**January 2023**



NJNG Home Performance with Energy Star Process & Impact Evaluation

PY1 Final Report

Table of Contents

Abstract i

Executive Summary i

Research Methods i

Program Design ii

Program Implementation iv

Impact Evaluation iv

Key Findings vii

Recommendations xii

I. Introduction and Conclusions 1

A. Key Findings and Recommendations 1

B. Report Contents 9

II. Evaluability Assessment 10

III. Process Evaluation 12

A. Research Conducted 12

B. Program Design 13

C. Program Implementation 16

D. Challenges 26

IV. Impact Evaluation 28

A. Research Conducted 28

B. Measures Installed 28

C. Measure Confirmation 30

D. Net to Gross Analysis 31

E. Savings and Realization Rates 32

F. TRM Updates 34

G. Non-Energy Impacts 35

V. Program Comparisons 36

VI. Appendices 39

A. HPwES Statistics 40

B. Participant Survey Instrument 47

C. Participant Feedback 71

D. Partial Participant Interview Guide 94

E. Partial Participant Feedback 97

F. Contractor Interview Guide 102

G. Contractor Feedback 110

Abstract

This report presents the findings from the Program Year 1 (PY1) Process and Impact Evaluation of New Jersey Natural Gas’ (NJNG) Home Performance with Energy Star Program (HPwES). The goals of this evaluation are to analyze program impacts on energy usage, realization rates, updates needed to the Technical Reference Manual (TRM), cost-effectiveness, challenges faced, and opportunities to improve program performance.

The NJNG PY1 HPwES Process and Impact Evaluation included the following research.

* Document Review: Review and analysis of all available program documentation.
* Interviews: In-depth telephone interviews with program actors.
* Quality Control Report Review: Review of the third-party quality control inspection reports.
* Participant Surveys: Surveys with full participants and partial program participants[[1]](#footnote-1).
* Program Data Analysis: Review of the HPwES database and generation of statistics.
* Evaluability Assessment: Assessment of available data for an Enhanced Rigor Evaluation.[[2]](#footnote-2)
* Net-to-Gross (NTG) Analysis: Use of participant survey data to develop the NTG estimate.
* Realization Rate Analysis: Comparison of plan and modeled savings estimates.
* Program Comparisons: We provide a comparison of these findings to other Home Performance programs offered in New Jersey and in other jurisdictions across the country.
* Recommendations for Refinement: Recommendations for program refinement are made based upon all of the research conducted.

The following additional research is planned.

* Technical Reference Manual Updates: We will compare the SnuggPro estimates to individual measure savings calculated through the NJ Technical Reference Manual (TRM) and recommend updates to the TRM in a separate memo prior to the TRM updates in early 2023.[[3]](#footnote-3)
* Cost-Effectiveness Analysis: We will use the projected savings and NJNG’s reported avoided costs to verify NJNG’s calculation of the NJ Cost Test and the other cost tests. This analysis will be conducted in PY2.

**Net-to-Gross**

Table A-1 shows that the free ridership calculation for the program overall was 87 percent (Method 1). An additional calculation was performed where customers who did not confirm installation of the measure (except a “refused” response) were assigned a free ridership score of zero (Method 2). The evaluation did not assess that there was spillover from the program.

**Table A-1**

**Net to Gross Analysis**

| **Free Rider Adjustment** | | | | |
| --- | --- | --- | --- | --- |
|  | **Method 1** | | **Method 2** | |
| **Respondents** | **NTG** | **Respondents** | **NTG** |
| Weighted Program Level | 89 | 87% | 91 | 89% |
| Air Sealing & Insulation | 89 | 89% | 91 | 89% |
| Heating System | 28 | 87% | 29 | 88% |
| Cooling System | 21 | 81% | 21 | 81% |
| Duct Sealing | 8 | 77% | 33 | 94% |
| Water Heating | 7 | 87% | 7 | 87% |

**Updated Savings Estimates**

Updated savings estimates for PY1 are based on the program’s modeled values. The program served 63 percent of the projected participants due to the short amount of time to ramp up following the filing. Average annual gas savings per home served were 68 percent of those projected in the plan. The total lifetime gas savings were 38 percent of the plan, due both to lower than projected savings in homes served and less than the expected number of customers treated in the first year.

**Table A-2**

**Comparison of HPwES Plan Savings and PY1 Savings**

| **PY1 Data** | **HPwES Plan** | **SnuggPro** | **Realization** |
| --- | --- | --- | --- |
| Participants | 670 | 425 | 63% |
| Annual Natural Gas Savings (Therms) | 206,938 | 89,250 | 43% |
| Participant Annual Gas Savings (Therms) | 309 | 210 | 68% |
| Lifetime Annual Gas Savings (Therms) | 3,517,940 | 1,334,925 | 38% |
| Participant Lifetime Gas Savings (Therms) | 5,251 | 3,141 | 60% |
| Annual Electric Savings (kWh) | 647,013 | 172,550 | 27% |
| Participant Annual Electric Savings (kWh) | 966 | 406 | 42% |
| Lifetime Annual Electric Savings (kWh) | 10,999,220 | 2,555,100 | 23% |
| Participant Lifetime Electric Savings (kWh) | 16,417 | 6,012 | 37% |

We analyzed pre-treatment energy usage for the HPwES program participants and found that the gas savings that were modeled in SnuggPro averaged 19 percent of the actual pre-treatment usage (based on a weather-normalized billing analysis). This compares to the 21 percent savings estimated using billing data for NJNG’s 2013 HPwES participants with somewhat lower average pre-treatment usage than the PY1 NJNG participants. Therefore, a future billing analysis may show higher average natural gas savings than what was modeled in SnuggPro.

**Table A-3**

**Distribution of SnuggPro Savings as a Percentage of Pre-Treatment Usage**

| **Variable** | **Number of Jobs** | **Mean** | **Percentile** | | |
| --- | --- | --- | --- | --- | --- |
| **25** | **50** | **75** |
| Annual Therm Use Pre-Program | 347 | 1,217 | 854 | 1,114 | 1,434 |
| Annual Percent Gas Savings | 347 | 19% | 8% | 14% | 27% |

**TRM Update Values**

SnuggPro, the energy modelling software, calculates the HPwES energy savings using a proprietary algorithm, so it is not possible to assess specifically how those estimates were calculated and should be adjusted. Initial analysis of the savings calculations suggests that the savings may be understated based on a comparison to previous billing analysis of NJNG’s 2013 HPwES program participants.

Future evaluation will further assess the modeled savings using the following approaches.

* Comparison to measure specific TRM estimates.[[4]](#footnote-4)
* Comparison to pre/post weather-normalized, comparison group-adjusted billing estimates.

**Recommendations**

Recommendations based on the research presented in this report are detailed below.

* Budgeting: Coordinate with electric utilities on expected jobs and costs prior to the next triennial to better align funding.
* Data Availability: Develop a method to obtain information on recommended measures that were not installed.
* Program Eligibility: Contact customers who were partial participants and assess eligibility for NJ Comfort Partners and Moderate-Income Weatherization (MIW).
* Contractor Recruitment: When recruiting contractors, highlight HPwES participation benefits including increased business, credibility, education, and training.
* Contractor HPwES Entry Challenges: If NJNG is not successful when they begin recruiting additional contractors, assess how to help contractors with paperwork and explore potential options for gap financing assistance.
* Contractor Training: Provide training on SnuggPro saving calculations, building science, customer service and sales, mechanical equipment, and combustion appliances.[[5]](#footnote-5)
* HPwES Marketing: Make sure contractors are aware of NJNG’s portal and consider increasing contractor marketing support to previous levels.[[6]](#footnote-6)
* Marketing Messages: Highlight energy bill savings, improved home comfort, new equipment, reduced carbon footprint, and improved air quality when promoting HPwES to customers.
* On-Bill Repayment (OBRP) Application: Include additional information on the OBRP application that clarifies the type of project. Also provide a checklist with the offerings and qualifications.
* Customer Education: Provide a document that clearly explains the rebate calculation and the on-bill repayment plan. Train contractors to educate customers and provide a one-page summary of installed measures.
* Quality Control Inspections: Increase the frequency of quality control inspections as soon as possible. Provide warnings to contractors about program participation consequences when gas leaks are found.
* Quality Control Report: Require the QC checklist to be submitted for all completed quality control inspections. (Note that this change has been made.)
* Net-to-Gross Calculation: Consider adjustment to the NTG score for customers who do not recall measure installation.
* Modeled Savings: Compare pre and post blower door readings to the 20 percent value and assess whether the air leakage reduction value or calculation methodology should be changed.

It is important to note that some recommendations must be considered and explored in consultation with the other NJ utilities since this is a core program and the BPU has directed the utilities strive for consistency in the delivery of core programs.

Executive Summary

The Clean Energy Act of 2018 (CEA) called for a significant overhaul of New Jersey’s energy systems while growing the economy, building sustainable infrastructure, creating well-paying local jobs, reducing carbon emissions, and improving public health. The CEA required each New Jersey investor-owned gas and electric utility (IOU) to develop energy efficiency (EE) programs in their service territories. In response to the passage of this Act, administration of most EE programs was transitioned from the New Jersey Board of Public Utilities (BPU) to the IOUs, and additional new EE programs were designed and implemented, beginning in July 2021.

The Home Performance with Energy Star (HPwES) program is one of the programs that New Jersey Natural Gas (NJNG) began administering in July 2021. HPwES provides rebates and on-bill financing (OBRP) for customers to pursue energy-efficient upgrades in their homes. Upgrades are recommended based on the findings of a comprehensive home audit. Measures include air sealing, duct sealing, insulation, high-efficiency heating and air conditioning, and water heating.

This report presents the findings from the Program Year 1 (PY1) Process and Impact Evaluation of NJNG’s HPwES Program. The evaluation aims to provide program impacts on energy usage, realization rates, updates needed to the Technical Reference Manual (TRM)[[7]](#footnote-7), cost-effectiveness, challenges faced, and opportunities to improve program performance.

Research Methods

The NJNG PY1 HPwES Process and Impact Evaluation included the following research.

* Document Review: Review and analysis of all available program documentation including the HPwES plan, contractor agreement, HPwES measures and testing procedures, program marketing, and the customer participation application and agreement.
* Interviews: In-depth telephone interviews were conducted with NJNG managers and staff, the third-party quality control inspector, and a sample of installation contractors.
* Quality Control Report Review: All of the third-party quality control inspection reports were reviewed.
* Participant Surveys and Interviews: A quantitative survey was conducted with program participants, and in-depth interviews were conducted with customers who undertook a home assessment but did not move forward with program participation.
* Program Data Analysis: The HPwES program database was reviewed, and key program statistics were generated.
* Evaluability Assessment: The level of data available and additional data needed for an Enhanced Rigor Evaluation were assessed.[[8]](#footnote-8)
* Net to Gross Analysis: Data from the participant survey were analyzed to develop the Net-to-Gross (NTG) estimate.
* Realization Rate Analysis: The initial program savings estimate from the HPwES plan, the modeled savings in the program database, and the percent of actual pre-treatment natural gas usage that was modeled were compared.
* Program Comparisons: We provide a comparison of these findings to other Home Performance programs offered in New Jersey and in other jurisdictions across the country.
* Recommendations for Refinement: We make recommendations for program refinement based upon all the research conducted.

The following additional research is planned.

* Technical Reference Manual Updates: We will compare the SnuggPro estimates to individual measure savings calculated through the NJ Technical Reference Manual (TRM) and recommend updates to the TRM in a separate memo prior to the TRM updates in early 2023.[[9]](#footnote-9)
* Cost-Effectiveness Analysis: We will use the projected savings and NJNG’s reported avoided costs to verify NJNG’s calculation of the NJ Cost Test and the other cost tests. This analysis will be conducted in PY2.

Program Design

Home Performance with Energy Star (HPwES) provides a holistic approach for customers to reduce energy usage and improve the comfort and safety of their homes. Upgrades are recommended based on the findings of a comprehensive home audit. Measures include air sealing, duct sealing, insulation, high-efficiency heating and air conditioning, and water heating. All HPwES projects must include air sealing and insulation. Customers receive rebates and may also use NJNG’s On-Bill Repayment Program (OBRP) to assist with the costs of these services.

NJNG had been implementing HPwES incentives and OBRP in coordination with the BPU incentives for several years, but many changes were made when the program management was transitioned to the utilities. Key changes related to program incentives, utility coordination, and reporting.

Table ES-1 displays the participation and savings goals, as well as the projected expenditures based on NJNG’s program plan. NJNG was required to develop their plan in a short timeframe, and before details were agreed upon across the utilities, so it is expected that the actual program implementation will differ from these initial projections.

**Table ES-1**

**HPwES Goals and Resources**

| **Metric** | **PY1** | **PY2** | **PY3** |
| --- | --- | --- | --- |
| Participants | 670 | 737 | 774 |
| Net Annual Natural Gas Savings (Therms) | 206,938 | 227,631 | 239,013 |
| Net Lifetime Natural Gas Savings (Therms) | 3,517,940 | 3,869,734 | 4,063,220 |
| Net Annual Electric Savings (kWh) | 647,013 | 711,714 | 747,300 |
| Net Lifetime Electric Savings (kWh) | 10,999,220 | 12,099,142 | 12,704,099 |
| Net Annual Peak Demand Savings (kW) | 22 | 24 | 25 |
| Net Lifetime Peak Demand Savings (kW) | 373 | 411 | 431 |
| Projected Expenditures | $9,455,211 | $10,088,142 | $10,550,060 |

“The SAVEGREEN Project Program Plan,” New Jersey Natural Gas, Published: December 21, 2020 and approved by the BPU on March 3, 2021.

The HPwES program has the following objectives.

* Achieve deep energy savings by reviewing opportunities for both the building envelope and equipment replacement.
* Increase customer awareness of how HPwES can improve home efficiency and comfort.
* Develop a trade ally network with Building Performance Institute (BPI) certified contractors.

HPwES is one of the “Core” residential energy efficiency programs which means that eligibility and incentives are aligned across the utilities and customers seamlessly receive both gas and electric measures and incentives from one contractor even if they are served by two different utilities. The primary utility is the utility that the customer or contractor applies to for program incentives.

Eligibility

All NJNG natural gas customers who live in single-family detached and single-family attached (1- to 4-unit buildings) are eligible for HPwES. The program is coordinated with the electric utility that serves the participating household.

Incentives

NJNG provides rebates and OBRP financing to eligible participants with modeled energy savings of at least five percent who install qualified measures. Energy efficiency improvements must be installed by a BPI-certified contractor who completed the NJNG contractor participation agreement process. All HPwES projects are required to include air sealing and insulation with pre and post blower door testing.

Rebates are $2,000 plus $150 for each percentage point of modeled savings above five percent, with a cap of $5,000 and 50 percent of project costs. The contractor receives an incentive of $500 per completed job.[[10]](#footnote-10) These incentives are consistent across the utilities.

Loans are offered at zero percent APR, with a seven-year term for loans up to $10,000 and a ten-year term for loans greater than or equal to $10,000. NJNG reports that most customers take as much financing as is available.

Program Implementation

NJNG serves as the HPwES program administrator and takes responsibility for data system development, marketing and outreach, contractor recruitment and training, review of applications for rebates and financing, review of paperwork for completed jobs, and approval for rebate and financing payments.

NJNG approves installation contractors who assess the homes and install or subcontract the measures. Contractors are required to sign an agreement with NJNG and meet several requirements relating to BPI certification and insurance. NJNG currently has 24 participating HPwES contractors. However, five of them perform the majority of all HPwES jobs. NJNG also contracted with a third-party contractor for quality control inspections.

NJNG has used several marketing methods to recruit customers, including their website, social media, newsletters, print advertisements, partnerships with municipalities, and direct customer outreach.

Impact Evaluation

Analysis of the **425 PY1 participants** in the HPwES database showed that the following measures were installed.

* Air Sealing and Insulation: 100 percent
* Duct Sealing: 44 percent
* Heating System Replacement: 32 percent
* Water Heater Replacement: 29 percent
* Cooling System Replacement: 27 percent

The HPwES database does not include measures that were recommended but not installed. In the participant survey, **79 percent reported that they installed all recommended measures**. Of those who did not install measures, they were most likely to not install a new heating system or hot water heater, either because it was too expensive or not needed because of current equipment that worked well or was recently replaced.

Respondents to the participant survey were asked to confirm installation of up to three major program measures. Between **96 and 100 percent of respondents confirmed air sealing and insulation, heating system, cooling system, and water heater installations**. While 23 percent confirmed duct sealing and 47 percent said they did not know if the work was done, 27 percent said it was not done. This may be because contractors provided duct sealing in coordination with HVAC work or because the participant did not focus on this less tangible aspect of the project.

Net-to-Gross

The HPwES participant survey included a battery of questions to assess free ridership and spillover. Except for the new cooling system, the majority of respondents stated that they had not planned to have the work done before they heard about the HPwES program.

Table ES-2 shows that the free ridership calculation for the program overall was 87 percent (Method 1). An additional calculation was performed where customers who did not confirm installation of the measure (except a “refused” response) were assigned a free ridership score of zero (Method 2). Since these customers did not recall the measure being installed, it is very unlikely that they would have undertaken the measure in the absence of HPwES. This change increased the duct sealing NTG to 94 percent and the program NTG to 89 percent.

While 20 percent of respondents said that they installed other energy efficiency improvements or products that they did not receive rebates for, many of these measures did appear to be included in the HPwES project based on additional survey responses, and only five percent said that the HPwES program was extremely important in their decision to install these measures that were not covered by the program. Contractors also reported that the program covered all measures or that there were rarely some related measures that usually did not have energy savings associated with them.

**Table ES-2**

**Net to Gross Analysis**

| **Free Rider Adjustment** | | | | |
| --- | --- | --- | --- | --- |
|  | **Method 1** | | **Method 2** | |
| **Respondents** | **NTG** | **Respondents** | **NTG** |
| Weighted Program Level | 89 | 87% | 91 | 89% |
| Air Sealing & Insulation | 89 | 89% | 91 | 89% |
| Heating System | 28 | 87% | 29 | 88% |
| Cooling System | 21 | 81% | 21 | 81% |
| Duct Sealing | 8 | 77% | 33 | 94% |
| Water Heating | 7 | 87% | 7 | 87% |

Energy Savings and Realization

Table ES-3 compares the projections from the HPwES plan to the modeled PY1 results. NJNG’s modeled gas savings were higher than the other reviewed HPwES programs and their electric savings were lower (see Section V).

The program served 63 percent of the projected participants due to the short amount of time to ramp up following the program filing. Average annual gas savings per home served were 68 percent of those projected in the plan. The total lifetime gas savings were 38 percent of the plan, due both to lower than projected savings in homes served and less than the expected number of customers treated in the first year.

**Table ES-3**

**Comparison of HPwES Plan Savings and PY1 Savings**

| **PY1 Data** | **HPwES Plan** | **SnuggPro** | **Realization** |
| --- | --- | --- | --- |
| Participants | 670 | 425 | 63% |
| Annual Natural Gas Savings (Therms) | 206,938 | 89,250 | 43% |
| Participant Annual Gas Savings (Therms) | 309 | 210 | 68% |
| Lifetime Annual Gas Savings (Therms) | 3,517,940 | 1,334,925 | 38% |
| Participant Lifetime Gas Savings (Therms) | 5,251 | 3,141 | 60% |
| Annual Electric Savings (kWh) | 647,013 | 172,550 | 27% |
| Participant Annual Electric Savings (kWh) | 966 | 406 | 42% |
| Lifetime Annual Electric Savings (kWh) | 10,999,220 | 2,555,100 | 23% |
| Participant Lifetime Electric Savings (kWh) | 16,417 | 6,012 | 37% |

HPwES Participants Pre-Treatment Usage and Projected Savings

We also analyzed pre-treatment energy usage for the HPwES program participants. We found that the **gas savings that were modeled in SnuggPro averaged 19 percent of the actual pre-treatment usage** (based on a weather-normalized billing analysis).[[11]](#footnote-11) This compares to the 21 percent savings estimated using billing data for NJNG’s 2013 HPwES participants who had somewhat lower average pre-treatment usage than the PY1 NJNG participants. Therefore, a future billing analysis may be expected to show greater than 19 percent savings and higher average natural gas savings than projected by the software.

**Table ES-4**

**Distribution of SnuggPro Savings as a Percentage of Pre-Treatment Usage**

| **Variable** | **Number of Jobs** | **Mean** | **Percentile** | | |
| --- | --- | --- | --- | --- | --- |
| **25** | **50** | **75** |
| Annual Therm Use Pre-Program | 347 | 1,217 | 854 | 1,114 | 1,434 |
| Annual Percent Gas Savings | 347 | 19% | 8% | 14% | 27% |

TRM Updates

SnuggPro, the energy modelling software, calculates the HPwES energy savings using an energy modelling engine called OptiMiser. Because it is a proprietary algorithm, it is not possible to assess how those estimates are calculated and should be adjusted. Initial analysis of the savings calculations suggests that the savings may be understated based on a comparison to previous billing analysis of NJNG’s 2013 HPwES program participants.

Future evaluation will further assess the modeled savings using the following approaches.

* Comparison to measure specific TRM estimates (prior to TRM updates in early 2023).[[12]](#footnote-12)
* Comparison to pre/post weather normalized, comparison group adjusted, billing estimates (when post-treatment usage data are available in PY2 or PY3).

Non-Energy Impacts

HPwES survey respondents reported many positive non-energy impacts that resulted from their program participation. While **58 percent said the home was more comfortable**, others noted improved hot water temperatures, improved air quality, and reduced noise. Respondents also placed high value on these benefits, as **61 percent said that these benefits had much more value or somewhat more value than the energy savings**.

Cost-Effectiveness

We will use the modeled savings and NJNG’s reported avoided costs to verify NJNG’s calculations of the NJ Cost Test and the other cost tests. This analysis will be conducted in fall 2022.

Key Findings

Key findings from the research are summarized below.

Evaluability Assessment

The only key data that were not available were measures that the contractor recommended that were not installed.

Modeled Energy Savings

One specific item to note regarding the savings calculations is that since October 20, 2021, HPwES air leakage reduction defaulted to a fixed 20 percent reduction. While contractors are still required to enter pre- and post-blower door results at project completion, the actual blower door results do not change the TES calculations. Contractors and NJNG staff perceive that this results in an underestimate of program savings.

This change was made because blower door results affect the loan and incentive amounts for that project and may require resubmission of all loan documents. Setting a fixed reduction prevents this need for loan resubmission and provides the customer with a known loan amount which can improve the relationship between the contractor and the customer. NJNG plans to compare the actual blower door reduction in air leakage to the 20 percent fixed value and assess whether and how this methodology should be changed.

