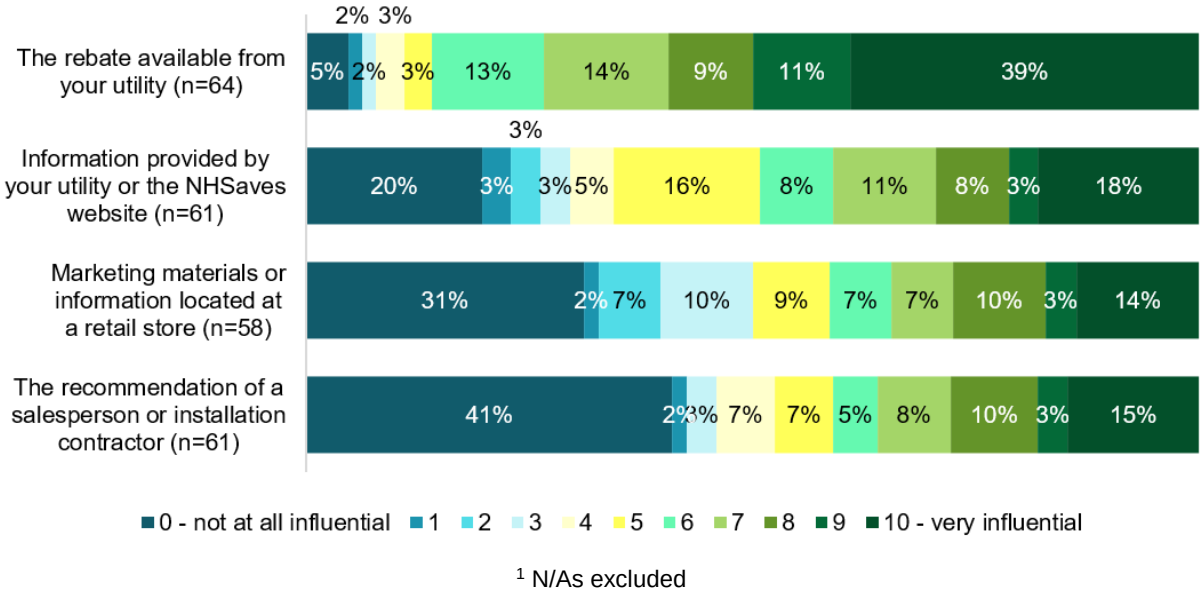


Figure 41: FR6. On a scale of 0 to 10, where 0 is "not at all influential" and 10 is " very influential", how influential were the elements listed below on your decision to purchase the heat pump water heater?[1]



[1] N/As excluded

D.2.1.4 Spillover

Table 125 presents qualifying spillover measures reported by survey respondents who installed a HPWH(s). Measures are considered qualifying if they:

- Did not receive utility incentives or financing,
- Were ENERGY STAR® labeled or certified, and
- Were influenced by NHSaves participation (Importance Score, SO15), with a low likelihood of being purchased absent the program (Likelihood Score, SO16).

The combination of these two scores needs to be 5 or greater for a measure to qualify as spillover.

Table 125: Heat Pump Water Heater Qualifying Spillover Measures (n=1)

Spillover Measure	Quantity	Per Unit kWh Savings	Per Unit MMBtu Savings
Refrigerator	1	44.2	0

D.2.1.5 Event Type

Table 126: ET1. Was the heat pump water heater purchased as part of a new construction or major renovation project?

	HPWH (n=67)
Yes	13%
No	87%
I'm not sure	0%

Table 127: ET3. Did the high-efficiency heat pump water heater you purchased replace any existing heat pump water heater or was it a new type of equipment that you did not have in your home before?

	HPWH (n=67)
Replaced existing equipment	40%
New equipment	60%
I'm not sure	0%

Table 128: ET4. Which of the following best describes the condition of your old equipment?

	HPWH (n=67)
The old equipment was working with no need for repair	39%
The old equipment was working with need of minor repair	26%
The old equipment was working with need of major repair	13%
The old equipment was no longer working	22%

Table 129: ET5. Do you think your old equipment would have lasted another two years?

	HPWH (n=15)
Yes	67%
No	27%
I'm not sure	7%

D.2.2 Gas Integrated Water Heaters

D.2.2.1 Screening

Table 130: S15. Do you know if you have one or more "mixing valves" on your water delivery system?

	Integrated Water Heater (n=37)
Yes, I know I have one or more mixing valves	41%
No, I know I do not have any mixing valves	8%
I'm not sure if I have any mixing valves	51%

Table 131: S14. If you have more than one mixing valve, please think about the most recent mixing valve you installed. Did you install this mixing valve before, at the same time, or after installing the integrated water heater?

(Respondents with 1 or more mixing valves)

	Integrated Water Heater (n=15)
I installed the mixing valve before installing the water heater.	7%
I installed the mixing valve at the same time as the water heater.	67%
I installed the mixing valve after the water heater.	7%
I'm not sure when I installed the mixing valve.	20%

D.2.2.2 Event Type

Table 132: ET1. Was the integrated water heater purchased as part of a new construction or major renovation project?

	Integrated Water Heater (n=37)
Yes	14%
No	84%
I'm not sure	3%

Table 133: ET3. Did the high-efficiency integrated water heater you purchased replace any existing integrated water heater or was it a new type of equipment that you did not have in your home before?

	Integrated Water Heater (n=37)
Replaced existing equipment	63%
New equipment	34%
I'm not sure	3%

Table 134: ET4. Which of the following best describes the condition of your old equipment?

	Integrated Water Heater (n=37)
The old equipment was working with no need for repair	10%
The old equipment was working with need of minor repair	5%
The old equipment was working with need of major repair	57%
The old equipment was no longer working	29%

Table 135: ET5. Do you think your old equipment would have lasted another two years?

	Integrated Water Heater (n=3)
Yes	100%

D.2.3 Demographics and Economic Factors

Table 136: D1. Do you own or rent your home?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Own	100%	97%
Rent	0%	3%

Table 137: D2. What do you consider to be your home's primary space heating fuel?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Electric baseboard	0%	3%
Electric heat pump	21%	3%
Natural gas	13%	86%
Liquid propane gas	12%	3%

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Fuel oil	31%	0%
Cord wood	6%	3%
Wood pellets	15%	0%
Coal	1%	0%
I'm not sure	0%	3%

Table 138: D3. What do you consider to be your home's primary water heating fuel?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Electricity	91%	11%
Natural gas	4%	86%
Liquid propane gas	1%	3%
Fuel oil	4%	0%

Table 139: D4. Who is responsible for paying the utility bill for the electricity used in your home?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
I am	100%	97%
Someone else	0%	3%

Table 140: D5. Who is responsible for paying for the primary heating fuel used in your home?

	Heat Pump Water Heater (n=55)	Integrated Water Heater (n=34)
I am	100%	94%
It is included in my condo fee	0%	3%
Someone else	0%	3%

Table 141: D6. Which of the following best describes your home or building?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Single-family house detached from any other house	91%	70%
Single-family house attached to one or more other houses	6%	16%
Mobile or manufactured home	0%	3%
Apartment in a building with 2 to 4 units	3%	5%
Apartment in a building with 5 or more units	0%	5%

Table 142: D8. What is the highest level of education that you have completed so far?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Nine to twelfth grade, no diploma	0%	3%
High school graduate (includes GED)	7%	8%
Some college, no degree	7%	16%
Associates or technical school degree	6%	16%

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Bachelor's degree	42%	30%
Graduate or professional degree	34%	24%
I'd rather not say	3%	3%

Table 143: Low-income Status

(D7. Counting yourself, in 2024, how many individuals lived in this home in each of the following age categories?
D9. Which of these categories best describes your total household income in 2024 before taxes—counting everyone living in your household?)

	Heat Pump Water Heater (n=63)	Integrated Water Heater (n=35)
Low income	6%	14%
Non-low income	86%	80%
I'd rather not say	8%	6%

Table 144: D10. Before taxes, what was your total household income in 2024?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Less than $10,000	0%	3%
$10,000 to $19,999	0%	0%
$20,000 to $29,999	0%	8%
$30,000 to $39,999	3%	3%
$40,000 to $49,999	0%	3%
$50,000 to $59,999	0%	8%
$60,000 to $74,999	4%	3%
$75,000 to $99,999	6%	11%
$100,000 to $124,999	9%	14%
$125,000 to $149,999	9%	5%
$150,000 to $199,999	18%	8%
$200,000 or more	18%	5%
I'd rather not say	33%	30%

Table 145: D11. How would you describe yourself?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Black or African American	0%	3%
Hispanic or Latino/Latina	4%	5%
Asian	6%	8%
White	82%	81%
I'd rather not say	12%	5%

Table 146: D12. When at home, does your household always speak English, usually speak English, usually speak a language or languages other than English, or speak English and another language equally?

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
Always speak English	90%	84%
Usually speak English	6%	5%
Usually speak language(s) other than English	0%	5%

	Heat Pump Water Heater (n=67)	Integrated Water Heater (n=36)
I'd rather not say	4%	5%

D.3 RESULTS BY MEASURE: SMALL APPLIANCE MEASURES

D.3.1 Pool Pumps

D.3.1.1 In-service Rate

Table 147: M1. Please indicate how many of the following products remain installed, were installed and then removed, or were never installed

	Pool Pump (n=67)
Currently installed	66
Installed but removed	1
Never installed	0
I'm not sure	0

Table 148: M2. Why is the pool pump not in use? Check all that apply.

	Pool Pump (n=1)
Removed because it broke	1

D.3.1.2 Demand

Table 149: M3. Do you remove the pool pump in the winter and reinstall it in the summer, keep it installed all year, or something else?

	Pool Pump (n=66)
I remove the pool pump in the winter and reinstall it in the summer	55%
I keep it installed all year	45%

Table 150: M4. On an average weekday in June, July, and August, do you use your pool pump between 1:00 pm and 5:00 pm?

	Pool Pump (n=66)
Yes	88%
No	12%

Table 151: M5. Is your pool pump able to be connected to Wi-Fi?

