HEAT Loan Assessment Study Phase 1
(MA25R08-B-HEAT)

Final Report

Prepared for:

Massachusetts Electric and Natural Gas Program Administrators

Part of the Residential Evaluation Program Area

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Table of Contents

Executive Summary **1**

1. Introduction & Background **6**

1.1 HEAT Loan Program Evolution 6
1.2 HEAT Loan Approval Process 7
1.3 Study Goals 8
1.4 Study Approach 10

2. Methodology **12**

2.1 Interviews 12
2.2 Survey 13
2.2.1 Targeted Population and Sampling 13
2.2.2 Recruitment, Incentives and Survey Fielding 15
2.2.3 Survey Instrument and Programming 15
2.2.4 Varying Interest Rate Module Design 15
2.2.5 Monthly Payment and Net Present Value Calculations for Survey Hypothetical Scenarios 16
2.2.6 Respondent Demographics 16
2.2.7 Survey Data and Interpretation Limitations 19
2.3 Tracking Data and Cost Analysis 20
2.3.1 Tracking Data Analysis 21
2.3.2 Cost Analysis 22
2.4 Benchmarking and Literature Review 22

3. Interview Findings **24**

3.1 Overview 24
3.2 Stakeholder Interview Feedback 25
3.2.1 HEAT Loan as an Enabler of Electrification 25
3.2.2 Importance of HEAT Loan to Non-Customer Stakeholders 25
3.2.3 Customer Experience and Process Challenges 25
3.2.4 Barriers to Participation 26
3.2.5 Opportunities for Improvement 26
3.3 Summary Findings 27

4. Customer Survey Findings **29**

4.1 Measures Overview and General Experience Notes 29
4.2 Rebate and Loan Option Awareness 31
4.3 Authorized Non-participant Findings 33
4.4 Participant Findings 36
4.4.1 Counterfactuals and the Importance of HEAT Loan 36
4.4.2 Customer Preferences on Rebates versus Loans 38

4.4.3 Customer Preferences for Interest Rate 39
4.4.4 Influence of Different Loan Variables and Customer Preferences 41
4.5 Ongoing Study Findings 44
4.6 Summary Findings 45
5. Tracking Data and Cost Analysis 47
5.1.1 Measure Level Trends 47
5.1.2 Customer Trends 50
5.1.3 Loan Distribution and Uptake 51
5.1.4 Data Limitations 52
5.1.5 Cost Analysis 52
5.2 Summary Findings 54
6. Benchmarking and Literature Review Findings 55
6.1 Other Financing Offerings in Massachusetts 55
6.2 Program Benchmarking 56
6.3 Best Practices Evaluation 59
6.4 Program Uptake 59
6.5 Summary Findings 62
7. Conclusion 63
7.1 Recommendations 64
7.2 Areas for Future Research 65
Appendix A. Survey Respondents' Demographic Information 1
Appendix B. Vendor Data Details 3
Appendix C. Alternative Loan Design Option Details 6
Appendix D. Survey Results with Additional Income Tiers 7
Appendix E. Additional Benchmarking Details 12

List of Tables

Table ES-1. Key Phase 1 Study Tasks 2
Table 1-1. HEAT Loan Assessment Phase 1 Research Questions 10
Table 1-2. Key Phase 1 Study Tasks 11
Table 2-1. Interview Targets 13
Table 2-2. Survey Frame and Response Counts 14
Table 2-3. Participant Gross Annual Household Income Levels (n=341) 18
Table 2-4. Authorized Non-participant Gross Annual Household Income Levels (n=56) 19
Table 2-5. Conservative Margins of Error for Survey Results 20
Table 2-6. HEAT Loan Vendor Data Details 21
Table 3-1. Interview Targets and Completes 24
Table 4-1. HEAT Loan Project Measures 29

Table 4-2. Is there anything else you would like tell us about your experience with the HEAT Loan? (Verbatim analysis, n = 68) 30
Table 4-3. Pairwise Comparisons of HEAT Loan Features (n=341) 42
Table 4-4. Relative Importance of HEAT Loan Features (AHP Results, n=341) 42
Table 5-1. Monthly Payment Comparison for a $25,000 Loan, 0% Interest at Different Term Lengths 53
Table 5-2. Loan Option Comparison: Varying Term Length and Interest Rate 53
Table 6-1. Other MA Financing Offerings 56
Table 6-2. Benchmarked Financing Program Details 57
Table 6-3. Best Practices Comparison 59
Table 6-4. Select Loan Program 2024 Uptake Details 60
Table 7-1. Potential Future Research Areas 66

List of Figures

Figure 4-1. Were you aware that Mass Save offered rebates for heat pumps? (n = 300) 31
Figure 4-2. Other than the HEAT Loan, what other loan options did you consider? Select all that apply. (n = 397) 31
Figure 4-3. Why did you choose the HEAT Loan over other loan options? Select all that apply. (n = 332) 32
Figure 4-4. What else did you use to cover the remaining out-of-pocket cost of your energy project besides a HEAT Loan? Select all that apply. (n = 341) 32
Figure 4-5. What were your main reasons for not using the HEAT Loan? Select up to three options. (n = 56) 33
Figure 4-6. How would you rate your experience with the HEAT Loan authorization process? (n = 56) 34
Figure 4-7. What was difficult about the process? Select all that apply. (n = 12) 34
Figure 4-8. Did you complete an energy project without the HEAT Loan? (n = 56) 35
Figure 4-9. What did you use to cover the cost of your energy project? Select all that apply. (n = 35) 35
Figure 4-10. How important was the HEAT Loan in allowing you to complete your project? (n = 341) 36
Figure 4-11. If the HEAT Loan were not available, which of the following best describes what you would have done? 37
Figure 4-12. If the HEAT Loan had not been available, what other type of loan or financing option would you have most likely used instead? (n = 88) 38
Figure 4-13. How important were rebates compared to the HEAT Loan in your decision to install a heat pump? (n = 263) 38
Figure 4-14. If you had a choice between a 0% interest 7-year loan with a monthly payment of $[X] OR a rebate of [X] (on top of any other rebates already applied to your project), which would you prefer? (n = 315) 39
Figure 4-15. Willingness to Adopt a HEAT Loan at Different Interest Rates (n = 315) 40
Figure 4-16. Willingness to Adopt a HEAT Loan at Different Interest Rates by Measure Type 40
Figure 4-17. Willingness to Adopt a HEAT Loan at Different Interest Rates by Income Level.. 41
Figure 4-18. Imagine you are given two loan options. Which one would you choose? 43
Figure 4-19. Imagine you are completing your energy efficiency project for a total cost of $[X] and are offered a loan at 2% interest. Which term length would you prefer? 43
Figure 4-20. How important are the following factors when considering financing options for a heat pump, on a scale of 1-5 with 1 being not at all important and 5 being very important? (n=320) 45

Figure 5-1. Common Measure Categories (2022 - 2024) 48
Figure 5-2. Heat Pump Prevalence in HEAT Loan Data 2022 - 2024 49
Figure 5-3. Air Source Heat Pump (ASHP) Measure Pairings 2024 50
Figure 5-4. HEAT Loan Uptake 2022 - 2024 51
Figure 5-5. Cost Equivalency of Different Loan Terms versus Interest Rate 54
Figure 6-1. Types of EE Financing Delivery Methods 56
Figure 6-2. Types of EE Financing Delivery Methods 56
Figure 6-3. Benchmarking Financing Program Key Design Features 58
Figure 6-4. Yearly Heat Pump Projects by State 2020 - 2023 61

Executive Summary

The Massachusetts Program Administrators (PAs) commissioned this Massachusetts (MA) HEAT Loan Assessment Study to assess the role of the Mass Save HEAT Loan in supporting residential energy efficiency and electrification goals and to inform potential refinements to the loan design as the program evolves. These outcomes are intended to ensure future iterations of the HEAT Loan align with the PAs' programmatic electrification goals while also implementing cost reduction opportunities and supporting access for underserved customers.

The study was designed to be conducted in two phases. This report presents the results from Phase 1 and provides initial recommendations to support Phase 2.

HEAT Loan Background

For years, the HEAT Loan program offered by the Sponsors of Mass Save has consistently attracted strong customer interest by offering 0% interest financing for approved energy efficiency upgrades. The PAs use program funds to buy down the interest rate on loans offered by private banks and credit unions, removing barriers to adoption, and offering considerable savings to customers.

Recent program data reports 14,567 HEAT Loans closed in 2024 for a total financed amount of approximately $278 million, with 11,282 of those loans including cooling/heat pump equipment. For context, Mass Save reports 27,745 total residential homes with a heat pump installed in the year 2024, indicating that approximately 41% of heat pump projects used a HEAT Loan.[1]

Recent spikes in loan volume, particularly for high-cost measures, along with rising interest rates, significantly increased the cost of HEAT Loans in the 2022-2024 term and sparked several mid-term modification requests. The PAs have sought to redesign the HEAT Loan offering while also balancing the need to support underserved customers with the desire to reduce costs associated with the loan.

In the latest 2025-2027 Three-Year Energy Efficiency Plan, the PAs propose several key modifications to the HEAT Loan offering, including income-based tiered loan terms, reinstatement of a $25,000 loan cap, and increased promotion of alternative energy financing options. The PAs also formed a stakeholder working group to explore cost reduction strategies and alternative loan models. This HEAT Loan Assessment complements the PAs' efforts by examining a broad range of proposed and potential changes to inform future iterations of the HEAT Loan.[2]

Study Methodology

Guidehouse Inc. (Guidehouse) designed an integrated research framework to provide actionable insights to inform the future of the HEAT Loan.

[1] Mass Save, Mass Save Data.

[2] At the time of this study, the PAs are in the process of moving forward with HEAT Loan modifications proposed in the Three-Year-Plan. The $25,000 loan cap has already been implemented.

The key study tasks for Phase 1 are outlined in Table ES-1 below.

Table ES-1. Key Phase 1 Study Tasks

Task	Purpose
Stakeholder Interviews	Guidehouse conducted 29 interviews with key HEAT Loan program stakeholders to collect detailed qualitative insights on program delivery customer experience, operational processes, common barriers and points of drop-off, and perspectives on program changes.
HEAT Loan Participant and Authorized Non-Participant Survey	Guidehouse administered an online survey to better understand customer demographics, motivations, barriers, and preferences related to the HEAT Loan program. The survey captured insights from 2024 HEAT Loan participants as well as non-participants that had received authorization for a HEAT loan but did not end up taking one out.
Tracking Data and Cost Analysis	Guidehouse analyzed program tracking data provided by two vendors from the previous program cycle (2022-2024). The review captured high-level measure trends, customer characteristics, and loan uptake trends. Guidehouse also conducted a high-level cost analysis to assess how alternative loan features could affect customer and PA costs.
Benchmarking and Literature Review	Guidehouse benchmarked the HEAT Loan program against 12 other prominent energy efficiency financing offerings across the country to compare key design features and evaluate best practices. Guidehouse also reviewed literature related to the HEAT Loan and specialized energy efficiency loan design more broadly to inform this assessment.

Source: Guidehouse

Study Findings

Key findings from Phase 1 are summarized below.

T**he HEAT Loan is widely viewed as a critical enabler of electrification.**

- Over 80% of interviewed stakeholders cited the HEAT Loan's favorable terms, particularly 0% interest, as highly valuable to participation, and all interviewed lenders (4 of 4) rated the HEAT Loan as very important to their organization.[3]

- Overall, 63% of surveyed participants reported that the HEAT Loan was essential to completing their project, with some variation by income type.[4] At the same time, many respondents indicated they would have still completed their project either by using their own funds or another financing option if the HEAT Loan had not been available.[5]

[3] Lenders were asked "How important is the HEAT Loan to your organization? On a scale of 1 to 5 (where 1 is not at all important and 5 is very important)."

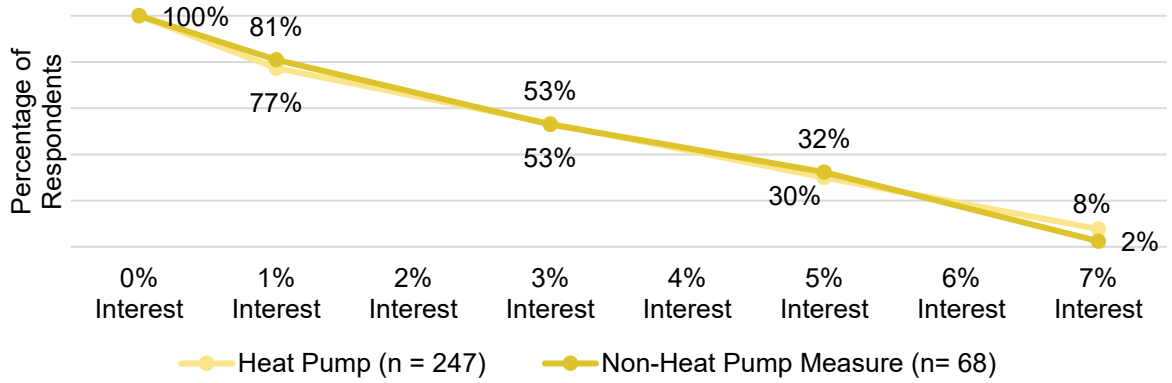
[4] 67% of households at <135% of SMI reported the loan was essential, compared to 60% at 135% - 300% SMI and 33% at >300% SMI. The sample size for the greater than 300% SMI income-tier was small (15 respondents) compared to the 100%-135% SMI income-tier (108 respondents).

[5] While this counterfactual question provides initial insights, it should not be used in isolation to infer free ridership. See section 4.4.1 for additional detail.

Customers are sensitive to interest rate changes.

- Survey results indicate a 22-percentage-point decline in willingness to adopt the HEAT Loan when interest increases from 0% to 1%, followed by an additional ~12 percentage point decline for every 2% increase in interest up to 7%. See Figure ES-1 below.

Figure ES-1. Willingness to Adopt a HEAT Loan at Different Interest Rates



Source: Guidehouse survey analysis

- Pairwise comparison results show that interest rate is the most important loan feature for customers, ranking higher than loan cap and monthly payment level.

- About half of contractor, vendor, and lender interviewees cautioned that even small increases in interest rate could reduce participation in the HEAT Loan program, particularly for customers with limited savings or less urgent project timelines.

Heat pumps dominate HEAT Loan participation, but other measures remain an important part of the HEAT Loan story.

- Tracking data from 2022-2024 shows that air source heat pumps account for approximately 66% of all HEAT Loan-financed measures, and an increasing share of total financed dollars over time.[6]

- Survey findings align with this trend, with 80% of participant respondents reporting installation of a heat pump using the HEAT Loan.

The HEAT Loan's 0% interest offering is a distinguishing feature among peer programs.

- Compared to reviewed programs, the HEAT Loan's 0% interest for relatively large loan amounts is unique; comparable programs offer an average interest rate of ~4.5%.

- Eleven of 12 interviewed contractors indicate they always or almost always promote the HEAT Loan to customers that may qualify.

[6] Boilers and furnaces were removed from the HEAT Loan qualified measure list in Fall 2024, as required by statue.

- Fifty-eight percent of surveyed participants reported the HEAT Loan was the only financing option they considered; among those who evaluated alternatives, 33% selected the HEAT Loan because no other option offered 0% interest.

There is some friction in the HEAT Loan customer and contractor experience.

- Almost a quarter (22% (n=56)) of authorized non-participants indicated the loan authorization process was difficult or very difficult when asked to rate their experience.

- Several contractors pointed out limitations in the current application portal, noting that the lack of direct communication with program staff or real-time status visibility. Two-thirds of contractors noted a contractor-facing portal or greater contractor visibility would be a helpful process improvement.

- About a third of interviewees, including contractors, energy assessors, and vendors, felt the rebate and loan processes can appear fragmented to customers, particularly when project details change or when documentation does not align across vendors.

- The lender stage was described as a common point of drop-off by half of interviewed contractors and most (three of four) vendors. Reasons cited included loan denials, concerns about multiple credit checks, and uncertainty about the steps that follow authorization. When asked the most common reason for denying a customer a loan, three of four lenders mentioned excessive debt-to-income ratios or low credit scores.

Benchmarking shows examples of peer programs varying loan terms. However, contractors expressed concern that tiered loan term lengths could complicate program delivery.

- Benchmarking shows that some peer programs vary interest rate or other loan terms by income, credit characteristics, or term length, reflecting strategies to balance affordability and cost containment.

- However, some contractors expressed concerns that tiered-loan terms would reduce participation and complicate how they communicate the program to customers.

- Surveyed customers did not show a clear preference for a single loan term length. At a fixed 2% interest rate, survey participants overall showed relatively even preferences across three-year, five-year and seven-year term lengths after reviewing the associated monthly payments and total interest accrued based on total project cost. The survey did not explore customer willingness to share income information.

HEAT Loan participation declined in 2024, underscoring the importance of continued monitoring.

- After increases in both loan counts and measure counts from 2022 to 2023, participation declined in 2024.[7] Early evidence shows this trend continuing into 2025 and 2026, warranting continued monitoring.

[7] This decline does coincides with the phase-out of fossil fuel heating equipment from the qualified measures list midway through 2024, which was required by statue.

Conclusions and Recommendations

Study findings show that the HEAT Loan is an important driver of customer adoption of energy efficient technologies, particularly high-cost measures such as heat pumps. Interview and survey results consistently indicate that the HEAT Loan's 0% interest offering plays a meaningful role in loan uptake and enables participation in the broader Mass Save program.

At the same time, Phase 1 highlights important tradeoffs relevant to managing program costs. For example, modest interest rates could reduce program costs but may also reduce participation based on survey results.

Differentiating loan structures by income group, as proposed in the latest Three-Year Plan, appears consistent with observed customer behavior in the study survey and broader market practices. An income-based loan program may offer a path to balance equity, affordability, and cost containment, but may have implementation and customer experience impacts that have not been studied in this Phase 1 Assessment.

Interviews and survey responses indicate that process complexity, fragmented loan-and-rebate workflows, and limited system visibility are sources of friction. The following recommendations may reduce overhead and support loan completion rates without major changes to the offering:

- Reviewing the authorization process and identifying opportunities to streamline.
- Providing more contractor-facing resources and improving communication channels for contractors (both with the PAs and the HEAT Loan vendor).
- Strengthening system integration between the loan and rebate process.

Phase 1 also underscores the need to strengthen data collection and tracking to support future decision-making. The following are near-term recommendations:

- HEAT Loan data should be collected on a regular cadence and supported by a clear, standardized data dictionary.
- Vendors should consistently distinguish between participants and authorized non-participants and track customers throughout the full loan process.
- Vendors should also track income-status, as feasible.
- A unique "loan ID" should be included in customer and measure data.

Phase 2 will further examine gaps and areas of interest identified in Phase 1 and will support the development of more detailed recommendations. Suggested priority areas include pinpointing areas to reduce friction in the customer authorization journey; improving understanding of contractor and lender practices; assessing the drivers of declining participation; and examining potential free ridership by expanding counterfactual and project-driver analysis.

1. Introduction & Background

The Massachusetts Program Administrators (PAs) and the Energy Efficiency Advisory Council (EEAC) consultants commissioned this Massachusetts (MA) HEAT Loan Assessment Study to assess the role of the Mass Save HEAT Loan in supporting residential energy efficiency and electrification goals and to inform potential refinements to the loan design as the program evolves. These outcomes are intended to ensure future iterations of the HEAT Loan align with the PAs' programmatic electrification goals while also implementing cost reduction opportunities and supporting access for underserved customers. To support this work, the Sponsors of Mass Save engaged Guidehouse Inc. (Guidehouse, "the team").

The study was designed to be conducted in two phases. This report presents the results from Phase 1 and provides initial recommendations to support Phase 2.

Phase 1 gathered feedback from key stakeholders, along with a benchmarking and literature review activity and an initial tracking data and cost analysis. Findings support the Massachusetts Program Administrators (PAs) and other stakeholders in determining how future iterations of the HEAT Loan can better align with the PAs' energy efficiency and electrification objectives while implementing cost-reduction opportunities and ensuring equitable use of ratepayer funds.

1.1 HEAT Loan Program Evolution

Since the 2005 passing of "An Act Relative to Heating Energy Assistance and Tax Relief",[8] the HEAT Loan program offered by the Sponsors of Mass Save has consistently attracted strong customer engagement by offering 0% interest financing for approved energy efficiency upgrades. The PAs use program funds to buy down the interest rate on loans offered by private banks and credit unions, removing barriers to adoption, and offering considerable savings to customers.

Recent program data reports 14,567 HEAT Loans closed in 2024 for a total financed amount of approximately $278 million, with 11,282 of those loans including cooling/heat pump equipment. For context, Mass Save reports 27,745 total residential homes with a heat pump installed in the year 2024, indicating that approximately 41% of heat pump projects used a HEAT Loan. For additional context into non-heat pump measures, recent program data indicates that 1,502 HEAT loans included envelope measures in 2024. By comparison, Mass Save reports 55,000 total homes weatherized in that same year.[9]

Over time, the PAs have expanded the list of eligible measures and adjusted loan terms to meet evolving energy program goals. Notably, during the 2022-2024 term, the program was enhanced to cover pre-electrification barriers such as electric panel upgrades. Between 2022 and 2024, the program issued over $748 million in loans.[10] Spikes in the volume of loans, particularly for high-cost measures, along with rising interest rates, have significantly increased the cost of HEAT Loans in the 2022-2024 term and sparked several mid-term modification requests. Recognizing the importance of the HEAT Loan, but also the desire to reduce costs

[8] The General Court of the Commonwealth of MA, An Act Relative to Heating Energy Assistance and Tax Relief.
[9] Mass Save, Mass Save Data.
[10] Ibid.

associated with the loan and allocate additional budget to equity priorities, the PAs have sought to redesign the HEAT Loan offering.

In the latest Three-Year Energy Efficiency Plan submitted to the DPU,[11] the PAs proposed several key modifications to the HEAT Loan offering, including:

- Introduction of tiered loan terms based on income thresholds (i.e., 3-, 5-, and 7-year terms)
- Reinstatement of a $25,000 loan cap[12]
- Increased promotion of alternative energy financing options
- Formation of a stakeholder working group to explore cost reduction strategies and alternative loan models

In response to the PAs' proposed restructuring, the Attorney General's Office (AGO) alternatively proposed consolidating the HEAT Loan structure from three tiers to two, aiming to reduce costs while maintaining alignment with the Massachusetts Community Climate Bank income thresholds.[13] Under the AGO model, applicants below the 135% SMI would receive 5-year interest-free loans, while higher-income applicants would qualify for 3-year terms.

While the DPU did not compel the adoption of the AGO's design recommendation, it did direct the PAs to consider whether any changes to repayment terms are appropriate through a HEAT Loan study.[14]

At the time of this study, the PAs are in the process of moving forward with HEAT Loan modifications approved as part of the Three-Year Plan, while simultaneously conducting the HEAT Loan study. The HEAT Loan study will complement the PAs' efforts by examining a broad range of proposed and potential changes to determine the most effective structure for future iterations of the HEAT Loan.

1.2 HEAT Loan Approval Process

Obtaining a HEAT Loan involves multiple steps and stakeholder hand-offs.[15] To receive a HEAT Loan, a customer must complete the following steps:

- **Step 1:** Schedule a Mass Save Home Energy Assessment (customer may receive and fill out a HEAT Loan Intake Form during their assessment).[16]

[11] Mass Save, MA 2022-2024 Three-Year-Plan.

[12] Previously, customers were eligible to receive up to $25,000 in pre-weatherization, weatherization, and other eligible efficiency upgrades, and an additional $25,000 if pursuing electrification through the installation of heat pumps for a maximum total loan of $50,000 (See HEAT Loan Information for additional information).

[13] The Massachusetts Community Climate Bank is a climate finance initiative that is supporting decarbonization strategies in the residential sector. Both the three-tiered loan terms based on income proposed by the PAs in the 2025-2027 Three-Year Plan and the alternative structure proposed by the AGO align with the Massachusetts Community Climate Bank income thresholds.

[14] MA Department of Public Utilities, DPU-24-140-through-DPU-24-149.

[15] This process is current as of March 2026. The team understands the PAs may be making changes to this process.

[16] Mass Save, 2023 HEAT Loan Intake Form.