Net-to-Gross Estimate

The Net-to-Gross calculation[[13]](#footnote-13) for the program overall was 87 percent. Values for individual measures ranged from 77 percent for duct sealing to 89 percent for air sealing and insulation. These results are shown in Table IV-4.[[14]](#footnote-14) These findings are similar to other HPwES programs reviewed in Section V.

The NTG score was much lower for duct sealing than the other measures because participants who did not confirm that they received a measure were not asked the free ridership and spillover questions related to that measure. For most measures there were very few participants who did not confirm measure installation but for duct sealing these were a majority of responses. An additional calculation was performed where customers who did not confirm installation of the measure (except a “refused” response) were assigned a free ridership score of zero. Since these customers did not recall the measure being installed, it is very unlikely that they would have undertaken the measure in the absence of HPwES. This change increased the duct sealing NTG to 94 percent and the program NTG to 89 percent.

Marketing

* Marketing Methods: Contractors used websites, social media, radio, print and television advertisements, and the NJNG portal to market the program. NJNG marketing, including the portal and contractor marketing reimbursement, had been helpful for most.
* Marketing Message: Participant survey respondents reported that they decided to participate in HPwES for the following reasons.
  + Reduce energy bills (61 percent)
  + Improve home comfort (49 percent)
  + Replace old equipment (38 percent)
  + Reduce their carbon footprint (29 percent)
  + Improve their home air quality (20 percent).

Contractors reported the same priorities among their HPwES customers.

Contractors

* Contractor Participation: NJNG had **17 contractors who delivered HPwES services in PY1**. However, **90 percent of the jobs were completed by nine contractors**. The top producing contractors performed 37, 16, and 11 percent of the jobs.
* Contractor Training: Under the previous program NJNG provided frequent training to contractors to increase their skills and understanding of the program. With the transition, NJNG has concentrated on training related to the new program processes. They are planning to reinstitute the training after the implementation challenges are addressed and pandemic restrictions on in-person events are lifted. Contractors noted that training on SnuggPro saving calculations, building science, customer service and sales, mechanical equipment, and combustion appliances would be helpful.

HPwES Participation

* Customer Participation: Overall, there were 425 HPwES jobs that had a work complete submit date and were considered closed by NJNG in PY1. This participation compares favorably to the 670 participants projected for PY1 given the brief time between program filing and implementation.
* Program Eligibility: Based on participant survey responses to questions about income and household size, a large percentage of the HPwES participants have income at or below 250 percent of the Federal Poverty Level (FPL) and may be eligible for NJ Comfort Partners (26 percent) or from 251 to 400 percent of the FPL and may be eligible for the Moderate-Income Weatherization Program (15 percent).[[15]](#footnote-15)
* Improvement Costs and Incentives: While the **mean project cost was just under $12,000**, the mean total incentive was $10,655 including the OBRP. The average participant had an upfront out of pocket cost of $1,340 and an average loan of $7,331.
* Utility Coordination: While the utilities are currently using a SharePoint site for coordination, they will eventually use a system set up by the statewide coordinator. The utilities have weekly meetings to discuss technical program issues. The largest issue that has been faced to date has been differences in utility budgeting which could potentially restrict job completion. The gas and electric utility budgets must align so that rebates are available for both fuels. Additional planning may be needed to ensure that sufficient budgets are available.

Challenges

The overriding challenge faced by NJNG was the extremely short timeline between their filing and the July 1, 2021 implementation date. NJNG had extensive work to complete in the short time, including coordination with the other NJ utilities, setting up internal systems, data collection and management procedures, qualifying installation contractors, and hiring quality control and evaluation contractors.

NJNG managers and staff reported that the main challenges they faced in HPwES were the end-to-end functioning of the software, customer confusion, lack of BPI contractors, and the quality of some contractors’ work. Given the need to implement the program so quickly, NJNG developed workarounds when needed, which were then disabled when the systems became more functional. This required internal staff training as well as contractor training.

Other challenges reported by NJNG were as follows.

* Contractor Participation: The initial cost to become an HPwES contractor is a significant barrier to entry for non-HPwES contractors. Recruiting contractors who can afford the BPI certification, necessary accreditations, equipment, paperwork costs, and working capital has proven difficult in the past. However, it was not a focus in the first year when the new program was ramping up.
* Work Quality: NJNG is finding it challenging to combat the rush mentality that some contractors have to complete one project and quickly move to the next. There is a tendency for some contractors to complete the installation as quickly as possible, resulting in insufficient air sealing or attic insulation, gas leaks, and mistakes in reporting the model numbers.
* Supply Chain Issues: Contractors have faced challenges due to supply-chain issues. Prices have increased and there are equipment shortages. Water heaters and furnaces were severely impacted by these issues. Additionally, materials such as foam have been scarce. However, contractors said that these problems have improved, and some said it is no longer a significant issue. Contractors also face challenges hiring staff needed to complete the work.

Participation Barriers

* Customer Application: NJNG reported that some customers do not understand the program and submit incorrect applications.
* Customer Education: Of the few participants who did not understand HPwES, most said it was the rebate level or OBRP that they did not understand.
* Customer Participation: Partial participants faced challenges in the program due to cost, failure to qualify due to low savings, denial for financing, and confusion about the program. Contractors said that customers faced barriers related to financing, home issues, calculated energy savings, and health and safety issues. Most contractors reported that health and safety barriers were not a common occurrence. When they did face barriers, the most common were mold and moisture, and knob and tube wiring.
* Partial Participants: Contractors had varying estimates of the percentage of customers who proceed with measure installation, ranging from 30 percent to 80 percent. Future data analysis will study the percent of submitted jobs that were not completed.
* Dropout Reasons: More than half of the partial participant respondents said that cost was a barrier to HPwES participation. They stated was that the HPwES incentives were not large enough, the job was more expensive than their neighbors’ jobs, or the expected energy savings were not high enough to justify the cost. Some of these customers participated in the electric utility’s program or installed some of the work outside of the program that was less extensive than what was required to obtain program incentives.
* Health and Safety Repairs: Only two percent of HPwES survey respondents (full participants) said that they needed to undertake repairs prior to implementing the HPwES measures. These repairs included roof repairs, mold remediation, and ventilation. This is lower than one of the comparison programs that provided data on installation barriers. Further study is needed to understand whether this means that customers who need repairs are unlikely to participate in HPwES due to the added cost, however contractors did not state that it was a major problem, nor did partial participants.

Job Timeline

* Job Completion: The average length of time from the date that the program application was submitted until the completed work was submitted was 75 days. This length of time may be due to review and approval of proposed and completed work scopes, as well as supply chain issues that cause delays in obtaining materials and equipment. On average, an additional 48 days elapsed between the date that the work completion was submitted and the check approval.[[16]](#footnote-16) However, half of the jobs took under 36 days.[[17]](#footnote-17)
* Job Backlogs: Contractors were likely to report that backlogs occurred while waiting for financing application submission or approval, town building permits, subcontracting, staff shortages, or gas meter installation.

Quality Control

* Quality Control Procedures: NJNG staff provide detailed review of applications and completed jobs. The third-party quality control inspector is required to inspect a minimum of ten percent of all HPwES jobs, and the first five jobs completed by each contractor.

The third-party quality control inspections comprehensively address all work completed, all testing to ensure that the home is safe, and a check for the comprehensiveness of the job. They also address any customer questions.

* Quality Control Findings: As of July 2022, nine inspections had been completed for the 425 PY1 HPwES jobs. The ten percent had not been completed due to program implementation challenges related to software. NJNG is currently working to increase the number of jobs inspected.

Of the nine inspections that were conducted, two were passed with no report, two were complete with minor inspector feedback, three were conditional passes, and two were incomplete.

Satisfaction and Recommendations

* Participant Satisfaction: **Most participants were very or somewhat satisfied with the improvements (84 percent), contractors (87 percent), and program (95 percent)**. This is similar to the other HPwES programs that were reviewed (see Section V). Those who were dissatisfied with the improvements, reported that their dissatisfaction was related to the equipment’s performance, the installation, and the cost. Those who were dissatisfied with the contractor reported that they did not clean thoroughly following the installation, they were not responsive, and they performed low-quality work.
* Participant Recommendations: Participants recommended that the contractor increase communication, decrease the lag between the assessment and the installations, make scheduling easier, and improve the work quality. Program recommendations included improved communication, increased incentives, and increasing the types of eligible equipment.

Partial participants recommended increasing the number of contractors, better communication from contractors and NJNG, higher rebates, and greater flexibility with eligible improvements.

* Contractor Satisfaction: Contractors were all very or somewhat satisfied with HPwES, and several said that their high satisfaction was related to their positive experience working with NJNG. They liked working with NJNG in-house staff as opposed to implementation contractors and reported that NJNG staff were responsive to their questions and were very helpful. They felt that NJNG’s HPwES program worked more smoothly than other utilities’ programs.
* Contractor Recommendations: Some contractors recommended that financial incentives be increased, efficiency requirements be reduced, and marketing assistance be increased. Contractors also recommended that NJNG increase marketing and educate customers about their contractor review process.

Recommendations

Recommendations based on the process evaluation findings are detailed below.

* Budgeting: The utilities provide joint funding for HPwES projects. However, there are challenges aligning the expenditures because they did not coordinate.

*Recommendation: Coordination on expected jobs and costs should be done prior to the next triennial to better align funding across gas and electric utilities.*

* Program Eligibility: Based on participant survey responses to questions about income and household size, a large percentage of the HPwES participants have income at or below 250 percent of the Federal Poverty Level (FPL) and may be eligible for NJ Comfort Partners (26 percent) or from 251 to 400 percent of the FPL and may be eligible for the Moderate-Income Weatherization Program (15%).[[18]](#footnote-18)

More than half of the partial participant respondents said that cost was a barrier to HPwES participation.

*Recommendation: Contact customers who were partial participants and assess eligibility for NJ Comfort Partners and MIW.*

* Contractor Recruitment: Contractors were long-standing participants in NJ HPwES and joined to increase their business, establish credibility with customers, and obtain education and training.

*Recommendation: These benefits should be highlighted when recruiting additional contractors.*

* Contractor HPwES Entry Challenges: Key challenges included paperwork, cashflow, and program changes.

*Recommendation: If NJNG is not successful when they begin recruiting additional contractors, they should assess how they can help contractors with paperwork and explore potential options for gap financing assistance.*

* Contractor Training: Contractors noted that training on SnuggPro saving calculations, building science, customer service and sales, mechanical equipment, and combustion appliances would be helpful.

*Recommendation: Include these topics when contractor training is reinstituted.*

* HPwES Marketing: Contractors used websites, social media, print and television advertisements to market the program. Contractors used the NJNG portal to get up-to-date information on the program. NJNG also has a contractor bidding portal where contractors can review customer audits and bid on projects. NJNG marketing, including the portal and their reimbursement, had been helpful for most.

*Recommendation: Make sure contractors are aware of the portal and consider increasing contractor marketing support to previous levels.*

* Marketing Messages: Participant survey respondents reported that they decided to participate in HPwES to reduce their energy bills (61 percent), improve home comfort (49 percent), replace old equipment (38 percent), reduce their carbon footprint (29 percent), and improve their home air quality (20 percent). Contractors reported the same priorities among their HPwES customers.

*Recommendation: Highlight these benefits when promoting HPwES to customers.*

* On-Bill Repayment Application: Customers often have errors on their applications.

*Recommendation: Include additional information at the beginning of the OBRP application that clarifies the type of project. Also provide a checklist with the offerings and qualifications, including that an HPwES contractor must be BPI-certified.*

* Customer Education: Of the few participants who did not understand HPwES, most said it was the rebate level or on-bill payment plan that they did not understand.

*Recommendation: Therefore, NJNG should provide a document that clearly explains the rebate calculation and the on-bill repayment plan.*

* Quality Control Inspections: Four of the six contractors felt that the quality control inspections were overly strict. However, only about ten inspections have been conducted to date for the program.

*Recommendation: It is important to set expectations for quality control inspections to occur. NJNG should aim to increase the frequency of these inspections as soon as possible.*

* Quality Control Report: At the time this report was initially drafted, the QC inspectors did not include the inspection checklist with completed QC reports. Since that time, the process has been modified to include the checklist with the report.

*Recommendation: Require the QC checklist to be submitted for all completed inspections.*

* Gas Leaks: Several inspections have found gas leaks.

*Recommendation: Increase the number of QC inspections and provide warnings to contractors about program participation consequences* *when gas leaks are found.*

* Contractor Training: QC inspections have found several issues.

*Recommendation: Provide the following training to contractors based on inspection findings.*

* + Gas leak testing
  + Combustion testing
  + Air sealing material selection and installation
  + Weatherstripping
  + Vapor barrier insulation
  + Providing sufficient make-up air
  + Moisture control
  + Mechanical ventilation
  + Best practices when installing insulation

Recommendations based on the impact evaluation findings are detailed below.

* Data Availability: The only key data that are not available are measures that the contractor recommended that were not installed.

*Recommendation: Develop a method to obtain information on recommended measures that were not installed.*

* Customer Measure Education: While 96 and 100 percent of respondents confirmed air sealing and insulation, heating system, cooling system, and water heater installations, only 23 percent confirmed duct sealing installation. The other respondents said they did not know if the work was done (47 percent) or that it was not done (27 percent). This may be because contractors provided duct sealing in coordination with HVAC work or because the participant did not focus on this less tangible aspect of the project.

*Recommendation: Train contractors to educate customers and provide a one-page summary of installed measures.*

* Net-to-Gross Analysis Methodology: The Net-to-Gross methodology was applied per the SWE Guidelines.[[19]](#footnote-19) This resulted in a lower NTG score for duct sealing than the other measures because participants who did not confirm that they received a measure were not asked the free ridership and spillover questions related to that measure. For most measures there were very few participants who did not confirm measure installation but for duct sealing these were a majority of responses. An additional calculation was performed where customers who did not confirm installation of the measure (except a “refused” response) were assigned a free ridership score of zero. Since these customers did not recall the measure being installed, it is very unlikely that they would have undertaken the measure in the absence of HPwES.

*Recommendation: Consider adjustment to NTG score for customers who do not recall measure installation.*

* Air Leakage Reduction Calculation: Beginning on October 20, 2021, HPwES air leakage reduction defaults to a fixed 20 percent reduction (based on a joint utility agreement and being monitored based on actual contractor results). This change provides the customer with a known loan amount which can improve the relationship between the contractor and the customer. While contractors are still required to enter pre and post blower door results at project completion, the actual blower door results do not change the TES calculations. Contractors and NJNG staff perceive that this results in an underestimate of program savings.

*Recommendation: Compare actual pre and post blower door readings to the 20 percent fixed value and assess whether and how the air leakage reduction value or calculation methodology should be changed.*

It is important to note that some recommendations must be considered and explored in consultation with the other NJ utilities since this is a core program and the BPU has directed the utilities strive for consistency in the delivery of core programs.

# Introduction and Conclusions

The Clean Energy Act of 2018 (CEA) called for a significant overhaul of New Jersey’s energy systems while growing the economy, building sustainable infrastructure, creating well-paying local jobs, reducing carbon emissions, and improving public health. The CEA required each New Jersey investor-owned gas and electric utility (IOU) to develop energy efficiency (EE) programs in their service territories. In response to the passage of this Act, administration of most EE programs was transitioned from the New Jersey Board of Public Utilities (BPU) to the IOUs, beginning in July 2021.

The Home Performance with Energy Star (HPwES) program is one of the programs that NJNG began administering in July 2021. HPwES provides rebates and on-bill financing for customers to pursue energy-efficient upgrades in their homes. Upgrades are recommended based on the findings of a comprehensive home audit. Measures include air sealing, duct sealing, insulation, high-efficiency heating and air conditioning, and water heating.

## Key Findings and Recommendations

Key findings from the research are summarized below.

Evaluability Assessment

The only key data that were not available are measures that the contractor recommended that were not installed.

Impact Evaluation

Key findings relating to measures and savings are summarized below.

* Measure Installation: Analysis of the 425 PY1 participants in the HPwES database showed that in addition to the required air sealing and insulation, 44 percent installed duct sealing, 32 percent installed a new heating system, 29 percent installed a new water heater, and 27 percent installed a new cooling system.
* Measure Confirmation: Between 96 and 100 percent of participant survey respondents confirmed air sealing and insulation, heating system, cooling system, and water heater installations. While 23 percent confirmed duct sealing and 47 percent said they did not know if the work was done, 27 percent said it was not done. This may be because contractors provided duct sealing in coordination with HVAC work or because the participant did not focus on this less tangible aspect of the project.
* Non-Energy Impacts: HPwES survey respondents reported many positive non-energy impacts that resulted from their program participation. While 58 percent said the home was more comfortable, others noted improved hot water temperatures, improved air quality, and reduced noise. Respondents also placed high value on these benefits, as 61 percent said that these benefits had much more value or somewhat more value than the energy savings.
* Modeled Energy Savings: One specific item to note regarding the savings calculations is that, beginning on October 20, 2021, HPwES air leakage reduction defaults to a fixed 20 percent reduction (based on a joint utility agreement; actual savings are being monitored based on contractor results). This change provides the customer with a known loan amount which can improve the relationship between the contractor and the customer. Contractors and NJNG staff perceive that this results in an underestimate of program savings.
* Net-to-Gross Estimate: The free ridership calculation for the program overall was 87 percent. Values for individual measures ranged from 77 percent for duct sealing to 89 percent for air sealing and insulation. This is similar to other reviewed HPwES programs (see Section V).

The NTG score was much lower for duct sealing than the other measures because participants who did not confirm that they received a measure were not asked the free ridership and spillover questions related to that measure. For most measures there were very few participants who did not confirm measure installation but for duct sealing these were a majority of responses. An additional calculation was performed where customers who did not confirm installation of the measure (except a “refused” response) were assigned a free ridership score of zero. Since these customers did not recall the measure being installed, it is very unlikely that they would have undertaken the measure in the absence of HPwES. This change increased the duct sealing NTG to 94 percent and the program NTG to 89 percent.

Marketing

* Marketing Methods: Contractors used websites, social media, radio, print and television advertisements, and the NJNG portal to market the program. NJNG marketing, including the portal and contractor marketing reimbursement, had been helpful for most.
* Marketing Message: Participant survey respondents reported that they decided to participate in HPwES to reduce their energy bills (61 percent), improve home comfort (49 percent), replace old equipment (38 percent), reduce their carbon footprint (29 percent), and improve their home air quality (20 percent). Contractors reported the same priorities among their HPwES customers.

Contractors

* Contractor Participation: NJNG had 17 contractors who delivered HPwES services in PY1. However, 90 percent of the jobs were completed by nine contractors. The top producing contractors performed 37, 16, and 11 percent of the jobs.
* Contractor Training: Under the previous program NJNG provided frequent training to contractors to increase their skills and understanding of the program. With the transition, NJNG has concentrated on training related to the new program processes. They are planning to reinstitute the training after the implementation challenges are addressed and pandemic restrictions on in-person events are lifted. Contractors noted that training on SnuggPro saving calculations, building science, customer service and sales, mechanical equipment, and combustion appliances would be helpful.

HPwES Participation

* Customer Participation: Overall, there were 425 HPwES jobs that had a work complete submit date and were considered closed by NJNG in PY1. This participation compares favorably to the 670 participants projected for PY1 given the brief time between program filing and implementation.
* Program Eligibility: Based on participant survey responses to questions about income and household size, a large percentage of the HPwES participants have income at or below 250 percent of the Federal Poverty Level (FPL) and may be eligible for NJ Comfort Partners (26 percent) or from 251 to 400 percent of the FPL and may be eligible for the Moderate-Income Weatherization Program (15%).[[20]](#footnote-20)
* Improvement Costs and Incentives: While the mean project cost was just under $12,000, the mean total incentive was $10,655 including the OBRP. The average participant had an upfront out of pocket cost of $1,340 and an average loan of $7,331.
* Utility Coordination: While the utilities are currently using a SharePoint site for coordination, they will eventually use a system set up by the statewide coordinator. The utilities have weekly meetings to discuss technical program issues. The largest issue that has been faced to date has been differences in utility budgeting which could potentially restrict job completion. The gas and electric utility budgets must align so that rebates are available for both fuels. Additional planning may be needed to ensure that sufficient budgets are available.[[21]](#footnote-21)

Participation Barriers

* Customer Education: Of the few participants who did not understand HPwES, most said it was the rebate level or OBRP that they did not understand.
* Partial Participants: Contractors had varying estimates of the percentage of customers who proceed with measure installation, ranging from 30 percent to 80 percent. Future data analysis will study the percent of submitted jobs that were not completed.
* Dropout Reasons: More than half of the partial participant respondents said that cost was a barrier to HPwES participation. They stated was that the HPwES incentives were not large enough, the job was more expensive than their neighbors’ jobs, or the expected energy savings were not high enough to justify the cost. Some of these customers participated in the electric utility’s program or installed some of the work outside of the program that was less extensive than what was required to obtain program incentives.
* Health and Safety Repairs: Only two percent of HPwES survey respondents said that they needed to undertake repairs prior to implementing the HPwES measures. These repairs included roof repairs, mold remediation, and ventilation. This is lower than one of the comparison HPwES programs that reported a rate of health and safety barriers (see Section V). Further study is needed to understand whether this means that customers who need repairs are unlikely to participate in HPwES due to the added cost, however contractors did not state that it was a major problem, nor did partial participants.

Job Timeline

* Job Completion: The average length of time from the date that the program application was submitted until the completed work was submitted was 75 days. This length of time may be due to review and approval of proposed and completed work scopes, as well as supply chain issues that cause delays in obtaining materials and equipment. On average, an additional 48 days elapsed between the date that the work completion was submitted and the check approval.[[22]](#footnote-22) However, half of the jobs took less than 36 days.[[23]](#footnote-23)
* Job Backlogs: Contractors were likely to report that backlogs occurred while waiting for financing application submission or approval, town building permits, subcontracting, staff shortages, or gas meter installation.

Quality Control

* Quality Control Procedures: NJNG staff provide detailed review of applications and completed jobs. The third-party quality control inspector is required to inspect a minimum of ten percent of all HPwES jobs, and the first five jobs completed by each contractor.

The third-party quality control inspections comprehensively address all work completed, all testing to ensure that the home is safe, and a check for the comprehensiveness of the job. They also address any customer questions.

* Quality Control Findings: As of July 2022, nine inspections had been completed for the PY1 HPwES jobs. The ten percent had not been completed due to program implementation challenges related to software. NJNG is currently working to increase the number of jobs inspected.