	Pool Pump (n=66)
Yes	6%
No	76%
I'm not sure	18%

Table 152: M6. Have you connected your pool pump to a Wi-Fi network?
(Respondents with Wi-Fi–enabled pool pumps)

	Pool Pump (n=66)
Yes	6%
No	76%
I'm not sure	18%

D.3.1.3 Free-Ridership

Figure 42: FR1. If there had been no rebate available through NHSaves or your utility, how likely is it that you would have purchased any type of pool pump at the same time?
(n=67)

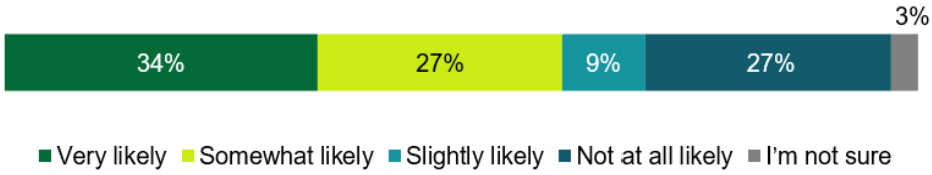


Figure 43: FR2. If there had been no rebate available through NHSaves or your utility, when do you think you would have moved forward with the purchase of the pool pump?
(n=24)

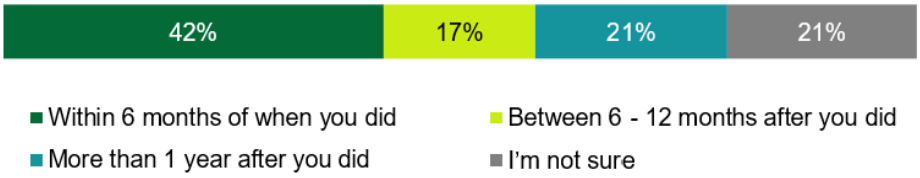


Figure 44: FR5. If there had been no rebate available through NHSaves or your utility, how likely would you have been to purchase the exact same efficiency level for your pool pump?
(n=49)

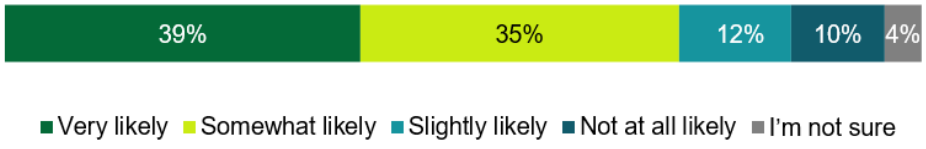
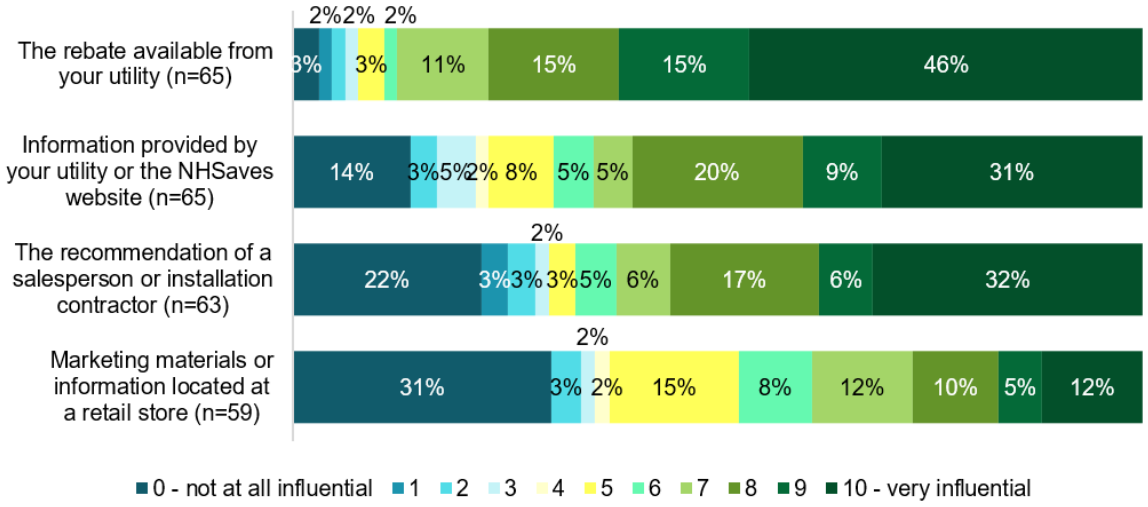


Figure 45: FR6. On a scale of 0 to 10, where 0 is "not at all influential" and 10 is " very influential", how influential were the elements listed below on your decision to purchase the pool pump?[1]



[1] N/As excluded

D.3.1.4 Spillover

Table 153 presents qualifying spillover measures reported by survey respondents who installed a HPWH(s). Measures are considered qualifying if they:

- Did not receive utility incentives or financing,
- Were ENERGY STAR® labeled or certified, and
- Were influenced by NHSaves participation (Importance Score, SO15), with a low likelihood of being purchased absent the program (Likelihood Score, SO16).

The combination of these two scores needs to be 5 or greater for a measure to qualify as spillover.

Table 153: Pool Pump Qualifying Spillover Measures (n=4)

Spillover Measure	Quantity	Per Unit kWh Savings	Per Unit MMBtu Savings
Central air conditioner	1	215.53	0
Clothes dryer	1	160.4	0
Clothes washer	1	88.1	0.024
Dehumidifier	1	82.3	0
Dishwasher	1	NA	NA
Furnace	1	104.2	9.8
Insulation	N/A[1]	0	5.28
Mini-split heat pump	4	363.16	0
Refrigerator	2	44.2	0
Wi-Fi thermostat	3	0	3.63

[1] Insulation quantity was not provided; a conservative default of 5.28 MMBtu (half the savings for a 1,200 sq ft home) was applied to avoid excluding insulation impact due to insufficient information.

D.3.1.5 Event Type

Table 154: ET2. Was the pool pump purchased for a new or existing pool?

	Pool Pump (n=67)
New	25%
Existing	75%

D.3.2 Air Purifiers

D.3.2.1 In-service Rate

Table 155: M1. Please indicate how many of the following products remain installed, were installed and then removed, or were never installed

	Air Purifier (n=68 responses)
Currently installed	75
Installed but removed	9
Never installed	5
I'm not sure	1
Total units purchased	**90**

Table 156: M2. Why is the air purifier not in use? Check all that apply.

	Air Purifier (n=12)
Removed because I only use it when needed	3
Do not need it; keeping it for later use	3
Removed because did not like it	2
Do not need it; no longer have it	2
Removed because it broke	1
Removed because it did not work properly	1

D.3.2.2 Demand

Table 157: M7. Do you use your air purifier all the time, or do you turn it on and off depending on the situation?

	Air Purifier (n=63)
I turn it on and off depending on the situation	59%
I always have it plugged in and turned on	41%

Table 158: M8. When the air purifier is turned on, how often do you use the "eco" or "energy efficiency" settings?

	Air Purifier (n=63)
I always use the eco or energy efficiency setting	44%
I do not know if my air purifier(s) has an eco or energy efficiency setting	21%
My air purifier(s) does not have an eco or energy efficiency setting	19%
I sometimes use the eco or energy efficiency setting	11%
I never use the eco or energy efficiency setting	3%
I use the auto setting	2%

Table 159: M9. On an average weekday in June, July, and August, do you have your air purifier(s) turned on between 1:00 pm and 5:00 pm?

	Air Purifier (n=63)
Yes	56%
No	38%
I'm not sure	6%

Table 160: M10. On an average weekday in December and January, do you have your air purifier(s) turned on between 5:00 pm and 7:00 pm?

	Air Purifier (n=63)
Yes	63%
No	32%
I'm not sure	5%

D.3.2.3 Event Type

Table 161: ET3. Did the high-efficiency air purifier you purchased replace any existing air purifier or was it a new type of equipment that you did not have in your home before?

	Air Purifier (n=69)
Replaced existing equipment	13%
New equipment	87%

Table 162: ET4. Which of the following best describes the condition of your old equipment?

	Air Purifier (n=9)
The old equipment was working with no need for repair	56%
The old equipment was working with need of minor repair	11%
The old equipment was working with need of major repair	11%
The old equipment was no longer working	11%
I'm not sure	11%

Table 163: ET5. Do you think your old equipment would have lasted another two years?

	Air Purifier (n=7)
Yes	57%
No	14%
I'm not sure	29%

D.3.3 Wi-Fi Thermostats

D.3.3.1 In-service Rate

Table 164: M1. Please indicate how many of the following products remain installed, were installed and then removed, or were never installed

	Wi-Fi Thermostat (n=65)
Currently installed	92
Installed but removed	7
Never installed	6
I'm not sure	0
Total units purchased	**105**

Table 165: M2. Why is the Wi-Fi thermostat not in use?

(Check all that apply.)

	Wi-Fi Thermostat (n=9)
Installation or connectivity issues	3
Removed because did not like it	2
Removed because it broke	2
Do not need it; keeping it for later use	2
Removed because it did not work properly	1
Do not need it; no longer have it	1
I moved	1

D.3.3.2 Event Type

Table 166: ET1. Was the Wi-Fi thermostat purchased as part of a new construction or major renovation project?

	Wi-Fi Thermostat (n=66)
Yes	3%
No	95%
I'm not sure	2%

Table 167: ET3. Did the high-efficiency Wi-Fi thermostat you purchased replace any existing Wi-Fi thermostat or was it a new type of equipment that you did not have in your home before?

	Wi-Fi Thermostat (n=64)
Replaced existing equipment	45%
New equipment	53%
I'm not sure	2%

Table 168: ET4. Which of the following best describes the condition of your old equipment?

	Wi-Fi Thermostat (n=31)
The old equipment was working with no need for repair	58%
The old equipment was working with need of minor repair	26%
The old equipment was working with need of major repair	3%
The old equipment was no longer working	10%
I'm not sure	3%

Table 169: ET5. Do you think your old equipment would have lasted another two years?

	Wi-Fi Thermostat (n=26)
Yes	73%
No	8%
I'm not sure	19%

D.3.4 Demographics and Economic Factors

Table 170: D1. Do you own or rent your home?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Own	99%	99%	88%
Rent	0%	1%	11%
Other	1%	0%	2%

Table 171: D2. What do you consider to be your home's primary space heating fuel?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Electric baseboard	1%	1%	0%
Electric heat pump	7%	7%	0%
Natural gas	19%	16%	97%
Liquid propane gas	21%	26%	2%
Fuel oil	42%	41%	2%
Cord wood	3%	4%	0%
Wood pellets	4%	4%	0%
Coal	0%	0%	0%
Other	1%	0%	0%

Table 172: D3. What do you consider to be your home's primary water heating fuel?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Electricity	19%	30%	12%
Natural gas	19%	14%	85%
Liquid propane gas	21%	22%	2%
Fuel oil	37%	33%	0%
Other	1%	0%	0%

Table 173: D4. Who is responsible for paying the utility bill for the electricity used in your home?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
I am	99%	97%	98%
Someone else	0%	3%	0%
I'm not sure	1%	0%	2%

Table 174: D5. Who is responsible for paying for the primary heating fuel used in your home?