- **Step 2:** Solicit contractor quote(s) for program-eligible work.
- **Step 3:** Submit HEAT Loan Intake Form and final, signed quote from selected contractor to their Mass Save HEAT Loan Administrator. This can be a physical form received during a Home Energy Assessment or a form submitted through the online HEAT Loan application portal. These materials will be reviewed and approved or not approved by the HEAT Loan Administrator.
- **Step 4:** Await approval from the HEAT Loan Administrator. If approved, a customer will receive a HEAT Loan Authorization Form.
- **Step 5:** Identify a participating lender.
- **Step 6:** Take HEAT Loan Authorization Form to the selected participating lender and apply for a loan directly through the lender. For most lenders, this can be done online or in-person.
- **Step 7:** If approved, receive a loan agreement and two-party check made out to the contractor and homeowner. Begin working with the contractor to complete project.
- **Step 8:** Work with contractor to complete project, pay contractor including with the two-party check.
- **Step 9: Optional:** Submit rebate application. To receive a rebate, customers must submit a completed and signed rebate form, a copy of their invoice from an HPIN contractor, and if applicable, a whole-home verification form, to a separate rebate portal.[17]
- **Step 10: Optional:** Contact Mass Save HEAT Loan Administrator once work is completed for a verification inspection.[18]

In this study, a HEAT Loan participant is a customer who has made it through all steps in this process. An authorized non-participant is a customer who completed at least Step 1 through Step 4 and at most Step 6, but never ultimately took out a loan.

1.3 Study Goals

The primary goal of this evaluation is to assess how the HEAT Loan structure can most effectively minimize costs and promote equitable outcomes while advancing energy efficiency goals.

This study is designed in two complementary phases. This report presents the results from Phase 1, which assessed program performance and explored the implications of proposed and potential modifications to the loan design. Phase 2 is planned for Spring 2026 and will build on findings from Phase 1. A brief overview of the goals of each phase is outlined below.

[17] Rebate specific instructions are available on the Mass Save website.

[18] The team understands that according to program requirements, not every project needs to go through a verification inspection and that the PAs determine what minimum percentage of projects must receive this inspection.

1. **Phase 1 (Complete):** Gather timely feedback on how the HEAT Loan is influencing energy efficiency project uptake and assess alternative options to the current and historical HEAT Loan structure, such as non-zero interest rates. Recommend future research, including for Phase 2 of this study, based on findings. Findings will support the PAs, PA vendors, EEAC consultants, and the stakeholder working group in future loan design decisions.

2. **Phase 2 (Upcoming):** Build off Phase 1 findings by addressing identified gaps and refining research which can inform future iterations of the HEAT Loan. Work closely with HEAT Loan stakeholders to prioritize key focus areas.

The primary study objectives include:[19]

- Identifying participant demographic characteristics (e.g., income, geography, LOTE status)
- Understanding the importance of the HEAT Loan across different customer groups
- Understanding the customer journey through the HEAT Loan process, including points of drop-off
- Identifying barriers to access and reasons for non-participation
- Assessing interest rate sensitivity, particularly moving to interest rates above 0%
- Assessing term length sensitivity
- Collecting lender data (e.g., application outcomes, income levels)
- Understanding HEAT Loan program costs, including fixed and variable loan costs, and administrative costs
- Exploring cost reduction opportunities while maintaining program effectiveness, both inside and outside the current lender environment
- Exploring interactions between the HEAT Loan, currently available alternative financing options, and potential future financing program designs

[19] Objectives listed below not directly addressed by this phase will be explored for Phase 2.

To address these objectives, Phase 1 of this study was guided by the research questions outlined in Table 1-1.

Table 1-1. HEAT Loan Assessment Phase 1 Research Questions

Category	Research Question
Program Impact	• How did the HEAT Loan changes affect participation and loan characteristics? • How critical is the HEAT Loan in enabling energy improvements? • How does the loan affect the scale and timing of improvements?
Customer Experience and Decision-Making	• How do the HEAT Loan offerings compare to other financing option offerings (e.g., Energy Saver Home Loan)? • At what stages are customers most likely to drop out, and why? • How do different customers respond to different loan characteristics (interest rates, terms, caps)?
Broader Insights	• What lessons from other states or utility/PA programs could inform future refinements? • How do changes in heat pump incentives influence customer response to loan offerings?
Relationship Between Financing and Incentives	• What is the relationship between loan characteristics and incentive levels, especially for heat pumps?

Source: Guidehouse

Phase 2 provides the opportunity to further assess these objectives, as well as any additional priorities identified based on Phase 1 findings.

1.4 Study Approach

To address the study objectives and research questions outlined above, Guidehouse designed an integrated research framework, including four targeted tasks developed to provide actionable insights to inform future HEAT Loan program design.

Key tasks are outlined in Table 1-2 below.

Table 1-2. Key Phase 1 Study Tasks

Task	Purpose
Stakeholder Interviews	Guidehouse conducted interviews with key HEAT Loan program stakeholders to collect detailed qualitative insights on program delivery and customer experience. These interviews explored operational processes, common customer barriers and points of drop-off, contractor and lender engagement, and perspectives on program changes and financing options.
HEAT Loan Participant and Authorized Non-Participant Survey	Guidehouse administered an online survey to better understand customer demographics, motivations, barriers, and preferences related to the HEAT Loan program. The survey captured insights from 2024 HEAT Loan participants as well as authorized non-participants focused on how different loan characteristics and incentives influence project decision making and customer willingness to adopt a HEAT Loan, the relative importance of financing and incentives, the likelihood of making energy efficiency improvements without the HEAT Loan and customer experience.
Tracking Data and Cost Analysis	Guidehouse analyzed program tracking data provided by two vendors from the previous program cycle (2022-2024). The review captured measure level trends, customer characteristics, and loan uptake trends. Guidehouse also conducted a high-level cost analysis to assess how alternative loan features could affect customer and PA costs.
Benchmarking and Literature Review	Guidehouse benchmarked the HEAT Loan program against 12 other prominent energy efficiency financing offerings across the country. The benchmark included a comparison of key design features and a best practices evaluation. The analysis also aimed to compare loan features in relation to uptake to assess whether specific design features are associated with higher participation. Guidehouse also reviewed literature related to the HEAT Loan and specialized energy efficiency loan design more broadly to support the assessment.

Source: Guidehouse

2. Methodology

This Phase 1 HEAT Loan Assessment was conducted from August 2025 through April 2026. The research approach combined qualitative data collection via stakeholder interviews with a customer survey, program data analysis, and a benchmarking and literature review. The methodology for each study task is outlined below.

2.1 Interviews

This section provides an overview of the stakeholder groups included in Phase 1 interviews and the approach used to collect consistent and high-quality qualitative data to support the study.

Guidehouse conducted interviews to collect detailed qualitative feedback on experiences with and perspectives on the HEAT Loan program. The objective of this task was to understand how different stakeholders interact with the program, the challenges they observe, and their views on recent and upcoming program changes. Interviewees represented all major roles involved in the delivery of the HEAT Loan, ensuring a comprehensive view of the customer journey and program operations.

The following stakeholder groups were targeted:

- **PA Program Managers (PA PMs)** – who oversee the implementation of the HEAT Loan for each PA
- **CLEAResult** – HEAT Loan vendor who oversees the implementation of the HEAT Loan along with PA PMs
- **HEAT Loan Lenders** – who partner with the PAs to offer loans to eligible customers
- **Residential Turnkey Services (RTS) Lead Vendors (LV PMs)** – leadership and/or program managers at the PAs various implementation vendors who collectively manage the HEAT Loan across the state
- **RTS Energy Assessors (LV EAs)** – LV staff who interact directly with customers during Home Energy Assessments and shape customer understanding of financing options
- **Home Performance Contractors (HPCs)** – who actively engage with customers to promote projects, present financing options, and have direct insight into customer motivations and decision-making
- **Heat Pump Installer Network (HPIN) Contractors** – who actively engage with customers to promote projects and present financing options, in addition to directly installing and maintaining systems

Stakeholders were identified through consultation with the HEAT Loan PAs, Mass Save vendors, and the study team. A recruitment list was developed collaboratively, and stakeholders were invited via email to participate in virtual interviews. Participation was voluntary, and no incentives were offered.

To ensure representation across all major roles in the HEAT Loan process, Guidehouse established interview targets for each stakeholder group in collaboration with the PAs and vendors. Table 2-1 summarizes the expected number of interviews conducted in Phase 1.

Table 2-1. Interview Targets

Stakeholder Group	Phase 1 Interview Target
PA Program Managers	6
CLEAResult	1
Home Performance Contractors (HPCs)	6
Heat Pump Installer Network (HPIN) Contractors	6
RTS Energy Assessors	4
RTS Lead Vendors	3
HEAT Loan Lenders	4
Total	**30**

Source: Guidehouse

Each interview lasted approximately 30-45 minutes and followed a semi-structured interview guide designed to ensure consistency while allowing interviewees the flexibility to elaborate on their unique roles and experiences. Interviews covered common topics related to customer interactions, loan process touchpoints, and stakeholder operational responsibilities. A member of the Guidehouse team took notes during each session using a standardized template to ensure consistent documentation. Interview input was reviewed and synthesized to identify common themes across stakeholder groups, which are summarized in the Interview Findings section.

2.2 Survey

This section provides an overview of the target population and sampling methods used for the HEAT Loan customer survey, detailing the approach taken to ensure robust and representative data collection for the study.

2.2.1 Targeted Population and Sampling

To better understand customer demographics, motivations, barriers, and preferences related to the HEAT Loan program, Guidehouse administered an online survey as part of Phase 1. The survey assessed:

- How loan characteristics (e.g., term-length, interest rate, loan cap) and incentives influence project decision making and willingness to adopt a HEAT Loan
- The relative importance of financing and incentives
- Likelihood of making energy efficiency improvements without the HEAT Loan
- The customer experience with HEAT Loan authorization

- Why some customers opted to not proceed with taking out a HEAT Loan after receiving loan authorization

- How customers handle any out-of-pocket costs not covered by the loan

This survey targeted the following stakeholder groups from the 2024 program year:

1. **2024 HEAT Loan Participants -** Customers who were authorized by an LV and received a HEAT Loan in 2024.

2. **2024 Authorized Non-participants -** Customers who were authorized for a HEAT Loan but did not take out a loan. Authorized customers are those who received an authorization form from a Mass Save HEAT Loan Administrator which they can bring to a lender for loan approval. The authorization process checks for equipment eligibility and a valid contractor quote but does not include any financial or background check (see Section 1.2 for additional detail).

Guidehouse received customer data from CLEAResult and RISE. Customers were included if their loan authorization date was in 2024. Following precedent from the RES 37 Study,[20] Guidehouse used "loan close date" to categorize a customer as a participant or an authorized non-participant. If the "loan close date" field was blank, the customer was assumed to be an authorized non-participant.

Based on these criteria, 13,661 unique customers were eligible for the survey; 6,263 customers were randomly selected to receive an invite to complete the survey. Guidehouse oversampled authorized non-participant due to the low response rate from this group during survey soft launch and because more than half (56%) of those respondents reporting in the survey that they had taken out a HEAT Loan, making them participants. A total of 397 surveys were completed. Guidehouse considered a survey to be complete once a respondent had answered all questions and either provided their email address for their gift card or opted out of a gift card. Partial responses and screen outs were not included in the response count or analysis.

Table 2-2. Survey Frame and Response Counts

Customer Type	Sampled Population	Response Target	Response Count
2024 HEAT Loan Participants	2,901	320	341
2024 Authorized Non-participants	3,362	80	56
Total	**6,263**	**400**	**397**

Source: Guidehouse

[20] HEAT Loan Assessment (RES 37), Navigant Consulting Inc. (now Guidehouse), 2018. To the team's knowledge, this was the most recent targeted HEAT Loan assessment prior to this study.

2.2.2 Recruitment, Incentives and Survey Fielding

The online survey was fielded from January to February 2026. Sampled customers received one survey invite email. Respondents who completed the full survey received a $20 e-gift card via Tango card.[21] Respondents could choose to opt out of receiving an e-gift card.

2.2.3 Survey Instrument and Programming

The survey consisted of five modules: Screeners and Participation Context, Customer Decision Making, Behavior and Counterfactuals, Financing Preferences. The latter two modules were only included for participants. Initial screening questions confirmed that respondents had been authorized for a HEAT Loan in 2024. Respondents were screened out if they reported they were not authorized for a HEAT Loan in 2024. Respondents were also asked to confirm their assigned participant type. If a customer reported a different participant type than what was assumed, they were recategorized and completed the survey based on their self-reported participant type. For example, if a customer was labeled as an authorized non-participant but they indicated in the survey that they had taken out a HEAT Loan, they were reclassified as a participant and completed the participant version of the survey.

Guidehouse developed the survey instrument in collaboration with study stakeholders and reviewed it prior to fielding to ensure clarity, alignment with the research plan, and appropriateness for residential customers.

2.2.4 Varying Interest Rate Module Design

One component of the Financing Preferences survey module presented participants with various non-zero interest rate scenarios, including the associated monthly payments, to evaluate how changes in interest rates could influence the likelihood of HEAT Loan uptake.

Guidehouse tested four interest rate levels with HEAT Loan participants: 1%, 3%, 5% and 7%. The loan term length was seven years for all scenarios in this question block. The first interest rate scenario shown was randomly chosen to be either 3% interest or 5% interest. For each question in this question block, customers were asked “Available to you is a HEAT Loan at [X]% interest paid over 7 years. Monthly payment: $[X]. Would you still have taken out a HEAT Loan?” Follow-up questions adjusted the interest rate level up or down by 2% depending on the respondent’s prior answer, with a maximum of three interest rates tested per respondent. This design produced a percentage of customers willing to adopt a HEAT Loan under different interest rates and illustrated how much HEAT Loan uptake might decrease if interest rates were non-zero. Respondents who indicated they were unwilling to adopt a HEAT Loan at any of the interest rates tested were asked what the maximum interest rate they would consider for a HEAT Loan would be.

[21] Tango incentives are prepaid digital rewards used to thank participants for completing surveys, interviews, or other research activities. They are commonly used to improve response rates and ensure representative data collection. Participants can redeem Tango incentives for a wide range of options, including gift cards for retailers like Amazon, Target, and Starbucks, or a general-use Mastercard gift card.

2.2.5 Monthly Payment and Net Present Value Calculations for Survey Hypothetical Scenarios

Several items in the Financing Preferences survey module presented hypothetical monthly payment scenarios calculated from the customer's total project cost. Additional questions offered hypothetical rebates equivalent to the net present value of providing a HEAT Loan to the customer, enabling Guidehouse to evaluate customer preferences between rebates and loans when both options represent equal costs to the utility.

Total project costs were taken from vendor data for all participants, except for respondents who were originally classified as authorized non-participants but indicated in the survey that they were actually participants. Those respondents were asked to report their total project cost directly within the survey.

Monthly payments were determined based on the total project cost (loan principal, *P*), the specific interest rate being tested in the survey question (monthly interest rate, *i*), and the required number of monthly installments over the tested loan term (number of monthly payments, *n*). The following formula was used to calculate monthly payments:

$$Monthly\ Payment = P * \frac{i(1+i)^n}{i(1+i)^n - 1}$$

For participants who used their HEAT Loan for a heat pump, the loan principal was limited to $50,000; otherwise, it was capped at $25,000, reflecting HEAT Loan policy at the time these customers took out a loan.

As mentioned above, some questions asked respondents to choose between a loan option and a rebate with equivalent cost to the PAs. In this case, the rebate was set to equal the total interest the PAs would pay over the loan lifetime using the following assumptions:

- **Interest Rate:** The interest rate was assumed to match the Federal Reserve Prime Rate from November 2024 (7.75%).
- **PA Margin:** It was assumed the PAs paid a 1% margin on each loan, in alignment with the margin the PAs have historically paid for HEAT Loans.[22]
- **NPV:** Interest payments were discounted to present value over the 84-month loan term, consistent with interest payment calculations shared in a PA interest rate calculator tool.

2.2.6 Respondent Demographics

Respondents were primarily from single-family (83%) and owner-occupied (97%) homes with a about a quarter of homes (26%) built in 1939 or earlier. Respondents were often more educated (54% with post-graduate degrees) from English-speaking households (62%) with typically 3 or fewer occupants. All demographic data was voluntary and self-reported within the survey.

Participant Income levels are shown in Table 2-3. Participants were asked to report their 2024 total annual income before taxes. Income levels are shown in terms of State Median Income (SMI) which accounts for the household size. Five percent of participants reported their gross

[22] The team understands that in more recent program years, the margin paid by the PAs differs by applicant credit score.

annual household income to be less than 60% SMI, classified as low-income per the Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan[23], while 10% reported income of 60-80% SMI, classified as moderate income.[24] Overall, 28% of participants reported their household income to be under the state median income level (less than 100% SMI).

Given the differences between this sample and the typical Massachusetts customer population, these results may not represent broader customer perspectives.[25] Phase 2 will look to leverage other ongoing study work to gather a broader range of customer perspectives.

Although seven income ranges were included as response options within the survey, participant results in this report are often segmented into three categories, as shown in Table 2-3, according to the suggested income brackets for future HEAT loan terms.[26] Based on the suggested breakdown from the 2025-2027 Three-Year Plan, a 7-year loan term will be offered to those earning up to 135% SMI. [27] Households earning 135-300% SMI will be eligible for a 5-year loan term while those earning above 300% SMI will be eligible for a 3-year term.

For the purposes of this report the customers who reported annual income below 135% SMI are called “Tier 1 households”, those with income between 135-300% SMI are called “Tier 2 households” and those with income over 300% SMI are called “Tier 3 households”. Participant income data is shown in Table 2-3 while authorized non-participant income is shown in Table 2-4.

Additional demographic details and additional information about income ranges for each SMI level can be found in Appendix A.

[23] Per the Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan, single-family households (1-4 units) qualify for single family low-income programs with a household income at or below 60% SMI while customers in multifamily buildings (5+ units) where at least 50 percent of units have residents with household income at or below 60% or Area Median Income (AMI) are eligible for multifamily low-income programs.

[24] Per the Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan, the Massachusetts PAs consider 60% SMI as the bottom threshold for moderate income classification and consider the greater of 80% SMI or Area Median Income (AMI) as the top threshold.

[25] The American Community Survey (ACS), which is part of the US Census, says that 28.5% of the Massachusetts population have annual income of <60% SMI, or low-income and 10.3% of households have income between 60-80% SMI, or moderate-income.

[26] Term lengths by income level are specified in the Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan.

[27] Through the Income Eligible Program offered by the Sponsors of Mass Save, eligible low-to-moderate income customers can receive a free Home Energy Assessment, insulation and air-sealing upgrades, heating and cooling equipment, and other home appliance without taking out a loan. See website for details.

Table 2-3. Participant Gross Annual Household Income Levels (n=341)

Income-Qualified Levels	Income Level Ranges within Survey Options	Income Categories for Survey Analysis	Response Counts	Percentage of Respondents[28]
Low-income	<60% SMI	<135% SMI (Tier 1 households)	17	5%
Moderate-income	60-80% SMI		34	10%
Below State Median Income	80-100% SMI		43	13%
Above State Median Income	100-135% SMI		53	16%
	135-200% SMI	135-300% SMI (Tier 2 households)	60	19%
	200-300% SMI		48	15%
	>300% SMI	>300% SMI (Tier 3 households)	15	4%
--	Prefer not to Respond	--	71	21%

Note: Only participant data is included in this table. See section 2.2.7 for survey data and interpretation limitations.
Source: Guidehouse, Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan

[28] Percentages are rounded and therefore may not sum to 100%.

Table 2-4. Authorized Non-participant Gross Annual Household Income Levels (n=56)

Income-Qualified Levels	Income Level Ranges within Survey Options	Response Counts	Percentage of Respondents[29]
Low-income	<60% SMI	12	21%
Moderate-income	60-80% SMI	7	13%
Below State Median Income	80-100% SMI	3	5%
Above State Median Income	100-135% SMI	7	13%
	135-200% SMI	10	18%
	200-300% SMI	2	4%
	>300% SMI	1	2%
--	Prefer not to Respond	14	25%

Note: Only non-participant data is included in this table. See section 2.2.7 for survey data and interpretation limitations.

Source: Guidehouse, Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan

2.2.7 Survey Data and Interpretation Limitations

Income information for the full HEAT Loan population, both participants and non-participants, is not known. All income data was self-reported by survey respondents and are therefore available only for those who completed the survey. Additionally, as discussed in Section 2.2.1, more than half of respondents initially identified as authorized non-participants reported in the survey that they had, in fact, taken out a HEAT Loan, indicating that the "loan close date" field is not a reliable method to determine participant status. As a result, income information and participant status cannot be determined for the full HEAT Loan population. While standard statistical methods can be applied to the survey responses to assess the precision of estimates (e.g., margins of error) and to test for statistically significant differences between groups of

[29] Percentages are rounded and therefore may not sum to 100%.

respondents, these methods do not address whether the respondents are representative of the broader HEAT Loan population. Accordingly, findings should be interpreted as reflecting patterns among survey respondents rather than definitive population-level estimates. In addition, smaller sample sizes within individual income tiers and the authorized non-participant group result in wider margins of error, limiting the precision of point estimates. Table 2-5 shows the margins of error for the relevant n-values for the survey analysis, using the Wilson Score method to calculate the margin of error with 90% confidence and assuming a conservative 0.5 p-value. These margins of error reflect the margins of error among survey responses rather than population-level estimates.

Table 2-5. Conservative Margins of Error for Survey Results

N-value	Margin of Error
14	+/-20.1%
15	+/-19.5%
56	+/-10.7%
98	+/-8.2%
108	+/-7.8%
137	+/-7.0%
147	+/-6.7%

Source: Guidehouse

Customers who were incorrectly classified as authorized non-participants and corrected their participant type to show they did receive a HEAT Loan (n=71) were asked to provide the estimated total cost of their project. This approach may be subject to recall error or misreporting.

A suggested focus area for Phase 2 is to gather the data needed to better understand representativeness and to collect additional stakeholder input from more recent program participants, and particularly authorized non-participants, to increase result confidence. In Phase 2, the team will also work with the HEAT Loan vendor to determine a more accurate method for identifying authorized non-participants.

2.3 Tracking Data and Cost Analysis

This section presents the methodology for the review of program tracking data and high-level cost analysis.

Guidehouse completed this task in two parts.

1. **Program Tracking Data Review:** Guidehouse reviewed HEAT Loan vendor data from 2022-2024 to conduct an initial assessment of measure and customer trends. As the first comprehensive review of program tracking data in several years, this analysis provides a preliminary understanding of program data and gaps and is intended to establish a foundation for additional analysis in Phase 2.
2. **Cost Analysis:** Guidehouse conducted a high-level analysis of loan options and cost reduction strategies informed by recent program changes outlined in the 2025-2027 Three Year Plan.

2.3.1 Tracking Data Analysis

2.3.1.1 Data Request

Guidehouse received HEAT Loan program tracking data in winter 2025 from two vendors: CLEAResult and RISE. Details on the data content and organization can be found in Table 2-6. Data from the two vendors were integrated to create the dataset used for this analysis. Because vendors' data structures differed substantially, significant data transformation and mapping were required. Details on the mapping can be found in Appendix B.

Table 2-6. HEAT Loan Vendor Data Details

Vendor	Data Overview	Years of Data	Customer ID Count	Measure ID Count
CLEAResult	Two data files, one organized by measure, another by customer. Measure data could be mapped to detailed customer information using a customerID field.	2022 – 2024	41,495	61,984
RISE	One data file, organized by measure. Customer information included in each measure row.	2022 – 2025	9,927	12,433

Source: Guidehouse analysis of vendor data

2.3.1.2 Analysis

Guidehouse analyzed loan participation trends to assess how participation has shifted and other key metrics about HEAT Loan uptake and participation.[30] This analysis was primarily stratified by measure type.

Key metrics assessed include:

- Measure-level trends, such as the most funded upgrades and average loan amounts by measure category
- Customer characteristics, including location and income[31]
- Loan distribution and uptake
- Total installed project cost breakdowns

These metrics support both descriptive analysis and exploratory comparisons of how customers navigate the HEAT Loan process across different measure types.

In addition to documenting findings from the program tracking data analysis, Guidehouse documented the data acquisition process, including any challenges encountered in accessing or interpreting the data. Based on the review, Guidehouse includes recommendations for

[30] RISE data included limited 2025 data which was not included in this analysis.

[31] Income information was limited to a moderate-income flag, only included in one vendor dataset.

enhancements to future data collection protocols to improve the evaluability of the HEAT Loan program.