Of the nine inspections that were conducted, two were passed with no report, two were complete with minor inspector feedback, three were conditional passes, and two were incomplete.

Satisfaction and Recommendations

* Participant Satisfaction: Most participants were very or somewhat satisfied with the improvements (84 percent), contractors (87 percent), and program (95 percent). This is similar to the other HPwES evaluations that were reviewed (see Section V). Those who were dissatisfied with the improvements reported that their dissatisfaction was related to the equipment’s performance, the installation, and the cost. Those who were dissatisfied with the contractor reported that they did not clean thoroughly following the installation, they were not responsive, and they performed low-quality work.
* Participant Recommendations: Participants recommended that the contractor increase communication, decrease the lag between the assessment and the installations, make scheduling easier, and improve the work quality. Program recommendations included improved communication, increased incentives, and increasing the types of eligible equipment.

Partial participants recommended increasing the number of contractors, better communication from contractors and NJNG, higher rebates, and greater flexibility with eligible improvements.

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* Contractor Recommendations: Some contractors recommended that financial incentives be increased, efficiency requirements be reduced, and marketing assistance be increased. Contractors also recommended that NJNG increase marketing and educate customers about their contractor review process.

Evaluation Recommendations

Recommendations based on the process evaluation findings are detailed below.

* Budgeting: The utilities provide joint funding for HPwES projects. However, there are challenges aligning the expenditures because they did not coordinate.

*Recommendation: Coordination on expected jobs and costs should be done prior to the next triennial to better align funding across gas and electric utilities.*

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*Recommendation: Contact customers who were partial participants and assess eligibility for NJ Comfort Partners and MIW.*

* Contractor Recruitment: Contractors were long-standing participants in NJ HPwES and joined to increase their business, establish credibility with customers, and obtain education and training.

*Recommendation: These benefits should be highlighted when recruiting additional contractors.*

* Contractor HPwES Entry Challenges: Key challenges included paperwork, cashflow, and program changes.

*Recommendation: If NJNG is not successful when they begin recruiting additional contractors, they should assess how they can help contractors with paperwork and explore potential options for gap financing assistance.*

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*Recommendation: Make sure contractors are aware of the portal and consider increasing contractor marketing support to previous levels.*

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*Recommendation: Highlight these benefits when promoting HPwES to customers.*

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*Recommendation: Require the QC checklist to be submitted for all completed inspections.*

* Gas Leaks: Several inspections have found gas leaks.

*Recommendation: Increase the number of QC inspections and provide warnings to contractors about program participation consequences when gas leaks are found.*

* Contractor Training: QC inspections have found several issues.

*Recommendation: Provide the following training to contractors based on inspection findings.*

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Recommendations based on the impact evaluation findings are detailed below.

* Data Availability: The only key data that are not available are measures that the contractor recommended that were not installed.

*Recommendation: Develop a method to obtain information on recommended measures that were not installed.*

* Customer Measure Education: While 96 and 100 percent of respondents confirmed air sealing and insulation, heating system, cooling system, and water heater installations, only 23 percent confirmed duct sealing installation. The other respondents said they did not know if the work was done (47 percent) or that it was not done (27 percent). This may be because contractors provided duct sealing in coordination with HVAC work or because the participant did not focus on this less tangible aspect of the project.

*Recommendation: Train contractors to educate customers and provide a one-page summary of installed measures.*

* Net-to-Gross Analysis Methodology: The Net-to-Gross methodology was applied per the SWE Guidelines.[[25]](#footnote-25) This resulted in a lower NTG score for duct sealing than the other measures because participants who did not confirm that they received a measure were not asked the free ridership and spillover questions related to that measure. For most measures there were very few participants who did not confirm measure installation but for duct sealing these were a majority of responses. An additional calculation was performed where customers who did not confirm installation of the measure (except a “refused” response) were assigned a free ridership score of zero. Since these customers did not recall the measure being installed, it is very unlikely that they would have undertaken the measure in the absence of HPwES.

*Recommendation: Consider adjustment to NTG score for customers who do not recall measure installation.*

* Air Leakage Reduction Calculation: Beginning on October 20, 2021, HPwES air leakage reduction defaults to a fixed 20 percent reduction (based on a joint utility agreement and being monitored based on actual contractor results). This change provides the customer with a known loan amount which can improve the relationship between the contractor and the customer. While contractors are still required to enter pre and post blower door results at project completion, the actual blower door results do not change the TES calculations. Contractors and NJNG staff perceive that this results in an underestimate of program savings.

*Recommendation: Compare actual pre and post blower door readings to the 20 percent fixed value and assess whether and how the air leakage reduction calculation methodology should be changed.*

It is important to note that some recommendations must be considered and explored in consultation with the other NJ utilities since this is a core program and the BPU has directed the utilities strive for consistency in the delivery of core programs.

## Report Contents

This report provides information to assess program design and implementation and make recommendations for program refinement. The following sections are included in the report.

* Section II – Evaluability Assessment: This section provides an overview of the program data availability and an assessment of any gaps in data needed to complete an “Enhanced Rigor” evaluation.[[26]](#footnote-26)
* Section III – Process Evaluation: This section provides a review of NJNG’s HPwES design and implementation based on review of program documents, interviews with program actors, and surveys with program participants.
* Section IV – Impact Evaluation: This section provides an analysis of the installations and impacts of NJNG’s HPwES program based on analysis of program data and NJNG natural gas usage data, and surveys with HPwES participants.
* Section V – Program Comparisons: This section provides a review of Process and Impact Evaluation findings from other HPwES programs that have been implemented around the country and a comparison to NJNG’s HPwES program.
* Appendices: The appendices provide additional detail on HPwES statistics, participant and partial participant instruments and feedback, and contractor interview guides and feedback.

APPRISE prepared this report for New Jersey Natural Gas. Any errors or omissions in this report are the responsibility of APPRISE. Further, the statements, findings, conclusions, and recommendations are solely those of analysts from APPRISE and do not necessarily reflect the views of New Jersey Natural Gas.

# Evaluability Assessment

This section provides a review of available HPwES data and an assessment of any gaps in data needed to complete an “Enhanced Rigor” evaluation as specified by the New Jersey Statewide Evaluator (SWE).[[27]](#footnote-27)

HPwES program data that are needed for the evaluation are summarized in Table II-1. Evaluators can download much of these data from the online program database as needed. NJNG can download most of the remaining data from the SnuggPro database as requested. Except for a few cases indicated in the table, all of the data have been reviewed and found to provide complete and accurate information. The few exceptions are as follows.

* Recommended Measures: Measures that were recommended by the installation contractor but not installed are not included in the data.
* Energy Savings: Electric demand savings are not currently included. Some outlier values need further investigation.

**Table II-1**

**HPwES Data Assessment**

| **Type** | **Variables** | **Use** | **Availability** |
| --- | --- | --- | --- |
| Participant | Name, address, phone number, email address, account number | Participant Surveys | Online HPwES Database |
| Partial Participant | Name, address, phone number, email address, account number | Partial Participant Interviews | Online HPwES Database |
| Program Dates | Assessment date, application date, application approval date, installation date, work submit date, inspection date, payment date | Process Analysis  Impact Analysis | Online HPwES Database  Data are fairly comprehensive, but it would be useful to have the assessment date |
| Home & Baseline Equipment | Square footage, baseline insulation levels, heating fuel, heating system type, air conditioning type, water heater type, water heating fuel | TRM Update | Separate SnuggPro download |
| Partner Utility Data | Utility name, and customer account number | Match to the electric usage data for the billing analysis. | Online HPwES Database |
| Contractor Data | Company name, contact name, phone number, email address | Contractor Interviews | Online HPwES Database |
| Recommended Measures | All recommended measures, gas savings, electric savings, demand savings | Missed Opportunities | Not available |
| Installed Measures | Installed measures, gas savings, electric savings demand savings | Impact Analysis | Online HPwES Database |
| Installed Measure Characteristics | Area of home sealed, insulation R level, heating and cooling system type and efficiency, water heater type and efficiency | TRM Update | Separate SnuggPro download |
| Incentives | Gas incentive amount, electric incentive amount, rebate amount, financing amount | Cost-Effectiveness | Online HPwES Database |
| Energy Savings | Annual and lifetime gas savings, annual and lifetime electric savings, demand savings, gas MMBTU savings, electric MMBTU savings, Total Energy Savings | Realization Rate, TRM Updates | Online HPwES Database  Data are complete and appear accurate except for missing demand savings some outliers that need to be investigated |
| Monthly Energy Usage | Gas and electric monthly billing data | Impact Analysis | Separate request to NJNG and electric utilities |

Monthly energy usage data are needed to develop a weather-normalized, comparison group adjusted estimate of savings that result from HPwES.

* Gas Data: NJNG can provide the requested data.
* Electric Data: The utilities will need to agree to provide energy usage data for the partner utilities.

Based on the assessment, the only key data that are not available are measures that the contractor recommended that were not installed.

# Process Evaluation

This section provides a description of New Jersey Natural Gas’ (NJNG) Home Performance with Energy Star (HPwES) Program and a discussion of program procedures and implementation.

## Research Conducted

We reviewed HPwES documents, interviewed program actors, and conducted participant surveys to develop a full understanding of NJNG’s HPwES program and opportunities for refinement.

We reviewed the following program documents.

* HPwES Plan
* HPwES Marketing Materials
* HPwES Measure List
* Contractor Agreement
* Portal Application Instructions
* Customer Participation Agreement
* On-Bill Repayment Application
* HPwES Test-Out Form

We conducted the following interviews.

* NJNG Program Managers and Staff
* Installation Contractors: In-depth telephone interviews were conducted with six of the ten NJNG HPwES who had served at least 12 NJNG customers in the HPwES program by May 2022. These contractors represented over 60 percent of the NJNG HPwES jobs completed in most of Program Year 1 (PY1).[[28]](#footnote-28)
* Participating Customers: Quantitative mixed mode web/phone surveys were conducted with 185 participants from PY1. Half of the respondents were asked about program satisfaction, recommendations, and demographics. The other half were asked about measure installation, free ridership and spillover, and demographics.
* Partial Participants: In-depth telephone interviews were conducted with 23 partial program participants from PY1 who had a home assessment but did not participate in the HPwES program. Respondents were asked why they did not move forward with program participation, the challenges they faced when they tried to participate, whether they moved forward with any recommended measures, and their recommendations for the program.

We analyzed NJNG’s HPwES program database for 425 HPwES PY1 jobs that had a work compete submit date and were considered closed by NJNG. While 23 additional HPwES jobs had a work complete submit date, they were not considered closed by NJNG because the loan documents were not approved (just a few cases) or they had not yet received confirmation from the contractor that they were complete.

## Program Design

Home Performance with Energy Star (HPwES) provides a holistic approach for customers to reduce energy usage and improve the comfort and safety of their homes. Upgrades are recommended based on the findings of a comprehensive home audit. Measures include air sealing, duct sealing, insulation, high-efficiency heating and air conditioning, and water heating. All HPwES projects must include air sealing and insulation. Customers receive rebates and on-bill financing to assist with the costs of these services.

NJNG had been implementing HPwES incentives and On-Bill Repayment in coordination with the state incentives for several years, but many changes were made when the program management was transitioned to the utilities.

The key changes made to the program when it transitioned to the utilities were as follows.

* Program incentives previously related to tiers of the Total Energy Savings (TES) calculation. The revised program bases the incentives on the modeled TES, and every point increase in the TES increases the rebate amount up to a cap.
* The rebate dollar amount was previously capped at $4,000 and is now capped at $5,000.
* Loans less than or equal to $10,000 have a seven-year term, and loans more than $10,000 have a ten-year term.
* Eligible measure determination has changed, including changes to the air conditioners and heat pumps.
* The program now requires substantially higher SEER ratings.
* Calculated energy savings due to a fuel switch from a delivered fuel to natural gas or electricity are treated differently than NJCEP had done, based on the new efficiency compared to a baseline efficiency level.
* The utilities are responsible for coordinating the program and providing increased reporting on program implementation and impacts, including regular evaluation by a third-party evaluator. These reporting requirements meant that NJNG needed to develop new data management systems.

Goals and Resources

Table III-1 displays the participation and savings goals, as well as the projected expenditures based on NJNG’s program plan. NJNG was required to develop their plan in a short timeframe and before details were agreed upon across the utilities, so it is expected that the actual program implementation will differ from these initial projections.

**Table III-1**

**HPwES Goals and Resources**

| **Metric** | **PY1** | **PY2** | **PY3** |
| --- | --- | --- | --- |
| Participants | 670 | 737 | 774 |
| Net Annual Natural Gas Savings (Therms) | 206,938 | 227,631 | 239,013 |
| Net Lifetime Natural Gas Savings (Therms) | 3,517,940 | 3,869,734 | 4,063,220 |
| Net Annual Electric Savings (kWh) | 647,013 | 711,714 | 747,300 |
| Net Lifetime Electric Savings (kWh) | 10,999,220 | 12,099,142 | 12,704,099 |
| Net Annual Peak Demand Savings (kW) | 22 | 24 | 25 |
| Net Lifetime Peak Demand Savings (kW) | 373 | 411 | 431 |
| Projected Expenditures | $9,455,211 | $10,088,142 | $10,550,060 |

“The SAVEGREEN Project Program Plan,” New Jersey Natural Gas, Published: December 21, 2020 and approved by the BPU on March 3, 2021 and approved by the BPU on March 3, 2021.

The HPwES program has the following objectives.

* Achieve deep energy savings by reviewing opportunities for both the building envelope and equipment replacement.
* Increase customer awareness of how the HPwES can improve home efficiency and comfort.
* Develop a trade ally network with Building Performance Institute (BPI) certified contractors.

HPwES is one of the “Core” residential energy efficiency (EE) programs, which means that eligibility and incentives are aligned across the utilities and customers seamlessly receive both gas and electric measures and incentives from one contractor even if they are served by two different utilities. The primary utility is the utility that the customer or contractor applies to for program incentives.

Eligibility

All NJNG natural gas customers who live in single-family detached and single-family attached (1- to 4-unit buildings) are eligible for HPwES. The program is coordinated with the electric utility that serves the participating household.

Incentives

NJNG provides rebates and OBRP financing to eligible participants with modeled energy savings of at least five percent who install qualified measures. EE improvements must be installed by a Building Performance Institute (BPI)-certified contractor who completed the NJNG contractor participation agreement process.

Rebates are $2,000 plus $150 for each percentage point of modeled savings above five percent, with a cap of $5,000. All rebates must not exceed 50 percent of costs. The contractor receives an incentive of $500 per completed job.[[29]](#footnote-29) These incentives are consistent across the utilities.

NJNG provides financing through On-Bill Repayment (OBRP). Loans are offered at 0 percent APR, with a seven-year term for loans up to $10,000 and a ten-year term for loans greater than or equal to $10,000. NJNG reports that most customers take as much financing as is available.

Table III-2 illustrates the minimum EE requirements that equipment must meet. All HPwES projects are required to include air sealing and insulation with pre and post blower door testing. If there are any safety issues that preclude blower door testing, the issue must be resolved before the customer is eligible for participation.

**Table III-2**

**HPwES Requirements**

| **Category** | **Measure** | **Requirement** |
| --- | --- | --- |
| Building Shell | Air Sealing | Attic, Attached Garages |
| Attic Floor Insulation, With Existing Insulation | If existing <7 inches, must install at least 6 inches |
| Attic Floor Insulation, None Existing | R-49 or fill cavity |
| Roof Deck, None Existing | R-20 or fill cavity |
| Walls (above grade), None Existing | R-20 or fill cavity |
| Floors, None Existing | R-19 or fill cavity |
| Foundation Walls, None Existing | R-10 |
| Ducted Distribution System | Duct Sealing | UL 181 B Mastic |
| New Ductwork / Duct Insulation | Sealed with mastic, R-8 in attics, R-6 in other locations (except conditioned) |
| Mechanical Ventilation | Exhaust Ventilation Fans | ENERGY STAR Qualified (vent to exterior) |
| Heat/Energy Recovery Ventilator |  |
| HVAC integrated with fan control and mechanical damper | Installed with eligible furnace installation with ECM/ICM motor |
| Heating System | Furnace – Natural Gas | AFUE 95 |
| Steam Boiler – Natural Gas | AFUE 82 |
| Boiler – Natural Gas | AFUE 90 |
| Air Source Heat Pump (central, mini split) | 16 SEER/12.5 EER/ 9 HSPF |
| Ground Source Heat Pump | Open loop 21.1 EER / 4.1 COP  Closed loop 17.1 EER / 3.6 COP |
| Cooling System | Central Ducted Split System | 16 SEER / 12.5 EER |
| Water Heater | Tank – Natural Gas, power/direct vent | ≤55 gal UEF≥.64 med draw, ≥.68 high |
| >55 gal UEF≥.78 med draw, ≥.80 high |
| Tankless On Demand – Natural Gas | <2 gal UEF ≥.87 |
| Indirect Fired Tank | ≥16 gal min R-5 insulation |
| Heat Pump Water Heater | UEF ≥2.0 |

The first $2,000 of costs associated with health and safety measures are eligible to be included in the work scope and financed by the program. These include the following measures.

* Smoke, radon, or carbon monoxide detectors.
* Combustion safety repairs and upgrades.
* Radon, lead, or asbestos abatement necessary to install eligible measures.
* Electrical upgrade needed to replace heating/cooling unit included in the work scope.
* Knob and tub wiring update to install insulation.
* Crawlspace vapor barriers, grading, and gutter repairs to address water intrusion and attic ventilation.
* Fuel line leak repairs.
* Exhaust fan and dryer venting and insulation.
* ENERGY STAR dehumidifier to control source moisture.

## Program Implementation

NJNG serves as the HPwES program administrator and takes responsibility for data system development, marketing and outreach, contractor recruitment and training, review of applications for rebates and financing, review of paperwork for completed jobs, and approval for rebate and financing payments.

NJNG has a third-party contractor responsible for quality control inspections and installation contractors who assess the homes and install or subcontract the measures.

Information Technology

NJNG has developed a robust data system to manage HPwES data for program administration, quality control, and evaluation. Nexant, also known as Resource Innovations, was the vendor selected to develop the new HPwES system software. Nexant configured the iEPM system, based on NJNG’s requirements, to allow program staff to track job progress internally. The database tracks project stages and other parameters, including job cost, measures installed, and estimated savings.

Contractors have been set up to use the iEPM system and can enter customer applications. Alternatively, they can ask the customer to enter the data or submit a paper application.

Contractors use SnuggPro to collect data in the field. This is the same software that was previously used by the New Jersey Clean Energy Program (NJCEP), which was helpful in the program transition. SnuggPro utilizes an energy modeling software called OptiMiser to calculate the projected energy savings.

Contractors reported that they were generally satisfied with the SnuggPro software, but most believe that it underestimates energy savings, or that there were some specific measures or home conditions that were not modeled properly.

An automated data transfer process imports data from SnuggPro into the iEPM system. However, program staff must manually import any physical documents into the system.

Once program staff verify that the job information saved in SnuggPro is consistent with the customer contract, the cost and savings figures from the job are uploaded to the iEPM system. Program staff then conduct a thorough review of job measures to ensure that the Nexant system retrieved the correct measure data from SnuggPro.

Marketing and Outreach

NJNG leverages the NJNG website, digital advertisements, bill inserts, municipal websites, and meetings and presentations to market HPwES. NJNG’s website sends customers to their SAVEGREEN Project website that has comprehensive information on their EE programs. NJNG also utilizes Facebook advertisements, promoted Google search advertisements (also known as Google Display) and advertisements on the neighborhood communication app ‘Nextdoor.’ NJNG reported that they have had considerable success through social media advertising and are currently considering a restructuring and redesign of their SAVEGREEN website.

The NJNG customer newsletter, which is sent with the bill, frequently contains information about SAVEGREEN. NJNG’s eTips[[30]](#footnote-30), an opt-in monthly newsletter sent to residential customers, has also been used to advertise the HPwES program.

NJNG runs advertisements in various publications and a partner utility, Jersey Central Power & Light (JCP&L), has been considering running print advertisements for the HPwES Program. This would in turn promote the NJNG HPwES Program.

SAVEGREEN works in partnership with New Jersey municipalities to strengthen their relationship to the SAVEGREEN program. Under the Sustainable Jersey program, municipalities can receive points for promoting the HPwES program including hyperlinks to the SAVEGREEN website on their respective websites.[[31]](#footnote-31)

NJNG reported that outreach through larger community family-focused events has not been successful, however some focused Green Fairs have performed better. In the past, SAVEGREEN had representatives visit local festivals and family-oriented events to market the program. SAVEGREEN staff occasionally joins the NJNG Conversion Department at events to explain the SAVEGREEN program if a customer chooses to convert to natural gas. These events largely target senior communities. NJNG also promotes its residential and commercial programs at Chamber of Commerce meetings.

NJNG reported that one of the most successful marketing strategies is targeting ‘lookalikes’, customers who closely resemble previous HPwES participants. NJNG also targets customers who have already replaced equipment but have the ability to pursue more comprehensive upgrades. NJNG is required to offer opt-in marketing materials and is unable to send promotions to potential customers unless the customer has opted in to receive marketing materials.

NJNG is currently transitioning to a new customer relationship management (CRM) platform. This platform will enable the SAVEGREEN marketing team to improve their targeted marketing efforts and track the customer pipeline from first contact to participation in a program. The new system will track which campaigns a customer received, which materials were sent to the customer, and which programs they are likely to be eligible for. The CRM was scheduled to launch in April 2022.

NJNG reported that the majority of all HPwES projects originate from HVAC contractors who recommend that customers participate for financing support and from Quick Home Energy Checkups (QHEC) auditors who ask the customer to sign a release form allowing contractors to contact them about advanced improvements. However, participant survey respondents were most likely to report that they learned about HPwES through word of mouth (42 percent), followed by their contractor (26 percent), a NJNG mailing (15 percent), and the NJNG website (ten percent).

Contractors reported that they face challenges marketing the program because of its complexity and the amount of competition in the market. They reported that NJNG marketing had been helpful, including the portal and NJNG’s marketing reimbursement program.

Participant survey respondents reported that they decided to participate in HPwES to **reduce their energy bills (61 percent), improve home comfort (49 percent), replace old equipment (38 percent), reduce their carbon footprint (29 percent), and improve their home air quality (20 percent)**. Contractors reported the same priorities among their HPwES customers. Therefore, these are all important messages to send to customers who promoting HPwES.

Many of the marketing materials are available in Spanish, there is a translator option integrated into the SAVEGREEN website, and NJNG continues to translate additional materials.