	Pool Pump (n=62)	Air Purifier (n=64)	Wi-Fi Thermostat (n=66)
I am	98%	95%	97%
It is included in my condo fee	0%	0%	2%
Someone else	0%	5%	0%
I'm not sure	2%	0%	2%

Table 175: D6. Which of the following best describes your home or building?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Single-family house detached from any other house	97%	87%	77%
Single-family house attached to one or more other houses	1%	6%	11%
Mobile or manufactured home	1%	4%	3%
Apartment in a building with 2 to 4 units	0%	0%	6%
Apartment in a building with 5 or more units	0%	3%	3%

Table 176: D8. What is the highest level of education that you have completed so far?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Nine to twelfth grade, no diploma	0%	1%	0%
High school graduate (includes GED)	1%	1%	6%
Some college, no degree	9%	9%	11%
Associates or technical school degree	15%	17%	3%
Bachelor's degree	43%	29%	41%
Graduate or professional degree	30%	41%	33%
I'd rather not say	1%	1%	6%

Table 177: Low-income Status

(D7. Counting yourself, in 2024, how many individuals lived in this home in each of the following age categories?
D9. Which of these categories best describes your total household income in 2024 before taxes—counting everyone living in your household?)

	Pool Pump (n=62)	Air Purifier (n=65)	Wi-Fi Thermostat (n=61)
Low income	3%	9%	16%
Non-low income	82%	74%	67%
I'd rather not say	15%	17%	16%

Table 178: D10. Before taxes, what was your total household income in 2024?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Less than $10,000	0%	0%	0%
$10,000 to $19,999	0%	0%	0%
$20,000 to $29,999	0%	0%	2%
$30,000 to $39,999	0%	0%	3%
$40,000 to $49,999	0%	6%	2%
$50,000 to $59,999	0%	3%	2%
$60,000 to $74,999	1%	3%	11%
$75,000 to $99,999	3%	13%	6%
$100,000 to $124,999	10%	3%	6%
$125,000 to $149,999	16%	16%	6%
$150,000 to $199,999	13%	13%	9%
$200,000 or more	24%	7%	9%
I'd rather not say	33%	30%	45%

Table 179: D11. How would you describe yourself?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Black or African American	1%	0%	0%
Hispanic or Latino/Latina	0%	3%	2%
Asian	1%	3%	15%
Middle Eastern or North African	0%	1%	2%
White	84%	86%	65%
I'd rather not say	13%	10%	18%

Table 180: D12. When at home, does your household always speak English, usually speak English, usually speak a language or languages other than English, or speak English and another language equally?

	Pool Pump (n=67)	Air Purifier (n=69)	Wi-Fi Thermostat (n=66)
Always speak English	93%	88%	79%
Usually speak English	3%	3%	2%
Usually speak language(s) other than English	0%	1%	6%
I'd rather not say	1%	3%	6%

D.4 Results by Measure: Recycling Measures

D.4.1 Refrigerator Recycling

Table 181: RF1. Which of the following best describes the condition of your recycled refrigerator?

	Refrigerator (n=100)
It was working with no need of repair	55%
It was working with need of minor repair	23%
It was working with need of major repair	16%
It was no longer working	5%
Don't know	1%

Table 182: RF2. Thinking about the 12 months before you recycled it, was the refrigerator plugged in…

	Refrigerator (n=100)
All of the time	77%
Some of the time	23%

Table 183: RF3. How many months was the refrigerator plugged in the year before you recycled it?

	Refrigerator (n=23)
Average number of months	5.26

Table 184: RF4. Where was the refrigerator located?

	Refrigerator (n=100)
Kitchen	64%
Garage	19%
Basement	14%
Yard	2%
Barn	1%

Table 185: RF5. Is the space where the refrigerator was located heated by your heating system in the winter?

	Refrigerator (n=36)
No	69%
Yes	31%

Table 186: RF6. Is the space where the refrigerator was located cooled with air conditioning in the summer?

	Refrigerator (n=100)
No	53%
Yes	46%
Don't know	1%

D.4.1.1 Refrigerator Free-Ridership

Table 187: RFR1. Before you heard about the NHSaves Appliance Recycling Program, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the community transfer station/dump or a recycling center yourself?

	Refrigerator (n=100)
No	57%
Yes	37%
Don't know	6%

Table 188: RFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your refrigerator?

	Refrigerator (n=100)
Gotten rid of it	74%
Kept it	12%
Don't know	14%

Table 189: RFR3. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the refrigerator?

	Refrigerator (n=73)
Taken it to a community transfer station/dump or put it out as trash	37%
Given it away for free	19%
Had a retail store come and pick it up	19%
Sold it	5%
Recycled it	5%
Hired a hauler to take it away	5%
Other	1%
Don't know	7%

Table 190: RFR4. Would you have sold the refrigerator to:

	Refrigerator (n=4)
Stranger (e.g., through an online ad)	4

Table 191: RFR5. If you had given the refrigerator away for free, who would you have given it to?

	Refrigerator (n=14)
Posted it online for free	11
Given it to a charity	2
Given to an acquaintance, friend, or family member	1

Table 192: RFR6. How would you have recycled the refrigerator?

	Refrigerator (n=14)
Taken it to a community transfer station/dump	2
Hired someone to take it	1
Don't know	1

D.4.2 Freezer Recycling

Table 193: FZ1. Which of the following best describes the condition of your recycled freezer?

	Freezer (n=62)
It was working with no need of repair	74%
It was working with need of minor repair	15%
It was working with need of major repair	3%
It was no longer working	5%
Don't know	3%

Table 194: FZ2. Thinking about the 12 months before you recycled it, was the freezer plugged in…

	Freezer (n=62)
All of the time	66%
Some of the time	23%
Never	11%

Table 195 FZ3: How many months was the freezer plugged in the year before you recycled it?

	Freezer (n=4)
Average:	6.86

Table 196 FZ4. Where was the freezer located?

	Freezer (n=62)
Basement	66%
Garage	23%
Laundry room	3%
Kitchen	3%
Porch/Patio	2%
Barn	2%
Yard	2%

Table 197: FZ5. Is the space where the freezer was located heated by your heating system in the winter?

	Freezer (n=60)
Yes	33%
No	63%
Don't know	3%

Table 198: FZ6. Is the space where the freezer was located cooled with air conditioning in the summer?

	Freezer (n=61)
Yes	7%
No	93%

D.4.2.1 Freezer Free-Ridership

Table 199: FFR1. Before you heard about the NHSaves Appliance Recycling Program, had you considered getting rid of the freezer? Meaning, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center yourself?

	Freezer (n=61)
Yes	61%
No	36%
Don't know	3%

Table 200: FFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your freezer?

	Freezer (n=61)
Yes	61%
No	15%
Don't know	25%

Table 201: FFR3. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the freezer?

	Freezer (n=61)
Taken it to a community transfer station/dump or put it out as trash	51%
Given it away for free	19%
Hired a hauler to take it away	14%
Had a retail store come and pick it up	8%
Sold it	5%
Recycled it	3%

Table 202: FFR4. Would you have sold the freezer to:

	Freezer (n=2)
Taken it to a community transfer station/dump or put it out as trash	2

Table 203: FFR5. If you had given the freezer away for free, who would you have given it to?

	Freezer (n=7)
Posted it online for free	4
Given to a charity	2
Given to an acquaintance, friend, or family member	1

Table 204: FFR6. How would you have recycled the freezer?

	Freezer (n=1)
Taken it to a community transfer station/dump	1

D.4.3 Dehumidifier Recycling

Table 205: DH1. Which of the following best describes the condition of your recycled dehumidifier?

	Dehumidifier (n=83)
It was working with no need of repair	35%
It was no longer working	33%
It was working with need of minor repair	19%
It was working with need of major repair	10%
Don't know	4%

Table 206: DH2. When you used the recycled dehumidifier, was it continuously draining, or did you have to manually empty the unit?

	Dehumidifier (n=83)
It was working with no need of repair	35%
It was no longer working	33%
It was working with need of minor repair	19%

Table 207: DH3. Thinking about the 12 months before you recycled it, was the dehumidifier turned on at any time in the year? ("Turned on" means it was plugged in and set to either run continuously or to run when the humidity reached a certain level.)

	Dehumidifier (n=83)
All of the time	34%
Some of the time	54%
Don't know	2%

Table 208: DH4. How many months in the year was the dehumidifier turned on before you recycled it?

	Dehumidifier (n=45)
Average months	5.8

Table 209: DH5. When it was turned on, about how many hours in the day did the dehumidifier run on average before you recycled it?

	Dehumidifier (n=72)
Average months	11.0

Table 210: DH6. When it was turned on, was your old dehumidifier that you recycled set to dehumidify constantly, or did you set controls that automatically shut it off when the humidity dropped below a certain level?

	Dehumidifier (n=73)
It was set to automatically shut off when humidity dropped below a certain level	78%
It was set to dehumidify constantly	19%
Don't know	3%

D.4.3.1 Dehumidifier Free-Ridership

Table 211: DFR1. Before you heard about the NHSaves Appliance Recycling Program, had you considered getting rid of the dehumidifier? Meaning, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center yourself?

	Dehumidifier (n=83)
Yes	66%
No	31%
Don't know	2%

Table 212: DFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your dehumidifier?

	Dehumidifier (n=83)
Gotten rid of it	65%
Kept it	20%
Don't know	14%

Table 213: DFR3. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the dehumidifier?

	Dehumidifier (n=54)
Taken it to a community transfer station/dump or put it out as trash	87%
Recycled it	11%
Given it away for free	2%

Table 214: DFR5. If you had given the dehumidifier away for free, who would you have given it to?

	Dehumidifier (n=1)
Put it on the curb	1

Table 215: DFR6. How would you have recycled the dehumidifier?

	Dehumidifier (n=5)
Take it to a community transfer station/dump	5

Table 216: DFR7A. In the past 3 years, did you purchase a new dehumidifier(s)?

	Dehumidifier (n=35)
Yes	80%
No	20%

Table 217: DFR7B. NHSaves offers a $30 rebate to buy a new dehumidifier(s). Did you use a rebate from NHSaves to buy this new dehumidifier(s)?

	Dehumidifier (n=28)
Yes	50%
No	43%
Don't know	7%

Table 218: DFR8. If there had been no rebate available for recycling your old dehumidifier, how likely is it that you would have purchased any type of new dehumidifier at the same time?

	Dehumidifier (n=14)
Slightly likely	6
Somewhat likely	4
Very likely	4

Table 219: DFR9. If there had been no rebate available for recycling your old dehumidifier, when do you think you would have purchased a new dehumidifier? Would you say…

	Dehumidifier (n=9)
Within 6 months of when you did	3
Between 6 months and 12 months of when you did	1
More than 1 year after when you did	5

Table 220: DFR10. If there had been no rebate available to buy a new dehumidifier, how likely is it that you would have recycled your old dehumidifier at the same time?