2.3.1.3 Challenges and Limitations

Guidehouse identified several challenges and limitations during this data review.

Historically, multiple HEAT Loan vendors each managed a separate step of the process, making it unclear which vendor held the requested data. As a result, obtaining data took several months. It is worth noting that as of 2025, the program has transitioned to a single vendor, which will likely resolve many of these issues and streamline data access going forward.

In addition, as mentioned above, this task represents a preliminary review of HEAT Loan data and the first in-depth assessment of recent years. Because a detailed data cleaning and quality assurance process was not completed as part of this review, findings should be taken as directional, but not definitive. The two vendors collected and stored data differently, and neither had information readily available at the project level, which resulted in a time-intensive effort to merge and understand the data.

2.3.2 Cost Analysis

This task also included a high-level analysis of loan options and cost reduction strategies, including exploration of the cost impact of varying loan terms and interest rates, and consideration of how interest rate changes may influence customer participation.

Specifically, Guidehouse reviewed:

- Variation in loan cost to the PAs at different term lengths, in light of the proposed term length changes in the 2025-2027 Three Year Plan.
- Variation in loan cost to both customers and the PAs at different interest rates and term lengths.

2.4 Benchmarking and Literature Review

Guidehouse conducted a targeted benchmarking and literature review of 12 residential energy financing programs in ten jurisdictions to identify best practices and actionable insights that can support the stakeholder subcommittee's work under the Three-Year Plan and help guide future refinements to the HEAT Loan. The review took place in Winter 2025 and findings reflect program status and offerings as of Winter 2025.

This effort built on the recent Connecticut financing program process evaluation, which included a literature review, cross-program comparisons, and interviews with administrators of leading loan programs nationwide.[32]

Programs included in the Connecticut benchmarking effort include:

- NYSERDA Green Jobs – Green New York (NY)
- Michigan Saves (MI)

[32] Residential & Commercial Financing Process Evaluation (X2223), Cadeo, May 2025.

- GoGreen Financing (CA)
- Green Energy Money $aver (HI)
- OPALCO Switch It Up! (WA)
- NEIF Residential Programs (NJ, NY, MA, and others)
- Connecticut's Heating Loan, Micro Loan, and Smart-E Loan (CT)

The review for this study revisited these programs to identify any updates and expand the scope by incorporating three additional jurisdictions identified in collaboration with study stakeholders. These included:

- Efficiency Maine's Home Energy Loans program, given its strong focus on heat pump adoption.
- TVA's EnergyRight program, a long-running, high-volume program with strong heat pump prevalence.
- Midwest Energy How$MART program, the longest running tariffed on-bill financing program.

The review focused on key topics such as:

- Customer loan behavior and rate sensitivity
- Implementation and delivery models and administrative structures
- Loan design features (e.g., repayment terms, underwriting criteria), particularly compared with the HEAT Loan and alternative financing mechanisms available in MA
- Integration of financing with incentive offerings.

In addition, Guidehouse reviewed previous HEAT Loan studies to inform the methodology of the survey and interview tasks conducted as part of this study, including the "Home Energy Services Initiative and HEAT Loan Delivery Assessment" (Cadmus, 2015)[33] and the "HEAT Loan Assessment (RES 37)".[34]

[33] Home Energy Services Initiative and HEAT Loan Delivery Assessment, Cadmus, 2015.
[34] HEAT Loan Assessment (RES 37), Navigant Consulting Inc., 2018.

3. Interview Findings

This section presents the findings from stakeholder interviews. These interviews provided key qualitative insights into how the HEAT Loan program is experienced and delivered in practice, offering early context for interpreting results from other Phase 1 study tasks.

3.1 Overview

As part of Phase 1, Guidehouse conducted qualitative interviews with key stakeholders involved in the design, delivery, and use of the HEAT Loan. These interviews were designed to capture experience-based perspectives on how the HEAT Loan is functioning in practice, where customers encounter friction, and how recent and proposed program changes could influence participation.

To ensure representation across core delivery functions, interviews were conducted across the stakeholder groups shown in Table 3-1.

Table 3-1. Interview Targets and Completes

Stakeholder Group	Interview Target	Interviews Completed
PA Program Managers	6	6
CLEAResult	1	1
Home Performance Contractors (HPCs)	6	4
Heat Pump Installer Network (HPIN) Contractors	6	8
RTS Energy Assessors (EAs)	4	3
RTS Lead Vendors	3	3
HEAT Loan Lenders	4	4
Total	**30**	**29**

Source: Guidehouse

Because several stakeholders operated in overlapping roles, the final interview counts differ slightly from the original targets. All HPIN contractors interviewed also served as HPCs, so individuals with both roles were counted in the HPIN category, while those working exclusively as HPCs are listed under HPCs. In addition, several HPCs had previous experience as Energy Assessors, and their input provided sufficient EA perspective. After outreach to additional EAs was unsuccessful, the team proceeded with three EA interviews rather than the original target of four.

Findings in this section reflect subjective, qualitative feedback rather than statistically representative results. They should be interpreted as directional insights that highlight common themes, pain points, and opportunities emerging across stakeholder groups.

3.2 Stakeholder Interview Feedback

3.2.1 HEAT Loan as an Enabler of Electrification

Many stakeholders described the HEAT Loan as an important factor in enabling customers to pursue energy efficiency and electrification projects, especially those involving higher upfront costs such as heat pumps. 0% interest was cited by over 80% of interviewees as a critical component and a key motivator for customer engagement, with several interviewees, including contractors, lenders, and vendors, suggesting that even small increases in interest would reduce participation, particularly for customers considering discretionary or non-urgent upgrades.

Stakeholders also noted that rebates and the HEAT Loan tend to work in combination: rebates can draw initial interest, while financing may make full project scopes more attainable. Some contractors felt that, without financing, certain customers, especially those pursuing more comprehensive upgrades, might struggle to move forward.

A third of interviewed contractors and energy assessors highlighted the current 7-year loan term as helpful for keeping monthly payments manageable. Some expressed concerns that shorter terms could raise payments to levels that may be challenging for some households. Others pointed out that few comparable financing options exist that offer the same combination of accessibility and low cost.

Overall, feedback suggests that the HEAT Loan plays a meaningful role for many customers considering electrification, though its impact may vary depending on income, project type, and the availability of alternative financing.

3.2.2 Importance of HEAT Loan to Non-Customer Stakeholders

When asked how important the HEAT Loan was to their organization on a scale of 1 to 5 (where 1 is not important at all and 5 is very important), all four interviewed lenders rated the loan 5, very important.

All interviewed contractors indicated they always or almost always promote the HEAT Loan to customers who may qualify.

The HEAT Loan was discussed as the primary financing offering contractors pitch to customers. A few contractors mentioned other financing options that they promote to customers including tax credit options and no-or-low-interest short-term loans to help cover upfront rebate costs.

3.2.3 Customer Experience and Process Challenges

Stakeholders reported several aspects of the customer experience that may create confusion or add friction during the loan process. Because loan and rebate steps are administered separately, about a third of interviewees, including contractors, energy assessors, and vendors, felt the process can appear fragmented to customers, particularly when project details change or when documentation does not align across vendors.

Several stakeholders pointed to limitations in the current portal, noting that the lack of integrated communication or real-time status visibility may slow issue resolution. Contractors mentioned

challenges in confirming whether customers have secured their loans, which can complicate scheduling and project planning.

Many contractors also described taking on a substantial support role for customers, helping them navigate account creation, documentation, and troubleshooting. Contractors noted that customers with limited digital familiarity may struggle more with the process.

Half of interviewed contractors, and at least one stakeholder from each of the other interviewed stakeholder groups, suggested that the number of forms and steps required for application—combined with potential future requirements such as income verification—may create additional drop-off risks for some customers.

Overall, stakeholders felt that a clearer, more connected process could reduce confusion and contractor burden.

3.2.4 Barriers to Participation

Interviewees identified several points in the process where customers may be more likely to disengage. Many noted that customers can lose momentum each time they are asked to complete an additional task, such as submitting documents or contacting lenders.

The lender stage was described as a common point of drop-off by half of interviewed contractors and most (three of four) vendors. Reasons cited included loan denials, concerns about multiple credit checks, and uncertainty about the steps that follow authorization. Stakeholders felt that this transition could benefit from clearer guidance.

Some contractors expressed concern that income-based or tiered terms could be difficult to explain and might introduce additional complexity when discussing monthly payments or eligibility. A few contractors (4 of 12) also mentioned that the $25,000 loan cap may limit financing for larger or multi-measure projects, though it was not widely viewed as a primary barrier.

Several stakeholders, including three contractors, one EA, and two vendors pointed to the upfront rebate amount as a challenge for customers who do not have sufficient savings, since this portion cannot be financed through the HEAT Loan.

These observations suggest that multiple small friction points, rather than a single issue, may influence whether customers complete the process.

3.2.5 Opportunities for Improvement

Stakeholders offered several ideas for improving customer and contractor experience. A frequently mentioned suggestion was creating a unified portal for loan and rebate steps, which some felt could reduce confusion and streamline documentation.[35]

Contractors expressed interest in enhanced portal features – such as visibility into customer status, easier document submission, and contractor-facing dashboards – that could help them

[35] The team understands the process is currently managed by separate vendors on different contracting schedules, which may limit the feasibility of implementing this request.

support customers more efficiently. Two-thirds of contractors noted a contractor-facing portal or greater contractor visibility would be a helpful process improvement.

Interviewees also suggested improving communication channels, including more consistent updates, clearer guidance when issues arise, and dedicated support for contractors. Based on these findings, it is suggested that Phase 2 include targeted contractor research to further probe on opportunities to improve the contractor and customer experience.

While stakeholders acknowledged the need to manage program costs, several emphasized the importance of keeping payments affordable. Ideas include adjusting term lengths if interest rates rise or promoting alternative financing options that can be stacked with the HEAT Loan for customers pursuing high-cost measures.

Other recommendations included simplifying application materials, providing clearer instructional tools, and exploring solutions to help customers cover upfront rebate costs.

3.3 Summary Findings

Key findings from stakeholder interviews are summarized below.

1. **The HEAT Loan is viewed as an important enabler of electrification.** 0% interest was cited by over 80% of interviewees as a critical component and a key motivator for customer engagement, with several interviewees, including contractors, lenders, and vendors, suggesting that even small increases in interest would reduce participation, particularly for customers considering discretionary or non-urgent upgrades. A third of interviewed contractors and energy assessors highlighted the 7-year loan term as helpful for keeping monthly payments manageable.

2. **Rebates and financing serve complementary roles.** Stakeholders frequently noted that rebates help draw customers into the process, while the HEAT Loan often enables them to pursue a full project scope rather than partial or deferred work. Several interviewees felt that financing remains particularly important for higher-cost electrification measures.

3. **The HEAT Loan is an important tool for contractors.** All interviewed contractors indicated they always or almost always promote the HEAT Loan to customers who may qualify.

4. **Contractors act as key navigators but face significant process burden.** Many contractors reported that they regularly assist customers with account creation, documentation, and troubleshooting. Over half of interviewed contractors suggested that limited portal visibility and/or unclear communication pathways can create difficulty for contractors to manage project timelines and customer expectations.

5. **Process complexity contributes to drop-off at multiple stages.** Stakeholders pointed to various friction points – such as form requirements, digital literacy barriers, and lender engagement – as areas where customers may disengage. The lender stage was described as a common point of drop-off by half of interviewed contractors and most (three of four) vendors as customers may face denials, credit concerns, or uncertainty about next steps.

6. **Income-based, tiered term lengths may introduce added complexity.** Some interviewees expressed concern that explaining tiered terms and estimating monthly payments based on income could be challenging in the field. A few suggested that additional requirements or complexity might affect customer confidence or willingness to proceed.

7. **Program tools and communication pathways may not fully support customer and contractor needs.** Several stakeholders highlighted limitations in the loan portal, including the lack of integrated communication and limited visibility into application status. Many felt that clearer guidance, improved responsiveness, and contractor-facing features could help reduce confusion and streamline project delivery. Two-thirds of contractors noted a contractor-facing portal or greater contractor visibility would be a helpful process improvement.

8. **Upfront rebate costs are a barrier for customers with limited savings.** Stakeholders, including three contractors, one energy assessors, and two vendors noted that customers must often pay substantial rebate amounts out-of-pocket before reimbursement, and these amounts cannot be financed through the HEAT Loan. Interviewees felt this gap can be a challenge for households without liquid savings, even when the loan covers most of the project cost. It is suggested that Phase 2 explore how contractors are addressing these concerns for customers in more detail (e.g., bridge loans).

9. **Affordability and simplicity were consistently emphasized.** Across stakeholder groups, interviewees highlighted that the combination of low or no interest, manageable monthly payments, and a straightforward process appears important for supporting participation. Several stakeholders suggested that changes to any of these elements could influence customer uptake.

4. Customer Survey Findings

This section summarizes the results of HEAT Loan customer survey, including responses from participants and authorized non-participants. The survey builds on themes identified through stakeholder interviews by quantifying customer experiences, decision-making, and preferences related to the HEAT Loan.

Participants reported that the HEAT Loan was important to completing their project, with the 0% interest rate identified as the most important loan feature. Results show that willingness to adopt the loan dropped by 22% when interest rates increased from 0% to 1%. Respondents view loans and rebates as equally important.

When evaluated by income level, the wealthiest income bracket, Tier 3 households, were most often to respond differently than the other income levels, often choosing the option that would require no interest accrual and using their own savings for projects if the HEAT Loan offering changed. Authorized non-participants identified barriers to the authorization process including confusion with the authorization form. Together, the results in the following section offer a nuanced understanding of the program's strengths and opportunities, setting the stage for further evaluation of the HEAT Loan program and participant experiences.

4.1 Measures Overview and General Experience Notes

Most often respondents pursued a HEAT Loan for a heat pump project. The respondents' HEAT Loan project measures are shown in Table 4-1.

Table 4-1. HEAT Loan Project Measures[36]

Measure Category	Measure Installed by Percentage of Participants (n=341)	Measure Installed by Percentage of Authorized Non-participants (n=56)[37]
Heat Pump	80%	50%
Heating Equipment	78%	52%
Cooling Equipment	24%	27%
Water Heating	17%	18%
Weatherization	10%	29%
Battery	5%	0%
Windows	3%	4%

Source: Guidehouse analysis of participant and authorized non-participant survey data

All respondents were given the opportunity to share any other thoughts on their experience with the HEAT Loan. Many of the customers who chose to elaborate on their experience reported having a positive experience with the program (47%). Other trends emerged from their responses which identified areas for improvement. Several respondents noted issues with the

[36] Heat pumps are not mutually exclusive from heating, cooling or water heating measures presented in the table.

[37] While only 63% of the authorized non-participants indicated they had completed a project without the HEAT Loan (Figure 4-8), percentages in this column are shown out of 56, the total number of authorized non-participant respondents.

HEAT Loan process (16%), most commonly citing general confusion with the process (9%) and challenges with customer service (3%). Additionally, customers reported issues with finding a lender (7%) or finding a contractor (7%). Some customers also noted problems with the rebate process (15%). These results are show in Table 4-2 below.

Table 4-2. Is there anything else you would like tell us about your experience with the HEAT Loan? (Verbatim analysis, n = 68)

Top Categories	Subcategories	Subcategory Responses (%)	Overall Category Responses (%)
Positive Experience	Overall satisfaction	28%	47%
	Lender satisfaction	9%	
	Essential to completing project	7%	
	Contractor satisfaction	3%	
Process & Navigation Challenges	General process confusion	9%	16%
	Customer service challenges	3%	
	Website/portal issues	1%	
	Timeliness	1%	
	Paperwork	1%	
External Partner Challenges	Issues finding a lender	7%	14%
	Issues with a contractor	7%	
Rebate Process Concerns	--	--	15%
Other	--	--	8%

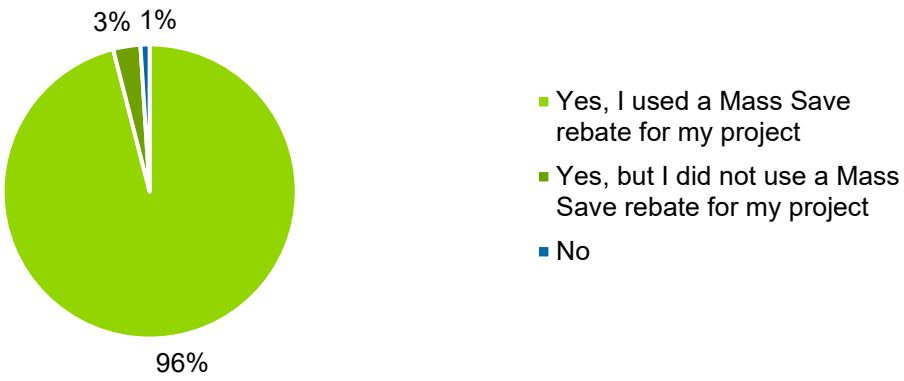
Source: Guidehouse survey analysis

4.2 Rebate and Loan Option Awareness

This section focuses on questions regarding customer awareness of different rebate and loan options as well as why they chose a HEAT Loan over alternatives.

All respondents who indicated they had installed, or been authorized to install, a heat pump with the HEAT Loan were asked about their awareness of heat pump rebates provided by the Sponsors of Mass Save. Nearly all heat pump customers (96%) knew about the rebates and utilized them for their heat pump installations (Figure 4-1).

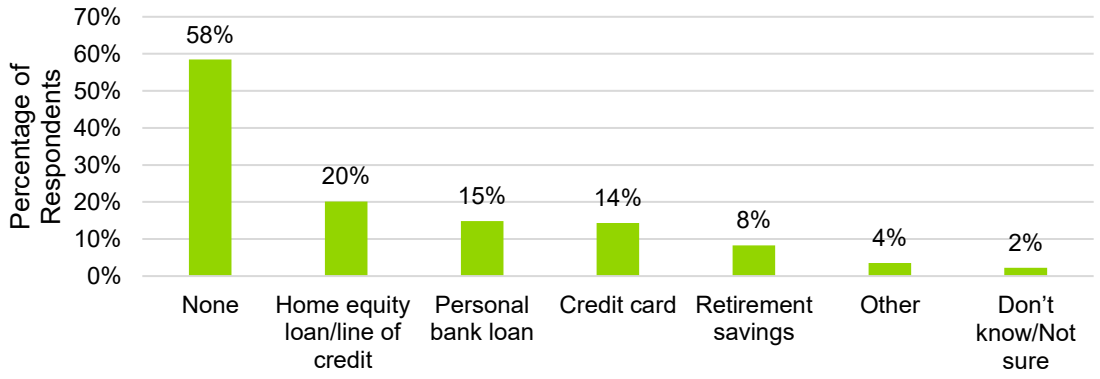
Figure 4-1. Were you aware that Mass Save offered rebates for heat pumps? (n = 300)



Source: Guidehouse analysis of participant and authorized non-participant survey responses

All respondents were asked about other loan options they had considered aside from the HEAT Loan. While most respondents (58%) indicated they only considered the HEAT Loan, those who explored other financing options frequently considered a home equity loan or line of credit (20%, Figure 4-2).

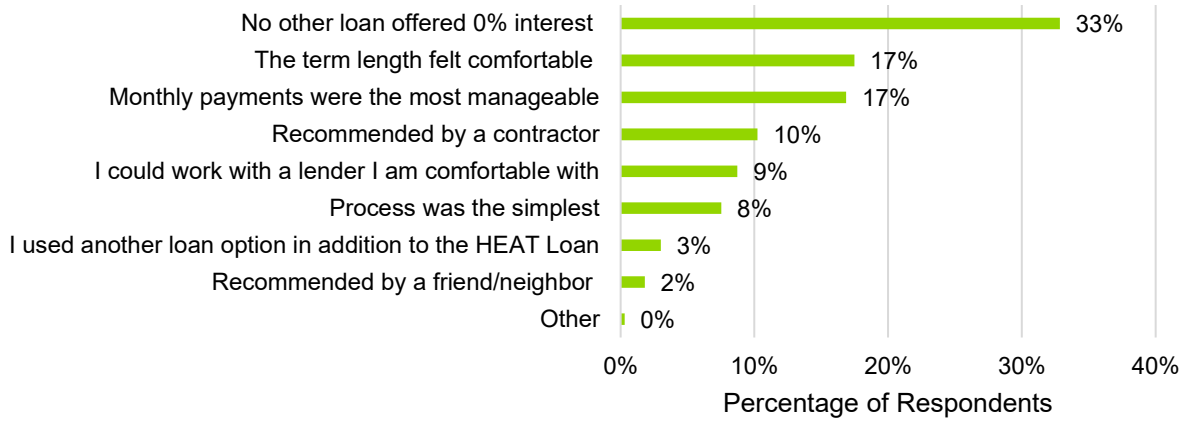
Figure 4-2. Other than the HEAT Loan, what other loan options did you consider? Select all that apply. (n = 397)



Source: Guidehouse analysis of participant and authorized non-participant survey responses

Participants were asked why they had chosen the HEAT Loan over other loan options. The most common reason was that no other loan offered 0% interest (33%) followed by customer comfort with the term length (17%) and manageable monthly payments (17%, Figure 4-3).

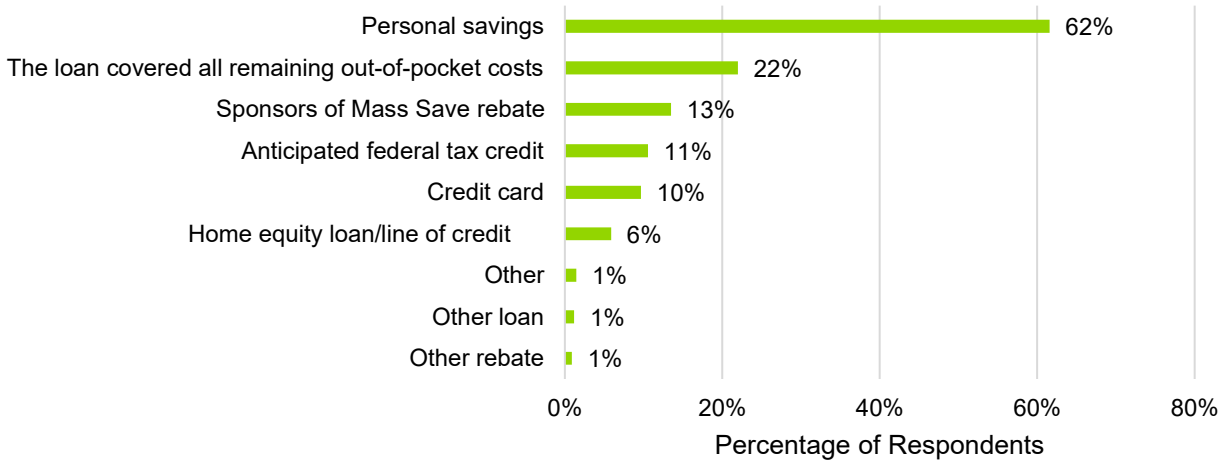
Figure 4-3. Why did you choose the HEAT Loan over other loan options? Select all that apply. (n = 332)



Source: Guidehouse analysis of participant and authorized non-participant survey responses

Participants were asked how they had covered any out-of-pocket cost for their energy project that was not covered by the HEAT Loan. Most participants (62%) indicated they had used personal savings to cover additional project costs. Almost a quarter of participants (22%) reported that the loan covered all remaining out-of-pocket costs for their project (Figure 4-4).