Contractors

Contractors are required to sign a participation agreement with NJNG and meet several requirements relating to BPI certification and insurance. NJNG currently has 24 participating HPwES contractors. However, five of them perform the majority of all HPwES jobs. The HPwES contractor agreement states that a participating contractor must complete a minimum of ten HPwES jobs per year to be considered an active participating contractor within the HPwES program.

Every other month, contractors are invited to provide feedback at the EE programs technical committee meeting with representatives from each utility. Contractors primarily report issues relating to the transition and changes in reporting requirements. Utilities also use it as a forum to share ideas regarding potential changes (e.g BPI standard implementation or DOE standard changes).

Under the previous program, NJNG provided frequent training to contractors to increase their skills and understanding of the program. With the transition, NJNG has concentrated on training related to the new program processes. They are planning to reinstitute the training after the implementation challenges are addressed and pandemic restrictions on in-person meetings are lifted. Contractors noted that training on SnuggPro saving calculations, building science, customer service and sales, mechanical equipment, and combustion appliances would be helpful.

NJNG is not currently recruiting new contractors, but they take on new contractor applicants who meet program requirements. They expect to renew outreach to obtain more contractors in the near future. The contractors who were interviewed stated that they chose to participate to gain a competitive advantage or to attract more customers, so these benefits should be highlighted when NJNG conducts contractor outreach.

Customer Education

HPwES is a complicated program with home assessment and testing, multiple measures, and rebates and on-bill financing. Contractors reported that they educate potential participants about the rebates and financing, building science and EE, and HPwES participation requirements.

Contractors appear to do a good job explaining the program to participants, as 87 percent of the survey respondents stated that they understood the program either somewhat or very well. Of the few who did not understand the program, most said it was the rebate level or on-bill payment plan that they did not understand. Therefore, NJNG should provide improved documentation of these program benefits.

Service Delivery

The HPwES home assessment must include several required tests to ensure safety and comprehensiveness.

* Blower door test in and out
* CAZ Depressurization Test
* Duct testing (if improvements are made)
* Water heater CO and draft pressure
* Heater CO and draft pressure
* Oven (if gas)
* Gas leakage
* CO alarm present
* Exhaust fans vented to outside
* Clothes dryer vented to outside

NJNG recommends that customers obtain multiple estimates for their HPwES jobs and provide “Find a Contractor” look-up on their website.

Contractors are generally expected to guide customers throughout the program process, but customers are also permitted to submit an OBRP application pending the selection of a HPwES contractor.

Following the application submission and contractor submission of audit data, the job undergoes technical review, and is then approved if it meets all requirements, including that the audit was conducted within the past year and had all required testing completed.

After the audit, contractors must provide homeowners with a professional report containing comprehensive recommendations for improving the home’s EE. The report includes an estimate of the total energy savings from the proposed improvements. Contractors must also provide a written warranty of labor and materials for a minimum of one year from the date the service is performed.

After the project has been approved and the loan is processed, contractors must complete the agreed upon work within 120 days of the rebate reservation approval. Customer or contractor payments are sent within 60 days following completion of the contractor work, submission of complete and required paperwork, and completion of any other necessary HPwES requirements such as field inspections, if required.

Participation

Table III-3 displays the number of jobs started and completed by quarter in the first program year. Overall, there were 425 HPwES jobs that had a work complete submit date and were considered closed by NJNG in PY1. While 23 additional HPwES jobs had a work complete submit date, they were not considered closed by NJNG because the loan documents were not approved (just a few cases) or they had not yet received confirmation from the contractor that they were complete. This participation compares favorably to the 670 participants projected for PY1 given the brief time between program filing and implementation.

**Table III-3**

**NJNG HPwES PY1 Participation**

| **Quarter of Program Year** | **Job Start Date** | | **Job Complete Date** | |
| --- | --- | --- | --- | --- |
| **#** | **%** | **#** | **%** |
| PY1 — Q1 | 126 | 30% | 21 | 5% |
| PY1 — Q2 | 145 | 34% | 116 | 27% |
| PY1 — Q3 | 119 | 28% | 167 | 39% |
| PY1 — Q4 | 35 | 8% | 121 | 28% |
| **Total** | **425** | **100%** | **425** | **100%** |
| **PY1 Annual Goal** | **670** | | | |

As expected, most of the HPwES participants (98 percent) were homeowners who live in single-family homes (80 percent) based on the participant survey. The survey also showed that 94 percent used natural gas for heating and 80 percent used natural gas for water heating. Most (93 percent) speak English at home.

Based on participant survey responses to questions about income and household size, a large percentage of the HPwES participants have income at or below 250 percent of the Federal Poverty Level (FPL) and may be eligible for NJ Comfort Partners (26 percent) or from 251 to 400 percent of the FPL and may be eligible for the Moderate-Income Weatherization Program (15 percent).[[32]](#footnote-32)

HPwES survey respondents were asked whether they needed to undertake repairs prior to implementing the HPwES measures. Only two percent said that they needed to do so. These repairs included roof repairs, mold remediation, and ventilation. Further study is needed to understand whether this means that customers who need repairs are unlikely to participate in HPwES due to the added cost.

HPwES offers rebates up to $5,000 and loans up to $15,000. While 88 percent of the participants received financing, about two thirds of those with financing had a seven-year loan (for amounts up to $10,000) and the other third had a ten-year loan (for amounts between $10,000 and $15,000). Table III-4 displays the distribution of job cost, rebate amount, loan amount, and total incentives. While the mean project cost was just under $12,000, the mean total incentive was $10,655 including the OBRP. The average participant had an upfront out of pocket cost of $1,340 and an average loan of $7,331.

**Table III-4**

**Distribution of Job Cost & Incentives**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Job Cost & Incentive** | **Number of Jobs** | **Value ($)** | | | | | |
| **Mean** | **Minimum** | **25th Percentile** | **Median** | **75th Percentile** | **Maximum** |
| Rebate Amount | 425 | $3,324 | $1,760 | $2,300 | $2,900 | $4,550 | $5,000 |
| Loan Amount | 425 | $7,331 | $0 | $3,545 | $6,154 | $12,000 | $15,000 |
| Total Incentives | 425 | $10,655 | $1,760 | $6,091 | $8,761 | $16,844 | $20,000 |
| Total Project Cost | 425 | $11,995 | $3,520 | $7,000 | $9,414 | $17,000 | $49,433 |
| SnuggPro Mean Annual MMBTU Electric and Gas Savings | 425 | 22 | $545 per annual MMBTU saved | | | | |

NJNG had 17 contractors who delivered HPwES services in PY1, however, 90 percent of the jobs were completed by nine contractors. The top producing contractors performed 37, 16, and 11 percent of the jobs.

The average length of time from the date that the program application was submitted until the completed work was submitted was 75 days. This length of time may be due to review and approval of proposed and completed work scopes, as well as supply chain issues that cause delays in obtaining materials and equipment. While jobs that only had air sealing and insulation work had a mean elapsed time of 64 days, jobs that included heating and/or cooling equipment averaged an additional two weeks.

On average, an additional 48 days elapsed between the date that the work completion was submitted and the check approval. However, half of the jobs took less than 36 days.[[33]](#footnote-33)

Contractors were likely to report that backlogs occurred while waiting for financing application submission or approval, town building permits, subcontracting, staff shortages, or gas meter installation.

Partial Participants

Contractors had varying estimates of the percentage of **customers who proceed with measure installation, ranging from 30 percent to 80 percent**. It is important to understand why customers engage in an energy audit but do not move forward with HPwES participation. In-depth interviews with such “partial participants” found the following key reasons.

* Project Cost: **More than half of the partial participant respondents said that cost was a barrier** to HPwES participation. They stated that the HPwES incentives were not large enough, the job was more expensive than their neighbors’ jobs, or the expected energy savings were not high enough to justify the cost. Some of these customers participated in the electric utility’s program or installed some of the work outside of the program.
* Program Requirements: Customers did not have high enough savings to qualify for the rebate or did not want to install required measures.
* Lack of Financing Approval: Customers were denied financing.[[34]](#footnote-34)
* Program Understanding: Customers were confused about switching contractors or rebates versus financing.

Other challenges that were not key to the participation decision were a **long finance approval process**[[35]](#footnote-35), **difficulty finding or scheduling a contractor, and confusion about the process**. One customer was upset by an overwhelming number of contractors attempting to market HPwES services.

Several partial participants installed measures outside of the program that were less extensive than the recommendations, or through their electric utility.

Utility Coordination

Utility customers can enter the program through the gas or electric utility and the cost share is determined by the percent of MMBTU savings attributable to each fuel. The gas utility is usually responsible for a larger portion of the rebate. While the utilities are currently using a SharePoint site for coordination, they will eventually use a system set up by the statewide coordinator. The utilities have weekly meetings to discuss technical program issues. The largest issue that has been faced to date has been differences in utility budgeting which could potentially restrict job completion (but did not restrict participation in PY1).

As a “Core” residential energy efficiency program, customers seamlessly receive both gas and electric measures and incentives from the installation contractor even if they are served by two different utilities. Table III-5 shows that the majority of NJNG’s HPwES participants had Jersey Central Power and Light (JCP&L) as their electric utility.

**Table III-5**

**Electric Partner Utility**

| **Electric Utility** | **#** | **%** |
| --- | --- | --- |
| JCP&L | 390 | 92% |
| ACE | 29 | 7% |
| PSE&G | 6 | 1% |
| **Total** | **425** | **100%** |

NJNG pays the full rebate to the customer and bills the electric utility for the portion of the rebate that is attributable to electric savings, based on the percent of MMBTU savings from electric usage reduction. One challenge that results from this design is that the gas and electric utility budgets must align so that rebates are available for both fuels. Additional planning may be needed to ensure that sufficient budgets are available.

Quality Control

NJNG staff review and approve jobs submitted by contractors. The review includes a check for consistency between information entered in SnuggPro and what appears in the customer’s contract, including all recommended measures, percent savings, and total job cost. Following installations, NJNG reviews the contractor’s certificate of completion, test-out form, model numbers, serial numbers, efficiency ratings, and any relevant Air Conditioning, Heating, and Refrigeration Institute (AHRI) certificates.

The third-party quality control inspector is required to inspect a minimum of ten percent of all HPwES jobs, and the first five jobs completed by each new contractor[[36]](#footnote-36). NJNG plans to assign a higher probability of selection to jobs performed by newer contractors or contractors with a poor history of inspections. However, the system is currently set up to select a random ten percent of jobs for inspection. NJNG can override the jobs that are selected or force a job to be inspected.

NJNG does not provide specifications for the inspections but states that the inspector assesses the quality of installations by checking against BPI standards and NJNG’s Program standards.

All inspections broadly encompass the following activities.

* Verification that contracted measures have been installed per the certificate of completion.
* Customer interview for description of the initial home condition and confirmation of installations.
* Testing, including combustion testing, blower door testing, and health and safety-related testing.

The inspections usually last for one hour, but range from 45 to 100 minutes. They comprehensively address all work completed, all testing to ensure that the home is safe, and a check for the comprehensiveness of the job. They also address any customer questions.

Inspectors are required to submit written reports and photographic documentation of their findings to NJNG. Most inspected jobs achieve conditional passes, requiring the contractor to revisit the home. Inspectors find that air sealing and insulation are insufficient, that there are gas leaks, and that the reported model numbers are incorrect. NJNG hopes to educate these contractors once the training is up and running again. In the interim, NJNG is coaching contractors as needed.

NJNG’s $500 contractor production incentive only applies to completed projects that pass a QC inspection on the first attempt. Jobs that pass with actions are still eligible for the incentive. If a job fails its QC inspection on the first attempt, the contractor is rendered ineligible for the production incentive.

As of July 2022, nine inspections had been completed for the 425 HPwES jobs. The ten percent had not been completed because of the large amount of work that needed to be completed at program implementation. NJNG is currently working to increase the number of jobs inspected.

We reviewed the reports for inspected jobs. Of the nine inspections that were conducted, two were passed so no report was required, two were complete with minor inspector feedback, three were conditional passes, and two were incomplete. The provided reports did not include an inspection checklist that marked off all required tests and reviews. We requested reports for those that were “passed with no report” and received the inspection checklist that we recommend be sent for all completed inspections. However, one of those had an oven carbon monoxide test result listed at 136 ppm.

For the complete inspections, the contractor feedback was that foam board on the attic stairs provided a slip hazard, and customer dissatisfaction with a hot water heater that did not have the highest efficiency as expected and the unit was dented.

Repairs required on the conditional passes included the following.

* Gas leaks (2)
* Air leakage pathways that were not satisfactorily sealed.
* Pulldown attic stair cover that did not meet contracted R-value.
* Improperly vented bath fan exhaust ducts
* Appliances listed as gas that were electric
* Model number that could not be verified because it was covered with mastic.

Repairs required on the incomplete jobs included the following.

* Gas leak.
* Improperly vented bath fan.
* Bathroom lighting not dammed to prevent insulation fire risk.
* CO detector not present in the home.
* Air leakage pathways that were not satisfactorily sealed.
* Incomplete pressure boundary.
* Blown insulation not at level called for in contract.
* Part of attic not insulated.
* Pulldown attic stair cover that did not meet contracted R-value (2).

Additional feedback on the incomplete jobs.

* Blower door test results did not match what QC contractor found.
* Air leakage pathways that were not satisfactorily sealed.
* Appliances listed as gas that were electric.

Contractors were generally satisfied with the third-party quality control inspections and said that they were straightforward. However, some said that they could be “strict” or “difficult”.

Participant and Contractor Satisfaction and Recommendations

As shown in Table III-6, most participants were very or somewhat satisfied with the improvements (84 percent), contractors (87 percent), and program (95 percent). This is similar to the other HPwES evaluations that were reviewed (see Section V).

* Those who were dissatisfied with the improvements reported that their dissatisfaction was related to the equipment’s performance, the installation, and the cost.
* Those who were dissatisfied with the contractor reported that they did not clean thoroughly following the installation, they were not responsive, and the quality of the work. They recommended that the contractor increase communication, decrease the lag between the assessment and the installations, make scheduling easier, and improve the work quality.
* Program recommendations included improved communication, increased incentives, and increasing the types of eligible equipment.

**Table III-6**

**Participant Satisfaction**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **How satisfied are you with the improvements, contractor, program?**  **Would you say you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?** | | | | | | |
| **Satisfaction** | **Improvements** | | **Contractor** | | **NJNG HPwES Program** | |
| **#** | **%** | **#** | **%** | **#** | **%** |
| Very Satisfied (1) | 50 | 56% | 61 | 68% | 56 | 60% |
| Somewhat Satisfied (2) | 27 | 28% | 18 | 19% | 31 | 35% |
| Somewhat Dissatisfied (3) | 7 | 8% | 9 | 9% | 3 | 3% |
| Very Dissatisfied (4) | 4 | 4% | 4 | 4% | 1 | 1% |
| Don’t Know | 4 | 5% | 0 | 0% | 1 | 1% |
| **Total** | **92** | **100%** | **92** | **100%** | **92** | **100%** |
| **Weighted Average1** | **1.6** | | **1.5** | | **1.5** | |

1 Mean weighted by frequency of responses, excluding “Don’t Know” and “Refused”

Partial participants recommended increasing the number of contractors, better communication from contractors and NJNG, higher rebates, and greater flexibility with eligible improvements.

Contractors were all very or somewhat satisfied with HPwES, and several said that their high satisfaction is related to their positive experience working with NJNG. They liked working with NJNG in-house staff as opposed to implementation contractors and reported that NJNG staff are responsive to their questions and are very helpful. They felt that NJNG’s HPwES program worked more smoothly than other utilities’ programs.

Some contractors recommended that financial incentives be increased, efficiency requirements be reduced, and marketing assistance be increased. Contractors also recommended that NJNG increase marketing and educate customers about their contractor review process.

## Challenges

The overriding challenge faced by NJNG was the extremely short timeline between approval of their EE plan and the July 1, 2021 implementation date. NJNG had extensive work to complete including coordination with the other NJ utilities, setting up internal systems including data management, qualifying installation contractors, and hiring quality control and evaluation contractors.

NJNG reported that the main challenges that they faced in HPwES were the end-to-end functioning of the software, customer confusion, and the quality of some contractors’ work. Given the need to implement the program so quickly, NJNG initially developed workarounds when needed, which were then disabled when the systems became more functional. This required internal staff training as well as contractor training.

Participation challenges include customers who do not understand the program and submit incorrect applications. Some customers submit HPwES applications for work that should qualify as an HVAC job or fill out the HVAC loan document instead of the HPwES loan document. Most customers do not seem to understand the OBRP process, though NJNG loan processors perceive that customers see the advantages of receiving the loan. Additionally, customers sometimes select contractors who are not HPwES-eligible and/or lack a BPI certification. Another challenge with respect to the application process is obtaining social security numbers from customers who do not use DocuSign.

The initial cost to become a HPwES contractor is a significant barrier to entry for non-HPwES contractors. While NJNG acknowledged that recruiting new HPwES contractors was not a high priority in PY1, they believe that recruiting contractors who can afford the BPI certification, necessary accreditations, equipment, paperwork costs, and working capital will be difficult.

NJNG is finding it challenging to combat the rush mentality that some contractors have to complete one project and move on to the next. There is a tendency for some contractors to want to get in and get out of the home as fast as possible resulting in insufficient air sealing or attic insulation, gas leaks, and mistakes in the model numbers.

Contractors have faced challenges due to supply-chain issues. Prices have increased and there are equipment shortages. Water heaters and furnaces have been severely impacted by these issues. Additionally, materials such as foam are scarce. However, contractors said that these problems have improved over time, and some said it is no longer a significant issue.

Contractors also face challenges hiring staff needed to complete the work. Contractors had hired up to 20 new staff members in the past year and were all looking to hire additional staff. Some of the program requirements, including the background check, drug testing, and a clean driving record, pose additional challenges for hiring new staff.

A potential future challenge is a move to the new BPI standard, which would increase the emphasis on mechanical ventilation and increase the job cost. One contractor did note that frequent changes to modeling and state funding were one of the challenges of HPwES participation.

Coordination with other NJ utilities has been a concern because some of their programs were not budgeted to match the number of jobs NJNG expected to complete or did not have their financing available.

Contractors said that customers faced barriers related to financing, home issues, calculated energy savings, and health and safety issues. Most contractors reported that health and safety barriers were not a common occurrence. When they did face barriers, the most common barriers were mold and moisture, and knob and tube wiring.

# Impact Evaluation

This section provides information on the impact evaluation research conducted and the findings from that research.

## Research Conducted

APPRISE conducted the following research to inform the HPwES Impact Evaluation.

* Program Data Analysis: The HPwES program database was reviewed, and key program statistics were generated.
* Evaluability Assessment: We assessed the level of data available and additional data needed for an Enhanced Rigor Evaluation.[[37]](#footnote-37)
* Net to Gross Analysis: Data from the participant survey were analyzed to develop the Net-to-Gross (NTG) estimate.
* Realization Analysis: We compared the initial program savings estimate from the HPwES plan, the estimates in the program database that were generated by SnuggPro, and the percent of actual pre-treatment natural gas usage that was projected.
* Technical Reference Manual Updates: We will compare the SnuggPro estimates to individual measure savings calculated through the NJ Technical Reference Manual (TRM) and recommend updates to the TRM.[[38]](#footnote-38) This analysis will be reported in a separate memo prior to the TRM update in early 2023.
* Cost-Effectiveness Analysis: We will use the projected savings and NJNG’s reported avoided costs to verify NJNG’s calculations of the NJ Cost Test and the other cost tests. This analysis will be conducted in PY2.

## Measures Installed

This section provides key statistics on services delivered based on analysis of the HPwES database.

Table IV-1 displays the percent of jobs with each type of measure. In addition to those shown in the table below, fewer than one percent of participants installed lighting, doors, health and safety measures, windows, and appliances. About 44 percent of the participants had the attic as the only location where insulation was installed, most of the rest installed an additional type of insulation, most commonly in the walls. Additionally, 81 percent installed one or more custom measures that do not have savings associated with the measure.

**Table IV-1**

**Measure Installation Rates**

| **Measure Category** | **#** | | **%** |  | **Insulation Type** | **#** | **%** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Total** | **425** | | |  | **Total** | **425** | |
| Air Sealing | 425 | 100% | |  | Attic Insulation | 419 | 99% |
| Attic Insulation | 419 | 99% | |  | Wall Insulation | 165 | 39% |
| Duct Sealing | 186 | 44% | |  | Crawl Space Insulation | 54 | 13% |
| Wall Insulation | 165 | 39% | |  | Basement Insulation | 40 | 9% |
| Heating System | 138 | 32% | |  | Floor Insulation | 17 | 4% |
| Water Heater | 122 | 29% | |  |  |  |  |
| Cooling System | 114 | 27% | |  |  |  |  |
| Crawl Space Insulation | 54 | 13% | |  |  |  |  |
| Basement Insulation | 40 | 9% | |  |  |  |  |
| Floor Insulation | 17 | 4% | |  |  |  |  |

Table IV-2 displays the cost distribution for the most commonly installed measures. The mean total project cost was just about $12,000. The mean measure costs were about $1,500 for air sealing, $5,500 for insulation, $7,000 for a heating system, and $6,300 for a cooling system.

**Table IV-2**

**Distribution of Measure Cost by Measure Category**

| **Measure Category** | **Number of Jobs** | **Measure Cost ($)** | | | |
| --- | --- | --- | --- | --- | --- |
| **Mean** | **25th Percentile** | **Median** | **75th Percentile** |
| Air Sealing | 425 | $1,563 | $1,000 | $1,500 | $1,777 |
| Insulation | 420 | $5,470 | $3,400 | $5,199 | $7,072 |
| Duct Sealing | 186 | $405 | $0 | $0 | $300 |
| Heating System | 138 | $7,075 | $5,000 | $6,467 | $8,500 |
| Water Heater | 122 | $2,730 | $2,200 | $2,700 | $3,150 |
| Cooling System | 114 | $6,335 | $5,000 | $5,663 | $7,000 |
| Custom | 345 | $275 | $0 | $125 | $300 |
| **Total Project** | **425** | **$11,995** | $7,000 | $9,414 | $17,000 |

The HPwES database does not include measures that were recommended but not installed. Table IV-3 provides information from the participant survey, which showed that 79 percent of participants installed all recommended measures. Of those who did not install measures, they were most likely to not install a new heating system or hot water heater, either because it was too expensive or not needed because of current equipment that worked well or was recently replaced. Contractors also reported that customers usually install most of the recommended measures and said that the measures most likely to be rejected were water heaters, mini splits, air conditioners, or less insulation than recommended.