	Dehumidifier (n=14)
Not at all likely	3
Slightly likely	6
Somewhat likely	1
Very likely	4

Table 221: DFR11. If there had been no rebate available to buy a new dehumidifier, how likely is it that you would have recycled your old dehumidifier at the same time? Would you say…

	Dehumidifier (n=7)
Within 6 months of when you did	1
Between 6 months and 12 months of when you did	1
More than 1 year after when you did	2
I would not have gotten rid of it	2
Don’t know	1

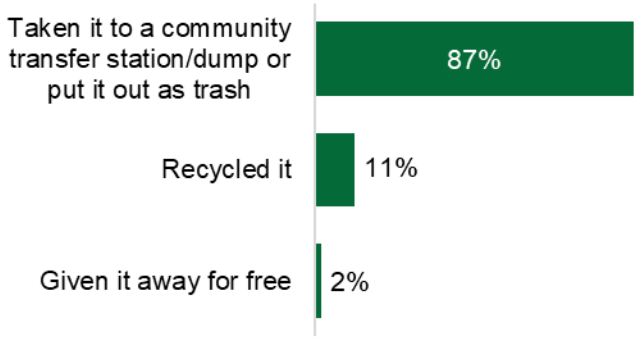
Table 222: DFR12. If there had been no rebate available for recycling your old dehumidifier, how likely is it that you would have purchased the dehumidifier with the exact same high-efficiency level?

	Dehumidifier (n=14)
Not at all likely	3
Slightly likely	2
Somewhat likely	2
Very likely	7

Two-thirds of respondents answered that before they had heard about the NHSaves appliance recycling offering they had plans to get their dehumidifier out of their home by selling it, giving it away, having someone pick up, or taking it to the community transfer station/dump or a recycling center (66%). If the Appliance Recycling had not been available, almost two-thirds (65%) would have gotten rid of their freezer, 20% would have kept it, and 14% answered that they were not sure.

Figure 46. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the dehumidifier?

(n=54)



One respondent answered that they would have given it away for free by putting it on the curb. Five people said that they would have recycled the dehumidifier by taking it to a community transfer station or dump.

Of the 28 people who had purchased a new dehumidifier in the past three years, half of them answered that they used a rebate from NHSaves to buy the new dehumidifier (14). Of those 14, ten said it was either slightly likely or somewhat likely that they would have purchased any new dehumidifier at the same time if there had been no rebate. Seven of the group that used a rebate (n=14) answered that if there had been no rebate to buy a new dehumidifier they would have been slightly or somewhat likely to recycle their old one at the same time.

D.4.4 Room Air Conditioner Recycling

Table 223: AC1. Which of the following best describes the condition of your recycled room air conditioner?

	Room AC (n=90)
It was working with no need of repair	56%
It was working with need of minor repair	28%
It was working with need of major repair	6%
It was no longer working	10%
Don't know	1%

Table 224: AC2. Thinking about the 12 months before you recycled it, was the room air conditioner ever in use?

	Room AC (n=90)
All of the time	2%
Just for cooling season	84%
Never	13%

Table 225: AC3. For cooling season, what month did you typically start using this room air conditioner?

	Room AC (n=76)
April	1%
May	16%
June	41%
July	39%
August	1%
Depends on temperature	1%

Table 226: AC4. What month did you typically stop using this room air conditioner for the season?

	Room AC (n=76)
August	7%
September	75%
October	16%
November	1%
Depends on temperature	1%

Table 227: AC5. Thinking about the last 12 months before you recycled it and when the room air conditioner was in use, did you run the air conditioner…

	Room AC (n=78)
Every day	17%
Some days	46%
Only on days when the temperature reached a certain level	37%

Table 228: AC6. How many days each week did you run the air conditioner on average?

	Room AC (n=36)
Two	6%
Three	28%
Four	31%
Five	31%
Six	3%
Seven	3%

Table 229: AC7. Thinking about the last 12 months before you recycled it, on days where you ran the room air conditioner, did you run the air conditioner…

	Room AC (n=78)
Only when someone was home or using the room	53%
Only during the night	18%
The entire day	17%
Only during daylight hours	13%

Table 230: AC8. What mechanism controlled the temperature most often for this air conditioner?

	Room AC (n=78)
Manual control such as a dial	67%
Thermostat	17%
Remote control	13%
Phone App	3%
Don't know	1%

Table 231: AC9. When you were running this air conditioner, how did you typically set the room air conditioner's [control type]?

	Room AC (n=78)
I set it to a constant temperature.	65%
I set it to different temperatures when at home and when away from home.	17%
I set it to different temperatures for day and night.	15%
AC has no thermostat controls	3%

Table 232: Questions AC10-AC14.

AC10: When you were running this room air conditioner, what temperature (°F) was the air conditioner's [ACCONTROL] usually set to?

AC11: When you were running this room air conditioner during the day, what temperature (°F) was the air conditioner's [ACCONTROL] usually set to?

AC12: When you were running this room air conditioner during the night, what temperature was the air conditioner's [ACCONTROL] usually set to?

AC13: When you were running this room air conditioner while at home, what temperature (°F) was the air conditioner's [ACCONTROL] usually set to

AC14: When you were running this room air conditioner while you were away from home, what temperature was the air conditioner's [ACCONTROL] usually set to?

	Average Temp	Don't know
Running the room air conditioner (n=51)	70.15	5
Running the room air conditioner during the day (n=12)	69.71	5
Running the room air conditioner during the night (n=12)	69.29	5
Running the room air conditioner while at home (n=11)	70.90	1
Running the room air conditioner while away from home (n=11)	76.89	2

Table 233: AC15. When you used this room air conditioner, what setting did you usually use it on?

	Room AC (n=78)
High cool	37%
Eco or Energy Efficiency Setting	22%

	Room AC (n=78)
Low cool	21%
Automatic	17%
Fan setting	1%
Don't know	3%

Table 234: AC16. At night, did you set the air conditioner to sleep mode?

	Room AC (n=78)
Yes	5%
No	36%
NA – There was no sleep mode	56%
Don't know	3%

Table 235: AC17. At the time of recycling, how was this room air conditioner used in your home?

	Room AC (n=78)
Main source of air conditioning	49%
Secondary source of air conditioning	32%
Spare source of air conditioning	18%
Don't know	1%

Table 236: AC18. At the time the room air conditioner was recycled, was it your only AC, or did you have additional units?

	Room AC (n=78)
I had at least one other unit	88%
It was the only unit	10%
Don't know	1%

Table 237: AC19. In what room was the recycled room air conditioner usually installed?

	Room AC (n=78)
Bedroom	53%
Living room/family room	35%
Kitchen	5%
Office	4%
Dining Room	3%
Attic	1%

Table 238: AC20. Does this room have a door?

	Room AC (n=78)
Yes	77%
No	23%

Table 239: AC21. When the room air conditioner was on, did you usually keep the doors to this room open or shut?

	Room AC (n=8)
Kept it shut	5
Kept it open	2
Don't know	1

D.4.4.1 Room Air Conditioner Free-Ridership

Table 240: AFR1. Before you heard about the NHSaves Appliance Recycling Program, had you considered getting rid of the room air conditioner? Meaning, did you already have plans to get the appliance out of your home by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center yourself?

	Room AC (n=90)
Yes	63%
No	29%
Don't know	8%

Table 241: AFR2. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done with your room air conditioner?

	Room AC (n=90)
Gotten rid of it	63%
Kept it	18%
Don't know	19%

Table 242: AFR3. If the NHSaves Appliance Recycling Program had not been available to you, what would you most likely have done to get rid of the room air conditioner?

	Room AC (n=57)
Take it to a transfer station/dump or put it out as trash	70%
Given it away for free	14%
Recycled it	9%
Sold it	4%
Hired a hauler to take it away	2%
Don't know	2%

Table 243: AFR4. Would you have sold the room air conditioner to:

	Room AC (n=2)
Stranger (e.g., through an online ad)	1
Don't know	1

Table 244: AFR5. If you had given the room air conditioner away for free, who would you have given it to?

	Room AC (n=8)
Posted it online for free	5
Given to an acquaintance, friend, or family member	2
Put it on the curb	1

Table 245: AFR6. How would you have recycled the room air conditioner?

	Room AC (n=2)
Take it to a community transfer station/dump	4
Hired someone to take it	1

Table 246: AFR7A. In the past 3 years, did you purchase a new room air conditioner(s)?

	Room AC (n=49)
Yes	67%
No	33%

Table 247: AFR7B. NHSaves offers a $30 rebate to buy a new room air conditioner(s). Did you use a rebate from NHSaves to buy this new room air conditioner(s)?

	Room AC (n=33)
Yes	21%
No	76%
Don't know	3%

Table 248: AFR8. If there had been no rebate available for recycling your old room air conditioner, how likely is it that you would have purchased any type of new air conditioner at the same time?

	Room AC (n=7)
Slightly likely	1
Somewhat likely	2
Very likely	2
Don't know	2

Table 249: AFR9. If there had been no rebate available for recycling your old room air conditioner, when do you think you would have purchased a new air conditioner? Would you say…

	Room AC (n=3)
Between 6 and 12 months of when you did	1
Don't know	2

Table 250: AFR10. If there had been no rebate available to buy a new room air conditioner, how likely is it that you would have recycled your old air conditioner at the same time?

	Room AC (n=7)
Not at all likely	3
Slightly likely	1
Somewhat likely	3

Table 251: AFR11. If there had been no rebate available to buy a new room air conditioner, when do you think you would have gotten rid of your old air conditioner? Would you say…

	Room AC (n=4)
Between 6 and 12 months of when you did	1
More than 1 year after when you did	1
I would not have gotten rid of it	1
Don't know	1

Table 252: AFR12. If there had been no rebate available for recycling your old room air conditioner, how likely is it that you would have purchased the air conditioner with the exact same high-efficiency level?

	Room AC (n=7)
Not at all likely	1
Slightly likely	1

	Room AC (n=7)
Somewhat likely	2
Very likely	1
Don’t know	2

Appendix E Heat Pump Baselines

This appendix presents the detailed study findings related to heat pump baselines.

E.1 CENTRAL ASHPS: BASELINES

This section describes the current state of the analysis of baseline conditions for central ASHP installations in New Hampshire.

E.1.1 Existing Baseline Definition

The 2026 TRM baseline for both central heat pump lost opportunity BC measure IDs is a minimally compliant 14.3 SEER2 and 7.5 HSPF2 heat pump unit. For the electric resistance BC measure ID, the baseline is a 3.412 HSPF electric heating system, which reflects the coefficient of performance of 1 for electric resistance heating.

E.1.2 Development of an Evaluated Baseline for Central ASHPs

The baseline information that follows is not intended for implementation in the 2027 TRM. This section describes the current state of the analysis of baseline conditions for central ASHP installations in New Hampshire. The EM&V Working Group and study team came to a consensus decision to maintain the current baseline definition for the 2027 program year. The baseline definition for program year 2028 onward is pending decisions related to program design and/or further research informed by these study results. Due to interactivity between baseline and NTG, the baseline investigation may affect the NTG ratios measured by this study; therefore, the NTG ratios described in Section 3.2.2.3 for central ASHPs and Section 3.3.2.3 for ductless mini-split ASHPs may be modified for program years after 2027. NMR anticipates that the EM&V Working Group, in conjunction with its evaluation contractor, will assess the need for and direction of additional future research based on program design changes and other relevant factors (e.g., interaction with the New England Heat Pump Accelerator and other adjacent programs) in advance of the 2028 program year.