Figure 4-4. What else did you use to cover the remaining out-of-pocket cost of your energy project besides a HEAT Loan? Select all that apply. (n = 341)



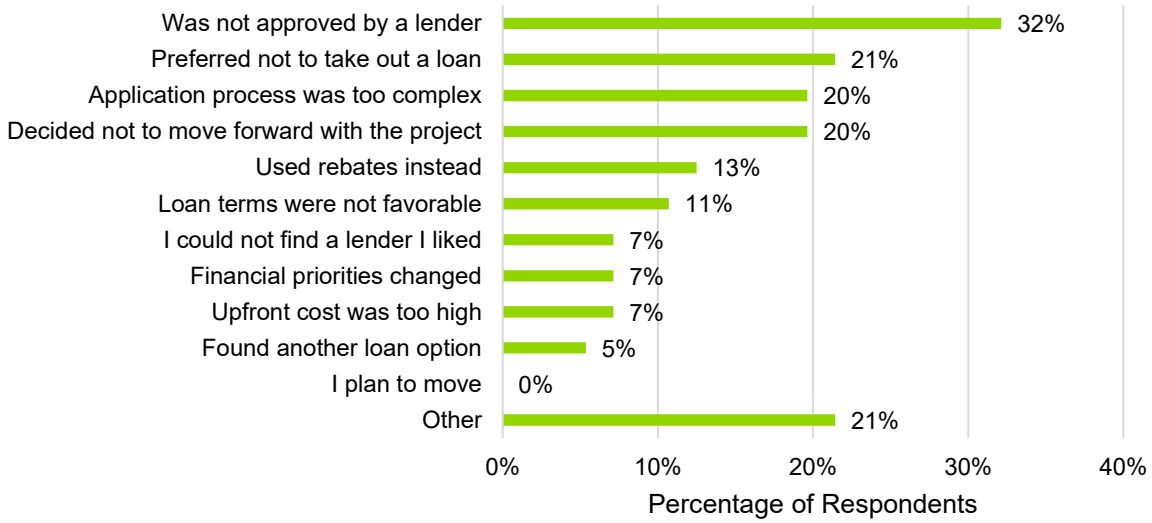
Source: Guidehouse analysis of participant survey responses

4.3 Authorized Non-participant Findings

This section summarizes results from questions directed at the authorized non-participants, focused on their experience with the authorization process and understanding why they did not ultimately take out a HEAT Loan.

Authorized non-participants were surveyed about their primary reasons for not using the HEAT Loan after receiving authorization. A third of non-participants (33%) indicated they had not been approved by a lender. The survey did not include follow-ups on why these customers weren't approved; this could be an area for further exploration in Phase 2. Other common responses included deciding they preferred not to take out a loan (21%), deciding not to move forward with the energy project (20%) and the application process being too complex (20%, Figure 4-5). Interestingly, two of the respondents who selected 'other' indicated the loan was not available. For example, one response wrote "tried to schedule and was told funds ran out, so they were no longer offering the HEAT Loan."[38]

Figure 4-5. What were your main reasons for not using the HEAT Loan? Select up to three options. (n = 56)



Source: Guidehouse analysis of authorized non-participant survey responses

Respondents were allowed to select up to three main reasons for not using a HEAT Loan. Of the respondents who indicated they were not approved by a lender, most only selected this option. Of the respondents who selected they were not approved by a lender and another option, the other options included that the upfront cost was too high (2), used rebates instead (2), loan terms were not favorable (1), application process was too complex (1), and found another loan option (1).

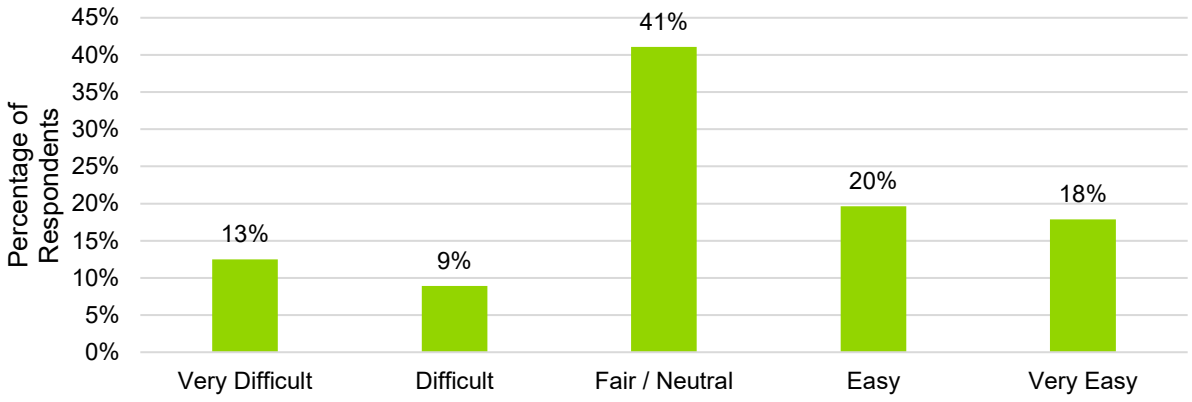
The six respondents who said the loan terms were unfavorable were asked to elaborate. Two indicated the max loan amount was not high enough for their project, two indicated the monthly

[38] To the team's knowledge, the program has never run out of funding.

payments were too high and two indicated that administrative or other additional costs were added to the loan.[39]

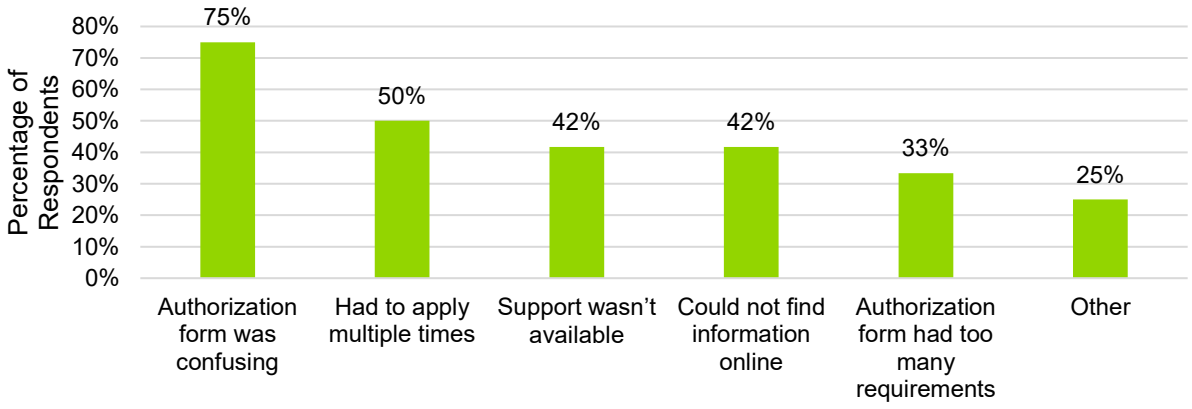
Authorized non-participants were asked to rate their experience with the HEAT Loan authorization process. About 22% of these respondents said the process was difficult or very difficult. An additional 41% rated the experience fair/neutral (Figure 4-6). Of those who said the process was difficult, the most common reasons were that the authorization form was confusing (75%) and that they had to apply multiple times (50%, Figure 4-7).

Figure 4-6. How would you rate your experience with the HEAT Loan authorization process? (n = 56)



Note: The authorization process refers to the process a customer goes through in order to receive an authorization form from a HEAT Loan Administrator. This includes completing the HEAT Loan intake form which confirms measure eligibility, gathering (a) contractor quote(s), and submitting this information to the administrator. This process happens before a customer is able to go to a lender to request loan approval. See Section 1.2 for detailed steps.
Source: Guidehouse analysis of authorized non-participant survey responses

Figure 4-7. What was difficult about the process? Select all that apply. (n = 12)



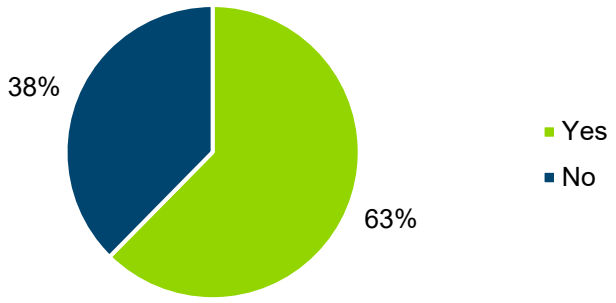
Source: Guidehouse analysis of authorized non-participant survey responses

Authorized non-participants were asked if they had moved forward with an energy project without the HEAT Loan. Most non-participants (63%) indicated they had completed a project

[39] The loan application process and requirements vary by lender.

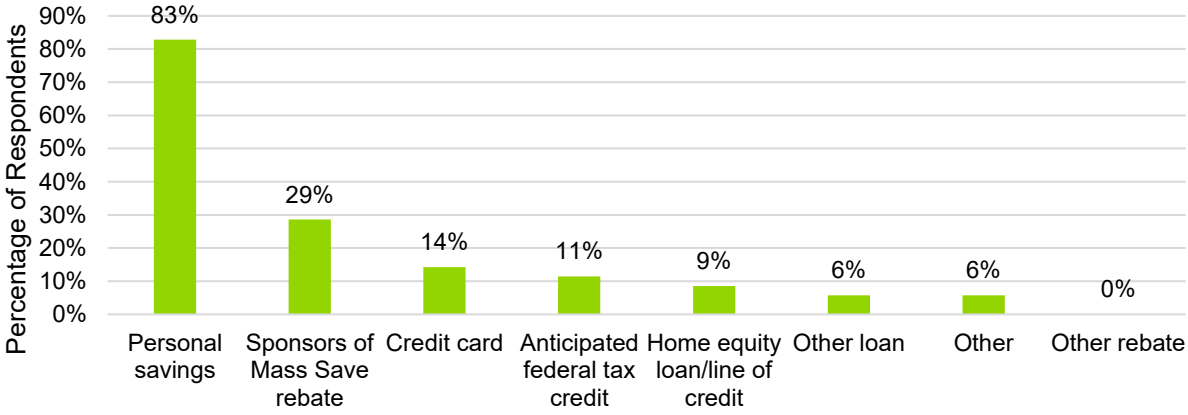
without the HEAT Loan (Figure 4-8). Results did not vary by income tier. These respondents were then asked what they had used to cover the cost of this energy project. Most often these respondents used personal savings to cover their energy project costs (83%), followed by a Sponsors of Mass Save rebate (29%, Figure 4-9).

Figure 4-8. Did you complete an energy project without the HEAT Loan? (n = 56)



Source: Guidehouse analysis of authorized non-participant survey responses

Figure 4-9. What did you use to cover the cost of your energy project? Select all that apply. (n = 35)



Source: Guidehouse analysis of authorized non-participant survey responses

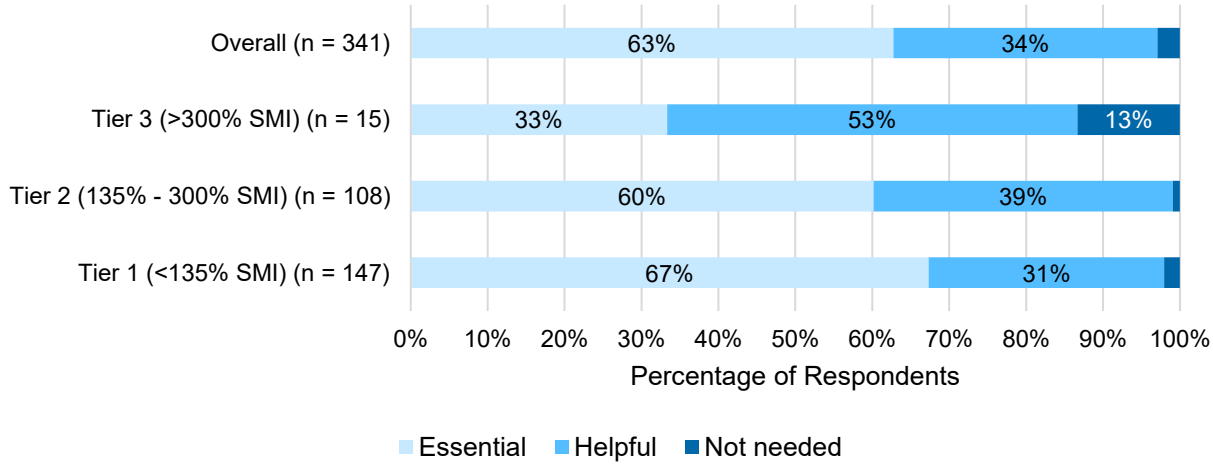
4.4 Participant Findings

This section summarizes the results from the questions asked of HEAT Loan participants including questions focused on customer preferences for term length and interest rate, the relative importance of these factors, and the importance of the HEAT Loan.

4.4.1 Counterfactuals and the Importance of HEAT Loan

Participants were asked to assess how important the HEAT Loan was in enabling them to complete their energy project. Most participants (63%) indicated the HEAT Loan was essential to their project. This was particularly true for Tier 1 households who were substantially more likely to consider the HEAT Loan essential (67%) compared to the Tier 3 households (33%, $p < 0.05$). Only 3% of participants overall indicated the HEAT Loan was not needed for completing their project (Figure 4-10).

Figure 4-10. How important was the HEAT Loan in allowing you to complete your project? (n = 341)

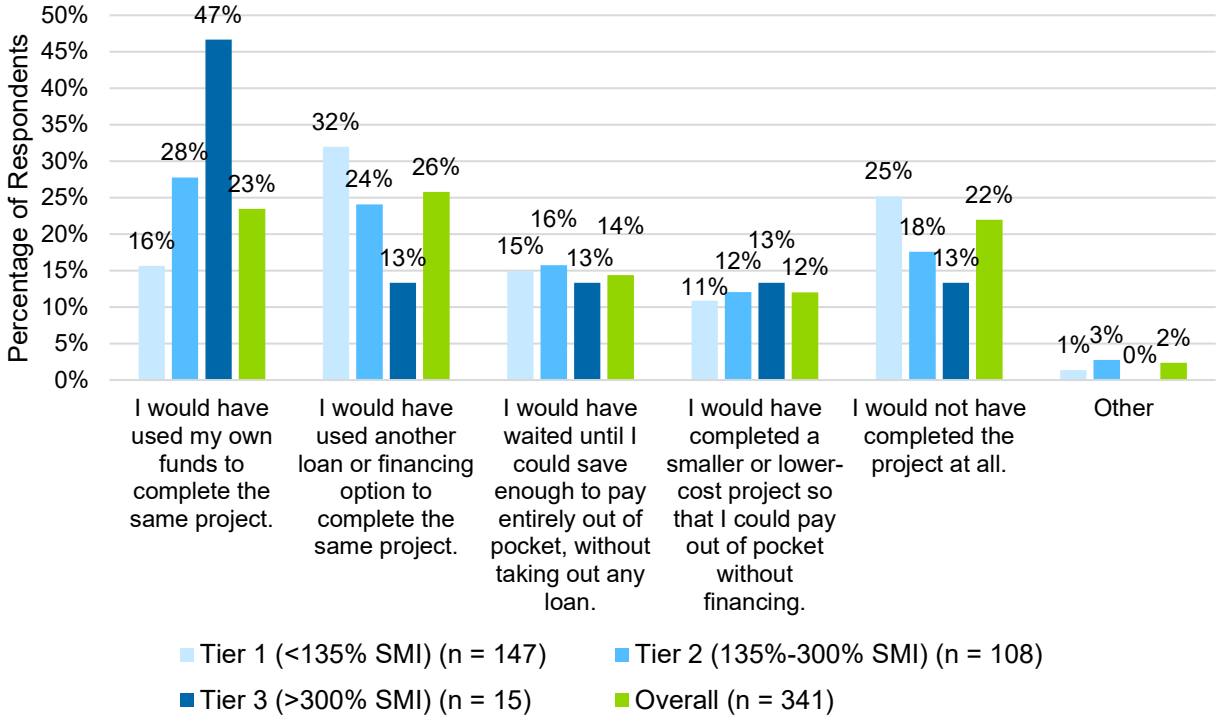


Source: Guidehouse analysis of participant survey results

To further understand the role of the HEAT Loan in customer decision making and project completion, participants were asked how they would have proceeded regarding their project if the HEAT Loan were not available. Overall, responses were relatively evenly distributed: about a quarter (26%) of participants said they would have used another financing option to complete the same project, 23% said they would use their own funds to complete the same project and 22% said they would not have completed the project at all without the HEAT Loan. Please note that overall, most respondents indicated they would have found a way to complete the project without the HEAT Loan and only 22% would have not completed the project at all. However, while this counterfactual question provides initial insights, it should not be used in insolation to infer free ridership. Customers frequently assume they would make the “right” or most efficient choice even in the absence of financial support, introducing potential bias. Additional probing is necessary to understand true behavior and decision drivers. These types of questions could be explored in greater depth in future research.

When viewed by income level, the Tier 3 households were statistically more likely to choose to fund their projects independently without the HEAT Loan (47%) compared to Tier 1 households ($p < 0.05$). Tier 3 households tended to choose to fund their projects out-of-pocket (47%) while those in the Tier 1 households were more likely to use an alternative financing option (32%) or not complete the project at all (25%, Figure 4-11).

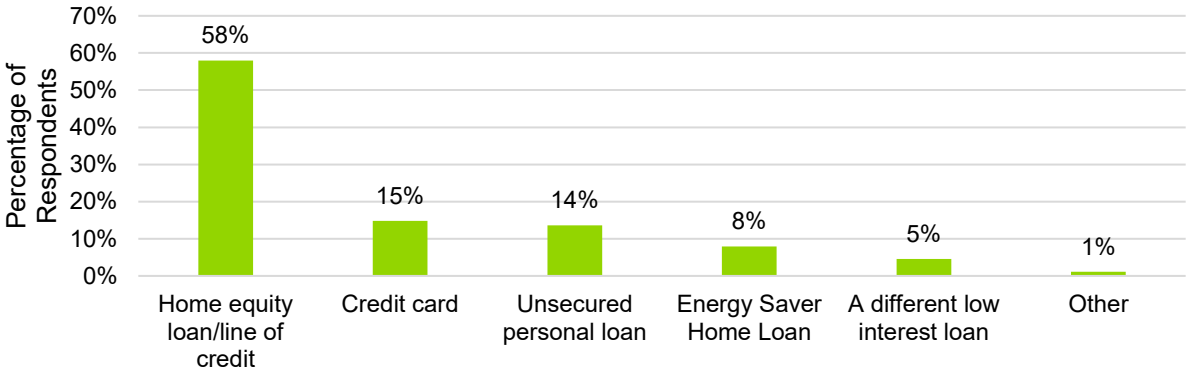
Figure 4-11. If the HEAT Loan were not available, which of the following best describes what you would have done?



Note: While this counterfactual question provides initial insights, it should not be used in isolation to infer free ridership. See above paragraph for additional interpretation context.
Source: Guidehouse analysis of participant survey results

Participants who indicated they would have used an alternative financing option to complete the same project were asked what other option they would have been most likely to use. A majority (58%) reported they would have used a home equity loan or line of credit (Figure 4-12).

Figure 4-12. If the HEAT Loan had not been available, what other type of loan or financing option would you have most likely used instead? (n = 88)

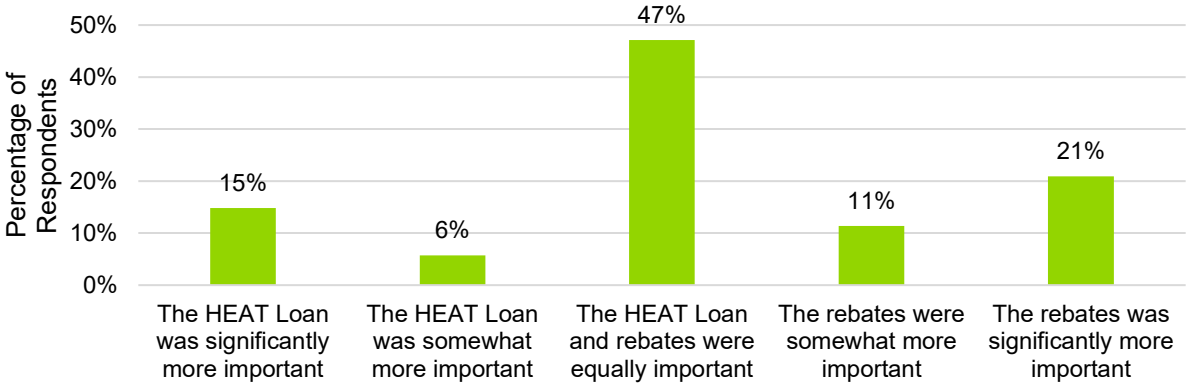


Source: Guidehouse analysis of participant survey results

4.4.2 Customer Preferences on Rebates versus Loans

Participants who used a HEAT Loan for a heat pump project were asked to compare the relative importance of rebates and the HEAT Loan in their decision to install a heat pump. Almost half of these respondents (47%) considered the HEAT Loan and rebates to be equally important. There was a mild preference for rebates compared to the HEAT Loan with 32% of respondents indicating rebates were somewhat or significantly more important to them. Results did not vary by income level (Figure 4-13).

Figure 4-13. How important were rebates compared to the HEAT Loan in your decision to install a heat pump? (n = 263)

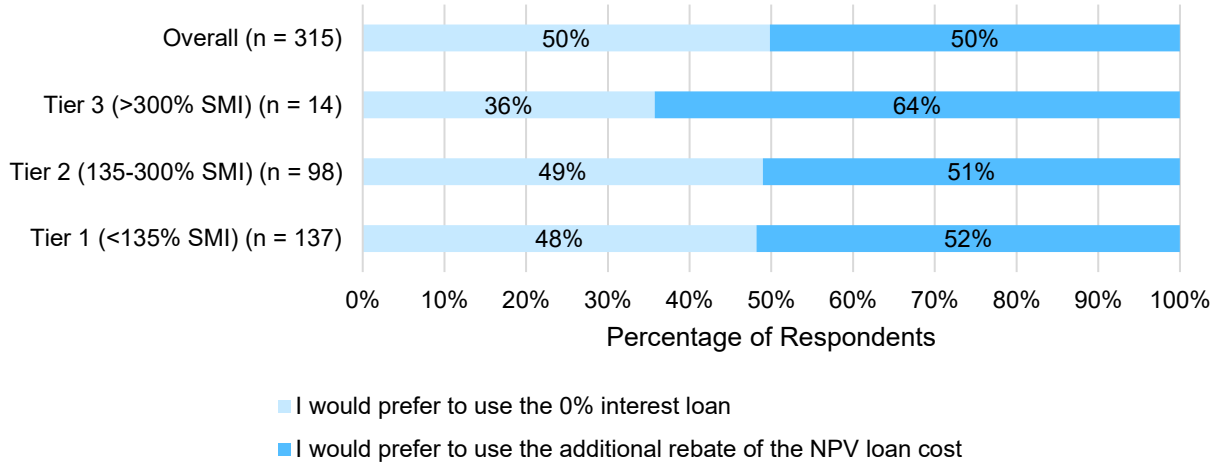


Source: Guidehouse analysis of participant survey results

To simulate a real-world trade-off between a rebate and a HEAT Loan, participants were asked if they would prefer a 0% interest, 7-year loan or an additional rebate equal to the net present value cost of providing the HEAT Loan. Both options were designed to cost the utility the same to offer. Overall, respondents were evenly divided in their preferences for the rebate or the loan. When analyzed by income levels, Tier 1 and Tier 2 households also showed relatively balanced

preferences with a slight leaning toward the rebate. In contrast, Tier 3 households displayed a stronger preference for the rebate, with 64% selecting this option (Figure 4-14).

Figure 4-14. If you had a choice between a 0% interest 7-year loan with a monthly payment of $[X] OR a rebate of [X] (on top of any other rebates already applied to your project), which would you prefer? (n = 315)



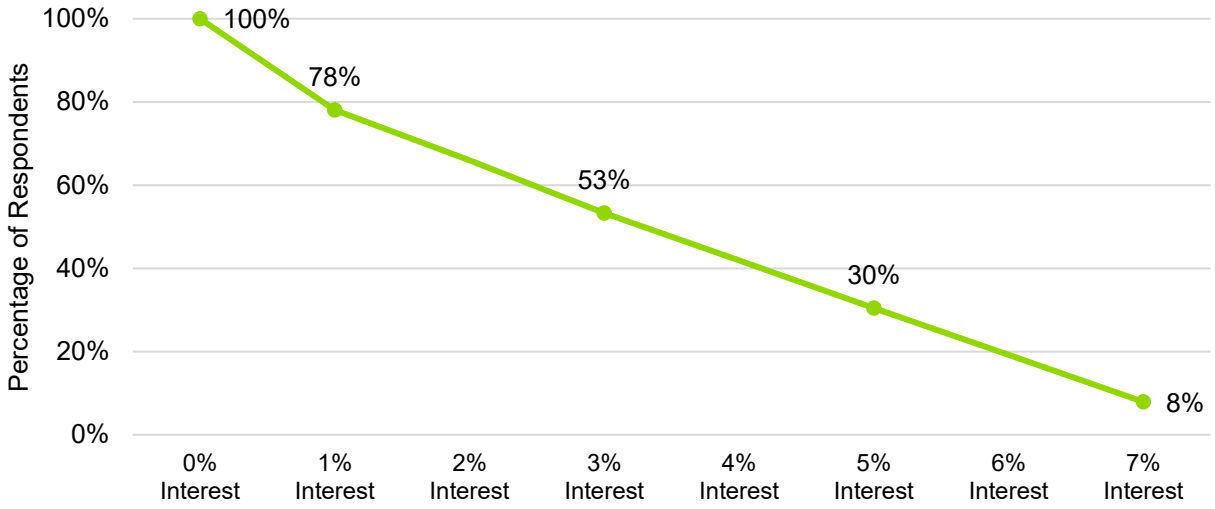
Source: Guidehouse survey analysis of participant survey results

4.4.3 Customer Preferences for Interest Rate

Participants were asked a series of questions to gauge their willingness to adopt a HEAT Loan at various non-zero interest rates. Because all respondents who completed this question block had used a HEAT Loan in 2024, it was assumed that 100% would be willing to adopt a HEAT Loan at 0% interest. Overall, HEAT Loan willingness to adopt decreases by 22% when interest rises from 0% to 1%. Beyond that point, willingness to adopt the loan falls by ~12% for each additional 1% increase in interest. It is important to note that the only interest rates tested in the survey were 1%, 3%, 5% and 7%; values for 2%, 4% and 6% are interpolated and were not measured directly.