**Table IV-3**

**Recommended Measures Not Installed by Participants**

| **Were there any improvements the contractor recommended but you did not install?** | | |
| --- | --- | --- |
| **Recommended Measures** | **#** | **%** |
| **Observations** | **93** | |
| Heating System | 2 | 2% |
| Hot Water Heater | 2 | 2% |
| Attic Insulation | 1 | 1% |
| Duct Sealing | 1 | 1% |
| Other Insulation | 1 | 1% |
| Windows[[39]](#footnote-39) | 1 | 1% |
| None | 75 | 79% |
| Don’t Know | 10 | 12% |
| Refused | 2 | 2% |

Note: Respondents could select more than one response.

## Measure Confirmation

Respondents to the participant survey were asked to confirm installation of up to three major program measures. Table IV-4 shows that between 96 and 100 percent of respondents confirmed air sealing and insulation, heating system, cooling system, and water heater installations. While 23 percent confirmed duct sealing and 47 percent said they did not know if the work was done, 27 percent said it was not done. This may be because contractors provided this in coordination with HVAC work or because the participant did not focus on this less tangible aspect of the project. Additional customer education would be needed to increase the understanding of this measure, but it is unclear that this is important for program results.

**Table IV-4**

**Measures Installed**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Did the contractor do air sealing and insulation work, duct sealing, or**  **install a new heating, cooling, or water heating system in your home?** | | | | | | | | | | |
| **Measure Installed** | **Air Sealing & Insulation** | | **Duct Sealing** | | **Heating System** | | **Cooling System** | | **Water Heater** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Yes | 89 | 96% | 8 | 23% | 28 | 97% | 21 | 100% | 7 | 100% |
| No | 1 | 1% | 9 | 27% | 1 | 3% | 0 | 0% | 0 | 0% |
| Don’t Know | 1 | 1% | 16 | 47% | 0 | 0% | 0 | 0% | 0 | 0% |
| Refused | 2 | 2% | 1 | 3% | 0 | 0% | 0 | 0% | 0 | 0% |
| **Total** | **93** | **100%** | **34** | **100%** | **29** | **100%** | **21** | **100%** | **7** | **100%** |

1Respondents were only asked about the first three measures reported in program data as installed in their home.

## Net to Gross Analysis

All of the interviewed installation contractors reported that the rebates and OBRP were very important in customers’ decisions to pursue energy efficiency upgrades. Those who thought the customers might move forward without the incentives were likely to say that the customers would install lower efficiency equipment or would move forward if their home was uncomfortable.

The HPwES participant survey included a battery of questions to assess free ridership and spillover. Except for the new cooling system, the majority of respondents stated that they had not planned to have the work done before they heard about the HPwES program. This includes 73 percent for the new water heater, 65 percent for duct sealing, 60 percent for the new heating system, and 59 percent for the air sealing and insulation work. However, 71 percent of respondents said that they had planned to replace their cooling system before they heard about the HPwES program.

When asked about the factors that influenced installation of air sealing and insulation, 73 percent said that the rebates and/or financing were extremely important, and 46 percent said that information provided by the contractor was extremely important. Only one percent said that the rebates and/or financing were not at all important. Additionally, 87 percent said that rebates and/or financing were extremely important in the decision to install a new heating system, and 81 percent in the decision to install a new cooling system.

While 20 percent of respondents said that they installed other energy efficiency improvements or products that they did not receive rebates for, some of these did appear to be included in the HPwES project based on additional responses, and only five percent said that the HPwES program was extremely important in their decision to install these measures. Contractors also reported that the program covered the measures or that there were rarely some related measures that usually did not have energy savings associated with them. **There were only three remaining measures with spillover savings that may be attributable to the program and deemed savings will need to be developed for these in the future. However, given the small adjustment expected for these few measures, the free-ridership analysis is a good estimate of the full Net-to-Gross.**

The Net-to-Gross methodology was applied per the SWE guidelines.[[40]](#footnote-40) Table IV-5 shows that the free ridership calculation for the program overall was 87 percent (Method 1). Values for individual measures ranged from 77 percent for duct sealing to 89 percent for air sealing and insulation.

The NTG score was much lower for duct sealing than the other measures because participants who did not confirm that they received a measure were not asked the free ridership and spillover questions related to that measure. For most measures there were very few participants who did not confirm measure installation, but for duct sealing these were a majority of responses. An additional calculation was performed where customers who did not confirm installation of the measure (except a “refused” response) were assigned a free ridership score of zero (Method 2). Since these customers did not recall the measure being installed, it is very unlikely that they would have undertaken the measure in the absence of HPwES. This change increased the duct sealing NTG to 94 percent and the program NTG to 89 percent.

NJNG’s free ridership estimates were similar to those of other reviewed HPwES evaluations (see Section V).

**Table IV-5**

**Net to Gross Analysis**

| **Free Rider Adjustment** | | | | |
| --- | --- | --- | --- | --- |
|  | **Method 1** | | **Method 2** | |
| **Respondents** | **NTG** | **Respondents** | **NTG** |
| Weighted Program Level | 89 | 87% | 91 | 89% |
| Air Sealing & Insulation | 89 | 89% | 91 | 89% |
| Heating System | 28 | 87% | 29 | 88% |
| Cooling System | 21 | 81% | 21 | 81% |
| Duct Sealing | 8 | 77% | 33 | 94% |
| Water Heating | 7 | 87% | 7 | 87% |

## Savings and Realization Rates

Table IV-6 displays the distribution of savings estimated through the SnuggPro software. Mean annual gas savings were 210 Therms and mean annual kWh savings were 406 kWh. While the gas savings were higher than other reviewed programs, the electric savings were lower (see Section V). The mean Total Energy Savings was 15 percent. The gas savings averaged 19 percent of pre-treatment usage and average pre-treatment usage of approximately 1,200 Therms. This compares to the 21 percent savings estimated using billing data for NJNG’s 2013 HPwES participants with average pre-treatment usage of about 1,050 Therms. Therefore, a future billing analysis may show greater than 19 percent savings and higher average natural gas savings, the projected by the software.

**Table IV-6**

**Distribution of Annual and Lifetime Savings by Job**

| **Variable** | **Number of Jobs** | **Mean** | **Percentile** | | |
| --- | --- | --- | --- | --- | --- |
| **25** | **50** | **75** |
| Annual kWh Savings | 425 | 406 | 71 | 159 | 474 |
| Lifetime kWh Savings | 425 | 6,012 | 1,070 | 2,383 | 7,115 |
| Annual Therm Savings | 425 | 210 | 90 | 168 | 289 |
| Lifetime Therm Savings | 425 | 3,141 | 1,346 | 2,517 | 4,334.3 |
| Annual Therm Use Pre-Program | 347 | 1,217 | 854 | 1,114 | 1,434 |
| Annual Percent Gas Savings | 347 | 19% | 8% | 14% | 27% |
| Total Energy Savings (TES) | 425 | 15% | 7% | 13% | 23% |

Table IV-7 displays the percent of SnuggPro estimated program savings attributable to each measure. While 85 percent of gas savings are attributed to air sealing, attic insulation, and heating system replacement, almost half of the electric savings are attributed to cooling system replacement, and the other half to attic insulation, duct sealing, and water heater replacement.

**Table IV-7**

**Measure Savings Contributions[[41]](#footnote-41)**

| **Measure** | **Therms** | | **kWh** | |
| --- | --- | --- | --- | --- |
| **Annual** | **Lifetime** | **Annual** | **Lifetime** |
| Air Sealing | 33% | 33% | -2% | -2% |
| Attic Insulation | 29% | 29% | 25% | 26% |
| Heating System | 23% | 23% | -2% | -2% |
| Duct Sealing | 8% | 8% | 17% | 17% |
| Water Heater | 6% | 6% | 13% | 13% |
| Crawl Space Insulation | 4% | 4% | -1% | -1% |
| Basement Insulation | 1% | 1% | 0% | 0% |
| Cooling System | 0% | 0% | 48% | 49% |
| Floor Insulation | 0% | 0% | 0% | 0% |
| Wall Insulation | -4% | -4% | -1% | -1% |
| **Total Savings** | **100%** | **100%** | **99%** | **100%** |

Table IV-8 compares the savings projected in the HPwES plan to the SnuggPro modeled savings. The program served 63 percent of the projected participants due to the short amount of time to ramp up following the filing. Average annual gas savings per home served were 68 percent of those projected in the plan. The total lifetime gas savings were 38 percent of the plan, due both to lower than projected savings in homes served and less than the expected number of customers treated in the first year.

**Table IV-8**

**Comparison of HPwES Plan Savings and PY1 Savings**

| **PY1 Data** | **HPwES Plan** | **SnuggPro** | **Realization** |
| --- | --- | --- | --- |
| Participants | 670 | 425 | 63% |
| Net Annual Natural Gas Savings (Therms) | 206,938 | 89,250 | 43% |
| Net Participant Annual Gas Savings (Therms) | 309 | 210 | 68% |
| Lifetime Net Annual Gas Savings (Therms) | 3,517,940 | 1,334,925 | 38% |
| Net Participant Lifetime Gas Savings (Therms) | 5,251 | 3,141 | 60% |
| Net Annual Electric Savings (kWh) | 647,013 | 172,550 | 27% |
| Net Participant Annual Electric Savings (kWh) | 966 | 406 | 42% |
| Lifetime Net Annual Electric Savings (kWh) | 10,999,220 | 2,555,100 | 23% |
| Net Participant Lifetime Electric Savings (kWh) | 16,417 | 6,012 | 37% |

## TRM Updates

SnuggPro, the energy modelling software, calculates the HPwES energy savings using an energy modelling engine called OptiMiser. Because it is a proprietary algorithm, it is not possible to assess how those estimates are calculated and should be adjusted. Initial analysis of the savings calculations suggests that the savings may be understated based on a comparison to previous billing analysis of NJNG’s 2013 HPwES program participants.

One specific item to note regarding the savings calculations is that beginning on October 20, 2021, HPwES air leakage reduction defaults to a fixed 20 percent reduction. While contractors are still required to enter pre and post blower door results at project completion, the actual blower door results will not change the TES calculations. Contractors and NJNG staff perceive that this results in an underestimate of program savings.

This change was made because blower door results affect the loan and incentive amounts for that project and may require resubmission of all loan documents. This created some customer satisfaction concerns as the final savings and related rebate amount often differed from what the contractor originally quoted. In an effort to address the concerns raised by the contractors, this change was made. Setting a fixed reduction prevents these kinds of customer issues. However, **NJNG plans to compare the actual readings to the 20 percent fixed value and assess whether and how this value or methodology should be changed.**

Future evaluation will further assess the modeled savings using the following approaches.

* Comparison to measure specific TRM estimates.[[42]](#footnote-42)
* Comparison to pre/post weather normalized, comparison group adjusted, billing estimates.

## Non-Energy Impacts

HPwES survey respondents reported many positive non-energy impacts that resulted from their program participation. While 58 percent said the home was more comfortable, others noted improved hot water temperatures, improved air quality, and reduced noise. Respondents also placed high value on these benefits, as 61 percent said that these benefits had much more value or somewhat more value than the energy savings.

# Program Comparisons

This section provides a review of Process and Impact Evaluation findings from other HPwES programs that have been implemented around the country and a comparison to NJNG’s HPwES program. They compared to the current evaluation in the following.

Table V-1 displays Process Evaluation findings. The comparison shows positive findings for NJNG’s program, especially considering the significant changes made in PY1.

* Awareness: Survey respondents were most likely to report that they learned about NJNG’s program through word of mouth, as compared to the previous NJNG and SJG evaluations where the respondents said that the contractor was the most common source of information. This suggests that NJNG’s program is becoming more well known after being offered for many years.
* Barriers: National Grid Rhode Island’s programs had a higher level of health and safety barriers than found in NJNG’s program.
* Satisfaction: While 95 percent of current NJNG HPwES participants were very or somewhat satisfied with the program, satisfaction with the other programs was similarly high.
* Recommendations: The most common recommendation from the current evaluation were to improve communication, compared to the other studies that recommended increased marketing and greater incentives.

**Table V-1**

**HPwES Process Evaluation Findings**

| **Utility** | **Public Service Company of Oklahoma** | **National Grid Rhode Island** | **New Jersey Natural Gas** | **South Jersey Gas** |
| --- | --- | --- | --- | --- |
| **Sample Size** | (n = 156 (Survey), 26 (Virtual Verification), and 3 (Interviews) | (n = 223) | (n =50) | (n = 334) |
| **Program** | Home Rebates Program | EnergyWise Single Family Program | Home Performance with Energy Star | Home Performance with Energy Star |
| **State** | Oklahoma | Rhode Island | New Jersey | New Jersey |
| **Year** | 2020 | 2017-2019 | 2014 | 2015 |
| **Program Awareness** | -- | -- | The most common source of information was the contractor. | Most often heard about the program from the contractor. |
| **Program Satisfaction** | “Program participants were generally satisfied with their contractors and with PSO program staff.” However, trade allies indicated their communication with program staff was helpful, but staff could be quicker at responding to questions. | 91% of participants expressed overall satisfaction with the program. Additionally, 97% of respondents indicated they would recommend he program to friends and family. | Overall, high satisfaction. Over 90% of respondents stated they were at least somewhat satisfied on each question investigating program satisfaction. | At least 75% of respondents reported they were very satisfied with each aspect of the program. |
| **Participant Barriers** | -- | Knob and tube wiring was most difficult to overcome. | Only 7 out of 45 participants reported experiencing any barriers to completing upgrades and only 4 reported experiencing any barriers to participating in the program. | -- |
| **Participant Recommendations** | -- | Increasing the incentive for customers with knob and tube wiring. | The most common recommendation was to increase marketing. | Increase program advertising, improve the load application process, improve loan payment process, and improve customer service/communication. |
| **Contractor Barriers** | -- | 15-30% of jobs have a health and safety issue not identified during assessment which forces job to stop. | -- | Contractors mentioned health and safety issues, loan denials, customers did not want to replace their hot water heater, and sometimes there was not enough space to add insulation. |
| **Contractor Recommendations** | -- | -- | -- | Contractors recommended increasing the rebate or similar to encourage whole house work, SJG should build customer awareness, SJG should reduce loan paperwork, lower efficiency requirements, and increase the number of contractors in the program. |

Table V-2 displays Impact Evaluation findings. NJNG’s savings that were estimated through the SnuggPro application averaged 210 Therms and 406 kWh per participant. The gas savings were higher than the other evaluations (except NJNG’s previous evaluation) and the electric savings were lower than these other evaluations. NJNG’s free ridership estimate was .11 to .13 (depending on the method), similar to that reported below.

**Table V-2**

**HPwES Impact Evaluation Findings**

| **Utility** | **Public Service Company of Oklahoma** | **National Grid Rhode Island** | **Multiple** | **New Jersey Natural Gas** | **South Jersey Gas** |
| --- | --- | --- | --- | --- | --- |
| **Program** | Home Rebates Program (Single Upgrade Component) | EnergyWise Single Family Program | Home Energy Services Initiative | Home Performance with Energy Star | Home Performance with Energy Star |
| **State** | Oklahoma | Rhode Island | Massachusetts | New Jersey | New Jersey |
| **Year(s)** | 2020 | 2017-2019 | 2015-2016 | 2013 | 2014-2015 |
| **Participants** | 1,847 | 3,087 (2017)  3,972 (2018)  3,125 (2019) | 10,487 | 1,720 | 1,808 |
| **Gross reported electricity savings** | 2,072 MWh | -- | -- | -- | -- |
| **Electricity savings per participant** | 1,122 kWh | 983 kWh | 1,298 kWh | -- | -- |
| **Peak demand electricity savings per participant** | 0.35 kW | -- | -- | -- | -- |
| **Electricity realization rate** | 99% | -- | -- | -- | -- |
| **Peak demand electricity realization rate** | 65% | -- | -- | -- | -- |
| **Gross reported gas savings** | -- | -- | -- | 38,032 MMBtu | 38,088 MMBtu |
| **Gas savings per participant** | -- | 100 Therms/yr | 130 Therms/yr | 221 Therms/yr | 199 Therms/yr |
| **Peak demand gas savings per participant** | -- | -- | -- | -- | -- |
| **Gas realization rate** | -- | -- | 73% | -- |  |
| **Peak demand gas realization rate** | -- | -- | -- | -- |  |
| **Cost effectiveness** | 1.41 (TRC)  0.92 (Utility) | -- | -- | -- |  |
| **Measure penetration** |  | -- | -- | -- | Gas furnace – 91%  Air sealing – 100%  Gas DWH – 84%  Attic/floor insulation – 84%  Central A/C – 70% |
| **Free Ridership** | 11% | 14% | -- | -- | -- |
| **Spillover** | 0% | 1% | -- | -- | -- |

# Appendices

The following appendices are included.

1. HPwES Statistics
2. Participant Survey Instrument
3. Participant Feedback
4. Partial Participant Interview Guide
5. Partial Participant Feedback
6. Contractor Interview Guide
7. Contractor Feedback

## HPwES Statistics

This section provides statistics from the analysis of NJNG’s HPwES program database for 425 HPwES PY1 jobs that had a work compete submit date and were considered closed by NJNG. While 23 additional HPwES jobs had a work complete submit date, they were not considered closed by NJNG because the loan documents were not approved (just a few cases) or they had not yet received confirmation from the contractor that they were complete.

**Table A-1**

**HPwES Application Status**

| **Application Status** | **#** | **%** |
| --- | --- | --- |
| Paid in Full | 333 | 78% |
| Payment Requested | 83 | 20% |
| Active | 3 | 1% |
| Approved | 2 | <1% |
| Revisions Required | 2 | <1% |
| Supervisor Approval Required | 2 | <1% |
| **Total** | **425** | **100%** |

**Table A-2**

**Electric Partner Utility**

| **Electric Utility** | **#** | **%** |
| --- | --- | --- |
| JCP&L | 390 | 92% |
| ACE | 28 | 7% |
| PSE&G | 6 | 1% |
| Orange Rockland | 1 | <1% |
| **Total** | **425** | **100%** |

**Table A-3**

**HPwES Contractors by Job Status**

| **Contractor** | **In Progress Jobs** | | **Completed Jobs** | | **Total Jobs** | |
| --- | --- | --- | --- | --- | --- | --- |
| **#** | **%** | **#** | **%** | **#** | **%** |
| AirSeal Insulation Systems | 26 | 28% | 131 | 39% | 157 | 37% |
| B&E Energy Solutions | 20 | 22% | 50 | 15% | 70 | 16% |
| Dave Hoh’s Home Comfort & Energy Experts | 17 | 18% | 30 | 9% | 47 | 11% |
| Arctic Air Conditioning | 2 | 2% | 22 | 7% | 24 | 6% |
| San Mark Sales dba Allied Construction | 3 | 3% | 17 | 5% | 20 | 5% |
| Insulation Heating & Cooling | 5 | 5% | 12 | 4% | 17 | 4% |
| BC Express | 3 | 3% | 13 | 4% | 16 | 4% |
| Oxford Contracting | 1 | 1% | 14 | 4% | 15 | 4% |
| Green Home Solutions | 3 | 3% | 11 | 3% | 14 | 3% |
| Divine Energy Solutions | 1 | 1% | 12 | 4% | 13 | 3% |
| Brittin Built | 4 | 4% | 7 | 2% | 11 | 3% |
| RJ Walsh Associates | 3 | 3% | 7 | 2% | 10 | 2% |
| Ciel Power | 0 | 0% | 4 | 1% | 4 | 1% |
| Residential Energy Improvements | 2 | 2% | 1 | <1% | 3 | 1% |
| Khalsa Heating & Cooling | 2 | 2% | 0 | 0% | 2 | <1% |
| Dwyer Refrigeration Heating & Air Conditioning | 0 | 0% | 1 | <1% | 1 | <1% |
| Home Comfort Solutions Heating & Cooling | 0 | 0% | 1 | <1% | 1 | <1% |
| **Total** | **92** | **100%** | **333** | **100%** | **425** | **100%** |

**Table A-4**

**Average Job Cost & Incentives by Loan Usage and Term Length**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Loan Usage and Term Length** | **Number of Jobs** | | **Mean Value ($)** | | |
| **#** | **%** | **Rebate Amount** | **Loan Amount** | **Total Project Cost** |
| Jobs with No Loan | 53 | 12% | $3,049 | - | $9,298 |
| Jobs with Loan | 372 | 88% | $3,362 | $8,376 | $12,380 |
| 7 Year Loan | 229 | 62% | $2,642 | $5,231 | $7,902 |
| 10 Year Loan | 143 | 38% | $4,516 | $13,413 | $19,551 |

The analysis also included pre-treatment natural gas usage analysis. Data were requested for program participants and were weather normalized using both a proprietary degree day analysis and a PRISM analysis.