The team took a three-part approach to evaluating baselines for central ASHPs:

1. Leveraged data from the study's participant survey to develop a set of heating, cooling, and displacement type weights, displayed in Table 253 (heating), Table 254 (cooling), and Table 255 (heating load displacement).
    a. This approach mirrors that taken by the MA and CT Heat Pump Metering Study (HPMS) (see Tables 2-16 and 2-17 of that study report).[151]
2. Conducted a literature review of recent TRMs and baseline studies to understand how other regional program administrators are defining baseline system efficiency assumptions.

[151] Guidehouse and Ridgeline Energy Analytics. Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS / CT R2246). August 2024, updated April 2025. https://ma-eeac.org/wp-content/uploads/MA-HPMS-CT-R2246-Heat-Pump-Metering-Study-Final-Report_April_2025.pdf.

3. Developed system-specific baseline heating and cooling efficiency recommendations, summarized in Table 256. Note that these recommended values apply to *both* central ASHPs and ductless mini-split ASHPs. These recommendations not only include baseline ASHP values to inform updates to baselines within the current impact framework, but also efficiency values for heating systems with non-electric fuels for use by the NH utilities in the future.

In Part 1 of the three-part approach, the evaluators followed the approach of the 2024 (updated 2025) MA and CT HPMS as closely as possible, including applying the same baseline question battery and reproducing tables in the same format. This let the team leverage a thoroughly vetted approach and draw comparisons between states. However, certain details of the MA and CT HPMS analysis approach were not available in that study's report. The evaluators of this study therefore made their best attempt to replicate the approach based on the question logic and output tables. In doing so, the evaluators encountered ambiguity around the treatment of certain counterfactual responses and translation of that data into "no-cooling" and "no-heating" baselines versus defining them as program-eligible heat pump units. Because there is arguably more than one way of accounting for the responses, the evaluators need more information to determine whether they adhered correctly to the MA and CT HPMS approach or may have departed from it. Table 253 and Table 254 present the evaluators' analysis of the survey data to produce heating and cooling baseline equipment type weights.[152]

A note regarding the tables in this section: The following weighting and system efficiency tables categorize results by either "existing unit" or "new unit." The **Existing Unit** category is informed from those who responded "I would have continued to use my old [heating/cooling] system" to question BL5 for heating and BL8 for cooling (Table 78 and Table 87). The **New Unit** category for heating is comprised of the remaining heating system-specific responses from question BL5 (Table 78) plus those responding "No, I/we did not consider any other options" or "Yes, I/we considered ONLY cooling options" to question BL3 (Table 76). Similarly, the New Unit category for cooling is comprised of the remaining cooling system-specific responses from question BL8 (Table 87) plus those responding "No, I/we did not consider any other options" or "Yes, I/we considered ONLY heating options" to question BL3 (Table 76).

Table 253: Baseline Heating Equipment Type Evaluated Weights (Central ASHP)*

Category	Baseline Heating Equipment Type	Central ASHP (n=59)
Existing Unit[1]	None ("no-heating baseline")	TBD[3]
	Oil boiler (n=3)	5.1%
	Oil furnace (n=2)	3.4%
	Natural gas boiler (n=1)	1.7%
	Natural gas furnace (n=1)	1.7%

[152] This analysis assigns respondents who selected "No, I did not consider any other options" in response to the question "Before you decided to install your new heat pump, did you or your contractor consider options other than your new heat pump to heat or cool your [space]?" to the "ENERGY STAR central ASHP" heating and cooling type, under the New Unit category.

Category	Baseline Heating Equipment Type	Central ASHP (n=59)
New Unit[2]	Propane boiler (n=1)	1.7%
	Propane furnace (n=1)	1.7%
	Central ASHP (n=1)	1.7%
	ENERGY STAR central ASHP[4] (n=27)	45.8%
	Propane furnace (n=7)	11.9%
	Natural gas furnace (n=4)	6.8%
	Oil boiler (n=3)	5.1%
	Propane boiler (n=3)	5.1%
	Geothermal or ground-source heat pump (n=2)	3.4%
	Natural gas boiler (n=1)	1.7%
	Electric space heater (n=1)	1.7%
	Woodstove, pellet stove, or fireplace (n=1)	1.7%

* From NMR survey analysis. Weights may not sum to 100% due to rounding.
[1] Existing Unit weights represent participants who said they would have left their existing heating system in place (i.e., those who selected option 2 in response to Question BL5).
[2] New Unit weights represent participants who would have installed an alternative heating system to their existing unit (i.e., all responses to BL5 *except* option 2, plus respondents who selected option 3 or 4 in response to Question BL3).
[3] A portion of respondents may fall into this category; to quantify that percentage, the evaluators need additional information about the MA/CT HPMS analysis. Note that the other values in this table would shift in this case.
[4] Includes respondents who indicated they did not consider any other heating system than the one they did install (i.e., selected option 3 or 4 in response to Question BL3).

Table 254: Baseline Cooling Equipment Type Evaluated Weights (Central ASHP)*

Category	Baseline Cooling Equipment Type	Central ASHP (n=57)
Existing Unit[1]	None (“no-cooling baseline”)	TBD[3]
	Central air conditioning (n=3)	5.3%
	Room, window, or through-the-wall air conditioning (n=1)	1.8%
	Central ASHP (n=1)	1.8%
	Other (n=1)	1.8%
New Unit[2]	ENERGY STAR central ASHP[4] (n=27)	47.4%
	Central air conditioning (n=17)	29.8%
	Room, window, or through-the-wall air conditioning (n=2)	3.5%
	Geothermal or ground-source heat pump (n=2)	3.5%
	Portable air conditioner (n=1)	1.8%
	Fan(s) (n=1)	1.8%
	Other (n=1)	1.8%

* From NMR survey analysis. Weights may not sum to 100% due to rounding.
[1] Existing Unit weights represent customers who would have left their existing cooling system in place (i.e., those who selected option 2 in response to Question BL8).

Category	Baseline Cooling Equipment Type	Central ASHP (n=57)

[2] New Unit weights represent customers who would have installed an alternative cooling system (i.e., all responses to Question BL8 *except* option 2, plus respondents who selected option 2 or 4 in response to Question BL3).
[3] A portion of respondents may fall into this category; to quantify that percentage, the evaluators need additional information about the MA/CT HPMS analysis. Note that the other values in this table would shift in this case.
[4] Includes respondents who indicated they did not consider any other cooling system than the one they did install (i.e., selected option 2 or 4 in response to Question BL3).

Table 255 displays the evaluated heating load displacement type weights based on survey responses in this study. The table lists weights by full or partial displacement. These weights can be used in conjunction with the corresponding full or partial EFLH values to calculate blended displacement savings. Displacement types are defined as follows:

- **Full displacement:** Respondent reports that HP serves entire home *and* that either "the previous system was removed or disconnected and not replaced" or "the previous system is still installed but is no longer operating"
- **Partial displacement:** Respondent reports that *either* (1) HP serves only selected room(s) or (2) serves entire home but "the previous system was removed and replaced with a new piece of equipment of the same type" *or* "the previous system is still installed and operating"

Table 255: Heating Load Displacement: Evaluated Central ASHP Weights (n=58)

Full Displacement Weight	Partial Displacement Weight
29.3%	70.7%

Table 256 provides the evaluators' recommendations for baseline HVAC unit efficiencies. These recommendations are not intended to be applied in 2027. If New Hampshire applies a revised baseline for heat pumps in 2028 or beyond, these values could be used to develop a blended baseline in concert with the weights in the other tables in this appendix. Note that (1) these recommendations do not include derating factors, and (2) these recommendations are applicable to *both* central ASHPs and ductless mini-split ASHPs.

Table 256: Baseline HVAC Unit Efficiency Assumption Recommendations

HVAC Type	2026 NH TRM Baselines	Recommended Existing Unit Baseline Efficiency[1]	Recommended New Unit Baseline Efficiency[2]	Source / Reasoning
Central AC	N/A	13.0 SEER 12.4 SEER2 11.0 EER	15.0 SEER 14.3 SEER2 11.7 EER	*Existing:* Table 2-15 of the Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246). Sourced from 2023 MA RBUECS. *New:* Code minimum efficiency assumed to characterize typical efficiency of ducted heat pumps on the market. Consistent with Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246) study approach.
Central Heat Pump	15.0 SEER 14.3 SEER2 12.3 EER 8.8 HSPF 7.5 HSPF2	13.0 SEER 12.4 SEER2 11.0 EER 7.1 HSPF 6.1 HSPF2	15.0 SEER 14.3 SEER2 11.7 EER 8.8 HSPF 7.5 HSPF2	*Existing:* Table 2-15 of the Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246). Sourced from 2023 MA RBUECS. *New*: Code minimum efficiency assumed to characterize typical efficiency of ducted heat pumps on the market. Consistent with Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246) study approach and current lost opportunity values in the 2026 NH TRM.
Mini-Split Heat Pump	15.0 SEER 14.3 SEER2 8.8 HSPF 7.5 HSPF2	20.0 SEER 19.0 SEER2 12.5 EER 11.0 HSPF 9.4 HSPF2	17.0 SEER 16.2 SEER2 12.0 EER 9.5 HSPF 8.1 HSPF2	*Existing:* Table 2-15 of the Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246). Sourced from 2023 MA RBUECS. *New:* Table 2-15 of the Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246). The assumptions developed by the MA and CT study team are reasonable representations of lower efficiency ductless mini-split heat pumps on the market.

HVAC Type	2026 NH TRM Baselines	Recommended Existing Unit Baseline Efficiency[1]	Recommended New Unit Baseline Efficiency[2]	Source / Reasoning
Window AC	N/A	11.0 CEER	13.7 CEER	*Existing*: Table 2-15 of the Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246). *New*: Federal standard minimum efficiency (to be effective 5/26/26) for *Without reverse cycle, with louvered sides and 6,000 to 7,900 Btu/h.*
Gas Furnace	N/A	87.4% AFUE	86.9% AFUE	Existing: Aligned unit efficiency with early replacement values developed for gas furnaces. New: Unit efficiency values aligned with lost opportunity figure for gas furnaces in this study.
Propane Furnace	N/A	87.4% AFUE	86.9% AFUE	Existing: Aligned unit efficiency with early replacement values developed for gas furnaces. New: Unit efficiency values aligned with lost opportunity figure for gas furnaces in this study.
Oil Furnace	N/A	85.0% AFUE	86.2% AFUE	Table 2-15 of the Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246).
Gas Boiler	N/A	85.7% AFUE	87.0% AFUE	Existing: Aligned unit efficiency with early replacement values developed for gas boilers. New: Unit efficiency values aligned with lost opportunity figure for gas furnaces in this study.
Propane Boiler	N/A	85.7% AFUE	87.0% AFUE	Existing: Aligned unit efficiency with early replacement values developed for gas boilers. New: Unit efficiency values aligned with lost opportunity figure for gas furnaces in this study.
Oil Boiler	N/A	85.0% AFUE	86.2% AFUE	Table 2-15 of the Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) / (CT R2246).
Electric Resistance	3.412 HSPF (retrofit only)	3.41 HSPF	3.41 HSPF	Standard engineering assumption for electric resistance heating efficiency.