Figure 4-15 below illustrates overall willingness to adopt results.

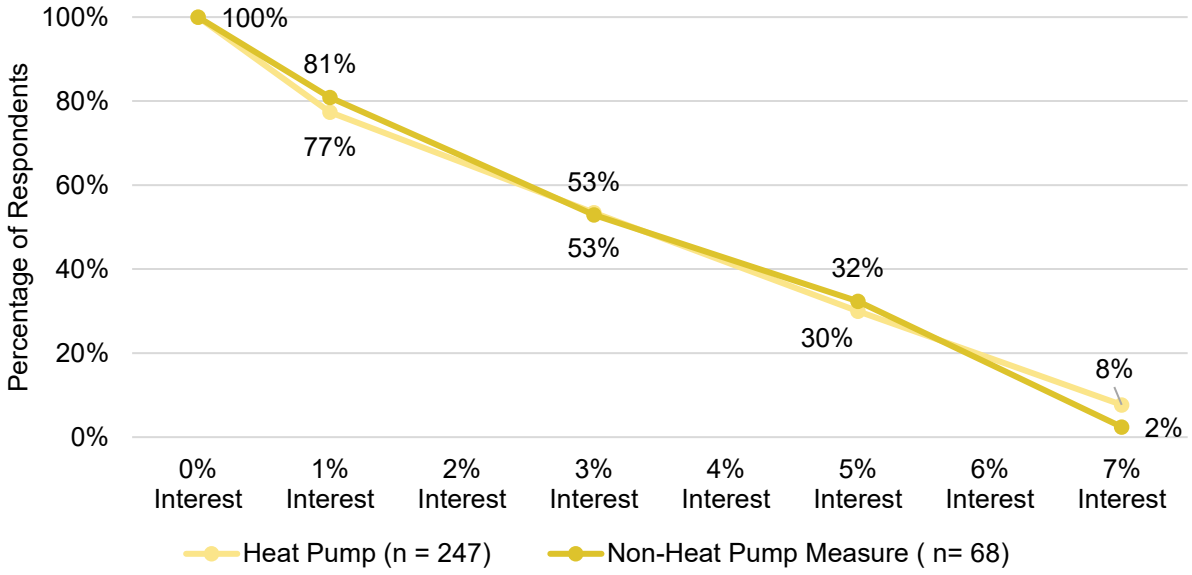
Figure 4-15. Willingness to Adopt a HEAT Loan at Different Interest Rates (n = 315)



Source: Guidehouse survey analysis of participant survey results

Willingness to adopt a HEAT Loan did not vary substantially between participants who installed a heat pump with their loan and those who did not (Figure 4-16).

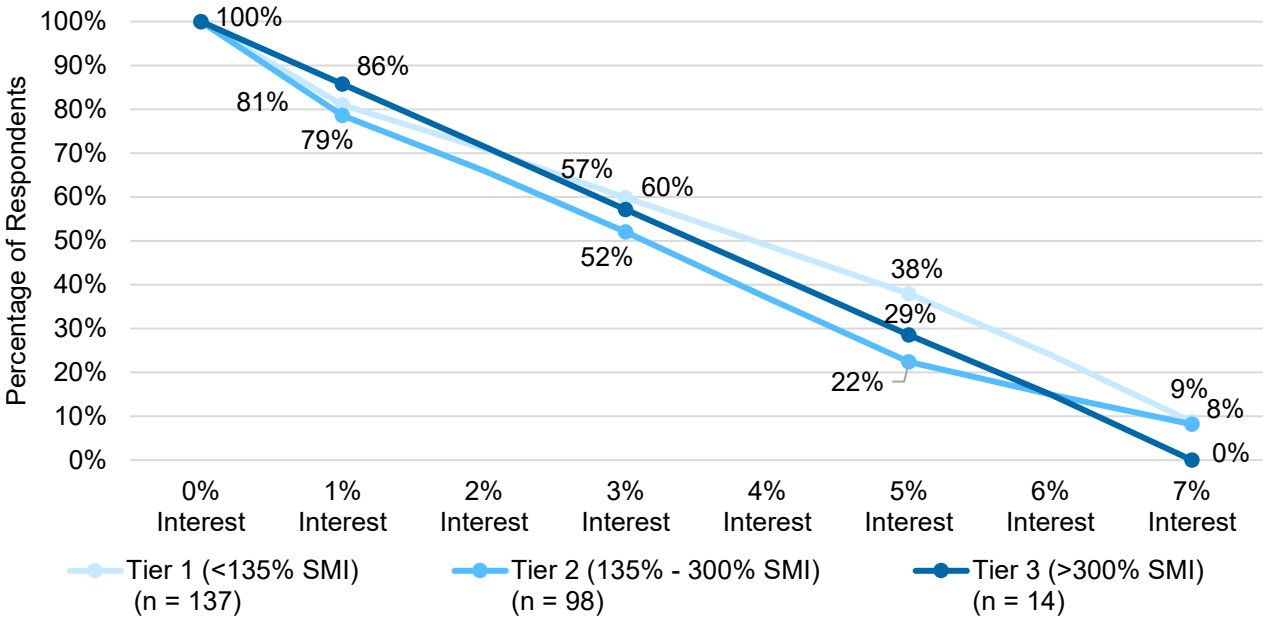
Figure 4-16. Willingness to Adopt a HEAT Loan at Different Interest Rates by Measure Type



Source: Guidehouse survey analysis of participant survey results

When willingness-to-adopt responses were analyzed by income level, no obvious patterns emerged. However, statistically significant income differences emerge at the 5% interest rate where Tier 1 customers are more likely than Tier 2 customers to be willing to adopt a HEAT Loan ($p < 0.05$, Figure 4-17).

Figure 4-17. Willingness to Adopt a HEAT Loan at Different Interest Rates by Income Level



Source: Guidehouse survey analysis of participant survey results

4.4.4 Influence of Different Loan Variables and Customer Preferences

The survey included a series of pairwise comparison questions designed to assess the relative importance of three key HEAT Loan features: interest rate, monthly payment level, and the maximum loan amount (loan cap). Participants were presented with three pairwise match-ups, each asking them to indicate which of two loan features was more important in their decision to use the HEAT Loan: 0% interest, low monthly payments, or a loan that covers the full project cost. After selecting the more important feature in each match-up, participants were asked to rate the strength of their preference on a 1-to-9 scale, where 1 indicated that the two features were equally important and 9 indicated that the selected feature was extremely more important than the alternative.

Table 4-3 summarizes the responses to the three pairwise comparisons including the number of participants who selected each feature as more important in each matchup and the average rating indicating the strength of that preference on the 1-9 scale.

Table 4-3. Pairwise Comparisons of HEAT Loan Features (n=341)

Comparison	Loan Feature Selected as More Important	Preference Count	Average Importance Rating
1	0% Interest	329	6.839
	Low Monthly Payments	12	4.333
2	0% Interest	271	6.524
	Loan Covers Full Project Cost	70	4.357
3	Loan Covers Full Project Cost	221	5.520
	Low Monthly Payments	120	5.425

Source: Guidehouse analysis of participant survey results

Guidehouse used an Analytical Hierarchy Process (AHP) to calculate the relative importance of these loan attributes based on respondents' responses. AHP is a structured methodology for quantifying the relative importance of multiple factors by taking the factors' rankings and mathematically aggregating them to produce normalized importance weights with the geometric mean. Table 4-4 presents the relative influence of each factor, presented as a percentage. The results indicate that 0% interest is by far the most important attribute (66%), followed by the loan covering the full project cost (21%) and low monthly payments (13%).

Table 4-4. Relative Importance of HEAT Loan Features (AHP Results, n=341)

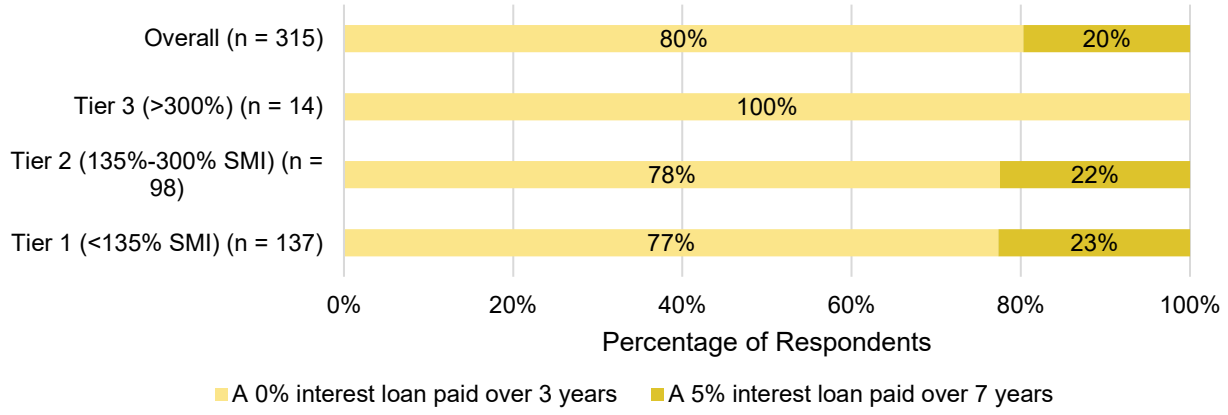
Rank	Tested Loan Feature	Relative Influence
1	0% interest	66%
2	Loan covers full project cost	21%
3	Low monthly payment	13%

Source: Guidehouse survey analysis of participant survey results

To better understand how customer decision making between term lengths and interest rates, participants were asked whether they would prefer a 0% interest loan repaid over 3 years or a 5% interest loan repaid over 7 years. For each option customers were shown the associated monthly payments and total payments based on their total project cost. Overall, 80% of respondents preferred the 0% interest rate with a shorter term. Similar preferences were observed for Tier 1 and Tier 2 households while all Tier 3 households indicated they would prefer the 0% interest rate with a shorter term. This result is consistent with the greater financial flexibility typically observed among Tier 3 households, who may be better positioned to absorb higher monthly payments in exchange for avoiding interest costs.

The results of these two interest rate and loan term length combination scenarios, by income, are should in Figure 4-18 below.

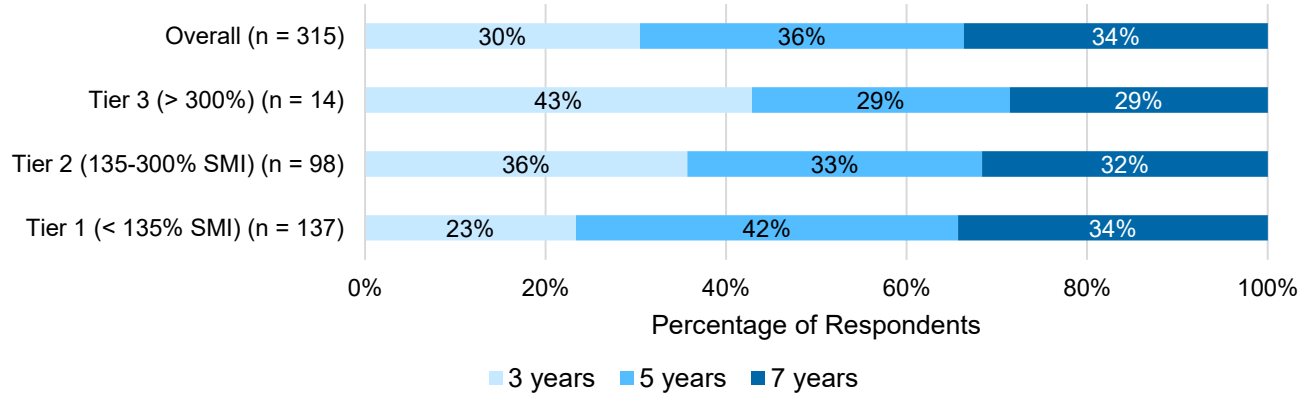
Figure 4-18. Imagine you are given two loan options. Which one would you choose?



Source: Guidehouse analysis of participant survey results

To learn more about customer preferences on loan term lengths, participants were asked whether they would prefer a three-year, five-year or seven-year term for a loan with a 2% interest rate. For each option customers were shown the associated monthly payments and total interest accrued over the term length based on their total project cost. The average total project costs was $23,565 for Tier 1 respondents, $26,974 for Tier 2 respondents and $31,315 for Tier 3 respondents. Overall, preferences were relatively evenly distributed between the three loan term options. When examined by income level, Tier 2 and Tier 3 households most often selected a three-year loan term while Tier 1 households preferred a 5-year loan term (Figure 4-19).

Figure 4-19. Imagine you are completing your energy efficiency project for a total cost of $[X] and are offered a loan at 2% interest. Which term length would you prefer?



Source: Guidehouse survey analysis of participant survey results

4.5 Ongoing Study Findings

Findings from other recent Massachusetts studies further support and contextualize the results of this HEAT Loan Assessment.

The Heat Pump Usage Behavior Study surveyed heat pump customers from 2025.[40] Of customers who used a HEAT Loan for their project, most (76%) indicated the loan was "very influential" in their decision to purchase a heat pump. Most (75%) also indicated they would not have purchased a heat pump without the 0% HEAT Loan or another low-interest financing option.

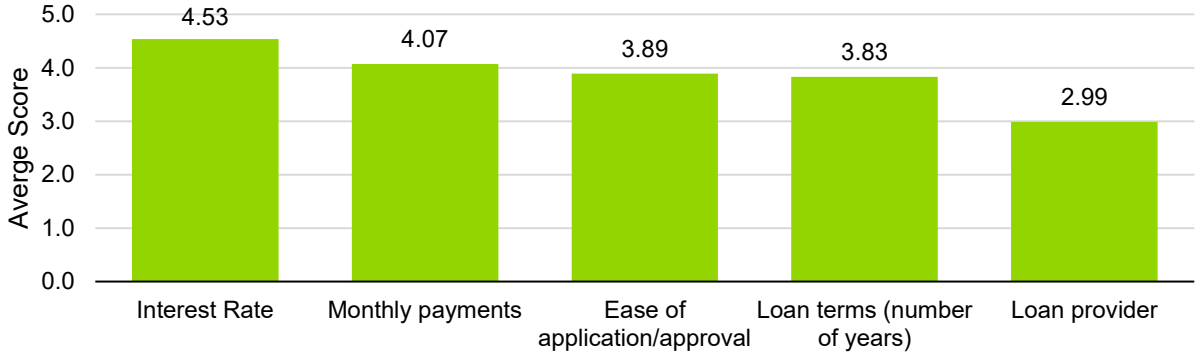
The MA Heat Pump Incentive Study surveyed 2022 and 2023 program participants who received a Mass Save incentive for a non-heat pump heating measure. Respondents were asked about their awareness of two financial support options: heat pump rebates offered by the Sponsors of Mass Save and the 0% HEAT Loan. If respondents were unaware of one or both options, they were asked whether knowing about these funding options would have made them more likely to choose a heat pump instead of the heating system they purchased. Respondents were informed that the HEAT Loan is a 0% interest financing option. Sixteen percent of customers who were unaware of the HEAT Loan or were unaware it could be used for heat pumps responded that the loan, combined with the heat pump rebate, would have made them more likely to adopt a heat pump. A third of respondents who were unaware of both heat pump rebates and the HEAT Loan indicated that knowing these options would have made them more likely to select a heat pump.

Although many non-heat pump customer respondents said the HEAT Loan would not make them more likely to choose a heat pump, more than half (57%) of customers who might consider a heat pump reported they could not afford one without financing. This was especially true for households with annual incomes below $175,000. These findings suggest that while the HEAT Loan is critical for affordability, other barriers and factors also influence customers' HVAC purchasing decisions.

[40] The Heat Pump Usage Behavior Study is an ongoing study designed to assess heat pump customer usage behavior and satisfaction. Results are draft at the time of this report.

As shown in Figure 4-20, when evaluating financing characteristics for heat pump financing options, non-heat pump customers ranked interest rate as the most important factor, with an average score of 4.53 on a 1–5 scale (1 = not at all important, 5 = very important). This is consistent with HEAT Loan participant survey results from this HEAT Loan Assessment. Monthly payment amount was the second most important factor, scoring 4.07.

Figure 4-20. How important are the following factors when considering financing options for a heat pump, on a scale of 1-5 with 1 being not at all important and 5 being very important? (n=320)



Source: Guidehouse analysis of Heat Pump Incentive Study non-heat pump customer survey data

These findings confirm the HEAT Loan's importance for customers who ultimately adopted heat pumps. For non-heat pump customers, while awareness of the HEAT Loan encouraged some customers to consider a heat pump, it did not persuade the majority, indicating that other barriers and factors also influence customers' HVAC purchasing decisions.

4.6 Summary Findings

Key findings from the survey research are summarized below.

1. **Customers consider the HEAT Loan important to their project completion.** Most participants (63%) indicated the HEAT Loan was essential for them to complete their home energy projects. This was particularly true for Tier 1 households who were substantially more likely to consider the HEAT Loan essential compared to the Tier 3 households ($p < 0.05$). Only 3% felt the HEAT Loan was not needed. When asked what action they would have taken regarding their energy project if the HEAT Loan had not been available, over 75% of participants indicated they would have still completed the project either with alternative financing, personal savings or by reducing the project scale.

2. **Barriers were identified in the authorization process.** Most non-participants (63%) did not feel the HEAT Loan authorization process was easy. Those who had difficulty cited confusion with the authorization form. A suggested priority for Phase 2 is to better understand the specific difficulties customers face in this process. Additionally, a third of non-participants said they did not proceed with a HEAT Loan because they were not approved by a lender.

3. **Interest rates are the most important feature of the HEAT Loan.** Based on the analysis of pairwise comparisons, the 0% interest rate was the most important factor in

participants' decision to use a HEAT Loan when compared to low monthly payments, and a loan that covers the full project cost. Full project cost coverage was second most important.

4. **Customers are split on loan versus rebate preferences.** Many respondents who installed heat pumps felt HEAT Loans and rebates were equally important for installing their project. Similarly, preferences between taking a loan or receiving a rebate of equal cost to the utility are evenly split; however, the wealthiest group favored rebates with a 64/36 ratio, likely due to their means to cover out-of-pocket costs.

5. **There is a steady decline in willingness to adopt a HEAT Loan with increasing interest.** While there is a 22% drop in willingness to adopt a HEAT Loan from 0-1%, there is a consistent drop of ~12% for every 1% increase in interest up to 7%. Results did not differ significantly by measure type or by income level except for Tier 1 households being statistically more likely to adopt a HEAT Loan at 5% than Tier 2 households ($p < 0.05$).

6. **The wealthiest customers have alternatives to loans**. Customers in the highest income bracket (Tier 3) tend to choose paying out-of-pocket using personal savings rather than taking on any form of interest.

7. **Home equity loan/line of credit are a commonly cited loan alternative.** When asked about other loan options they have considered or would consider, home equity loans or lines of credit were consistently the most often cited. Tier 1 respondents were most likely to consider alternative financing options in the absence of the HEAT Loan, followed by Tier 2 respondents.

8. **Customers are split on term length preferences.** When the interest rate was the same for all term length scenarios, preferences were relatively evenly distributed overall between the three loan term options (three-year, five-year and seven-year). When interest rate differed between the scenarios, respondents opted for the shorter loan term with no interest over the longer loan term with 5% interest.

5. Tracking Data and Cost Analysis

This section presents key results from the review of program tracking data and high-level cost analysis conducted as part of this Phase 1 assessment. Building on insights from stakeholder interviews and the customer survey, this analysis provides evidence on participation trends, measure uptake, customer characteristics, and the cost implications of the HEAT Loan's proposed and alternative design features. This analysis strengthens the Phase 1 Assessment by providing additional quantitative insights that integrate with stakeholder findings to inform consideration of potential program refinements.

It is important to emphasize that these results reflect a preliminary assessment of HEAT Loan vendor data and the first comprehensive review of this data in recent years. While the analysis provides valuable initial insights, it should be noted that extensive data cleaning and quality control procedures were not performed at this stage. As such, findings should be interpreted as directional rather than definitive, and further validation and refinement are recommended for future phases.

5.1.1 Measure Level Trends

This section examines the types of measures financed through the HEAT Loan program and trends in measure prevalence, combinations, and characteristics.

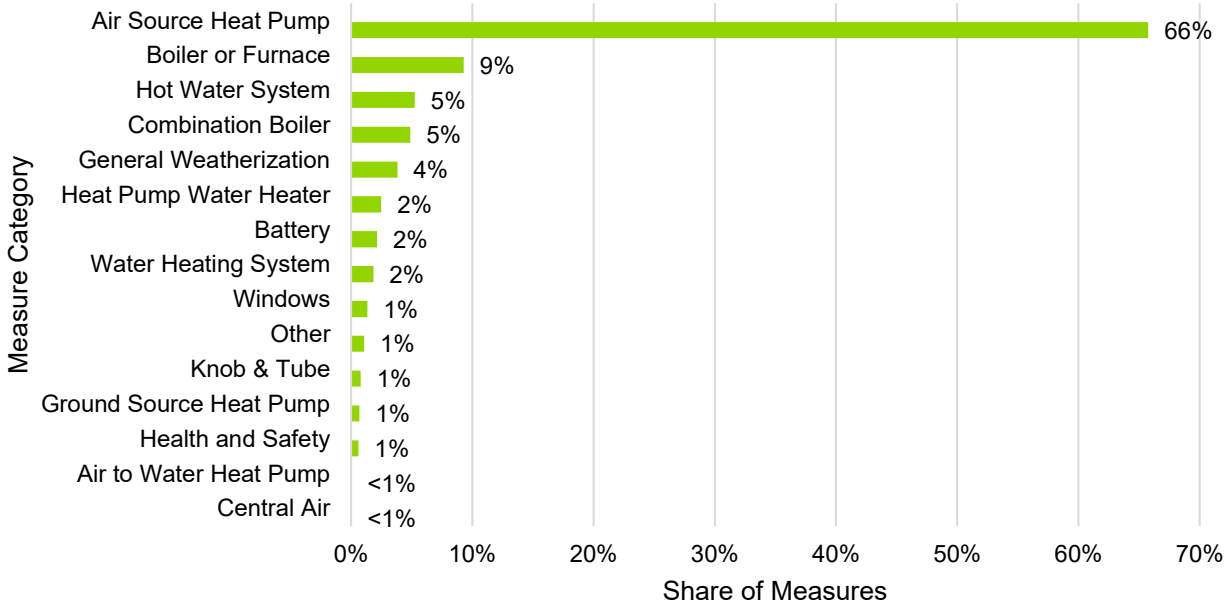
5.1.1.1 All Measure Trends

Analysis of measure-level trends revealed that heat pumps were by far the most commonly financed measure in the previous program cycle. Across all measure categories in 2022-2024, air source heat pumps accounted for 66% of total measures, making them the dominant measure category by a wide margin. The remaining share of measures is split across a variety of categories with the next most common category, boilers and furnaces, representing less than 10% of all measures.[41]

[41] Boilers and furnaces were removed from the HEAT Loan qualified measure list in Fall 2024, as required by statue.

Common measure categories are shown in Figure 5-1 below. See Appendix B for more information on average financed amount of these measure categories.