**Table A-5**

**Pre-Treatment Usage Data Attrition**

| **Inclusion Reason** | **Degree Day Normalization** | | **PRISM Normalization** | |
| --- | --- | --- | --- | --- |
| **N** | **%** | **N** | **%** |
| Program Participants | 425 | 100% | 425 | 100% |
| Usage Data in Year Prior to Application | 410 | 96% | 410 | 96% |
| Valid PRISM Output | - | - | 371 | 87% |
| Six or More Bills in Pre-treatment Year | 352 | 83% | 351 | 83% |
| Winter Usage Data Included | 347 | 82% | 347 | 82% |
| **Accounts in Analysis** | **347** | **82%** | **347** | **82%** |

**Table A-6**

**Pre-Treatment Natural Gas Usage**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **Percentile** | | | | | | |
| **Min** | **10th** | **25th** | **50th** | **75th** | **90th** | **Max** |
| Number of Bills | 11.4 | 6 | 9 | 12 | 12 | 12 | 12 | 13 |
| Number of Days | 347 | 158 | 272 | 360 | 364 | 366 | 369 | 397 |
| Raw Usage (Therms) | 1,082 | 180 | 560 | 760 | 1,000 | 1,302 | 1,645 | 4,114 |
| Degree Day Normalized Usage (Therms) | 1,217 | 232 | 699 | 854 | 1,114 | 1,434 | 1,845 | 4,495 |
| PRISM Normalized Usage (Therms) | 1,202 | 230 | 692 | 850 | 1,108 | 1,432 | 1,810 | 4,489 |

**Table A-7**

**Average Modeled Annual Savings by Job Type**

| **Job Type** | **Number of Jobs** | **Mean Annual Savings** | | |
| --- | --- | --- | --- | --- |
| **Electric (kWh)** | **Natural Gas (Therms)** | **Percent Gas Savings1** |
| Air Sealing & No Insulation | 5 | 826 | 208 | 23% |
| Air Sealing & Insulation | 115 | 103 | 175 | 17% |
| Air Sealing, Insulation, & Water Heater | 12 | 442 | 212 | 23% |
| Air Sealing, Insulation, & Duct Sealing | 156 | 172 | 112 | 10% |
| Air Sealing, Insulation, & Heating System | 27 | 668 | 412 | 43% |
| Air Sealing, Insulation, & Cooling System | 3 | 867 | 239 | 19% |
| Air Sealing, Insulation, Heating System, & Cooling System | 107 | 969 | 336 | 30% |
| **Total** | **425** | **406** | **210** | **19%** |

1 Calculated for 347 jobs with pre-program usage data.

**Table A-8**

**Distribution of Annual and Lifetime Savings by Job**

|  | **Number of Jobs** | **Mean** | **Minimum** | **Percentile** | | | **Maximum** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **25** | **50** | **75** |
| Annual kWh Savings | 425 | 406 | -4,204 | 71 | 159 | 474 | 6,513 |
| Lifetime kWh Savings | 425 | 6,012 | -63,067 | 1,070 | 2,383 | 7,115 | 97,696 |
| Annual Therm Savings | 425 | 210 | -141 | 90 | 168 | 289 | 1,028 |
| Lifetime Therm Savings | 425 | 3,141 | -2,121 | 1,346 | 2,517 | 4,334.3 | 15,415 |
| Annual Therm Use | 347 | 1,217 | 232 | 854 | 1,114 | 1,434 | 4,495 |
| Percent Gas Savings | 347 | 19% | -14% | 8% | 14% | 27% | 231% |
| Total Energy Savings (TES) | 425 | 15% | 5% | 7% | 13% | 23% | 47% |

**Table A-9**

**Measure Installation Rates by Job**

| **Measure Category** | **#** | | **%** | **Measure Recommendation** | **#** |
| --- | --- | --- | --- | --- | --- |
| **Total** | **425** | | |
| Air Sealing | 425 | 100% | | Seal Air Leaks | 425 |
| Attic Insulation1 | 419 | 99% | | Insulate Attic | 295 |
| Insulate Vault | 176 |
| Insulate Attic & Kneewall | 122 |
| Insulate Attic – Remove | 1 |
| Insulate Attic Under Floor | 1 |
| Insulate Attic Enclosed Slopes | 1 |
| Duct Sealing | 186 | 44% | | Seal Duct Work | 184 |
| Install New R-8 Sealed Ductwork | 2 |
| Wall Insulation3 | 165 | 39% | | Insulate Walls | 163 |
| Insulate Walls – Attic | 1 |
| Attic – Insulate Gable-Walls | 1 |
| Heating System | 138 | 32% | | Upgrade Heating System | 137 |
| Upgrade Heating System – 2 | 1 |
| Water Heater | 122 | 29% | | Upgrade Water Heater | 122 |
| Cooling System | 114 | 27% | | Upgrade Cooling System | 114 |
| Crawl Space Insulation | 54 | 13% | | Insulate Crawl Space | 42 |
| Insulate Crawl Space & Rim Joist | 11 |
| Insulate Crawl Space 2 | 1 |
| Basement Insulation | 40 | 9% | | Insulate Basement | 36 |
| Insulate Basement & Rim Joist | 2 |
| Basement Insulate Walls & Rim Joist | 1 |
| Insulate Crawl Space | 1 |
| Floor Insulation2 | 17 | 4% | | Insulate Frame Floor | 12 |
| Insulate Floors | 4 |
| Insulate Garage Ceiling | 1 |
| Lighting | 2 | <1% | | Upgrade Lighting | 2 |
| Doors | 1 | <1% | | Replace Doors or Add Storm Doors | 1 |
| Health & Safety | 1 | <1% | | Health & Safety | 1 |
| Dishwasher | 1 | <1% | | Upgrade Dishwasher | 1 |
| Refrigerator | 1 | <1% | | Refrigerator | 1 |
| Freezer | 1 | <1% | | Replace Freezer | 1 |
| Clothes Washer | 1 | <1% | | Upgrade Clothes Washer | 1 |
| Hot Water Temperature | 1 | <1% | | Lower Hot Water Temp | 1 |
| Tank or Pipe Wrap | 1 | <1% | | Add Tank or Pipe Wrap | 1 |
| Miscellaneous Electric Loads | 1 | <1% | | Misc. Electric Loads | 1 |
| PV | 1 | <1% | | PV | 1 |
| Pool Pumps | 1 | <1% | | Upgrade Pool Pump | 1 |
| Thermostat Setting | 1 | <1% | | Thermostat Set Points | 1 |
| Windows | 1 | <1% | | Upgrade Windows | 1 |
| Custom4 | 345 | 81% | | Air Sealing | 180 |
| Dryer Venting | 179 |
| Rebate/Incentive/Discount | 103 |
| Bathroom Ventilation | 99 |
| Attic Access Insulation | 56 |
| Attic Access Cover | 49 |
| Create/Close Attic/Kneewall Access | 46 |
| CO Detector | 22 |
| Other Insulation | 17 |
| Vapor Barrier | 14 |
| Removal | 11 |
| Mechanical Ventilation | 10 |
| Miscellaneous | 7 |
| Ductwork | 6 |
| Health & Safety | 4 |
| Chimney | 3 |
| Dehumidifier | 2 |
| Gas Conversion | 1 |
| Thermostat | 1 |

Note: Multiple measures could be installed on a single job.

1 Includes attic insulation and insulation of vaulted ceilings.

2 Includes floor insulation and garage ceiling insulation.

3 Includes wall insulation and gable insulation.

4 Includes miscellaneous measures such as discounts, venting, and repairing gas leaks.

**Table A-10**

**Distribution of Measure Cost by Measure Category**

| **Measure Category** | **Number of Jobs** | **Measure Cost ($)** | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mean** | **Minimum** | **Percentile** | | | **Maximum** |
| **25** | **50** | **75** |
| Air Sealing | 425 | $1,563 | $0 | $1,000 | $1,500 | $1,777 | $7,042 |
| Insulation | 420 | $5,470 | $543 | $3,400 | $5,199 | $7,072 | $19,563 |
| Duct Sealing | 186 | $405 | $0 | $0 | $0 | $300 | $8,475 |
| Heating System | 138 | $7,075 | $1,600 | $5,000 | $6,467 | $8,500 | $19,800 |
| Water Heater | 122 | $2,730 | $0 | $2,200 | $2,700 | $3,150 | $5,491 |
| Cooling System | 114 | $6,335 | $3,500 | $5,000 | $5,663 | $7,000 | $13,887 |
| Custom | 345 | $275 | -$3,366 | $0 | $125 | $300 | $6,270 |

**Table A-11**

**Custom and Insulation Measures Per Job**

| **Number Per Job** | **Custom Measures** | | **Types of Insulation** | |
| --- | --- | --- | --- | --- |
| **#** | **%** | **#** | **%** |
| 0 | 80 | 19% | 5 | 1% |
| 1 | 72 | 17% | 185 | 44% |
| 2 | 166 | 39% | 203 | 48% |
| 3 | 40 | 9% | 25 | 6% |
| 4 | 32 | 8% | 6 | 1% |
| 5 | 22 | 5% | 1 | <1% |
| 6+ | 13 | 3% | - | - |
| **Total** | **425** | **100%** | **425** | **100%** |

**Table A-12**

**Types of Insulation**

|  |  |  |
| --- | --- | --- |
| **Measure Category** | **#** | **%** |
| **Total** | **425** | |
| Attic Insulation | 419 | 99% |
| Basement Insulation | 40 | 9% |
| Crawl Space Insulation | 54 | 13% |
| Floor Insulation | 17 | 4% |
| Wall Insulation | 165 | 39% |

Note: Multiple types of insulation could be installed in the same project.

## Participant Survey Instrument

The survey was offered online and by phone. The telephone version is shown below.

**New Jersey Natural Gas**

**Home Performance with Energy Star Program**

**Draft Participant Survey**

**TELEPHONE VERSION**

Interviewee Group: HPwES Participants

Evaluation: Process and Impact Evaluation

Note: Sample to be divided in two to reduce survey length. See skip patterns for Group 1 and Group 2. Both groups will be asked the demographic questions.

* GROUP 1: This group will provide information for the Process Evaluation, including program knowledge and participation, understanding, non-energy impacts, and satisfaction.
* GROUP 2: This group will provide information for the Impact Evaluation, including confirmation of installed measures and free ridership and spillover.

The Home Performance with Energy Star Program Survey’s primary research topics are summarized in the following table.

| **Primary Topic** | **Sub-Topics** | | |
| --- | --- | --- | --- |
| Demographics | Own/rent | Primary language | Race |
| Participation | Information source | Motivation | Challenges |
| Program Incentives | Rebates | On-bill financing |  |
| Measures | Uptake | Rejection reasons | Satisfaction and Challenges |
| Free Ridership | Prior measure consideration | Measure timing | Measure efficiency, quality |
| Spill over | Additional measures | Others outside program |  |
| Impacts | Usage | Comfort | Health, safety, other |
| Satisfaction | Program | Contractor | Audit and installation |
| Challenges | Program incentives, cost | Program understanding | Home readiness, other |
| Recommendations | Program | Contractor | Other |

**GROUPS 1 & 2**

Hello. This is {INTERVIEWER} calling from APPRISE on behalf of New Jersey Natural Gas for {NAME}. I’m calling to ask you about your experience with the New Jersey Natural Gas Home Performance with Energy Star program. This program provides rebates and on-bill financing to install energy efficient upgrades in your home such as air sealing, insulation, and heating or cooling equipment. APPRISE has been contracted by NJNG to speak with you about the program. You should have received a letter in the mail notifying you about this survey with a $5 incentive as a thank you for considering participating. The survey will take approximately 15 minutes.

Can I please speak to someone knowledgeable about the energy work you had completed on your home?

1. [Interviewer: DO NOT READ, to whom are you speaking?]
2. NAME
3. SPOUSE/PARTNER
4. CARETAKER/GUARDIAN
5. OTHER/DON’T KNOW [GO TO S2]
6. **[ASK S2 IF S1 = 04]** When can I call back to speak with {NAME} or the spouse or partner of {NAME}?
7. \_\_\_\_\_\_\_\_\_\_\_\_\_ [WRITE DATE AND TIME FOR CALLBACK]
8. DON’T KNOW
9. REFUSED

**Section A: Program Knowledge – GROUP 1**

1. How did you learn about the New Jersey Natural Gas Home Performance with Energy Star program**? [MARK ALL THAT APPLY.]**
2. WHEN I CALLED TO OPEN A NJNG ACCOUNT
3. LETTER/MAILING FROM NJNG
4. EMAIL FROM NJNG
5. NJNG’S WEBSITE
6. CONTRACTOR INFORMED ME WHEN CAME TO REPLACE HEATING, COOLING EQUIPMENT
7. CONTRACTOR ADVERTISEMENT
8. GOOGLE/FACEBOOK ADVERTISEMENT
9. WORD OF MOUTH
10. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
11. DON’T KNOW
12. REFUSED
13. Why did you decide to participate in the NJNG Home Performance with Energy Star program**? [MARK ALL THAT APPLY.]**
14. REDUCE ENERGY BILLS
15. IMPROVE COMFORT
16. OLD EQUIPMENT NEEDED TO BE REPLACED
17. REDUCE CARBON FOOTPRINT / ENVIRONMENTAL IMPACTS
18. IMPROVE HOME AIR QUALITY
19. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
20. DON’T KNOW
21. REFUSED
22. How well would you say you understand or do not understand the Home Performance with Energy Star program? Would you say that you understand it very well, somewhat well, not that well, or not at all?
23. VERY WELL
24. SOMEWHAT WELL
25. NOT THAT WELL
26. NOT AT ALL
27. DON’T KNOW
28. REFUSED
29. **[ASK A4 IF A3 = 03 | 04]** What do you not understand about the Home Performance with Energy Star program? **[MARK ALL THAT APPLY.]**
30. HOW REBATE LEVEL WAS DETERMINED
31. HOW THE ON-BILL REPAYMENT PLAN WORKS
32. WHAT IMPROVEMENTS WERE MADE TO MY HOME
33. PROGRAM TIMELINE
34. PROGRAM ELIGIBIITY
35. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
36. DON’T KNOW
37. REFUSED**Section B: Energy Efficiency Improvements – GROUP 2**

[USE A COUNTER FOR QUESTIONS B1-B5. EVERY TIME RESPONDENT IS ASKED A QUESTION INCREASE COUNT BY 1.]

1. Did the contractor do air sealing and insulation work in your home?
2. YES
3. NO
4. DON’T KNOW
5. REFUSED
6. **[ASK B2 IF HEATSYS=1]** Did the contractor install a new heating system in your home?
7. YES
8. NO
9. DON’T KNOW
10. REFUSED
11. **[ASK B3 IF COOLSYS=1]** Did the contractor install a new cooling system in your home?
12. YES
13. NO
14. DON’T KNOW
15. REFUSED
16. **[ASK B4 IF DUCT=1 & COUNT<3]** Did the contractor do duct sealing work in your home?
17. YES
18. NO
19. DON’T KNOW
20. REFUSED
21. **[ASK B5 IF WHEAT=1 & COUNT<3]** Did the contractor install a new water heating system in your home?
22. YES
23. NO
24. DON’T KNOW
25. REFUSED
26. Were there any improvements the contractor recommended but you did not install? **[MARK ALL THAT APPLY.]**
27. HEATING SYSTEM
28. COOLING SYSTEM
29. ATTIC INSULATION
30. DUCT SEALING
31. OTHER INSULATION
32. HOT WATER HEATER
33. NONE
34. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
35. DON’T KNOW
36. REFUSED

**[ASK B7 FOR EACH MEASURE CHECKED IN B6]**

**[SKIP B7 IF B6 = 07, 96, OR 97]**

1. Why did you decide to not implement the {INSERT B6 RESPONSE(S)}? **[DO NOT PROMPT. MARK ALL THAT APPLY.]**
2. DID NOT UNDERSTAND OR TRUST MEASURE
3. MEASURE IS TOO EXPENSIVE
4. DON’T NEED IT/CURRENT MEASURE FUNCTIONS WELL
5. WILL IMPLEMENT AT A LATER DATE
6. PLANNING MAJOR HOME RENOVATION BEFORE IMPLEMENTATION
7. AUDITOR REPORTED HOME REPAIRS THAT NEEDED TO BE FIXED FIRST (MOLD, MOISTURE, WIRING, ASBESTOS, ROOF REPAIRS, ETC)
8. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
9. DON’T KNOW
10. REFUSED
11. Did the contractor say that repairs would be needed in your home before they could implement any of the home improvements?
12. YES
13. NO [SKIP TO C1]
14. DON’T KNOW
15. REFUSED
16. **[ASK B9 IF B8 = 01, “YES”]** What repairs did the contractor say would be needed? **[MARK ALL THAT APPLY.]**
17. ROOF REPAIRS
18. WIRING REPAIRS
19. PLUMBING REPAIRS
20. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
21. DON’T KNOW
22. REFUSED
23. **[ASK B10 IF B8 = 01, “YES”]** What repairs did you undertake? **[MARK ALL THAT APPLY.]**
24. ROOF REPAIRS
25. WIRING REPAIRS
26. PLUMBING REPAIRS
27. NONE
28. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
29. DON’T KNOW
30. REFUSED

**Section C: Free Ridership and Spillover – GROUP 2**

ASK ABOUT EACH MEASURE IF INSTALLED; UP TO 3 MEASURES AT MOST STARTING FROM THE FIRST ONE LISTED BELOW AND GOING IN THAT ORDER:

* Air sealing and insulation (ASK IF B1=1)
* Heating system (ASK IF B2=1)
* Cooling system (ASK IF B3=1)
* Duct sealing (ASK IF B4=1 AND COUNT<3)
* Water heating system (ASK IF B5=1 AND COUNT<3)

1. Before you heard about the Home Performance with Energy Star program, had you already planned to have the *air sealing and insulation* work done?
2. YES
3. NO
4. DON’T KNOW
5. REFUSED
6. Would you most likely have paid for the same *air sealing and insulation* work if it were ineligible for Home Performance with Energy Star rebates or financing?
7. YES
8. NO
9. DON’T KNOW
10. REFUSED
11. **[ASK C3a IF C2a = 02 | C2a = 96]** Would you most likely have paid for different *air sealing and insulation* work if it were ineligible for Home Performance with Energy Star rebates or financing, or would you have decided not to have any air sealing and insulation work done?
12. DIFFERENT *AIR SEALING AND INSULATION* WORK
13. NOT INSTALLED *AIR SEALING AND INSULATION*
14. DON’T KNOW
15. REFUSED
16. Without Home Performance with Energy Star rebates or financing, how much *air sealing and insulation* work would you have done?
17. SAME AMOUNT
18. LESS WORK
19. DON’T KNOW
20. REFUSED
21. Thinking about timing, without Home Performance with Energy Star rebates or financing, when would you have most likely had the *air sealing and insulation* work done?
22. SAME TIME
23. 0 - 12 MONTHS LATER
24. 1 - 2 YEARS LATER
25. MORE THAN 2 YEARS LATER/NEVER
26. DON’T KNOW
27. REFUSED
28. Please rate how important the Home Performance with Energy Star rebates or financing were in your decision to have *air sealing and insulation* work done. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
29. 1 - NOT AT ALL IMPORTANT
30. 2 - SLIGHTLY IMPORTANT
31. 3 - MODERATELY IMPORTANT
32. 4 - VERY IMPORTANT
33. 5 - EXTREMELY IMPORTANT
34. DON’T KNOW
35. REFUSED
36. Please rate how important a recommendation from NJNG program staff was in your decision to have *air sealing and insulation* work done. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
37. 1 - NOT AT ALL IMPORTANT
38. 2 - SLIGHTLY IMPORTANT
39. 3 - MODERATELY IMPORTANT
40. 4 - VERY IMPORTANT
41. 5 - EXTREMELY IMPORTANT
42. DON’T KNOW
43. REFUSED
44. NOT APPLICABLE - DID NOT RECEIVE RECOMMENDATION
45. Please rate how important energy efficiency information that NJNG provided to you was in your decision to have *air sealing and insulation* work done. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
46. 1 - NOT AT ALL IMPORTANT
47. 2 - SLIGHTLY IMPORTANT
48. 3 - MODERATELY IMPORTANT
49. 4 - VERY IMPORTANT
50. 5 - EXTREMELY IMPORTANT
51. DON’T KNOW
52. REFUSED
53. NOT APPLICABLE - NO INFORMATION RECEIEVED
54. Please rate how important information from a contractor was in your decision to have *air sealing and insulation* work done. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
55. 1 - NOT AT ALL IMPORTANT
56. 2 - SLIGHTLY IMPORTANT
57. 3 - MODERATELY IMPORTANT
58. 4 – VERY IMPORTANT
59. 5 - EXTREMELY IMPORTANT
60. DON’T KNOW
61. REFUSED
62. Please rate how important previous participation in a NJNG energy efficiency program was in your decision to have *air sealing and insulation* work done. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
63. 1 - NOT AT ALL IMPORTANT
64. 2 - SLIGHTLY IMPORTANT
65. 3 - MODERATELY IMPORTANT
66. 4 - VERY IMPORTANT
67. 5 - EXTREMELY IMPORTANT
68. DON’T KNOW
69. REFUSED
70. NOT APPLICABLE - NO PREVIOUS PARTICIPATION IN PROGRAMS
71. In your own words, can you please describe how important the Home Performance with Energy Star program was in your decision to have *air sealing and insulation* work done?
72. RECORD ANSWER IF PROVIDED: \_\_\_\_\_\_\_\_\_\_\_\_\_
73. DON’T KNOW
74. REFUSED

**[ASK QUESTIONS C1b – C11b IF B2 = 1. USE “HEATING SYSTEM” FOR {}.]**

**[REPEAT QUESTIONS C1b-C11b IF B3 = 1. USE “COOLING SYSTEM” FOR {}. THESE WILL BE NUMBERED C1c-C11c EVEN IF C1b-C11b WERE NOT ASKED.]**

1. Before you heard about the Home Performance with Energy Star program, had you already planned to purchase and install the {}?
2. YES
3. NO
4. DON’T KNOW
5. REFUSED
6. Would you most likely have purchased the same {} if it were ineligible for Home Performance with Energy Star rebates or financing?
7. YES
8. NO
9. DON’T KNOW
10. REFUSED
11. **[ASK C3a IF C2a = 02 | C2a = 96]** Would you most likely have purchased a different {} if it were ineligible for Home Performance with Energy Star rebates or financing, or would you have decided not to purchase the {}?
12. PURCHASED A DIFFERENT {}
13. NOT PURCHASED THE {}
14. DON’T KNOW
15. REFUSED
16. Without Home Performance with Energy Star rebates or financing, what efficiency level of {} would you most likely have purchased?
17. SAME EFFICIENCY OR HIGHER
18. LOWER EFFICIENCY
19. LOWEST EFFICIENCY/LOWEST COST {}
20. DON’T KNOW
21. REFUSED
22. Thinking about timing, without Home Performance with Energy Star rebates or financing, when would you have most likely purchased the {}?
23. SAME TIME
24. 0 - 12 MONTHS LATER
25. 1 - 2 YEARS LATER
26. MORE THAN 2 YEARS LATER/NEVER
27. DON’T KNOW
28. REFUSED
29. Please rate how important the Home Performance with Energy Star rebates or financing were in your decision to purchase and install the {}. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
30. 1 - NOT AT ALL IMPORTANT
31. 2 - SLIGHTLY IMPORTANT
32. 3 - MODERATELY IMPORTANT
33. 4 – VERY IMPORTANT
34. 5 - EXTREMELY IMPORTANT
35. DON’T KNOW
36. REFUSED
37. Please rate how important a recommendation from NJNG program staff was in your decision purchase and install the {}. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
38. 1 - NOT AT ALL IMPORTANT
39. 2 - SLIGHTLY IMPORTANT
40. 3 - MODERATELY IMPORTANT
41. 4 - VERY IMPORTANT
42. 5 - EXTREMELY IMPORTANT
43. DON’T KNOW
44. REFUSED
45. NOT APPLICABLE - DID NOT RECEIVE RECOMMENDATION
46. Please rate how important energy efficiency information that NJNG provided to you was in your decision to purchase and install the {}. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
47. 1 - NOT AT ALL IMPORTANT
48. 2 - SLIGHTLY IMPORTANT
49. 3 - MODERATELY IMPORTANT
50. 4 - VERY IMPORTANT
51. 5 - EXTREMELY IMPORTANT
52. DON’T KNOW
53. REFUSED
54. NOT APPLICABLE - NO INFORMATION RECEIEVED
55. Please rate how important information from a contractor was in your decision to purchase and install the {}. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
56. 1 - NOT AT ALL IMPORTANT
57. 2 - SLIGHTLY IMPORTANT
58. 3 - MODERATELY IMPORTANT
59. 4 - VERY IMPORTANT
60. 5 - EXTREMELY IMPORTANT
61. DON’T KNOW
62. REFUSED
63. Please rate how important previous participation in a NJNG energy efficiency program was in your decision to purchase and install the {}. Use a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important.”
64. 1 - NOT AT ALL IMPORTANT
65. 2 - SLIGHTLY IMPORTANT
66. 3 - MODERATELY IMPORTANT
67. 4 - VERY IMPORTANT
68. 5 - EXTREMELY IMPORTANT
69. DON’T KNOW
70. REFUSED
71. NOT APPLICABLE - NO PREVIOUS PARTICIPATION IN PROGRAMS
72. In your own words, can you please describe how important the Home Performance with Energy Star program was in your decision to purchase and install the {}?
73. RECORD ANSWER IF PROVIDED: \_\_\_\_\_\_\_\_\_\_\_\_\_
74. DON’T KNOW
75. REFUSED