[1] Existing unit efficiency represent customers who would have left their existing HVAC system in place.
[2] New efficiency values represent customers who would have installed an alternative HVAC system.

E.2 DUCTLESS MINI-SPLIT ASHPS: BASELINES

This section presents the current state of the analysis of baseline conditions for ductless mini-split ASHP installations in New Hampshire. Portions of this section reference the previous section on central ASHPs. Note that the baseline information that follows is not intended for implementation in the 2027 TRM and the baseline definition for program year 2028 onward is pending decisions related to program design and/or further research informed by these study results.

E.2.1 Existing Baseline Definition

The current baseline for both ductless mini-split ASHP lost opportunity BC measure IDs is a minimally compliant, 14.3 SEER2 and HSPF2 7.5 heat pump unit. For the electric resistance BC measure ID, the baseline is an HSPF 3.412 electric heating system, which reflects the coefficient of performance of 1 for electric resistance heating.

E.2.2 Development of an Evaluated Baseline for Ductless Mini-Split ASHPs

The following tables present the current state of the analysis of baseline conditions for ductless mini-split ASHP installations in New Hampshire. Please refer to the discussion in Appendix E.1.2 for important context regarding these findings.

A note regarding the tables in this section: The following weighting and system efficiency tables categorize results by either “existing unit” or “new unit.” The Existing Unit category is informed from those who responded “I would have continued to use my old [heating/cooling] system” to question BL5 for heating and BL8 for cooling (Table 78 and Table 87). The New Unit category for heating is comprised of the remaining heating system-specific responses from question BL5 (Table 78) plus those responding “No, I/we did not consider any other options” or “Yes, I/we considered ONLY cooling options” to question BL3 (Table 76). Similarly, the New Unit category for cooling is comprised of the remaining cooling system-specific responses from question BL8 (Table 87) plus those responding “No, I/we did not consider any other options” or “Yes, I/we considered ONLY heating options” to question BL3 (Table 76).

Table 257: Baseline Heating Equipment Type Recommended Weights (Ductless Mini-Split ASHP)*

Category	Baseline Heating Equipment Type	Ductless Mini-Split ASHP (n=57)
Existing Unit[1]	None (“no-heating baseline”)	TBD[3]
	Oil boiler (n=3)	5.3%
	Oil furnace (n=2)	3.5%
New Unit[2]	ENERGY STAR ductless mini-split ASHP[4] (n=37)	64.9%
	Propane furnace (n=2)	3.5%
	Natural gas furnace (n=1)	1.8%
	Oil boiler (n=1)	1.8%
	Propane boiler (n=1)	1.8%

Category	Baseline Heating Equipment Type	Ductless Mini-Split ASHP (n=57)
	Geothermal or ground-source heat pump	–
	Natural gas boiler (n=2)	3.5%
	Electric space heater (n=1)	1.8%
	Woodstove, pellet stove, or fireplace (n=2)	3.5%
	Oil furnace (n=2)	3.5%
	Electric baseboard (n=1)	1.8%
	Gas space heater(n=1)	1.8%
	None (left space unheated)	1.8%

* From NMR survey analysis. Weights may not sum to 100% due to rounding.
[1] Existing Unit weights represent participants who said they would have left their existing heating system in place (i.e., those who selected option 2 in response to Question BL5).
[2] New Unit weights represent participants who would have installed an alternative heating system to their existing unit (i.e., all responses to BL5 *except* option 2, plus respondents who selected option 3 or 4 in response to Question BL3).
[3] A portion of respondents may fall into this category; to quantify that percentage, the evaluators need additional information about the MA/CT HPMS analysis. Note that the other values in this table would shift in this case.
[4] Includes respondents who indicated they did not consider any other heating system than the one they did install (i.e., selected option 3 or 4 in response to Question BL3).

Table 258: Baseline Cooling Equipment Type Recommended Weights (Ductless Mini-Split ASHP)*

Category	Baseline Cooling Equipment Type	Ductless Mini-Split ASHP (n=58)
Existing Unit[1]	None (“no-cooling baseline”)	TBD[3]
	Central air conditioning (n=3)	5.2%
	Room, window, or through-the-wall air conditioning (n=2)	3.4%
New Unit[2]	ENERGY STAR ductless mini-split heat HP[4] (n=37)	63.8%
	Central air conditioning (n=2)	3.4%
	Room, window, or through-the-wall air conditioning (n=7)	12.1%
	Portable air conditioner (n=3)	5.2%
	Other ductless mini-split heat pump (n=1)	1.7%
	Ductless AC (no heating) (n=1)	1.7%
	Central ASHP (n=1)	1.7%
	None (left space uncooled) (n=1)	1.7%

[1] Existing Unit weights represent customers who would have left their existing cooling system in place (i.e., those who selected option 2 in response to Question BL8).
[2] New Unit weights represent customers who would have installed an alternative cooling system (i.e., all responses to Question BL8 *except* option 2, plus respondents who selected option 2 or 4 in response to Question BL3).
[3] A portion of respondents may fall into this category; to quantify that percentage, the evaluators need additional information about the MA/CT HPMS analysis. Note that the other values in this table would shift in this case.
[4] Includes respondents who indicated they did not consider any other cooling system than the one they did install (i.e., selected option 2 or 4 in response to Question BL3).

Table 259 displays the recommended heating load displacement type weights for ductless mini-split ASHPs based on survey responses in this study. The table lists weights by full or partial displacement. These weights can be used in conjunction with the corresponding full or partial EFLH values to calculate blended displacement savings. Displacement types are defined as follows:

- **Full displacement:** Respondent reports that the ductless heat pump serves entire home *and* that either "the previous system was removed or disconnected and not replaced" or "the previous system is still installed but is no longer operating"
- **Partial displacement:** Respondent reports that the ductless heat pump *either* (1) serves only selected room(s) or (2) serves entire home but "the previous system was removed and replaced with a new piece of equipment of the same type" *or* "the previous system is still installed and operating"

Table 259: Heating Load Displacement Type: Recommended Ductless Mini-split ASHP Weights (n=55)

Full Displacement Weight	Partial Displacement Weight
9.1%	90.9%

Please refer to Table 256 for the evaluators' recommended **baseline HVAC unit efficiencies**. Note that these recommendations are applicable to both central and ductless mini-split ASHPs and that these recommendations are not intended to be applied in 2027. If New Hampshire applies a revised baseline for heat pumps in 2028 or beyond, these values could be used to develop a blended baseline in concert with the weights in the other tables in this appendix.

Appendix F Recommendations & Considerations

This appendix includes a comprehensive compilation of the recommendations and considerations included in the body of this report.

F.1 Impact Recommendations

Table 260 and Table 261 specify the impact factors recommended by this study for installed and recycling measures, respectively. All recommendations in these tables are high priority. The New Hampshire utilities applied these updates to the 2027 TRM submitted on July 1, 2026. Refer to Section 3.1.1 in the main report for additional information.

Table 260: Measure-Level Results Summary – Installed Measures

Measure	Baseline	ISR	Demand Usage Ratio (DUR) or Coincidence Factor (CF)	NTG
Heat Pump, central air-source (Sec 3.2)	Table 9. Section 3.2.2.2, and Appendix E	100%	DUR Summer: 0.948 DUR Winter: 0.898	63%
Heat Pump, ductless (Sec 3.3)	Table 13, Section 3.3.2.2, and Appendix E	100%	DUR Summer: 0.839 DUR Winter: 0.596	68%
Gas Furnace (Sec 3.4)	86.9% AFUE (LO) 87.4% AFUE (ER) 87.0% AFUE (Blended LO-ER)	100%*	CF Summer: 0.0 CF Winter: 0.45	63%
Gas Boiler (Sec 3.5)	85.7% AFUE (LO) 87.0% AFUE (ER) 86.7% AFUE (Blended LO-ER)	100%*	N/A	63%
Gas Wi-fi Thermostat (Sec 3.6)	A manual or programmable thermostat	88%	N/A	N/A*
Heat Pump Water Heater, Downstream (≤55 gal) (Sec 3.7)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)	100%	CF Summer: 0.41* CF Winter: 0.74*	67%
Heat Pump Water Heater, Downstream (>55 gal) (Sec 3.7)	1.02 UEF (electric) 0.74 UEF (propane) 0.71 UEF (oil)	100%	CF Summer: 0.41* CF Winter: 0.74*	67%
Gas Integrated Water Heater (Sec 3.8)	85% AFUE boiler with a 0.60 UEF water heater	100%*	N/A	N/A*
Pool Pump (Sec 3.9)	Pool Pump meeting the July 2021 Federal Standard 10 CFR part 431	99%	CF summer: 0.88 CF winter: 0.00	88%
Room Air Purifier (Sec 3.10)	1.9 CADR/W (10-100 CADR) 2.4 CADR/W (100-150 CADR) 2.9 CADR/W (≥150 CADR)	88%	CF summer: 0.59 CF winter: 0.67	N/A*

* Factors marked with an asterisk were not in scope and were not evaluated in this study.

Table 261: Measure-Level Results Summary – Recycling Measures

Measure	Realization Rate (Part-Use Factor)	Gross Savings (UEC)	NTG
Refrigerator, Primary and Secondary (Sec 3.11)	87%	998 kWh	38%
Freezer, Secondary (Sec 3.12)	79%	795 kWh	39%
Dehumidifier (Sec 3.13)	100%	1,020 kWh	30%
Room Air Conditioner (Sec 3.14)	100%	245 kWh	35% (retrospective) 36% (prospective)

F.1.1 Measure-Specific TRM Entry Recommendations

The evaluators offer the following recommendations and considerations to improve accuracy and clarity of the New Hampshire Technical Reference Manual. All recommendations in this section are high priority. Except where otherwise indicated, the New Hampshire Utilities have already implemented most of the following recommendations in the 2027 TRM submitted on July 1, 2026.