Figure 5-1. Common Measure Categories (2022 - 2024)



Source: Guidehouse analysis of 2022-2024 HEAT Loan vendor data

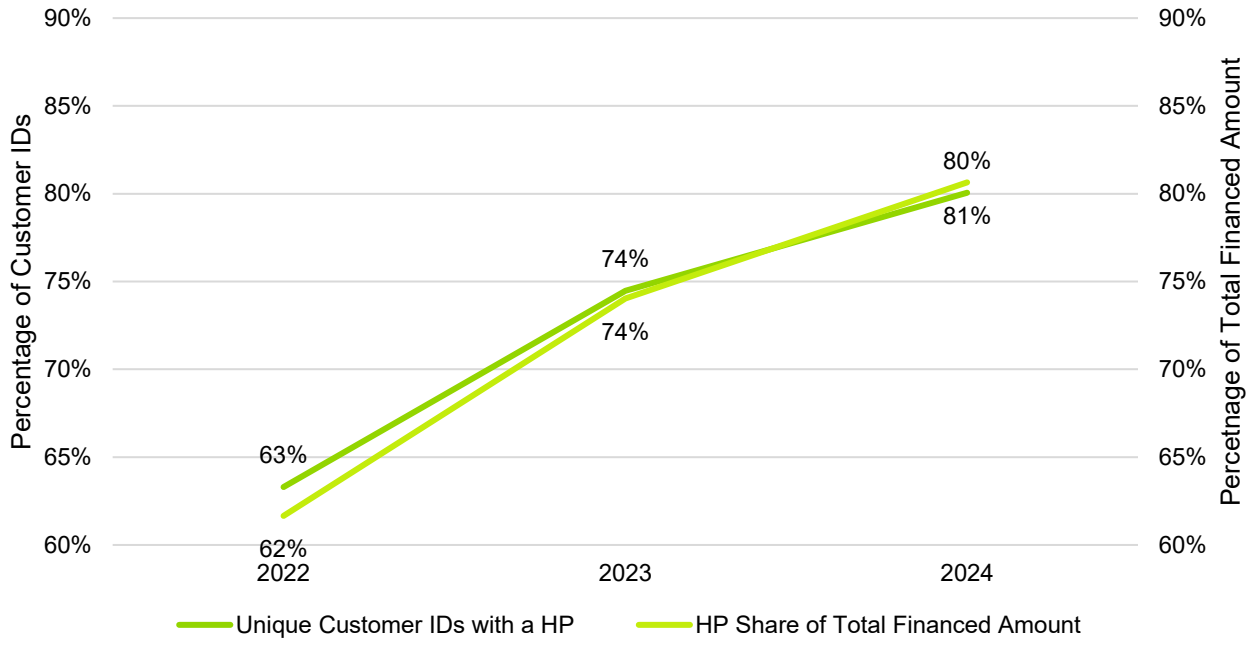
The most common measures were consistent across all three years of the previous program cycle; air source heat pumps, boilers or furnaces, and water heating systems remained the top three measure categories. While the ranking of these measures remained unchanged, the share of air source heat pumps increased over time, while the share of boilers or furnaces declined. Boilers and furnaces are expected to be absent from measure categories in the next program as the HEAT Loan no longer supports fossil-fuel based measures, as required by statue.

Approximately half of customer IDs were associated with more than one measure and common measure pairings included multiple mini-split heat pumps or health and safety/weatherization paired with heating/cooling equipment. Some 2024 customer IDs (4%) were associated with both cooling/heat pump equipment and another heating equipment measure (e.g., boiler, furnace).

5.1.1.2 Heat Pump Trends

Year-over-year analysis showed a marked increase in the prevalence of heat pumps both in terms of customer adoption and the share of total financed dollars, as shown in Figure 5-2.

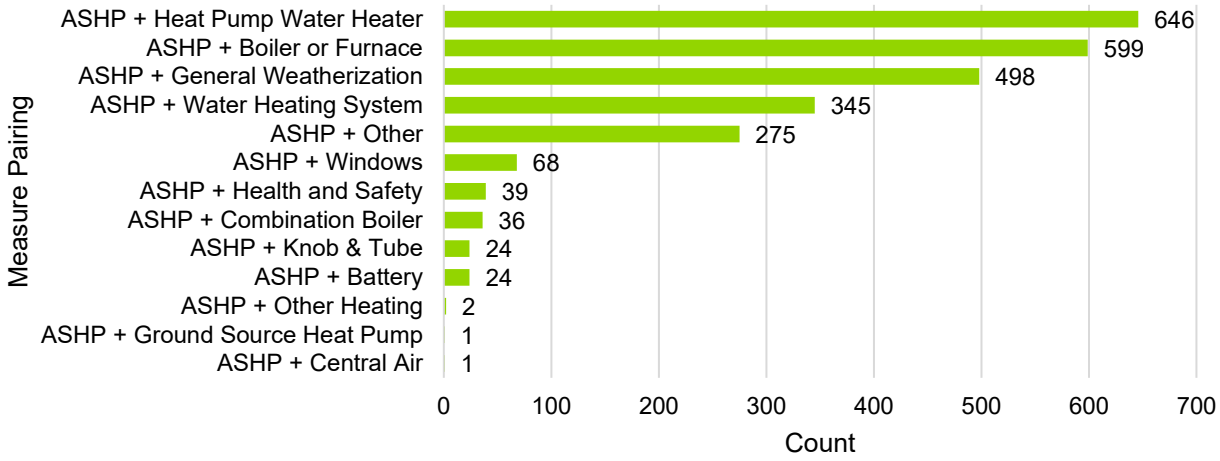
Figure 5-2. Heat Pump Prevalence in HEAT Loan Data 2022 - 2024



Source: Guidehouse analysis of 2022-2024 HEAT Loan vendor data

In 2024, ~20% of customer IDs who were associated with an air source heat pump were also associated with one or more additional measure type. Most commonly, this was a heat pump water heater. Other common pairings are shown in Figure 5-3 below. Note, this figure does not include multiple air source heat pump pairings.[42]

Figure 5-3. Air Source Heat Pump (ASHP) Measure Pairings 2024



Source: Guidehouse analysis of 2022-2024 HEAT Loan vendor data

5.1.2 Customer Trends

This section summarizes customer characteristics available in vendor tracking data, including household characteristics, pre-existing fuel type, and select demographic proxies where available. Due to vendor differences in data structures and fields, customer trends were analyzed at the vendor level.

5.1.2.1 CLEAResult

Based on available customer information, the CLEAResult data indicates several key HEAT Loan customer characteristics including:

- Most properties were single family (85%).
- Most customers had natural gas as their pre-existing fuel type (56%).
- Loans were associated with zip codes across the state, but were most common in Middlesex and Norfolk County zip codes.
- Overall, only 1% of customer IDs were flagged as moderate-income.[43] When reviewed year-over-year, the percentage was the highest in 2024 at 2%.

[42] 629 air source heat pumps were paired with at least one other air source heat pump. Up to 6 air source heat pumps were associated with a single Customer ID.

[43] According to CLEAResult, data from this field is populated by customer data.

5.1.2.2 RISE

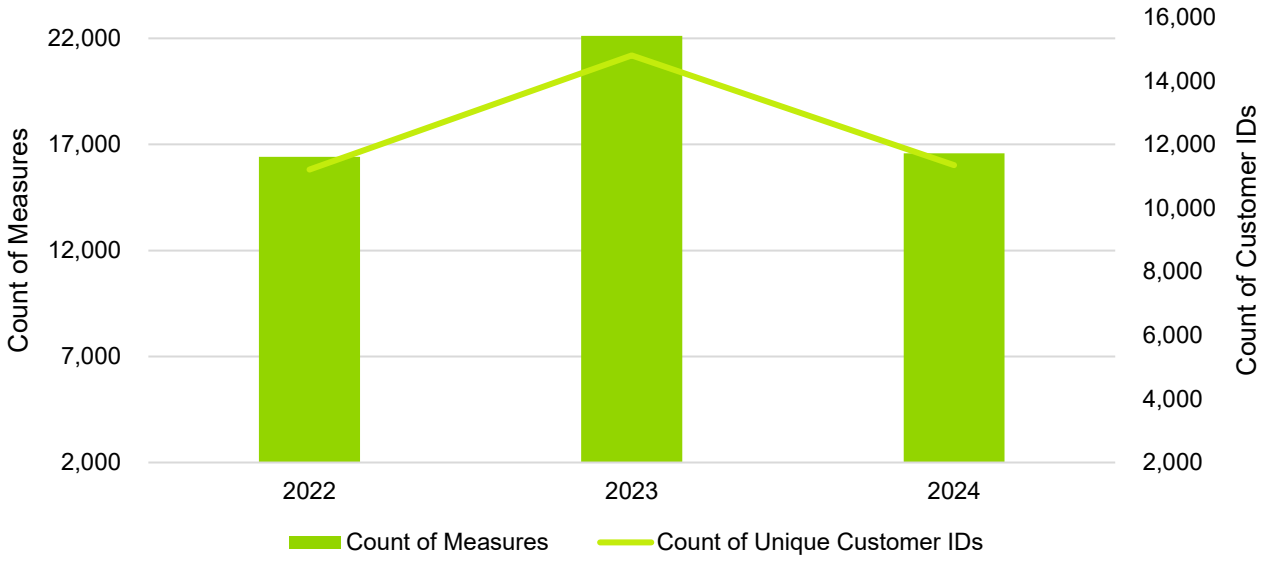
RISE collected customer information that differs from the data captured by CLEAResult and provides complementary insight into HEAT Loan participants. RISE data revealed the following customer characteristics:

- Most RISE HEAT Loan customers speak English as their primary language (93%).
- About half of RISE customers had natural gas as their pre-existing fuel type, similar to CLEAResult.
- Loans were commonly associated with zip codes in western MA, Cape Cod and the Islands, along with other zip codes scattered across the state.

5.1.3 Loan Distribution and Uptake

In the previous program cycle, there was an increase in number of loans and number of measures funded between 2022 and 2023, and a drop between 2023 and 2024, as shown in Figure 5-4. Note, some of this drop is likely due to the removal of fossil fuel equipment from the qualified measures list in Fall 2024, as required by statue.[44]

Figure 5-4. HEAT Loan Uptake 2022 - 2024



Note: This figure only includes measures and customer IDs that could be clearly identified as participants (loan close date field populated).
Source: Guidehouse analysis of 2022-2024 HEAT Loan vendor data

Vendor data shows that many lenders and contractors are involved in the HEAT Loan process. Overall, there were over 100 unique lenders associated with a HEAT Loan and over 3,000 unique contractors. The lender associated with the most HEAT Loans was associated with

[44] The 194th General Court of the Commonwealth of MA, General Laws Part I Title II Chapter 25 Section 21.

approximately 25% of Customer IDs.[45] The contractor associated with the most HEAT Loans was associated with approximately 5% of measure IDs.

5.1.4 Data Limitations

This analysis was informed by HEAT Loan data from multiple vendors and is subject to several limitations. Historically, the HEAT Loan program was administered by multiple vendors, which made it unclear which entity held specific data elements and resulted in delays in data acquisition. In addition, while the data were generally complete and interpretable, inconsistencies in formatting (e.g., loan terms reported in both months and years, anomalous loan amount values) required additional cleaning and interpretations. Merging datasets from different vendors was also challenging due to some major differences in how data was structured and stored, as well as limited supporting data dictionaries. Finally, some key fields were unavailable or insufficiently detailed, including project-level data, indicators of customer engagement pathways, and clear differentiation between authorized customers and loan participants.

To improve evaluability and support future analyses, several data enhancements are recommended. HEAT Loan data should be collected on a regular cadence and supported by a clear, standardized data dictionary. Vendors should consistently distinguish between participants and authorized non-participants and track customers throughout the full loan process. Future efforts should also clarify which stakeholders are responsible for collecting specific data fields and at what stage in the HEAT Loan process (e.g., what fields are populated based on data collected by vendors during authorization and what fields are updated based on lender reported data after authorization).

5.1.5 Cost Analysis

In order to offer the HEAT Loan at 0% interest, the PAs buy-down the interest from the Federal Reserve Prime Rate. The PAs also pay a margin to lenders based on customer credit score. As a result, customers are only responsible for the principal loan amount, paid in monthly payments over the term length.

In the 2025-2027 Three-Year Plan, the PAs proposed varying term length in accordance with three income brackets.

[45] The lender field is only populated for two-thirds of Customer IDs. The percentage shown represents the share of Customer IDs where a lender is noted.

Varying the loan term length significantly affects monthly payment amounts for customers, as illustrated by Table 5-1 below.

Table 5-1. Monthly Payment Comparison for a $25,000 Loan, 0% Interest at Different Term Lengths

	3-year Term Length	5-year Term Length	7-year Term Length
Monthly Payment ($25,000 loan, 0% Interest)	$694	$417	$298
Approximate Cost to PAs (assume 8.75% interest including margin)	$3,515	$5,956	$8,521

Source: Guidehouse analysis

In order to keep monthly payments reasonable for customers, one alternative loan option is offering longer term lengths at higher interest to all customers. An example is shown in Table 5-2 below. These two loan options, 3 years at 0% interest and 7 years at 5% interest have approximately equivalent cost to the PAs. One provides a lower monthly payment for the customer, representing a smaller portion of their monthly income, in exchange for some interest accumulation. The other offers a higher monthly payment to the customer, representing a larger portion of their monthly income, but avoiding any interest.

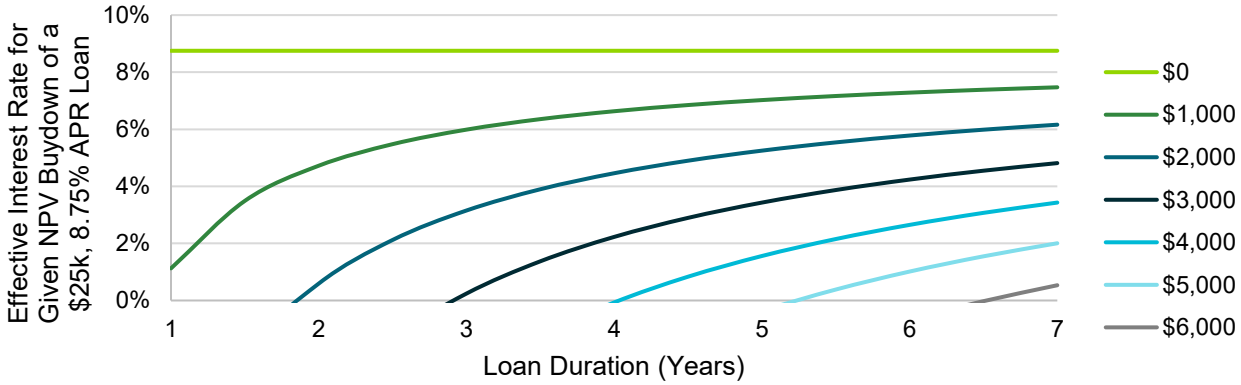
Table 5-2. Loan Option Comparison: Varying Term Length and Interest Rate

	Scenario A – Lower Term Length, Lower Interest	Scenario B – Longer Term Length, Higher Interest
Customer	Customer makes ~100,000/year, ~$8,300 per month	
HEAT Loan Offering	$25,000, **3-year term length, 0% interest**	$25,000, **7-year term length, 5% interest**
Monthly Customer Loan Payment	$694/month	$353/month
Monthly Customer Loan Payment As % of Income	8%	4%
Total Customer Payment	$25,000	$29,681

Source: Guidehouse analysis

These tradeoffs can be considered across a range of term lengths and interest rate buy-downs. The contour lines in Figure 5-5 illustrate the tradeoff between loan term and interest rate from the PA perspective.

Figure 5-5. Cost Equivalency of Different Loan Terms versus Interest Rate



Note: The contour lines illustrate the tradeoff between loan term and interest rate from the PAs' perspective.
Source: Guidehouse analysis

It is worth noting that the latest Heat Pump Pricing Study[46] found that HEAT Loans are associated with statistically significant higher costs for both ducted projects and ductless projects. The study was not able to confirm whether participants with higher project costs were more likely to pursue HEAT Loans, or whether some contractors charge more, knowing a customer is receiving a loan. Further understanding of the drivers behind this result will be important as potential design changes are considered, particularly with respect to cost reduction opportunities.

5.2 Summary Findings

1. **Heat pumps make up the majority of HEAT Loan participation.** Tracking data from 2022-2024 shows that air source heat pumps accounted for approximately two thirds of all measures financed through the HEAT Loan.

2. **Heat loan participation declined in 2024.** The number of measures funded increased between 2022 and 2023 but declined in 2024, warranting continued monitoring.

3. **Program delivery relies on a broad network.** Customers across the state are using HEAT. Loans and more than 100 lenders and thousands of contractors were associated with HEAT Loans in the 2022-2024 period.

4. **There are tradeoffs between loan terms and interest rates.** Shorter loan terms can substantially reduce buy-down costs for the PAs but result in higher monthly payments for customers. Alternatively, longer terms paired with non-zero interest rates can achieve similar costs to the PAs while lowering monthly payments, illustrating opportunities to balance customer affordability with program cost containment. However, based on customer survey findings and interview results, adding interest will likely impact participation.

[46] This reflects the Heat Pump Pricing Study Draft from February 27, 2026. Any later updates are not reflected.

6. Benchmarking and Literature Review Findings

This section presents the results of the literature review and benchmarking activity. Complementing HEAT Loan-specific analyses discussed earlier in the report, this task examines peer programs and relevant literature to identify best practices and actionable insight on alternative loan structures that can support future refinements to the HEAT Loan. As discussed in Section 2.4, this benchmarking exercise builds off of the benchmarking activity completed as part of the CT Financing Process Evaluation Study.[47]

6.1 Other Financing Offerings in Massachusetts

While the HEAT Loan remains the primary energy efficiency financing option in MA, several alternative programs are also available to eligible customers. The Energy Saver Home Loan Program offers low-interest financing to low-to-moderate income customers and can be paired with other financing or incentives. A notable feature of this program is its tiered interest rates based on income, providing an alternative approach to the income-based term lengths proposed for the HEAT Loan in the latest Three-Year Plan. This loan also requires improvements to reduce the home's total energy usage by at least 20% to be eligible. The Home Green Loan offers financing of up to $50,000 for eligible improvements for MA homeowners. However, its identical term length to the HEAT Loan and comparatively higher interest rate make it a less competitive option. Both programs are relatively new and, to date, have not reached loan volumes comparable to the HEAT Loan. Finally, the National Energy Improvement Fund's Energy Plus Loan is another option available in Massachusetts and nationwide. This loan serves a broad customer base but carries higher interest rates than other options, including the HEAT Loan.

[47] Residential & Commercial Financing Process Evaluation (X2223), Cadeo, May 2025.

Additional details on these programs are provided in Table 6-1 below.

Table 6-1. Other MA Financing Offerings

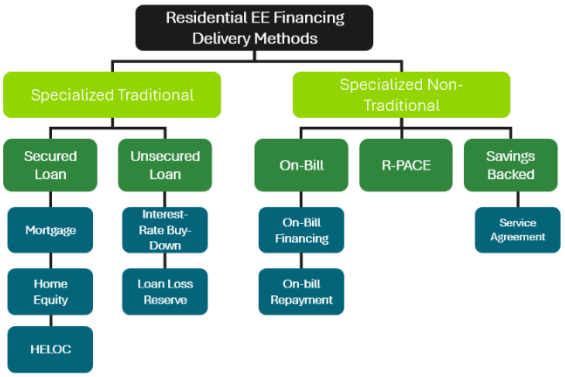
	Energy Saver Home Loan Program	Home Green	NEIF Energy Plus
Admin	MCCB & MassHousing	Capital Good Fund Non-profit, CDFI	National Energy Improvement Fund LLC.
Start Date	April 2024	April 2025	Expanded to MA in 2019
Term Length	20 years	1 - 7 years	Up to 12 years
Financing Range	$10,000 - $100,000	$1,000 - $50,000	$2,500 - $50,000
Interest Rate	0.5% if <80% AMI, 2% if 80% - 135% AMI	9.99%	8.99% for most customers (14.99% for credit scores <700)
Eligibility	Up to 135% AMI. Must reduce total energy usage by at least 20%.	RI or MA homeowner	No income restrictions
Eligible Measures	Health and safety, weatherization, retrofit packages, electrical upgrades, HVAC, domestic hot water, appliances, lighting, solar, battery storage, EV charging	Wall insulation and replacement windows, duct sealing, removal of knob-and-tube wiring, high efficiency heating and cooling equipment	Heating and cooling, windows, air sealing, electrical, plumbing, kitchens & baths, geothermal, solar, other energy projects
Participation	Up to $20 million allocated; goal of committing up to 1,000 loans over the next two years.[48]	Program has financed over 16,000 loans totaling over $50M with a 97% repayment rate.[49]	Program has funded 255,000+ energy improvements; responsible for $900M in financing.[50]

Source: Guidehouse analysis

6.2 Program Benchmarking

There are many possible ways to deliver specialized energy efficiency financing, as shown in Figure 6-2. More details on these delivery methods are available in Appendix C. Guidehouse reviewed the HEAT Loan against 12 other financing programs, 9 of which were also included in the CT Financing Process Evaluation Study. All of the programs could be categorized as either unsecured loans or on-bill programs.

Figure 6-1. Types of EE Financing Delivery Methods



Source: Guidehouse

[48] Massachusetts Community Climate Bank Launches First Consumer Loan Product, Mass Save, April 2024.

[49] Capital Good Fund Announces Launch of HomeGreen Energy-Efficiency Loan in Massachusetts and Rhode Island, Capital Good Fund, April 2025.

[50] NEIF Launches Lower-Interest EnergyPlus for Colorado Financing Program for Home HVAC and Energy Efficiency Upgrades, National Energy Improvement Fund, September 2025.

The loan type, administrator type, and key program details are shown in Table 6-2 below.

Table 6-2. Benchmarked Financing Program Details

Program	Administrator	Other Details
Unsecured personal loans (via partner lenders)		
Michigan Saves	Green bank / non-profit	• Financing ranges, interest rate, and term lengths vary by lender. Most lenders offer credit score-based interest rates. • Michigan Saves maintains a loan loss reserve fund for defaulted loans. • 8,406 projects supported in 2025.
GoGreen Financing (California)	State Green Bank	• Lower interest (0% or 2%) is available to low-income households located in low-income and disadvantage communities for heat pump projects. • Operates using loan loss reserve funds. • 2,603 standard and 854 micro loans closed FY23-24.
CT Heating Loan	CT Green Bank, in partnership with local utilities	• No longer offered.
CT Smart-E Loan		• Offering a 0.99% interest rate for heat pump projects for a limited time (through March 2026). • 533 Smart-E loans for a total of $12.3M issued in 2024.
Efficiency Maine Home Energy Loan	Quasi-state Energy Agency / Green Bank	• Interest rate varies with loan term length (lower interest for shorter term lengths). Income / credit score eligible customers can receive a lower interest rate at a higher term length, but loan caps are lower. • Loan origination fee of $500 required for a 1 year 0% interest loan. • 264 projects facilitated through loans, $1.12M loaned.
NYSERDA Smart Energy Loan (New York)	State Energy Authority	• Lower interest rate available for automatic payment. • 3,811 loans issued in 2024.
On-Bill programs		
Green Energy Money $aver (Hawaii)	State Green Bank	• Project must meet estimate minimum savings standards to be eligible. • Limited measure list (solar water heaters, solar PV systems, heat pump water heaters, or energy storage systems).
Switch It Up (Washington)	Non-profit Utility Co-op	• Cannot apply for both incentives and on-bill financing, except in certain fuel switching cases.
CT Micro Loan	State Green Bank	• 0% interest for small projects (up to $3,000). • 645 loans from 2021-2023.
TVA EnergyRight (Tennessee Valley)	Utility	• Minimum credit score of 625 required. • Loans offered through local power companies.
Midwest Energy How$MART (Kansas)	Utility	• Charge on the utility bill must be less than the estimated savings associated with the improvements.
NYSERDA On-Bill Recovery Loan (New York)	State Energy Authority	• Estimated monthly energy cost savings must be greater than monthly loan payment amounts to be eligible. • 681 loans issued in 2024.