**[REPEAT QUESTIONS C1a – C11a IF B4 = 1 & COUNT <3. SUBSTITUTE “AIR SEALING AND INSULATION” WITH “DUCT SEALING.” THESE WILL BE NUMBERED C1d-C11d EVEN IF EARLIER QUESTIONS WERE NOT ASKED.]**

**[REPEAT QUESTIONS C1b – C11b IF B5 = 1 & COUNT <3. USE “WATER HEATING SYSTEM” FOR {}. THESE WILL BE NUMBERED C1e-C11e EVEN IF EARLIER QUESTIONS WERE NOT ASKED.]**

1. Since participating in the Home Performance with Energy Star program, have you made any other energy efficient improvements or installed any other energy efficient products in your home that you did ***NOT*** receive rebates or financing for from NJNG or another organization?
2. YES
3. NO [SKIP TO D1]
4. DON’T KNOW
5. REFUSED

**[SKIP C13 – C17 IF C12 = 02, 96, OR 97]**

1. What energy efficient products or improvements have you purchased and installed since you participated in the Home Performance with Energy Star program? **[MARK ALL THAT APPLY.]**
2. HEATING SYSTEM
3. COOLING SYSTEM
4. AIR SEALING
5. ATTIC INSULATION
6. DUCT SEALING
7. OTHER INSULATION
8. HOT WATER HEATER
9. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
10. DON’T KNOW
11. REFUSED

**[ASK QUESTIONS C14-C17 FOR EACH RESPONSE TO C13, FIRST TIME C14a, SECOND TIME C14b, etc.]**

**[SKIP C14 – C17 IF C13 = 96 OR 97]**

1. On a scale from 1 to 5, with 1 meaning “not at all important” and 5 meaning “extremely important”, please rate how important your experience participating in the Home Performance with Energy Star program was in your decision to install the {INSERT C13 RESPONSE. ASK ONE FOR EACH RESPONSE TO C13}.
2. 1 - NOT AT ALL IMPORTANT
3. 2 - SLIGHTLY IMPORTANT
4. 3 - MODERATELY IMPORTANT
5. 4 - VERY IMPORTANT
6. 5 - EXTREMELY IMPORTANT
7. DON’T KNOW
8. REFUSED
9. Why did you not apply for and receive a rebate or financing for the {INSERT C13 RESPONSE}?
10. UNAWARE IF REBATE/FINANCING IS AVAILABLE
11. PRODUCT DID NOT QUALIFY
12. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
13. DON’T KNOW
14. REFUSED
15. How did you know that the {INSERT C13 RESPONSE} was energy efficient? **[MARK ALL THAT APPLY.]**
16. KNOWLEDGE GAINED FROM PARTICIPATION IN HPwES
17. INFORMATION PROVIDED IN NJNG MARKETING MATERIALS
18. INFORMED BY CONTRACTOR
19. INFORMED BY SALES ASSOCIATE
20. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
21. DON’T KNOW
22. REFUSED
23. In what year did you purchase and install the {INSERT C13 RESPONSE}?
24. 2021
25. 2022
26. DON’T KNOW
27. REFUSED**Section D: Program Impacts – GROUP 1**
28. Have you noticed any changes in your home since the energy efficiency improvements were done? **[DO NOT PROMPT. MARK ALL THAT APPLY.]**
29. MORE COMFORTABLE
30. LESS COMFORTABLE
31. IMPROVED AIR QUALITY
32. WORSENED AIR QUALITY
33. REDUCED NOISE
34. MORE NOISE
35. REDUCED PESTS
36. MORE PESTS
37. HOT WATER TEMPERATURE IMPROVED
38. HOT WATER TEMPERATURE WORSENED
39. NO CHANGE
40. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
41. DON’T KNOW
42. REFUSED

**[SKIP D2 IF 13=11, 96, OR 97]**

1. Think about the value you experienced from these changes – would you say it is much more value, somewhat more value, the same value, somewhat less value, or much less value, as the energy savings you may have received from the program?
2. MUCH MORE VALUE
3. SOMEWHAT MORE VALUE
4. THE SAME VALUE
5. SOMEWHAT LESS VALUE
6. MUCH LESS VALUE
7. DON’T KNOW
8. REFUSED

**Section E: Satisfaction – GROUP 1**

1. How satisfied are you with the energy efficiency improvements that were done? Would you say you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?
2. VERY SATISFIED
3. SOMEWHAT SATISFIED
4. SOMEWHAT DISSATISFIED
5. VERY DISSATISFIED
6. DON’T KNOW
7. REFUSED

**[ASK E2 & E3 IF E1 = 03 | 04]**

1. What about the improvements dissatisfied you? **[MARK ALL THAT APPLY.]**
2. COST
3. INSTALLATION
4. ASTHETICS
5. PERFORMANCE
6. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
7. DON’T KNOW
8. REFUSED
9. What could have improved your satisfaction with the energy efficiency improvements?
10. RECORD ANSWER IF PROVIDED: \_\_\_\_\_\_\_\_\_\_\_\_\_
11. DON’T KNOW
12. REFUSED
13. How satisfied were you with your contractor? Would you say you were very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?
14. VERY SATISFIED
15. SOMEWHAT SATISFIED
16. SOMEWHAT DISSATISFIED
17. VERY DISSATISFIED
18. DON’T KNOW
19. REFUSED

**[ASK E5 & E6 IF E4 = 03 | 04]**

1. What about your contractor dissatisfied you? **[MARK ALL THAT APPLY.]**
2. TIME TO INSTALL EQUIPMENT
3. DID NOT CLEAN UP AFTER THEMSELVES
4. CONTRACTOR WAS NOT RESPONSIVE
5. CONTRACTOR WAS LATE
6. CONTRACTOR RECOMMENDATIONS WERE NOT COMPREHENSIVE
7. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
8. DON’T KNOW
9. REFUSED
10. What could have improved your satisfaction with your contractor?
11. RECORD ANSWER IF PROVIDED: \_\_\_\_\_\_\_\_\_\_\_\_\_
12. DON’T KNOW
13. REFUSED
14. What recommendations would you make to improve your contractor’s services? **[MARK ALL THAT APPLY.]**
15. DECREASE TIME BETWEEN AUDIT AND SERVICE DELIVERY
16. MAKE SCHEDULING PROCESS EASIER
17. EXERCISE MORE CAUTION DURING HOME VISITS
18. INCREASE COMMUNICATION
19. NO RECOMMENDATIONS
20. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
21. DON’T KNOW
22. REFUSED
23. How satisfied are you with the NJNG Home Performance with Energy Star program? Would you say you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?
24. VERY SATISFIED
25. SOMEWHAT SATISFIED
26. SOMEWHAT DISSATISFIED
27. VERY DISSATISFIED
28. DON’T KNOW
29. REFUSED

**[ASK E9 & E10 IF E8 = 03 | 04]**

1. What about the NJNG Home Performance with Energy Star program dissatisfied you? **[MARK ALL THAT APPLY.]**
2. NEEDED MORE FINANCIAL ASSISTANCE FOR UPGRADES
3. NEEDED MORE HELP TO FIND CONTRACTOR
4. LACK OF INFORMATIONAL MATERIALS
5. COMMUNICATION/ NOT UPFRONT WITH PROCESS
6. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
7. DON’T KNOW
8. REFUSED
9. What could have improved your satisfaction with the NJNG Home Performance with Energy Star program?
10. RECORD ANSWER IF PROVIDED: \_\_\_\_\_\_\_\_\_\_\_\_\_
11. DON’T KNOW
12. REFUSED
13. What recommendations would you make to improve the NJNG Home Performance with Energy Star program? **[DO NOT PROMPT. MARK ALL THAT APPLY.]**
14. IMPROVE MARKETING MATERIALS
15. INCREASE REBATE/LOAN AMOUNTS
16. EXPAND LIST OF ELIGIBLE EQUIPMENT
17. EXPAND LIST OF PARTICIPATING CONTRACTORS
18. NO RECOMMENDATIONS
19. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
20. DON’T KNOW
21. REFUSED

**Section F: Demographics – GROUPS 1 & 2**

1. Do you rent or own your home?
2. RENT
3. OWN
4. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
5. DON’T KNOW
6. REFUSED
7. Which of the following best describes your home?
8. SINGLE-FAMILY
9. DUPLEX
10. TRIPLE DECKER (THREE STORY HOUSE WITH EACH FLOOR A SEPARATE UNIT)
11. APARTMENT/CONDO IN A 2-4 UNIT BUILDING
12. APARTMENT/CONDO IN A 5+ UNIT BUILDING
13. TOWNHOUSE OR ROW HOUSE (ADJACENT WALLS TO ANOTHER HOUSE)
14. MOBILE HOME OR TRAILER
15. OTHER (PLEASE DESCRIBE) \_\_\_\_\_\_\_\_\_\_
16. DON’T KNOW
17. REFUSED
18. When was your home built?
19. BEFORE 1960
20. 1960-1979
21. 1980-1999
22. 2000-2009
23. 2010 OR LATER
24. DON’T KNOW
25. REFUSED
26. About how many square feet is your home? If you are unsure, an estimate is OK?
27. LESS THAN 1,000 SQUARE FEET
28. 1,000-1,999 SQUARE FEET
29. 2,000-2,999 SQUARE FEET
30. 3,000-3,999 SQUARE FEET
31. 4,000-4,999 SQUARE FEET
32. 5,000 OR GREATER SQUARE FEET
33. DON’T KNOW
34. REFUSED
35. What is the main fuel used for heating your home?
36. Electricity
37. Natural Gas
38. Propane
39. Oil
40. OTHER (PLEASE SPECIFY) \_\_\_\_\_\_\_\_\_\_
41. DON’T KNOW
42. REFUSED
43. What fuel does your main water heater use?
44. Electricity
45. Natural Gas
46. Propane
47. Oil
48. OTHER (PLEASE SPECIFY) \_\_\_\_\_\_\_\_\_\_
49. DON’T KNOW
50. REFUSED
51. What is your age?
52. Under 18 years old
53. 18-24 years old
54. 25-34 years old
55. 35-44 years old
56. 45-54 years old
57. 55-64 years old
58. 65-74 years old
59. 75-85 years old
60. 86 years old or older
61. REFUSED
62. What is the primary language spoken in your home?
63. English
64. Spanish
65. Chinese
66. German
67. Native American language
68. Vietnamese
69. Russian
70. Tagalog
71. Hmong
72. Korean
73. African language
74. French
75. Japanese
76. OTHER (Please specify)
77. REFUSED
78. NJNG is committed to providing energy efficiency programs to all customers in the communities they serve. Please share your race/ethnicity to help us understand the diversity of our program participants (MARK ALL THAT APPLY).
79. African
80. African American/Black
81. Asian-American
82. Caribbean American
83. East Asian (Including Chinese, Japanese, Korean, Mongolian, Tibetan, and Taiwanese)
84. Hispanic or Latino
85. Indigenous American/First Nations (Including Native American/American Indian, Alaska Native, Pacific Islander, and Native Hawaiian)
86. Middle Eastern or North African
87. South Asian (Including Bangladeshi, Bhutanese, Indian, Nepali, Pakistani, and Sri Lankan)
88. Southeast Asian (Including Burmese, Cambodian, Filipino, Hmong, Indonesian, Laotian, Malaysian, Mien, Singaporean, Thai, and Vietnamese)
89. White
90. Not Listed (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_
91. Prefer not to answer
92. Including yourself, how many people are living in your household?
93. RECORD ANSWER: \_\_\_\_\_\_\_\_\_\_\_\_\_
94. DON’T KNOW
95. REFUSED

**[SKIP F11 IF F10=96 OR 97]**

1. Is your annual household income over or under [CUTOFF]?

IF Q10 = 1 CUTOFF = $33,976

IF Q10 = 2 CUTOFF = $45,776

IF Q10 = 3 CUTOFF = $57,576

IF Q10 = 4 CUTOFF = $69,376

IF Q10 = 5 CUTOFF = $81,176

IF Q10 = 6 CUTOFF = $92,976

IF Q10 = 7 CUTOFF = $104,776

IF Q10 = 8 CUTOFF = $116,576

IF Q10 = 9 CUTOFF = $128,376

IF Q10 = 10 CUTOFF = $140,176

IF Q10 = 11 CUTOFF = $151,976

IF Q10 = 12 CUTOFF = $163,776

IF Q10 = 13 CUTOFF = $175,576

IF Q10 = 14 CUTOFF = $187,376

1. OVER
2. UNDER
3. DON’T KNOW
4. REFUSED

**[SKIP F12 IF F11 = 02 OR F10=96 OR 97]**

1. Is your annual household income over or under [CUTOFF]?

IF Q10 = 1 CUTOFF = $54,360

IF Q10 = 2 CUTOFF = $73,240

IF Q10 = 3 CUTOFF = $92,120

IF Q10 = 4 CUTOFF = $111,000

IF Q10= 5 CUTOFF = $129,880

IF Q10 = 6 CUTOFF = $148,760

IF Q10 = 7 CUTOFF = $167,640

IF Q10 = 8 CUTOFF = $186,520

IF Q10 = 9 CUTOFF = $205,400

IF Q10 = 10 CUTOFF = $224,280

IF Q10 = 11 CUTOFF = $243,160

IF Q10 = 12 CUTOFF = $262,040

IF Q10 = 13 CUTOFF = $280,920

IF Q10 = 14 CUTOFF = $299,800

1. OVER
2. UNDER
3. DON’T KNOW
4. REFUSED

That was my last question.  Thank you very much for your time and cooperation.  Have a pleasant day/evening.

## Participant Feedback

APPRISE conducted mixed mode web/telephone surveys with participants in New Jersey Natural Gas’s (NJNG) Home Performance with Energy Star (HPwES) program in June and July 2022.

The sample was comprised of 325 customers who participated in HPwES and reached at least the final review stage of program participation by May 18, 2022. The sample was stratified by the types of measures installed.

Because of the survey length, the sample was divided into two groups.

* Group 1: This group was asked about program satisfaction and recommendations, as well as demographic characteristics. The survey was approximately five to ten minutes in length.
* Group 2: This group was asked to confirm measure installation, provide information on free ridership and spillover, and to provide demographic data. The survey was approximately ten to 15 minutes in length.

Outreach to the sample was conducted in the following manner. Table C-1 summarizes this outreach.

* Advance Letter: Customers were sent an advance letter on 6/14/22 that included a $5 bill, explained the purpose of the survey, provided the link to complete the web survey, notified them that they would be called to complete the survey, and provided the option to call a toll-free number to complete the survey at their convenience.
* Email #1: Customers were sent an email with the same information as the advance letter on 6/17/22.
* Email #2: Customers were sent a second email on 6/24/22.
* Outbound Calling: Telephone calls were made to all selected customers who had not responded online beginning on 6/28/22. Calls were made during the day, evening, and weekends.
* Email #3: Customers were sent a final email on 7/13/22.

The survey was closed on July 15, 2022.

**Table C-1**

**Survey Outreach**

|  |  |
| --- | --- |
| **Contact Method** | **Date** |
| First Advance Letter | 6/14/22 |
| First Advance Email | 6/17/22 |
| Second Advance Email | 6/24/22 |
| Survey Calling Implementation | 6/28/22 |
| Final Advance Email | 7/13/22 |
| Survey Calling Terminated | 7/15/22 |

Table C-2 furnishes information on the final disposition for each group and the entire sample. Surveys were completed with 185 HPwES participants, 57 percent of the selected sample. The response rate for the total sample was 57 percent, and 80 percent of customers who were reached completed the survey. Sixty percent of participant surveys were completed online, while 40 percent were completed via phone.

**Table C-2**

**Survey Response**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Survey Response Status** | **Group 1** | | **Group 2** | | **Total HPwES Participants** | |
| **#** | **%** | **#** | **%** | **#** | **%** |
| **Total** | **162** | **100%** | **163** | **100%** | **325** | **100%** |
| Voicemail/No Answer | 40 | 25% | 40 | 25% | 80 | 25% |
| Refusal | 23 | 14% | 17 | 10% | 40 | 12% |
| Not Available/Deceased | 0 | 0% | 7 | 4% | 7 | 2% |
| Promised to Complete Online | 3 | 2% | 4 | 2% | 7 | 2% |
| Callback Requested | 2 | 1% | 1 | 1% | 3 | 1% |
| Wrong Number | 1 | 1% | 1 | 1% | 2 | 1% |
| Non-Working Number | 1 | 1% | 0 | 0% | 1 | % |
| **Complete** | **92** | **57%** | **93** | **57%** | **185** | **57%** |
| **Survey Method** | | | | | | |
| Phone | 34 | 37% | 41 | 44% | 75 | 40% |
| Online | 58 | 63% | 52 | 56% | 110 | 60% |
| Cooperation Rate | **-** | **78%** | **-** | **82%** | **-** | **80%** |
| Response Rate | **-** | **57%** | **-** | **58%** | **-** | **57%** |

The sample was stratified by the types of measures installed, divided equally across the groups. Table C-3 displays the distribution of completed cases in the sample frame and in each survey group. The completed cases were weighted in the analysis so that the distribution of respondents matched the completed HPwES jobs.

**Table C-3**

**Distribution of Sample by Strata**

| **Stratum by Measures Installed** | **Sample Frame: All HPwES Participants** | **Surveys Completed** | |
| --- | --- | --- | --- |
| **Group 1** | **Group 2** |
| **%** | **%** | **%** |
| Air Seal & Insulation | 26% | 26% | 31% |
| Air Seal, Insulation, & Water Heater | 2% | 2% | 2% |
| Air Seal, Insulation, & Duct Sealing | 39% | 29% | 35% |
| Air Seal, Insulation, & Heating System1 | 7% | 11% | 9% |
| Air Seal, Insulation, Heating System, & Cooling System1 | 26% | 32% | 23% |
| **Complete** | **100%** | **100%** | **100%** |

1 Some of these jobs had duct sealing and/or water heater work

**Demographics**

**Table C-4**

**Home Ownership**

|  |  |  |
| --- | --- | --- |
| **Do you rent or own your home?** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| Own | 182 | 98% |
| Refused | 3 | 2% |
| **Total** | **185** | **100%** |

**Table C-5**

**Home Type**

|  |  |  |
| --- | --- | --- |
| **Which of the following best describes your home?** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| Single-Family | 152 | 80% |
| Townhouse or Row House | 16 | 10% |
| Duplex | 15 | 9% |
| Apartment/Condo in 2-4 Unit Building | 1 | 1% |
| Refused | 1 | 1% |
| **Total** | **185** | **100%** |

**Table C-6**

**Home Age**

|  |  |  |
| --- | --- | --- |
| **When was your home built?** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| Before 1960 | 29 | 13% |
| 1960-1979 | 43 | 22% |
| 1980-1999 | 48 | 26% |
| 2000-2009 | 24 | 13% |
| 2010 or later | 38 | 24% |
| Don’t Know | 2 | 1% |
| Refused | 1 | 1% |
| **Total** | **185** | **100%** |

**Table C-7**

**Home Size**

|  |  |  |
| --- | --- | --- |
| **About how many square feet is your home?**  **If you are unsure, an estimate is OK.** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| Less than 1,000 sq ft | 3 | 2% |
| 1,000-1,999 sq ft | 61 | 32% |
| 2,000-2,999 sq ft | 72 | 38% |
| 3,000-3,999 sq ft | 29 | 17% |
| 4,000-4,999 sq ft | 6 | 4% |
| 5,000 or more sq ft | 4 | 2% |
| Don’t Know | 9 | 5% |
| Refused | 1 | 1% |
| **Total** | **185** | **100%** |

**Table C-8**

**Main Heating and Water Heater Fuel**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **What is the main fuel used for heating your home?**  **What fuel does your main water heater use?** | | | | |
| **Fuel** | **Heating** | | **Water Heater** | |
| **#** | **%** | **#** | **%** |
| Natural Gas | 176 | 94% | 151 | 80% |
| Electricity | 2 | 1% | 13 | 7% |
| Multiple Fuels | 1 | 1% | 0 | 0% |
| Don’t Know | 5 | 3% | 20 | 12% |
| Refused | 1 | 1% | 1 | 1% |
| **Total** | **185** | **100%** | **185** | **100%** |

**Table C-9**

**Respondent Age**

|  |  |  |
| --- | --- | --- |
| **What is your age?** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| 18-24 years old | 2 | 1% |
| 25-34 years old | 49 | 29% |
| 35-44 years old | 39 | 20% |
| 45-54 years old | 22 | 12% |
| 55-64 years old | 29 | 15% |
| 65-74 years old | 31 | 16% |
| 75-85 years old | 3 | 1% |
| 86 years or older | 1 | 1% |
| Refused | 9 | 5% |
| **Total** | **185** | **100%** |

**Table C-10**

**Primary Language**

|  |  |  |
| --- | --- | --- |
| **What is the primary language spoken in your home?** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| English | 173 | 93% |
| Yiddish | 5 | 3% |
| Spanish | 2 | 1% |
| French | 1 | 1% |
| Hindi | 1 | <1% |
| Refused | 3 | 2% |
| **Total** | **185** | **100%** |

**Table C-11**

**Participant Race/Ethnicity**

| **NJNG is committed to providing energy efficiency programs to all customers in the communities they serve. Please share your race/**  **ethnicity to help us understand the diversity of our program participants.** | | |
| --- | --- | --- |
| **Response** | **Participants** | |
| **#** | **%** |
| **Observations** | **185** | |
| White | 147 | 80% |
| Hispanic or Latino | 10 | 5% |
| Asian American | 4 | 2% |
| Southeast Asian | 3 | 2% |
| Black/African American | 3 | 1% |
| Indigenous American/First Nations | 2 | 1% |
| Jewish | 2 | 1% |
| South Asian | 2 | 1% |
| African | 1 | <1% |
| Caribbean American | 1 | <1% |
| East Asian | 1 | <1% |
| Refused | 23 | 13% |

Note: Respondents could select more than one response.