F.1.1.1 Central ASHPs

- **Recommendation TRM-1:** For consistency and alignment with the most up-to-date heat pump rating metrics, the team recommends defaulting the TRM algorithms to be in terms of "SEER2, HSPF2, and EER2" instead of "SEER, HSPF, and EER." Further, we recommend leaving the conversion tables in place and adding the EER to EER2 conversion which is currently missing from the 2026 NH TRM. This recommendation is partially implemented in the 2027 TRM.
- **Recommendation TRM-2:** The 2026 NH TRM references a pilot offering starting in 2021 to account for baselines in homes that are oil or propane-heater. Because this pilot is not in effect, the evaluators recommend removing the language about the pilot.
- **Recommendation TRM-3:** The team recommends replacing the current effective full-load heating and cooling values in the 2026 TRM section, which are sourced from the New York State TRM and represent an average of values for Albany and Massena (1,020 $EFLH_{heat}$ and 280 $EFLH_{cool}$). By adopting the effective full load heating and cooling hours developed in this study using 2023 data specific to Concord, NH (1,663 $EFLH_{heat}$ and 377 $EFLH_{cool}$), the TRM will provide more current and representative values for use in heat pump impact calculations. Please see the attached workbook titled "NH EFLH calculator 14Apr26.xlsx."
- **Recommendation TRM-4:** The evaluators recommend clarifying whether cooling impacts are considered for the electric resistance retrofit BC measure ID (EA3b034). The impact factor summary table provides both winter and summer CFs.[153] This recommendation is partially implemented in the 2027 TRM.
- **Consideration TRM-5:** Since the utility implementation vendors do not currently track COP and capacity at 5°F, consider including a secondary algorithm that captures seasonal demand using the delta HSPF as the savings basis.

F.1.1.2 Ductless Mini-Split ASHPs

- **Recommendation TRM-6:** For consistency and alignment with the most up-to-date heat pump rating metrics, the team recommends defaulting the TRM algorithms to be in terms of "SEER2, HSPF2, and EER2" instead of "SEER, HSPF, and EER." Further, we recommend leaving the conversion tables in place and adding the EER to EER2 conversion which is currently missing from the 2026 NH TRM. This recommendation is partially implemented in the 2027 TRM.

[153] Note that the efficiency baseline does not provide any cooling baseline metrics for the retrofit – resistance scenario (BC measure ID EA3b034).

- **Recommendation TRM-7:** The 2026 NH TRM references a pilot offering starting in 2021 to account for baselines in homes that are oil or propane-heater. Because this pilot is not in effect, the evaluators recommend removing the language about the pilot.
- **Recommendation TRM-8:** The team recommends replacing the current effective full-load heating and cooling values in the 2026 TRM section, which are sourced from the New York State TRM and represent an average of values for Albany and Massena (1,117 $EFLH_{heat,full\ disp}$, 535 $EFLH_{heat,partial\ disp}$, and 218 $EFLH_{cool}$). By adopting effective full load heating and cooling hours developed by the team using 2023 data specific to Concord, NH (1,663 $EFLH_{heat,full\ disp}$, 1,255 $EFLH_{heat,partial\ disp}$, and 377 $EFLH_{cool}$), the TRM will provide more current and NH-representative values for use in heat pump impact calculations. Please see the attached workbook titled "NH EFLH calculator 14Apr26.xlsx."
- **Recommendation TRM-9:** The evaluators recommend clarifying the criteria for partial- and full-displacement in the TRM to ensure the correct EFLH heating value is applied. Further, to match the implementation default, consider adding language to clarify that lost opportunity ductless mini-split ASHPs should be considered as partial displacement only.
- **Recommendation TRM-10:** The evaluators recommend clarifying whether cooling impacts are considered for the electric resistance retrofit BC measure ID (EA3b031). The impact factor summary table provides both winter and summer CFs, but the efficiency baseline does not provide any cooling baseline metrics for the retrofit – resistance scenario.[154]
- **Consideration TRM-11:** Since the utility implementation vendors do not currently track COP and capacity at 5°F, consider including a secondary algorithm that captures seasonal demand using the delta HSPF as the savings basis.

F.1.1.3 Natural Gas Furnaces

- **Recommendation TRM-12:** Include a table showing the recommended deemed savings for both BC measure IDs. While the HVAC Furnace section in the 2026 NH TRM references the 2019–2021 MA calculations workbook (Mass Save, 2018) that the deemed savings for the ES Products BC measure IDs are sourced from, the 2026 TRM section does not list the deemed savings values themselves.

F.1.1.4 Natural Gas Boilers

- **Recommendation TRM-13:** Edit the high-efficiency case language to mention the 90% AFUE BC measure ID. The HVAC Boiler section in the 2026 NH TRM describes the efficient case as "a boiler with an AFUE rating of 95% or greater," implying that the ES Products Program offers only one high-efficiency boiler (95% AFUE). The TRM description should align with the program's offering of two separate BC measure IDs (GA3b006 for 90% AFUE and GA3b007 for 95% AFUE).
- **Recommendation TRM-14:** Add the two boiler BC measure IDs to the table for clarity on the impact factors. The two ES Products BC measure IDs for boilers are not listed in the

[154] Note that the efficiency baseline does not provide any cooling baseline metrics for the retrofit – resistance scenario (BC measure ID EA3b031).

"Impact Factors for Calculating Adjusted Gross Savings" table in the 2026 NH TRM section.

F.1.1.5 Heat Pump Water Heaters

- **Recommendation TRM-15:** Ensure that default propane and oil UEF_{base} values are portrayed correctly in the TRM. The Lost Opportunity Baseline table in the 2026 NH TRM incorrectly lists the default propane UEF_{base} values under the oil column and the default oil UEF_{base} values under the propane column.
- **Recommendation TRM-16:** Correct the BC measure ID from *EA3038* to *EA3b038.* The BC measure ID for *Energy Star Integrated HPWH, 120V, Split System 55 gallons or less* contains a typo in the impact summary table of the 2026 NH TRM.
- **Recommendation TRM-17:** During the next (2028) TRM update, determine whether hot water consumption assumptions should vary by HPWH tank size. The HPWH calculator cited in the 2026 NH TRM savings assumes identical hot water heater consumption for both size tiers.

F.1.1.6 Pool Pumps

- **Recommendation TRM-18:** Clarify whether the deemed kW value shown represents summer peak coincident demand (as understood by the evaluators) or overall average demand savings for pool pumps.

F.1.1.7 Refrigerator Recycling

- **Consideration TRM-19:** Consider combining primary and secondary refrigerator recycling into a single measure, as the UMP savings algorithm accounts for primary and secondary use, resulting in a blended UEC.

F.1.1.8 Room AC Recycling

1. **Recommendation TRM-20:** Apply the factors shown in Table 57, using the retrospective factors for all units recycled before May 26, 2026, and the prospective factors for units recycled on or after May 26, 2026. This differentiation reflects a change in the ENERGY STAR version for new room air conditions, and the efficiency of newly manufactured units plays a part in the NTG algorithm.

F.1.2 Data Tracking Considerations

The evaluators offer the following considerations for changes to the New Hampshire Utilities' data tracking practices for the ES Products Program.

F.1.2.1 All Measures

- **Consideration DT-1:** Track the program pathway through which each measure was incentivized to facilitate future analysis and evaluation.[155]

F.1.2.2 Central ASHPs[156] and Ductless Mini-Split ASHPs[157]

- **Consideration DT-2:** The 2026 NH TRM peak demand savings algorithm requires the COP and capacity of the installed heat pump unit at 5°F. The study team recommends collecting and tracking these parameters for future projects to enable use of the peak demand savings algorithm used in the 2026 TRM.
- **Consideration DT-3:** Specify in the tracking system data fields whether efficiency values reflect the 1.0 or 2.0 efficiency parameter rating system. The utility tracking databases currently do not indicate whether the tracked heat pump efficiency parameters reflect the 1.0 or 2.0 version of the rating system (i.e., HSPF/SEER/EER or HSPF2/SEER2/EER2). The NH utilities have confirmed that the tracked values consistently use the version 2.0 rating system, despite the variables being labeled as "HSPF," "SEER," and "EER."

F.1.2.3 Refrigerator Recycling

- **Consideration DT-4:** Track the following factors that contribute to accurate energy savings calculation:
  a. door configuration (top or bottom freezer, single or double doors)
  b. whether the customer designated the refrigerator as the primary or secondary unit for the home during the year prior to recycling
  c. nameplate information or model number (when available)

F.1.2.4 Freezer Recycling

- **Consideration DT-5:** Use nameplate information or model number (when available) to more accurately track appliance size, rather than defaulting to the program maximum size.

F.1.2.5 Dehumidifier Recycling

- **Consideration DT-6:** Track the capacity of recycled dehumidifiers in either pints/day or liters/day to allow for the development of a NH-specific deemed savings estimate.

F.1.2.6 Room AC Recycling

- **Consideration DT-7:** Track the capacity and efficiency of recycled units and calculate UEC based on the formula in Section 3.14.2.1, adapted from the Pennsylvania TRM and used in this report for gross savings assumptions.

[155] Appears in Section 3.1.1
[156] Appear in Section 3.2.1.2
[157] Appear in Section 3.3.1.2

F.2 Overall Process Recommendations and Considerations for the ES Products Program

This section presents the recommendations and considerations put forth in this report that affect the overall design and operation of the program. Recommendations and considerations specific to certain measure types appear in Appendix Sections F.3 and F.4 below. Note that each recommendation is assigned a priority level of *low*, *moderate*, or *high*, whereas considerations are not assigned a priority level. The recommendations in this section should be acted upon within the program year following issuance of this report unless noted otherwise. Refer to Section 4.1.2 in the main report for additional information.

- **Recommendation P-1:** Review current education and engagement opportunities for participating HVAC and water heating contractors and identify ways to expand them, such as through partnerships with HVAC companies, dedicated program representatives, and training events. Consider seeking feedback from contractors about what they would find valuable and identify activities with benefits both for contractors and for the program. Note that this recommendation supports high-priority recommendations for ASHPs (see Appendix F.4) *(Priority: High)*
- **Recommendation P-2:** Undertake a comprehensive review of program application and documentation requirements. Remove requirements and questions that are not essential or valuable to the program and provide additional guidance on where and how to find the required information (e.g., consider including videos and/or visual examples of how to find AHRI reference and model numbers, calculate tonnage, etc.). Thereafter, perform an annual review to ensure each required component remains valuable. Also, continue to offer paper applications to support program accessibility, and consider specifying that by participating, the customer agrees to allow access and/or share their data for evaluation purposes. *(Priority: High)*
- **Recommendation P-3:** Continue to review the rebate amount for each measure at least annually and raise incentive levels where cost-effective and necessary to drive adoption. Higher incentives tend to decrease FR rates and drive participation and program satisfaction.[158] As part of this process, undertake a review of rebate amounts and processes across the NH utilities and either create alignment or document the reason(s) for ongoing inconsistencies. The evaluators note that the program proactively increased rebate levels for several measures in 2026, in alignment with this recommendation. *(Priority: Moderate)*
- **Recommendation P-4:** Increase awareness of and participation in NHSaves and the ES Products Program by promoting them through multiple channels. Revisit existing plans for communications to participating contractors, in-store promotions, and general brand and program marketing activities and identify activities that can be increased within the approved budget. Cross-promote ES Products offerings to participants in other NHSaves programs to help increase the program's reach: For example, include or increase Products

[158] This statement applies to measures early in their adoption cycle when incentives reduce barriers, making them more appealing to a wider range of consumers. When a market matures, higher incentives have little impact on adoption and can increase FR rates. See Rogers, E.M. 2003. *Diffusion of Innovations*. 236 to 238. Fifth Edition. Free Press: New York.

promotions in email communications to current and recent participants in the Home Energy Assistance and Home Energy Performance programs. *(Priority: Low)*

- **Recommendation P-5:** Cross-promote weatherization through the Home Energy Performance and Home Energy Assistance programs with installation of heating and/or cooling measures such as heat pumps, furnaces, and boilers. Promote the benefits of weatherizing their homes first (e.g., saving additional energy and reducing equipment costs by reducing heating and cooling loads) to customers visiting the NHSaves website heating and cooling pages and in other customer-facing promotions and communications. Train installation contractors to encourage their heating and cooling customers to pursue weatherization to help them save additional energy while promoting cross-program participation.[159] *(Priority: Low)*
- **Recommendation P-6:** Tout the careful vetting process and ease of selection as reasons to purchase efficient products from the online marketplace in communications to customers and participants, emphasizing that the limited number of product options on the marketplace is a strength. Additionally, review the offered products and product categories at least annually and consider adding additional types of measures, such as new types of "smart" home technologies, as they become viable. *(Priority: Low)*
- **Consideration P-7:** Investigate the feasibility of enabling participants and/or contractors to easily track or look up their application status.
- **Consideration P-8:** Consider expanding instant and/or midstream rebate offerings for measures with low-to-moderate FR rates to reduce administrative burden and improve customer and contractor experience. Also consider adding measures to the online marketplace where feasible.
- **Consideration P-9:** Consider expanding the existing NHSaves financing options to include ES Products measures and offering loan amounts sufficient for customers to undertake major measures such as heat pumps.