Note: Available information varies by program. Loan volume is shown for programs where information was available.
Source: Guidehouse

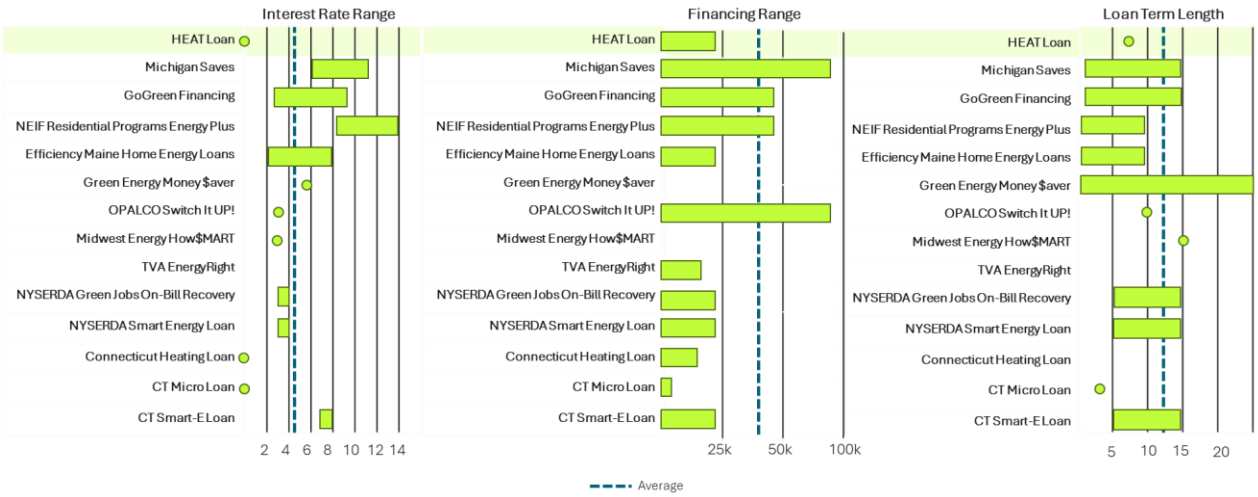
Additional details on the types of measures funded by each of the evaluated programs can be found in Appendix E.

The programs summarized in Table 6-2 highlight the range of financing models used across states. Together, they provide useful reference points for understanding how program structures vary across the market and contextualizing the MA financing market.

Figure 6-3 below compares key financing program design features: interest rate, financing ranges, and loan term length. Notable findings from this review include:

- The HEAT Loan 0% interest offering for up to $25,000 is unique. While the Micro Loan in CT offers 0% interest financing, it only covers up to $3,000. The Heating Loan in CT offered 0.99% interest financing, the closest comparable interest offering, but the offering expired at the end of 2024.
- The average interest rate of the reviewed programs was ~4.5%.
- At least 3 programs offer interest rates that vary based on income or credit score (e.g., GoGreen Financing[51]) and at least 3 programs offer interest rates that vary based on term length (e.g., Efficiency Maine Home Energy Loan) or lender (e.g., TVA Energy Right).
- While the HEAT Loan cap is lower than the average of the benchmarked programs, it is on par amongst programs with a less than 4% interest rate.
- The loan term length offered by the HEAT Loan is lower than the average term length (note: this includes all reviewed programs, including those with higher interest rates) .
- Rather than specifying a loan cap, some on-bill programs require energy cost savings to be greater than monthly payments.

Figure 6-3. Benchmarking Financing Program Key Design Features



Note: Some fields where information was not available for a program are blank.
Source: Guidehouse, adapted from CT Financing Program Evaluation Report

[51] As indicated in Table 6-2, the GoGreen Financing program in California operates using a loan loss reserve fund.

6.3 Best Practices Evaluation

The CT Financing Process Evaluation Study identified 7 financing program best practices based on literature consensus and characteristics of successful programs. Guidehouse benchmarked the HEAT Loan against these best practices and found that MA is fully applying six of the best practices. The seventh was only partially reviewed through this study. Details can be found in Table 6-3.

Table 6-3. Best Practices Comparison

Best Practice	MA Applying Practice?	Explanation
Centralizing loan operations and information	Yes	The Mass Save website is a one-stop shop portal for information on financing and identifying contractors and lenders. The website also has information on rebates.
Offering a variety of measures to best meet participant needs	Yes	The HEAT Loan is available for a variety of measures including heat pumps, other efficient heating and cooling equipment, battery storage projects, insulation/air sealing, windows, and water heating.
Using inclusive financing models, such as 0% interest, on-bill, limited credit checks	Yes	The HEAT Loan offers 0% financing to all customers.
Coupling loans with subsidies to alleviate upfront cost barriers	Yes	Mass Save offers both incentives and financing for heat pumps. Information on both can be found on the Mass Save website. Financing is calculated after rebates.
Attaching debt financing offerings to long repayment conditions to target deeper retrofits	Yes	The HEAT Loan is currently offered as a 7-year repayment term, although there are plans to transition to a income-tiered repayment term structure.
Coordinating with other organizations for financing outreach and delivery	Yes	The HEAT Loan works with an extensive network of contractors and lenders across the state. However, improvements could be made to streamline communication and offer additional services, like real-time loan tracking.
Technical fluency for installer contractors	Partial Review	MA offers a variety of no-cost virtual and in-person contractor trainings. However, this study did not assess technical fluency for installer contractors.

Source: Guidehouse analysis using CT Financing Process Evaluation Study best practices

6.4 Program Uptake

When comparing and evaluating alternative financing structures, it is important to consider how each structure influences program uptake. This analysis compares loan program participation in MA and surrounding states with similar geographies and climates. The information available on loan program uptake varies between programs.

Table 6-4 below describes loan uptake details in five states, including Massachusetts, other New England states and New York. Overall, Massachusetts distributed more loans in 2024 than any of the other reviewed states, both in total volume and as a percentage of population.

Table 6-4. Select Loan Program 2024 Uptake Details

State	Uptake Details	2024 Population[52]
Massachusetts	17,432 measures funded through loans	7.1M
New York	4,492 loans in 2024 (681 on-bill, 3,811 Smart Energy Loan unsecured personal loans). $81.7M total loan value.	19.9M
Maine[53]	264 projects facilitated through loans, $1.12M loaned.	1.4M
Connecticut	2,005 Heating loans issued, 533 Smart-E Loans issued.	3.7M
Vermont	478 loans via the Home Energy Loan totaling in loan principal closed. $5.4M total loan value	648,000

Note: The available information on loan volume varies by state.
Source: Guidehouse analysis

Because heat pumps are a key energy-efficiency technology and a common measure funded through loan programs, the analysis also examined how states compare in terms of heat pump uptake. This metric offers additional insight into how program offerings are influencing the adoption of high-impact technologies. This analysis draws on data reported in the NEEP Northeast High Performance Market Assessment Report.[54]

Of the five states listed in Table 6-4 above, Maine, New York, and MA are the three top performing heat pump states by project volume. It should be noted that all three of these states also offer incentives for heat pump adoption. Efficiency Maine offers market rate customers $3,000 per rebate-eligible outdoor air source heat pump units, up to $9,000 per household. New York has multiple rebate programs including the New York State Clean Heat Rebate program which offers up to $10,000 in rebates for eligible air source heat pumps and the PSEG Long Island rebate program which offers up to $4,500 in rebates for market rate air source heat pump customers.

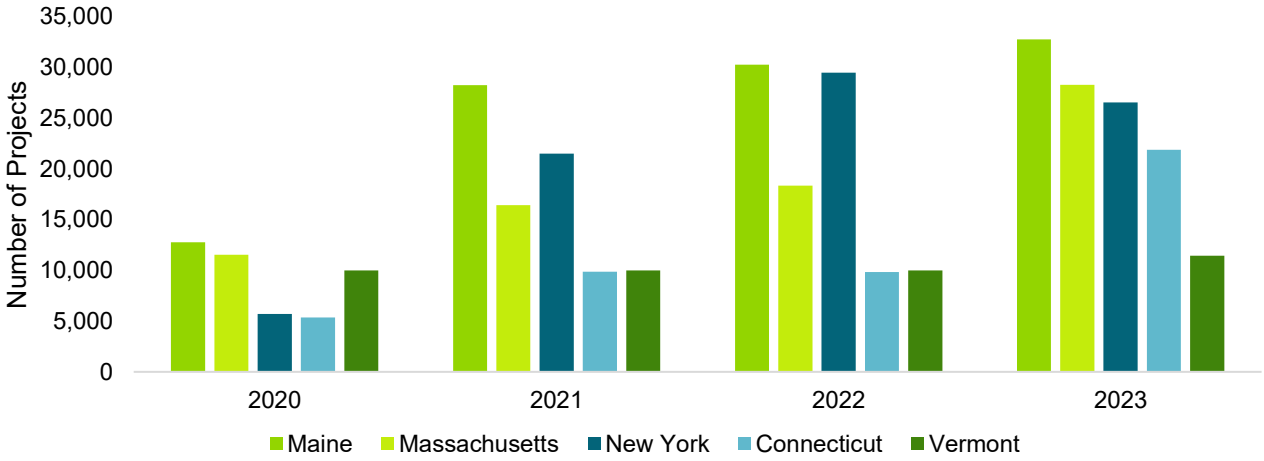
[52] Based on Census Data for 2024.

[53] In FY2024, Maine limited loans to income-eligible applicants due to a high-demand in the previous year leading to a depleting pool of available capital. As a result, there was a significant drop in loan/project volume. For example, it 2023, loans facilitated 1,1258 projects. The loan was originally capitalized with federal funds from the American Recovery and Reinvestment Act of 201 and has since been supplemented by RGGI funds. In FY2025, Maine reinstated its loan offerings for all income levels. However, loan volumes remained relatively low in FY 2025, with loans facilitating 329 projects.

[54] Northeast High-Performance HVAC Market Assessment Report, NEEP, May 2025.

Figure 6-4 below indicates the number of heat pump projects completed in each state for the years 2020 through 2023.

Figure 6-4. Yearly Heat Pump Projects by State 2020 - 2023



Source: Northeast High Performance HVAC Market Assessment Report, NEEP, May 2025

Although New York has a high number of heat pump projects compared to these other states, its heat pump volume is lower on a per capita basis (see Table 6-4 for state population information). Maine has the highest heat pump project volume relative to its population among the included states.

Maine has achieved strong heat pump adoption despite low loan volumes relative to Massachusetts. Maine reported over 28,000 heat pump installations in 2024, despite a loan volume of less than 300.[55] Maine's efforts to increase heat pump adoption have instead focused on other areas including:

- **Marketing and Communication:** Maine has historically been the most heating fuel reliant state in the nation and spends more than $4.5 billion on imported petroleum annually. Heat pumps remain more cost effective and less volatile than heating oil. Spreading awareness on the economic benefits to heat pump electrification has been key to Maine's heat pump adoption strategy.

- **Workforce Development:** Maine has nearly 700 registered heat pump installers. The state invested over $7M in clean energy workforce development and innovation through the Clean Energy Partnership Program (an initiative of DOER). Th Efficiency Maine Trust is also responsible for negotiating instant discounts and stocking incentives with retailers and distributors. [56]

[55] Heat pump installations by year are reported in the DOER 2025 Annual Report. Loan volumes are reported in Efficiency Maine Annual Reports. The DOER 2025 Annual report specifies that "Efficiency Maine bases its count of units on a "heat pump equivalent" to accommodate the diversity of systems installed across the residential and commercial sectors. One "heat pump equivalent" represents the potential to offset 25.1 MMBtu of delivered heat per year.

[56] Governor Mills Announces Reduction of Heating Oil Reliance in Maine, Office of Governor Janet T Mills, September 2025.

It should also be noted that Maine is the most home heating fuel-dependent state in the nation and spends more than $4.5 billion on imported fossil fuels each year.[57] Electricity costs in Miane have also historically been lower than Massachusetts.[58]

These comparisons suggest that loan volume alone does not fully explain adoption patterns. High heat pump volume in states like Maine with relatively low loan volumes reflect the influence of additional programmatic and market factors. This variation also highlights how successful financing programs help drive adoption among customers who require financing, but do not need to serve all customers.

6.5 Summary Findings

1. **The HEAT Loan prioritizes 0% interest, a distinguishing feature amongst prominent financing programs across the country.** While the loan cap and term length offerings are lower than the average of the reviewed programs, the HEAT Loan issued the most loans by volume in 2024. 0% interest encouraging uptake is consistent with the survey finding that interest rate is the most important loan feature to customers.

2. **The HEAT Loan program already applies most financing program best practices.** Of the seven best practices identified by the CT Financing Process Evaluation Study, the HEAT Loan is already fully applying six. There is also some evidence of the program applying the seventh best practice regarding contractor technical fluency, however, it was not fully evaluated in this assessment.

3. **Varying multiple financing program characteristics is common among peer programs (e.g., interest rate and term length).** While the HEAT Loan has a set interest rate, financing cap, and term length, some programs offer multiple combinations of term lengths and interest rates (e.g., Maine) or financing caps and interest rates (e.g., CT), allowing borrowers to choose the option that best fits their needs. Some also offer characteristics that vary based on income or credit score, consistent with the proposed income-tiered term lengths for the HEAT Loan.

4. **Loan volume is not always correlated with heat pump volume.** For example, Maine has the highest heat pump volume in the Northeast but issued loans for only 264 projects in 2024. This highlights the importance of a coordinated approach including incentives, financing, workforce development, and marketing/communication.

5. **While it is the most longstanding, the HEAT loan is not the only financing option in the state, and more options have surfaced within the past year**. These programs can complement the HEAT Loan; for example, the Home Energy Saver Loan program explicitly advertises that the loan can be used along with other loan programs**.**

[57] Maine Energy Plan, Maine Governor's Energy Office, January 2025.
[58] Maine's electricity prices grew at third fastest rate in the U.S. , The Maine Monitor, April 2025.

7. Conclusion

Phase 1 of the HEAT Loan Assessment provides an understanding of how the HEAT Loan supports energy efficiency and electrification goals, where there are opportunities for improvement, and which loan design elements may most strongly influence participation. Findings from stakeholder interviews, customer survey research, tracking data and cost analysis, and benchmarking collectively highlight the HEAT Loan's continued importance, while also identifying opportunities to improve the customer experience, reduce program costs, and strengthen evaluability as the program evolves. Key findings from the study can be summarized as:

- **The HEAT Loan is widely viewed as a critical enabler of electrification.** Stakeholders consistently emphasized that the favorable loan terms play a central role in enabling customers to pursue higher-cost measures, particularly heat pumps. Most surveyed customers indicated the HEAT Loan was essential to the completion of their energy efficiency project.

- **Customers are sensitive to interest rate changes.** Survey results show a sharp decline in willingness to adopt the HEAT Loan with even modest interest rate increases, with a 22% drop from 0% to 1% interest and a steady 12% decline for every 2% increase in interest through 7%. Many interviewees cautioned that increases in interest rate or reduction in term length could dampen participation, especially for customers with limited savings or less urgent projects timelines.

- **Different income groups demonstrate distinct financing behaviors and risk tolerances.** Higher-income households are more likely to self-finance projects or prefer rebates over loans, while lower-income households rely more heavily on affordable financing to proceed. These differences highlight the importance of program design that maintains access and affordability for customers with fewer alternatives.

- **Heat pumps dominate HEAT Loan participation.** Tracking data from 2022-2024 shows that air source heat pumps account for around two-thirds of all financed measures, with the share of air source heat pumps across all financed measures and total loan dollars increasing over time, highlighting the HEAT Loan's central role in electrification. A similar trend was seen amongst survey respondents with 80% of participant respondents indicating they installed a heat pump.

- **HEAT Loan participation declined in 2024, warranting continued monitoring.** After growth from 2022 to 2023, both loan counts and measure counts declined in 2024. This trend underscores the importance of ongoing data review to assess whether recent program changes are influencing uptake.

- **The HEAT Loan's 0% interest offering is unique.** Compared to peer programs, the HEAT Loan's 0% offering is a distinguishing feature. Survey findings show that most participants only considered the HEAT Loan and approximately a third of those respondents did so because the HEAT Loan was the only 0% interest offering available. These findings suggest this feature is a key differentiator supporting Massachusetts' high loan volume and heat pump adoption.

- **There is some friction in the HEAT Loan customer and contractor experience.** Stakeholders pointed to various friction points – such as form requirements, unclear communication, and disconnects with the rebate process – as areas where customers are frustrated and may disengage.

7.1 Recommendations

Findings from Phase 1 suggest that the HEAT Loan continues to play a central role in enabling residential energy efficiency uptake and electrification in Massachusetts. Survey findings suggest that significant changes to HEAT Loan financing terms should be approached carefully over time as results demonstrate a high degree of customer sensitivity to interest rate changes, with willingness to adopt the HEAT Loan declining even with modest increases above 0% interest.

Phase 2 will look to make more specific recommendations following additional research and collaboration with study stakeholders. In addition to directional insights to support future design decisions, Phase 1 identified several other near-term recommendation areas outlined below.

Interviews and survey responses indicate that process complexity, fragmented loan-and-rebate workflows, and limited system visibility are sources of friction. These friction points can contribute to drop-off, increase contractor burden, and require additional administrative effort. The following recommendations may reduce long-term overhead and support higher loan completion rates without major changes to the loan offering:

- Reviewing the authorization process and identifying opportunities to streamline.
- Providing more contractor-facing resources and improving communication channels for contractors (both with the PAs and the HEAT Loan vendor) to ensure contractors are aware of key program changes and have a clear support pathway.
- Strengthening system integration between the loan and rebate process.

Phase 1 also underscores the need to strengthen data collection and tracking to support future decision-making. Greater understanding regarding who collects data and when, along with filling in collection gaps, will help improve evaluability. The following are near-term recommendations:

- HEAT Loan data should be collected on a regular cadence and supported by a clear, standardized data dictionary.
- Vendors should consistently distinguish between participants and authorized non-participants and track customers throughout the full loan process.
- Vendors should also track income-status, as feasible.
- A unique “loan ID” should be included in the data, in addition to the existing “measure ID” and “customer ID”.

7.2 Areas for Future Research

Building on Phase 1 findings, Phase 2 should prioritize targeted analysis to refine key research and address evidence gaps identified in Phase 1. This phase should closely align with upcoming program planning and design considerations.

Recommendations for future areas of research are included in Table 7-1.

Table 7-1. Potential Future Research Areas

Activity	Objective	Rationale
2025 HEAT Loan Customer Survey	Survey both participants and authorized non-participants, building on Phase 1 survey and adding more detailed free ridership, decision-making and customer experience questions.	In Phase 1, some surveyed customers indicated they would have still completed their project without the HEAT Loan. Exploring this counterfactual behavior in more detail in Phase 2 will be critical to understanding free ridership. Further, while Phase 1 focused on assessing participant loan design preferences, there is more to explore around non-participant behavior and reasons for not proceeding with a loan, as well as friction in the customer journey.
Targeted Contractor/ Stakeholder Experience Research	Interview contractors and/or other stakeholders to understand experiences, and workflows in greater depth.	Phase 1 highlighted contractors' central role in the customer journey. A deeper dive will identify where standardization or clarification would produce the greatest return on investment. This research would also help pinpoint reasons for participation declines, as well as what alternative financing options contractors promote.
Customer Journey Mapping	Map the end-to-end customer journey, points of confusion, and improvement opportunities.	Phase 1 survey findings showed most customers did not find the authorization process easy and it is causing some participation drop-off. Mapping will highlight points of confusion, stakeholder roles, and opportunities to streamline.
Deep Dive Data Review	Review 2025 program tracking data to identify uptake trends and reconcile vendor discrepancies.	Phase 1 tracking data review revealed a participation drop in 2024. Monitoring whether this trend continues will help determine if recent program changes are affecting uptake. Further, Phase 1 revealed some vendor data discrepancies which are important to resolve for future tracking and reporting.
Non-participating Lender or PM Interviews	Interview non-participating lenders or PMs from programs reviewed as part of the Phase 1 benchmarking task to identify alternative structures.	Talking to other program stakeholders can provide insight into how alternative structures operate and affect uptake, as well as provide insight into whether participation declines are due to broader market effects or specific program changes.
Customer Focus Groups	Explore detailed customer authorization steps, decision drivers, and barriers.	The Phase 1 survey revealed some confusion around the authorization process. Qualitative work will clarify motivations and pain points to ensure any recommendations for process improvements are targeted at high-impact points.
Lender Data and Experience Survey	Assess lender data management, including approval criteria and rates, loan volumes and amounts, customer profiles, and reimbursement timelines.	Phase 1 revealed there is limited visibility into the post-authorization process. Gathering insights into lenders' management practices will build on Phase 1 lender interview findings. A lender survey could also serve as a framework for future lender data collection.

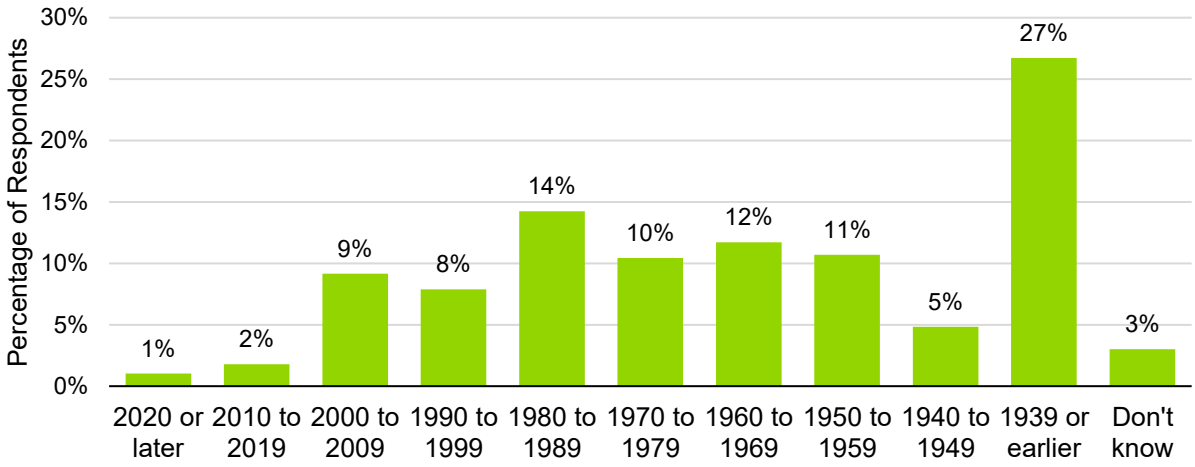
Source: Guidehouse

Appendix A. Survey Respondents' Demographic Information

This section provides the demographic characteristics of survey respondents, offering insight into the composition of the surveyed population. Please note that all demographic questions were optional and responses reflect only those respondents who chose to provide this information.

Almost all respondents (97%) reported owning their home. A higher percentage of respondents (26%) lived in homes built in 1939 or earlier.

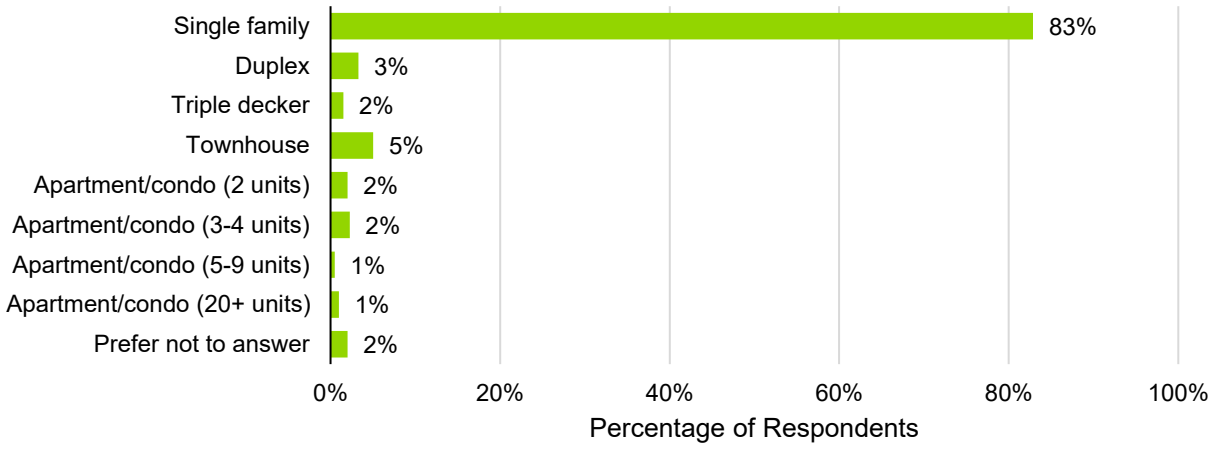
Figure A-1. Please select the range of years in which your home was built.



Source: Guidehouse analysis

Most respondents (83%) live in single family homes.

Figure A-2. Which of the following best describes your current type of housing?



Source: Guidehouse analysis

The average reported household size is 2.88, 42% of homes have children under 18 and 24% of homes have seniors 65+.

Table A-1. Income Level Ranges by Household Size

		Household Size			
		1	2	3	4
Income Level Ranges	Less than 60%SMI	Less than $49,200	Less than $64,300	Less than $79,500	Less than $94,600
	60-80%SMI	$49,201 - $65,600	$64,301 - $85,800	$79,501 - $106,000	$94,601 - $126,100
	80-100%SMI	$65,601 - $82,000	$85,801 - $107,200	$106,001 - $132,500	$126,101 - $157,700
	100-135%SMI	$82,001 - $110,700	$107,201 - $144,700	$132,501 - $178,800	$157,701 - $212,900
	135-200%SMI	$110,701 - $164,000	$144,701 - $214,400	$178,801 - $264,900	$212,901 - $315,400
	200-300%SMI	$164,001 - $246,000	$214,401 - $321,700	$264,901 - $397,400	$315,401 - $473,000
	Over 300%SMI	Greater than $246,000	Greater than $321,700	Greater than $397,400	Greater than $473,000

Source: Guidehouse

Appendix B. Vendor Data Details

This section contains details on the RISE and CLEAResult vendor tracking data reviewed as part of this study.

Table B-1 shows the average financed amount by common measure category for HEAT Loan measures.

Table B-1. Average Financed Amount By Common Measure Category

Measure Category	Average Financed Amount
Air to Water Heat Pump	$27,357
Ground Source Heat Pump	$25,367
Battery	$18,319
Windows	$15,171
Combination Boiler	$13,829
Air Source Heat Pump	$13,355
Hot Water System	$11,796
Central Air	$10,998
Boiler or Furnace	$9,995
Other Heating	$8,665
Knob & Tube	$6,032
Health and Safety	$5,990
Water Heating System	$5,444
Heat Pump Water Heater	$5,277
Other	$4,687
General Weatherization	$2,124

Source: Guidehouse analysis of 2024 HEAT Loan vendor data

Table B-2 on the following page details how fields from the two vendors were mapped to the combined data file.

Table B-2. Customer Level Cross Vendor Mapping

Name in Combined Data	CLEAResult Field	RISE Field
Program	Program	Program
LoanNumber	Loan.Application.Number	Loanno
Custno	Enrollment.Application:Enrollment.ID	Custno
FirstName	Applicant.First.Name	First
LastName	Applicant.Last.Name	Last
StreetAddress	Applicant.Address_1	paste(Streetno, Streetname, Streetst, Aptno)
City	Applicant.City	City
State	Applicant.State	State
ZipCode	Applicant.Zip.Code	Zip
PhoneNumber	Applicant.Phone.Number	paste(Home, Hphone)
Email	Applicant.Email.Address	Email
PropertyType	Property.Type	Dwelltype
NumUnits	No.of.Units	Units
OwnerOccupied	Owner.Occupied	Ownerocc
HeatingFuel	(if_else(typeH.Natural.Gas="Yes","Natural Gas","Other"))	Heatfuel
GasProvider	Gas.service.provider	Gsponsor
ElecProvider	Electric.service.provider	Esponsor
ElecAcctNumber	Electric.Account.Number	Acctno
GasAcctNumber	Gas.Account.Number	NA
ApplicationType	Application.Type	NA
LoanType	Loan.Type	Loantype
LoanTerm	as.double(Term.of.Loan)	as.double(Loanterm)/12
LenderName	Lender.Name	NA
LoanAmt	Lender.Approved.Total.Loan.Amt	Loan_Amt
AppReceivedDate	Application.Received.Date	Loan_App
FormGeneratedDate	Loan.Form.Generated.Date	Regdate
LoanAuthDate	NA	Auth_Date
LoanOfferExpireDate	Expiration.Date	Loan_Exp
LoanCloseDate	Loan.Closed.Date	Loan_Cls
LoanDeniedDate	NA	Loan_Denid
LoanStatus	Status	NA

Source: Guidehouse

Table B-3 shows the same mapping information at the measure level.

Table B-3. Measure Level Cross Vendor Mapping

Name in Combined Data	CLEAResult Field	RISE Field
ID	Enrollment.Application:.Enrollment.ID	Custno_1
MeasNumber	Measure.Line. Item:Measure.Line.Item.Number	Loanno_1
Contractor	if_else(is.na(Contractor), if_else(is.na(Contractor.Name), Add.Contractor.Name, Contractor.Name), Contractor)	Contractor_1
BaselineEquipFuel	Existing.Equipment.Fuel.Type	NA
Measure	Measure.Description	Category
MeasSubType	HP.QPL	Type
MakeModel	NA	paste(Make, Model, sep = " | ")
EquipCost	Total.Cost	Totcost
Incent	Total.Incentive.Requested	Rebamt
FinanceAmt	Amount.to.Be.Financed	Finamnt

Source: Guidehouse

Appendix C. Alternative Loan Design Option Details

This section provides additional detail on the alternative loan design structures reviewed as part of the Benchmarking and Literature Review. A key source in this review was the Current Practices in Efficiency Financing Report prepared by Berkley National Laboratory.

Table C-1. Alternative Loan Design Options Comparison

Loan Type		Description	Benefits	Disadvantages
Specialized Traditional	**Unsecured Loan**	Paid directly to the lender. Interest rates can be lower for borrowers if supported by: • **Loan loss reserves**: a fund available to cover some portion of losses with non-payment of loans. • **Interest rate buy-downs:** direct payment of interest on individual loans.	Familiar to customers, widely used by financial institutions, relatively simple administration, ease of underwriting and fast-approvals for unsecured loans.	May not be transferable, may not be cash-flow positive, does not solve split incentive issues.
	Secured Loan	Paid directly to lender. Attached to some form of collateral. Includes: • **Mortgages:** Finance energy improvements within your mortgage. • **Home Equity Loan**: lump sum loan with fixed interest, secured by your home. • **HELOC:** line of credit secured by your home that gives you a revolving credit line to use for large expenses.	Familiar to customers, collateral often allows for lower interest rates	May take longer to execute and have higher transaction costs than other financing products.
Specialized Non-Traditional	**On-Bill**	Loan repaid via utility bill. Can be offered either as: • **On-Bill Financing:** capital comes from utility shareholder/bill-payer or other public funds. • **On-Bill Repayment:** capital comes from non-utility investors.	May expand financing access, simplify applications, improve borrower cash flow, allow balance transfers, and remain intact through bankruptcy.	Transferability and bankruptcy protection remain largely untested. Billing system upgrades can be costly.
	R-PACE	Secured loan. Repayment via property tax assessment; launched in early 2000s.	Offers lenders strong security, often meaning lower payments for borrowers. Can be transferred.	PACE has faced significant regulatory challenge from key actors in the mortgage market.
	Savings Backed	The service provider assumes the performance risk of efficiency projects by guaranteeing or sharing energy savings. The most relevant type for the residential market is: • **Savings Agreement:** Arrangements between the customer and the agreement provider.	100% financing, long-term payback (usually over 30 years), mitigation of a project's performance risk and mitigation of utility bill price risk.	Savings guarantees can be expensive and introduce transaction costs. May be difficult to implement in residential markets with low-dollar projects.

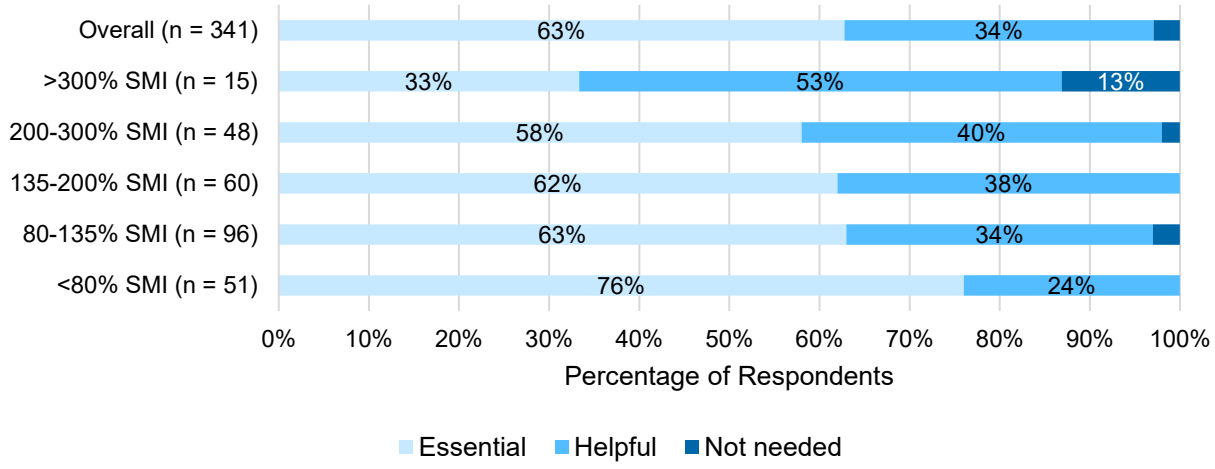
Source: Guidehouse

Appendix D. Survey Results with Additional Income Tiers

Results from select questions were segmented into an additional two income tiers, meaning customers who self-reported their annual income were divided into five income tiers. Tier 1 has been broken into two income tiers, <80% SMI and 80-135% SMI, and Tier 2 has been broken into two income tiers, 135-200% SMI and 200-300% SMI. The <80% SMI group represents the low- and moderate-income (LMI) respondents as defined by the Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan.

As shown in Section 4.4.1, most participants indicated the HEAT Loan was essential to their project. More than 75% of LMI respondents consider the loan essential. The LMI tier, the 80-135% SMI tier and the 135-200% tier were statistically more likely to consider the HEAT Loan essential compared to the >300% SMI tier ($p < 0.05$, Figure D-1).

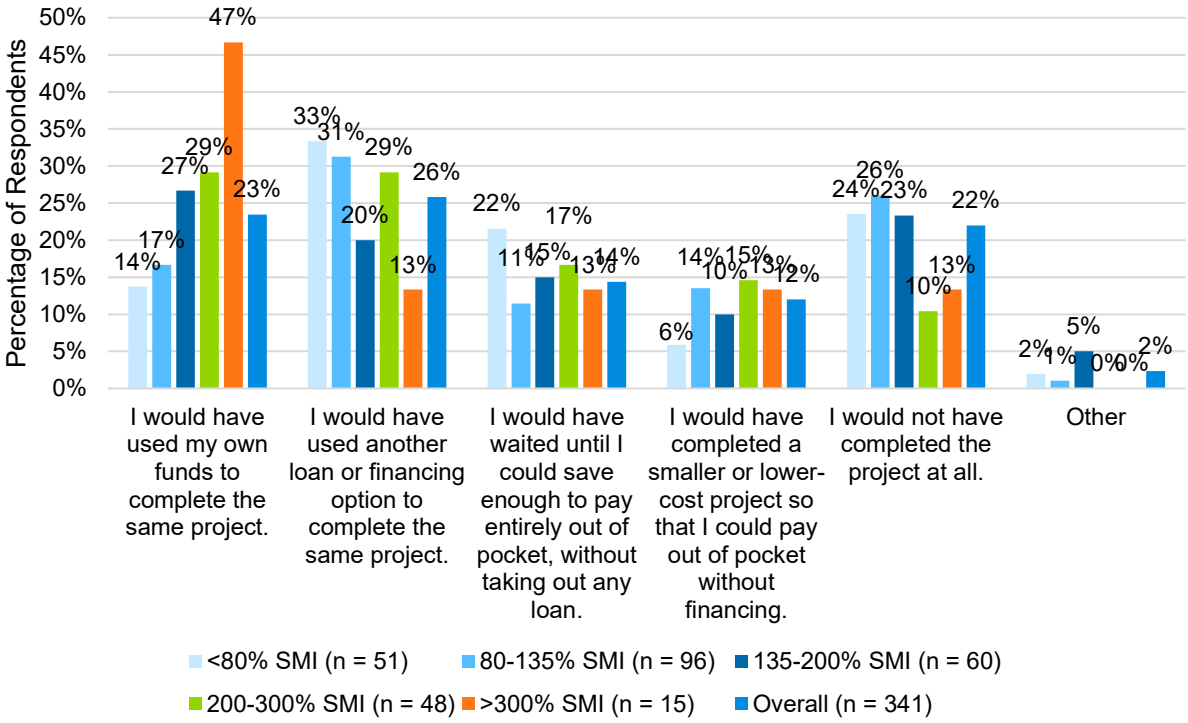
Figure D-1. How important was the HEAT Loan in allowing you to complete your project?



Source: Guidehouse analysis of participant survey results

When asked what action the respondent would have taken if the HEAT Loan had not been available, the results show a clear directional relationship between income and respondents' choice to pay for their project with their funds. The LMI respondents were significantly less likely to fund the project on their own compared to respondents with income greater than 300% SMI ($p < 0.05$). About a third of the LMI respondents would look for another financing option in the absence of the HEAT Loan while almost a quarter of them would not complete the project at all (Figure D-2).

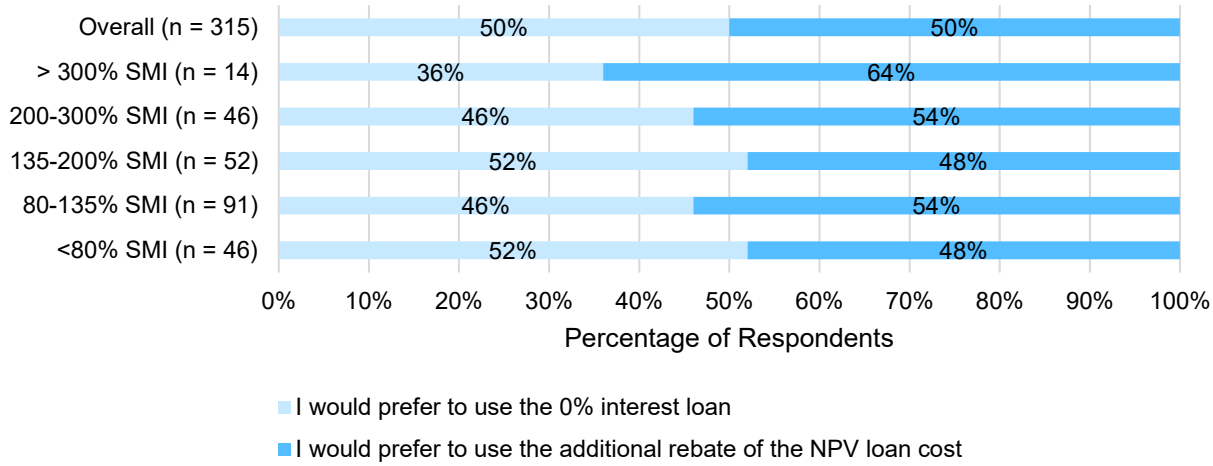
Figure D-2. If the HEAT Loan were not available, which of the following best describes what you would have done?



Source: Guidehouse analysis of participant survey results

As discussed in Section 4.4.2, income tiers aside from >300% SMI were relatively balanced between preferences for a rebate versus a loan when those options cost the same to the utility. The LMI respondents and the 135-200% SMI respondents showed a slight preference for a 0% loan while the 80-135% SMI and 200-300% SMI respondents showed a slight preference for a rebate (Figure D-3).

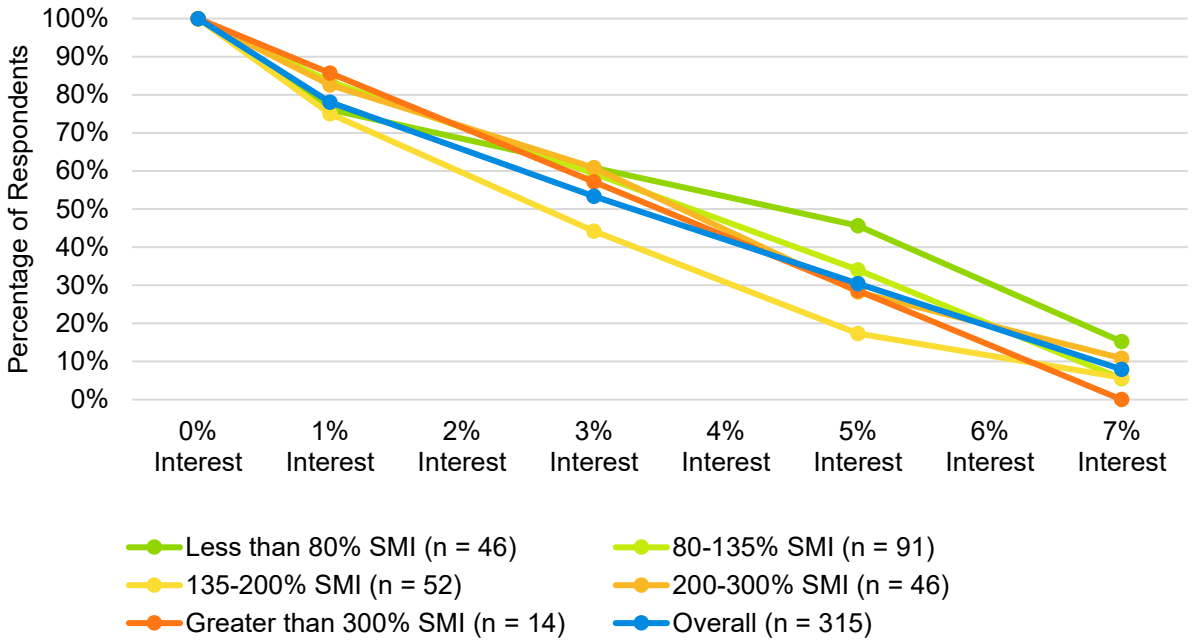
Figure D-3. If you had a choice between a 0% interest 7-year loan with a monthly payment of $[X] OR a rebate of [X] (on top of any other rebates already applied to your project), which would you prefer?



Source: Guidehouse survey analysis of participant survey results

Similar to the results shown in Section 4.4.3, the willingness-to-adopt responses when testing different nonzero interest rates did not demonstrate any strong patterns by income level. Once again, the only statistically significant income differences emerge at the 5% interest rate where LMI respondents are more likely than the 135-200% SMI respondents to be willing to adopt a HEAT Loan ($p < 0.05$, Figure D-4).

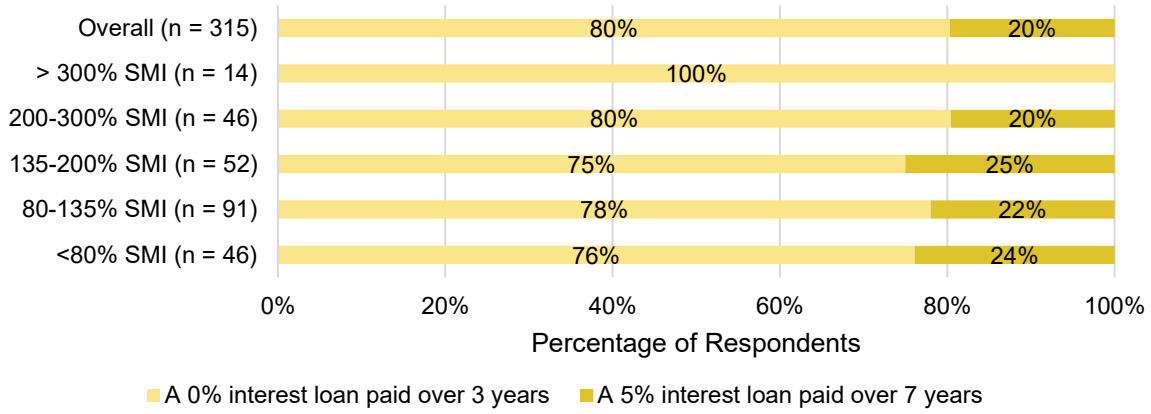
Figure D-4. Willingness to Adopt a HEAT Loan at Different Interest Rates by Income Level



Source: Guidehouse survey analysis of participant survey results

When asked whether they would prefer a 0% interest loan repaid over 3 years or a 5% interest loan repaid over 7 years, 75-80% of the respondents in each tier preferred the 0% interest rate over a shorter term apart from the >300% SMI tier where 100% preferred the 0% interest loan (Figure D-5).

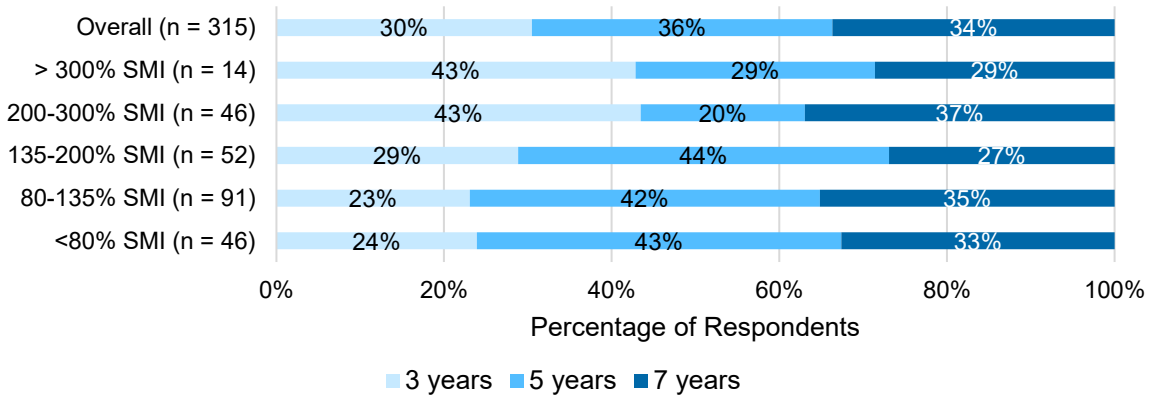
Figure D-5. Imagine you are given two loan options. Which one would you choose?



Source: Guidehouse analysis of participant survey results

Responses varied somewhat by income level when respondents were asked whether they would prefer a three-year, five-year or seven-year term for a loan with a 2% interest rate. Among respondents with incomes below 200% SMI, the most frequently selected option was a five-year term. In contrast, respondents with incomes above 200% SMI most often preferred a three-year term (Figure D-6).

Figure D-6. Imagine you are completing your energy efficiency project for a total cost of $[X] and are offered a loan at 2% interest. Which term length would you prefer?



Source: Guidehouse survey analysis of participant survey results

Appendix E. Additional Benchmarking Details

Table E-1 Below indicates what measures are funded by each of the loan programs reviewed as part of the benchmarking assessment.

Table E-1. Measures Funded by Benchmarked Programs

Program	Measures Funded
Michigan Saves	Roofing, solar photovoltaic, insulation, low-flow toilets, faucets, showerheads, windows, air sealing, smart appliances, remediation, HVAC, water heaters, heat pumps, battery storage, EVs
GoGreen Financing (California)	Appliances, cool roofs, EV charging, efficient appliances, heating and cooling, insulation, lighting, water heating, pool products
CT Heating Loan	Heating systems, solar and battery systems, weatherization, appliances, fiber internet, EV charging.
CT Smart-E Loan	Solar PV, high efficiency heating and cooling equipment, insulation, resilience, or other home energy upgrades.
Efficiency Maine Home Energy Loan	Heat pumps, insulation and air sealing.
NYSERDA Smart Energy Loan (New York)	Solar photovoltaic systems, ground source heat pumps, air source heat pumps, and energy efficiency improvements.
Green Energy Money $aver (Hawaii)	Solar water heaters, solar PV systems, heat pump water heaters, or energy storage systems.
Switch It Up (Washington)	Heating systems, solar and battery systems, weatherization, appliances, fiber internet, EV charging.
CT Micro Loan	High-efficiency HVAC, High-efficiency water heating, weatherization.
TVA EnergyRight (Tennessee Valley)	HVAC units, insulation, air sealing, duct systems, water heaters
Midwest Energy How$MART (Kansas)	Insulation/air sealing, geothermal, lighting.
NYSERDA On-Bill Recovery Loan (New York)	Solar photovoltaic systems, ground source heat pumps, air source heat pumps, and energy efficiency improvements.

Source: Guidehouse