[159] The evaluators note that the utilities included a similar strategy in their proposed NHSaves 2027–2029 Plan.

F.3 KEY PROCESS RECOMMENDATIONS AND CONSIDERATIONS FOR SELECTED MEASURES

This section presents the recommendations and considerations put forth in this report that are relevant to certain measure types other than ASHPs (recommendations for ASHPs appear in Appendix F.4). Note that each recommendation is assigned a priority level of *low*, *moderate*, or *high*, whereas considerations are not assigned a priority level. The recommendations in this section should be acted upon within the program year following issuance of this report unless noted otherwise. Refer to Section 3.1.2 in the main report for additional information.

F.3.1 All Measures

- **Recommendation PM-1:** Expand communications to participating contractors and customers about the energy savings customers can expect to see after installing measures through the program and the factors that affect those savings (e.g., weather, insulation levels, occupancy, equipment settings, fuel conversion, etc.). *(Priority: High)*
    a. Issue guidance to participating contractors about how to represent the changes customers can expect in their energy usage after installing a measure.
    b. Update the NHSaves website and other communications to inform potential participants about the energy savings they can expect. For example, consider adding a page or blog post describing the factors that affect energy bill savings, and revise or replace existing content that does not acknowledge these factors.

F.3.2 Heat Pump Water Heaters

- **Recommendation PM-2:** Coordinate with NEHPA and HEAR to the extent possible to carry out the following activities:
    a. Co-promote the HPWH rebate and incorporate education to help customers understand the advantages of HPWHs and factors that affect their success.
    b. Monitor HPWH rebate activity and set the rebate amount at an appropriate level to drive installations while using rebate funds efficiently.
    c. Ensure that the language on the rebate form and NHSaves website about combining the ES Products rebate with other offers is clear and specific to prevent customer confusion. *(Priority: Moderate)*
- **Recommendation PM-3:** Reinforce recommended practices around HPWH sizing in contractor communications and trainings. Consider sharing video or written case studies showing successful approaches to right-sizing. *(Priority: Moderate)*
- **Consideration PM-4:** Undertake a targeted effort to learn more about contractor experiences with the midstream pathway. Because the evaluators spoke with only a small number of contractors who had experience with the midstream pathway, it may be worthwhile to hear from additional contractors, particularly if there are any issues or uncertainty about how the pathway is functioning. Note that this investigation could be conducted internally or through an evaluation study.

F.3.3 Natural Gas Furnaces

- **Recommendation PM-5:** Investigate contractor recommendation practices for furnaces and how the program can best support contractors in guiding customer decision-making while highlighting the program's role. Note that this investigation could be conducted internally or through an evaluation study. *(Priority: Moderate)*
- **Consideration PM-6:** Consider revising the program design to differentiate between noncondensing-to-condensing and condensing-to-condensing furnace replacements, or to focus exclusively on noncondensing-to-condensing projects.

F.3.4 Other

- **Consideration PM-7:** The electric utilities should consider including ECM motors for boiler circulator pumps as a measure in the midstream pathway, akin to the existing furnace ECM offering.

F.4 Recommendations and Considerations for Air-Source Heat Pump Measures

This section presents the recommendations and considerations for ASHPs that are put forth in this report. Note that each recommendation is assigned a priority level of *low*, *moderate*, or *high*, whereas considerations are not assigned a priority level. The recommendations in this section should be acted upon within the program year following issuance of this report unless noted otherwise. Refer to Section 3.1.3 in the main report for additional information.

- **Recommendation HP-1:** Leverage one or more of the strategies described in Section 4.2.3 (i.e., increase and/or implement tiered incentives, target specific market segments, and/or raise qualifying equipment thresholds) to revise the ASHP incentive offerings with the goal of reducing FR rates and driving energy savings above current baseline. *(Priority: High)*
- **Recommendation HP-2:** Investigate current installed equipment trends and the factors that influence which equipment brands, models, and efficiency levels contractors recommend to customers. The utilities might use recent program participation data to understand the distribution of installed equipment efficiency levels and other criteria, and use interviews, focus groups, or other market research methods to explore the underlying drivers. In particular, it would be helpful to assess to what extent program rebates influence contractor decisions to stock higher-efficiency equipment that meets program requirements or whether those models would be their standard offering regardless. Understanding these practices could help clarify the program's influence on equipment selection and efficiency levels installed and help define appropriate equipment efficiency thresholds or tiers. Note that this investigation could be conducted internally and/or through an evaluation study. *(Priority: High)*
- **Recommendation HP-3:** Based on the contractor stocking and recommendation practices findings, increase program qualifying equipment efficiency levels to encourage more customers to adopt higher-efficiency heat pumps. Alternatively, consider creating tiered incentives by efficiency level, with at least one tier at a higher efficiency level than the current offering. *(Priority: High)*
- **Recommendation HP-4:** Reinforce and highlight the program's role in customer decision-making by providing contractors with guidance on heat pump recommendation practices that align with program theory and help steer customers toward the highest feasible efficiency levels. Consider focusing partnership efforts on contractor firms that specialize in heat pump installation because customers of those contractors are already interested in installing a heat pump, consistent with the program's goal. Partnership efforts could include direct outreach (email, newsletters), events, trainings, and/or collaboration through an installer network. *(Priority: High)*
- **Recommendation HP-5:** As part of ongoing coordination efforts with the NEHPA and HEAR programs, devise approaches to drive customers participating in the other programs to adopt higher-efficiency ASHPs than they would otherwise. For example, provide training and support to the contractors that are engaged by the NEHPA and HEAR programs and align customer marketing and communication approaches to focus the

NHSaves Products program's efforts on high-efficiency model selection, sizing, and quality installation. *(Priority: High)*

- **Recommendation HP-6:** Revise the Heat Pumps page[160] on the NHSaves website and other customer communications to provide customers with guidance on how to select an efficient ASHP system, how to use their system efficiently to maximize overall energy savings and reduce its impact on summer and winter peak demand, and changes they should expect to see in their energy usage.[161] *(Priority: High)*
    a. Include explanations of heat pump efficiency rating criteria (e.g., SEER and HSPF ratings) and questions they should ask their contractor about the efficiency levels of models suitable for their home.
    b. Building on the "Heat Pump User Tips" already posted on the webpage, the program should provide additional information about ASHP controls and settings, available financing, and related NHSaves opportunities (e.g., incentives for smart thermostats and participation in the utilities' demand response programs).
    c. Inform potential participants about the energy savings they can expect. For example, consider adding a page or blog post describing the factors that affect energy bill savings (e.g., annual weather variation, occupancy, fuel switching, changes in rates), and revise or replace existing content that does not acknowledge these factors.[162]
- **Recommendation HP-7:** Maintain the baseline defined in the 2026 TRM for the 2027 program year for central ASHPs and ductless MSHPs. Once the new program design has been implemented, reassess the appropriate baseline definition based on the redesigned program offering. *(Priority: Moderate)*
- **Recommendation HP-8:** Explore program attribution in more depth and fine-tune the NTG evaluation approach in a future evaluation of the heat pump offerings.[163] Ideally, this will occur once program redesign efforts have been put in place and the heat pump baseline is more clearly defined, and as soon as possible after the purchase decision to support respondent recall. Explore the following components:
    a. Dissect the customer decision-making process to differentiate the decision to install a heat pump from the decision of which type, efficiency level, and specific model of heat pump to install.
    b. Investigate the ways in which contractors influence customer decision-making, including the decision to purchase a heat pump, the number and diversity of options presented for specific models or efficiency levels, as well as how contractors influence installation timing and quantity/system size. It would also be informative to look at the role of the ENERGY STAR label in equipment selection.

[160] NHSaves, "Heat Pumps," accessed August 12, 2026. https://nhsaves.com/residential/electric-heating-cooling-equipment/
[161] Consistent with Steps 2 and 3 in Figure 1.
[162] For example, https://nhsaves.com/learn/2020/08/is-it-time-to-invest-in-a-new-heating-system/.
[163] Ideally, the study should be planned in conjunction with the program redesign process and data collection should begin when the redesigned offering has been in operation for six to twelve months.

c. Examine customer awareness of the rebate, third-party programs, and financing offerings, and their roles in lowering the purchase price.
d. Examine how FR and SO estimates vary when the counterfactual heating fuel differs.
e. Develop alternative scoring in NTG algorithms that emphasizes the program influence on efficiency over the decision to adopt and the timing of that adoption.
f. Explore the interaction between the NHSaves ES Products Program and other program offerings in New Hampshire, such as the NEHPA and HEAR programs. *(Priority: Moderate)*

- **Consideration HP-9:** Consider revising or expanding the line of baseline questioning in a future evaluation survey to dissect the counterfactual action in more detail and reduce the risk of confirmation bias if repeating the baseline question battery.
- **Consideration HP-10:** Consider adopting a midstream model to capture incremental efficiency savings among customers who are already planning to install a heat pump. Given contractors' reported influence on equipment selection, a midstream approach may provide a more direct mechanism for influencing contractor recommendations and encouraging customers to select higher-efficiency models. In addition, a midstream design could improve the customer experience by reducing paperwork and simplifying rebate delivery, which may increase program satisfaction. Two key factors to consider before deciding to adopt a midstream model include the current free-ridership rate (which may be increased under a midstream approach) and program costs associated with the delivery method.