**Table C-12**

**Household Size**

|  |  |  |
| --- | --- | --- |
| **Including yourself, how many people are living in your household?** | | |
| **Household Size** | **Participants** | |
| **#** | **%** |
| 1 | 17 | 9% |
| 2 | 49 | 25% |
| 3 | 28 | 14% |
| 4 | 20 | 10% |
| 5 | 14 | 8% |
| 6 or more | 36 | 22% |
| Refused | 21 | 13% |
| **Total** | **185** | **100%** |

**Table C-13**

**Household Size Distribution**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Household Size Distribution** | | | | | | |
| Observations | Minimum | Maximum | Median | Mean | 90% C.I. | |
| 164 | 1 | 11 | 3 | 3.9 | 3.6 | 4.2 |

**Table C-14**

**Household Income**

|  |  |  |
| --- | --- | --- |
| **Is your annual household income…** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| < 250% FPL | 35 | 20% |
| 250% - 400% FPL | 21 | 11% |
| > 400% FPL | 81 | 42% |
| Don’t Know | 6 | 3% |
| Refused | 19 | 10% |
| **Total**1 | **162** | **100%** |

1 Only respondents who provided a valid household size were asked their household income.

**HPwES Information and Understanding**

**Table C-15**

**HPwES Participants’ Information Sources**

|  |  |  |
| --- | --- | --- |
| **How did you learn about the New Jersey Natural Gas Home Performance with Energy Star program?** | | |
| **Sources of Information** | **#** | **%** |
| **Observations** | **92** | |
| Word of Mouth | 38 | 42% |
| Contractor Replacing Equipment | 25 | 26% |
| NJNG Mailing | 14 | 15% |
| NJNG Website | 9 | 10% |
| NJNG Email | 5 | 5% |
| Contractor Advertisement | 4 | 5% |
| NJNG Account Initiation | 3 | 3% |
| Social Media Advertisement | 2 | 2% |
| Previous Program Participation | 2 | 2% |
| Other | 2 | 2% |

Note: Respondents could select more than one response.

**Table C-16**

**HPwES Participation Reasons**

|  |  |  |
| --- | --- | --- |
| **Why did you decide to participate in the NJNG**  **Home Performance with Energy Star program?** | | |
| **Reasons for Participation** | **#** | **%** |
| **Observations** | **92** | |
| Reduce Energy Bills | 55 | 61% |
| Improve Home Comfort | 44 | 49% |
| Replace Old Equipment | 41 | 38% |
| Reduce Carbon Footprint | 27 | 29% |
| Improve Home Air Quality | 19 | 20% |
| Rebates and Financing | 9 | 9% |
| Other | 3 | 3% |

Note: Respondents could select more than one response.

**Table C-17**

**Participant Understanding of Program**

|  |  |  |
| --- | --- | --- |
| **How well would you say you understand or do not understand the**  **Home Performance with Energy Star program? Would you say that**  **you understand it very well, somewhat well, not that well, or not at all?** | | |
| **Current Level of Understanding** | **Participants** | |
| **#** | **%** |
| Very Well (1) | 33 | 37% |
| Somewhat Well (2) | 47 | 50% |
| Not That Well (3) | 7 | 7% |
| Not At All (4) | 1 | 1% |
| Don’t Know | 3 | 3% |
| Refused | 1 | 1% |
| **Total** | **92** | **100%** |
| **Weighted Average1** | **1.7** | |

1 Mean weighted by frequency of responses, excluding “Don’t Know” and “Refused”

**Table C-18**

**Areas of Participant Confusion**

| **What do you not understand about the**  **Home Performance with Energy Star program?** | | |
| --- | --- | --- |
| **Reasons for Confusion** | **#** | **%** |
| **Observations**1 | **92** | |
| Rebate Level | 4 | 4% |
| On-Bill Payment Plan | 3 | 3% |
| Improvements Made to Home | 2 | 2% |
| Program Timeline | 1 | 1% |
| Program Eligibility | 1 | 1% |
| Other | 3 | 3% |
| Don’t Know | 1 | 1% |
| Understood Program | 84 | 92% |

Note: Respondents could select more than one response.

1Only respondents who reported not understanding the HPwES program were asked what they did not understand.

**Energy Efficiency Measures**

**Table C-19**

**Measures Installed**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Did the contractor do air sealing and insulation work, duct sealing, or**  **install a new heating, cooling, or water heating system in your home?** | | | | | | | | | | |
| **Measure Installed** | **Air Sealing** | | **Duct Sealing** | | **Heating System** | | **Cooling System** | | **Water Heater** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Yes | 89 | 96% | 8 | 23% | 28 | 97% | 21 | 100% | 7 | 100% |
| No | 1 | 1% | 9 | 27% | 1 | 3% | 0 | 0% | 0 | 0% |
| Don’t Know | 1 | 1% | 16 | 47% | 0 | 0% | 0 | 0% | 0 | 0% |
| Refused | 2 | 2% | 1 | 3% | 0 | 0% | 0 | 0% | 0 | 0% |
| **Total** | **93** | **100%** | **34** | **100%** | **29** | **100%** | **21** | **100%** | **7** | **100%** |

1Respondents were only asked about the first three measures reported in program data as installed in their home.

**Table C-20**

**Recommended Measures Not Installed by Participants**

| **Were there any improvements the contractor**  **recommended but you did not install?** | | |
| --- | --- | --- |
| **Recommended Measures** | **#** | **%** |
| **Observations** | **93** | |
| Heating System | 2 | 2% |
| Hot Water Heater | 2 | 2% |
| Attic Insulation | 1 | 1% |
| Duct Sealing | 1 | 1% |
| Other Insulation | 1 | 1% |
| Windows | 1 | 1% |
| None | 75 | 79% |
| Don’t Know | 10 | 12% |
| Refused | 2 | 2% |

Note: Respondents could select more than one response.

**Table C-21**

**Reasons for Not Installing Recommended Measures**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Why did you decide to not implement the recommended measures?** | | | | | | | | | | | | | | |
| **Reason for Not Installing** | **Heating System** | | **Water Heater** | | **Attic Insulation** | | **Duct Sealing** | | **Other Insulation** | | **Windows** | | **All Measures** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| **Observations**1 | **2** | | **2** | | **1** | | **1** | | **1** | | **1** | | **8** | |
| Too Expensive | 0 | 0% | 1 | 51% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 100% | 2 | 29% |
| Not Needed | 1 | 51% | 1 | 49% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 2 | 24% |
| Don’t Know | 1 | 49% | 0 | 0% | 1 | 100% | 1 | 100% | 1 | 100% | 0 | 0% | 4 | 40% |

Note: Respondents could select more than one response.

1 Only respondents who reported not installing each measure were asked for their reasons.

**Table C-22**

**Repairs Needed Before Measures**

|  |  |  |
| --- | --- | --- |
| **Did the contractor say that repairs would be needed in your home before they could implement any of the home improvements?** | | |
| **Response** | **Participants** | |
| **#** | **%** |
| Yes | 2 | 2% |
| No | 86 | 92% |
| Don’t Know | 4 | 5% |
| Refused | 1 | 1% |
| **Total** | **93** | **100%** |

**Table C-23**

**Repairs Needed and Undertook**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **What repairs did the contractor say would be needed in your home before they could implement any of the home improvements? What repairs did you undertake?** | | | | |
| **Repairs** | **Repairs Needed** | | **Repairs Done** | |
| **#** | **%** | **#** | **%** |
| **Observations**1 | **93** | | **93** | |
| Roof | 0 | 0% | 1 | 1% |
| Mold Remediation | 1 | 1% | 1 | 1% |
| Ventilation | 1 | 1% | 1 | 1% |
| None | 91 | 98% | 91 | 98% |

Note: Respondents could select more than one response.

1 Only respondents who indicated needing repairs were asked which repairs they needed and which they undertook.

**Free-Ridership and Spillover**

**Table C-24**

**Improvements Planned Prior to HPwES**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Before you heard about the Home Performance with Energy Star program,**  **had you already planned to have the work done/ planned to purchase and install the system?** | | | | | | | | | | |
| **Work Planned Before HPwES** | **Air Sealing & Insulation** | | **Duct Sealing** | | **Heating System** | | **Cooling System** | | **Water Heater** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Yes | 35 | 38% | 3 | 35% | 11 | 40% | 15 | 71% | 2 | 27% |
| No | 52 | 59% | 5 | 65% | 17 | 60% | 6 | 29% | 5 | 73% |
| Don’t Know | 2 | 2% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| **Total**1 | **89** | **100%** | **8** | **100%** | **28** | **100%** | **21** | **100%** | **7** | **100%** |

1 Only respondents who indicated implementing a measure were asked whether they planned to implement it prior to HPwES.

**Table C-25**

**Same Measure Without HPwES Financing**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Would you most likely have paid for the same work/system if it were**  **ineligible for Home Performance with Energy Star rebates or financing?** | | | | | | | | | | |
| **Same Measure Without HPwES** | **Air Sealing & Insulation** | | **Duct Sealing** | | **Heating System** | | **Cooling System** | | **Water Heater** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Yes | 13 | 14% | 1 | 13% | 7 | 25% | 7 | 33% | 2 | 27% |
| No | 63 | 72% | 6 | 78% | 16 | 57% | 13 | 62% | 4 | 60% |
| Don’t Know | 13 | 14% | 1 | 9% | 5 | 18% | 1 | 5% | 1 | 13% |
| **Total**1 | **89** | **100%** | **8** | **100%** | **28** | **100%** | **21** | **100%** | **7** | **100%** |

1 Only respondents who indicated implementing a measure were asked whether they would have paid for the same work or system.

**Table C-26**

**Different Measure Without HPwES Financing**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Would you most likely have paid for different work/system if it were ineligible for Home Performance with Energy Star rebates or financing, or would you have decided not to have any work done/purchase the system?** | | | | | | | | | | |
| **Different Measure Without HPwES** | **Air Sealing & Insulation** | | **Duct Sealing** | | **Heating System** | | **Cooling System** | | **Water Heater** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Same System | 13 | 14% | 1 | 13% | 7 | 25% | 7 | 33% | 2 | 27% |
| Different Work/System | 18 | 19% | 0 | 0% | 7 | 26% | 7 | 33% | 1 | 13% |
| No Work/System | 39 | 45% | 5 | 65% | 11 | 40% | 4 | 19% | 3 | 47% |
| Don’t Know | 19 | 21% | 2 | 22% | 3 | 9% | 3 | 14% | 1 | 13% |
| **Total**1 | **89** | **100%** | **8** | **100%** | **28** | **100%** | **21** | **100%** | **7** | **100%** |

1 Only respondents who indicated they would not or did not know if they would have paid for the same work were asked whether they would have paid for different work.

**Table C-27**

**Amount of Work Without HPwES**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Without Home Performance with Energy Star rebates or financing,**  **how much work would you have done /what efficiency level would you have installed?** | | | | | | | | | | |
| **Level of Work/Efficiency**  **Without HPwES** | **Air Sealing & Insulation** | | **Duct Sealing** | | **Heating System** | | **Cooling System** | | **Water Heater** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Same or Higher | 20 | 22% | 1 | 13% | 15 | 52% | 12 | 57% | 5 | 70% |
| Less Work/Efficiency | 53 | 60% | 5 | 65% | 3 | 10% | 2 | 10% | 0 | 0% |
| Lowest Efficiency or Cost | - | - | - | - | 6 | 23% | 4 | 19% | 1 | 17% |
| Don’t Know | 16 | 19% | 2 | 22% | 4 | 14% | 3 | 14% | 1 | 13% |
| **Total**1 | **89** | **100%** | **8** | **100%** | **28** | **100%** | **21** | **100%** | **7** | **100%** |

1 Only respondents who indicated implementing a measure were asked the amount of work they would have done or what efficiency of system they would have purchased.

**Table C-28**

**Measure Timeline Without HPwES Financing**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Thinking about timing, without Home Performance with Energy Star rebates or**  **financing, when would you have most likely had the work done/purchased the system?** | | | | | | | | | | |
| **Timing Without HPwES** | **Air Sealing & Insulation** | | **Duct Sealing** | | **Heating System** | | **Cooling System** | | **Water Heater** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Same Time | 25 | 27% | 2 | 26% | 7 | 27% | 10 | 48% | 0 | 0% |
| 0 – 12 Months Later | 9 | 10% | 0 | 0% | 2 | 7% | 2 | 10% | 1 | 13% |
| 1 – 2 Years Later | 13 | 14% | 1 | 9% | 6 | 21% | 4 | 19% | 1 | 17% |
| > 2 Years Later or Never | 29 | 34% | 3 | 39% | 9 | 31% | 3 | 14% | 4 | 57% |
| Don’t Know | 13 | 15% | 2 | 26% | 4 | 14% | 2 | 10% | 1 | 13% |
| **Total**1 | **89** | **100%** | **8** | **100%** | **28** | **100%** | **21** | **100%** | **7** | **100%** |

1 Only respondents who indicated implementing a measure were asked when they would have completed the work.

**Table C-29**

**Important Air Sealing & Insulation Decision Factors**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **How important were the following in your decision to have air sealing & insulation work done?** | | | | | | | | | | |
| **Level of Importance** | **Rebates/**  **Financing** | | **NJNG Staff** | | **Energy Efficiency** | | **Contractor Information** | | **Previous NJNG EE Participation** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Extremely Important (5) | 64 | 73% | 36 | 40% | 34 | 38% | 41 | 46% | 13 | 15% |
| Very Important (4) | 16 | 18% | 18 | 20% | 22 | 24% | 28 | 31% | 11 | 12% |
| Moderately Important (3) | 8 | 8% | 11 | 12% | 12 | 13% | 9 | 10% | 5 | 6% |
| Slightly Important (2) | 0 | 0% | 0 | 0% | 2 | 3% | 4 | 5% | 3 | 3% |
| Not At All Important (1) | 1 | 1% | 6 | 7% | 4 | 5% | 5 | 6% | 4 | 5% |
| Don’t Know | 0 | 0% | 2 | 3% | 2 | 3% | 1 | 1% | 3 | 4% |
| Refused | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 1% | 0 | 0% |
| Not Applicable | - | - | 16 | 18% | 13 | 15% | - | - | 50 | 55% |
| **Total**1 | **89** | **100%** | **89** | **100%** | **89** | **100%** | **89** | **100%** | **89** | **100%** |
| **Weighted Average**2 | **4.6** | | **4.1** | | **4.1** | | **4.1** | | **3.7** | |

1 Respondents who did not confirm that air sealing work had been done in their home were not asked these questions.

2 Mean weighted by frequency of responses, excluding “Don’t Know,” “Refused,” and “Not Applicable.”

**Table C-30**

**Important Duct Sealing Decision Factors**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **How important were the following in your decision to have duct sealing work done?** | | | | | | | | | | |
| **Level of Importance** | **Rebates/**  **Financing** | | **NJNG Staff** | | **Energy Efficiency** | | **Contractor Information** | | **Previous NJNG EE Participation** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Extremely Important (5) | 2 | 26% | 2 | 22% | 3 | 35% | 2 | 22% | 0 | 0% |
| Very Important (4) | 3 | 35% | 3 | 39% | 1 | 13% | 3 | 39% | 2 | 26% |
| Moderately Important (3) | 0 | 0% | 0 | 0% | 1 | 13% | 1 | 13% | 0 | 0% |
| Slightly Important (2) | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Not At All Important (1) | 1 | 13% | 1 | 13% | 0 | 0% | 1 | 13% | 1 | 13% |
| Don’t Know | 2 | 26% | 1 | 13% | 2 | 26% | 1 | 13% | 1 | 13% |
| Not Applicable | - | - | 1 | 13% | 1 | 13% | - | - | 4 | 48% |
| **Total**1 | **8** | **100%** | **8** | **100%** | **8** | **100%** | **8** | **100%** | **8** | **100%** |
| **Weighted Average**2 | **3.8** | | **3.8** | | **4.4** | | **3.9** | | **3.0** | |

1 Only respondents who indicated implementing duct sealing were asked these questions.

2 Mean weighted by frequency of responses, excluding “Don’t Know,” “Refused,” and “Not Applicable.”

**Table C-31**

**Important Heating System Decision Factors**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **How important were the following in your decision to purchase and install the heating system?** | | | | | | | | | | |
| **Level of Importance** | **Rebates/**  **Financing** | | **NJNG Staff** | | **Energy Efficiency** | | **Contractor Information** | | **Previous NJNG EE Participation** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Extremely Important (5) | 24 | 87% | 15 | 54% | 14 | 52% | 15 | 52% | 7 | 26% |
| Very Important (4) | 4 | 13% | 2 | 7% | 7 | 25% | 6 | 21% | 2 | 7% |
| Moderately Important (3) | 0 | 0% | 5 | 18% | 0 | 0% | 6 | 23% | 1 | 4% |
| Slightly Important (2) | 0 | 0% | 0 | 0% | 1 | 4% | 0 | 0% | 0 | 0% |
| Not At All Important (1) | 0 | 0% | 1 | 4% | 1 | 4% | 1 | 4% | 1 | 4% |
| Don’t Know | 0 | 0% | 0 | 0% | 1 | 4% | 0 | 0% | 0 | 0% |
| Not Applicable | - | - | 5 | 17% | 4 | 12% | - | - | 17 | 60% |
| **Total**1 | **28** | **100%** | **28** | **100%** | **28** | **100%** | **28** | **100%** | **28** | **100%** |
| **Weighted Average**2 | **4.9** | | **4.3** | | **4.4** | | **4.1** | | **4.3** | |

1 Only respondents who indicated purchasing a new heating system were asked these questions.

2 Mean weighted by frequency of responses, excluding “Don’t Know,” “Refused,” and “Not Applicable.”

**Table C-32**

**Important Cooling System Decision Factors**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **How important were the following in your decision to purchase and install the cooling system?** | | | | | | | | | | |
| **Level of Importance** | **Rebates/**  **Financing** | | **NJNG Staff** | | **Energy Efficiency** | | **Contractor Information** | | **Previous NJNG EE Participation** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Extremely Important (5) | 17 | 81% | 12 | 57% | 12 | 57% | 11 | 52% | 8 | 38% |
| Very Important (4) | 2 | 10% | 4 | 19% | 3 | 14% | 2 | 10% | 2 | 10% |
| Moderately Important (3) | 1 | 5% | 1 | 5% | 2 | 10% | 5 | 24% | 0 | 0% |
| Slightly Important (2) | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Not At All Important (1) | 0 | 0% | 1 | 5% | 1 | 5% | 2 | 10% | 0 | 0% |
| Don’t Know | 1 | 5% | 0 | 0% | 1 | 5% | 1 | 5% | 0 | 0% |
| Not Applicable | - | - | 3 | 14% | 2 | 10% | - | - | 11 | 52% |
| **Total**1 | **21** | **100%** | **21** | **100%** | **21** | **100%** | **21** | **100%** | **21** | **100%** |
| **Weighted Average**2 | **4.8** | | **4.4** | | **4.4** | | **3.9** | | **4.8** | |

1 Only respondents who indicated purchasing a new cooling system were asked these questions.

2 Mean weighted by frequency of responses, excluding “Don’t Know,” “Refused,” and “Not Applicable.”

**Table C-33**

**Important Water Heater Decision Factors**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **How important were the following in your decision to purchase and install the water heating system?** | | | | | | | | | | |
| **Level of Importance** | **Rebates/**  **Financing** | | **NJNG Staff** | | **Energy Efficiency** | | **Contractor Information** | | **Previous NJNG EE Participation** | |
| **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** |
| Extremely Important (5) | 3 | 40% | 1 | 13% | 1 | 13% | 3 | 40% | 2 | 30% |
| Very Important (4) | 4 | 60% | 3 | 43% | 4 | 60% | 3 | 43% | 2 | 30% |
| Moderately Important (3) | 0 | 0% | 1 | 17% | 0 | 0% | 1 | 17% | 0 | 0% |
| Slightly Important (2) | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Not At All Important (1) | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Not Applicable | - | - | 2 | 27% | 2 | 27% | - | - | 3 | 40% |
| **Total**1 | **7** | **100%** | **7** | **100%** | **7** | **100%** | **7** | **100%** | **7** | **100%** |
| **Weighted Average**2 | **4.4** | | **4.0** | | **4.2** | | **4.0** | | **4.5** | |

1 Only respondents who indicated purchasing a new water heating system were asked these questions.

2 Mean weighted by frequency of responses, excluding “Don’t Know,” “Refused,” and “Not Applicable.”

**Table C-34**

**Non-HPwES Improvements Made**

|  |  |  |
| --- | --- | --- |
| **Since participating in the Home Performance with Energy Star program, have you made any other energy efficient improvements or installed any other energy efficient products in your home that you did *NOT* receive rebates or financing for from NJNG or another organization?** | | |
| **Improvements Made** | **Participants** | |
| **#** | **%** |
| Yes | 20 | 20% |
| No | 70 | 77% |
| Don’t Know | 2 | 2% |
| Refused | 1 | 1% |
| **Total** | **93** | **100%** |

**Table C-35**

**Non-HPwES Measures Installed**

| **What energy efficient products or improvements have you purchased and installed since you participated in the Home Performance with Energy Star program?** | | |
| --- | --- | --- |
| **Recommended Measures** | **#** | **%** |
| **Observations**1 | **93** | |
| Windows and Doors | 6 | 6% |
| Other Insulation | 4 | 4% |
| Hot Water Heater | 3 | 3% |
| Heating System | 2 | 2% |
| Air Sealing | 2 | 2% |
| Duct Sealing | 2 | 2% |
| Lighting | 2 | 2% |
| Appliances | 2 | 2% |
| Attic Insulation | 1 | 1% |
| Cooling System | 1 | 1% |
| Ventilation | 1 | 1% |
| Other | 1 | 1% |
| Refused | 1 | 1% |
| None | 73 | 80% |

Note: Respondents could select more than one response.

1 Only respondents who indicated that they have made improvements without rebates since HPwES were asked this question.

**Table C-36**

**HPwES Importance for Non-HPwES Measures**

|  |  |  |  |
| --- | --- | --- | --- |
| **On a scale from 1 to 5, with 1 meaning “not at all important” and 5**  **meaning “extremely important”, please rate how important your**  **experience participating in the Home Performance with Energy**  **Star program was in your decision to install the non-HPwES measure?** | | | |
| **Level of Importance** | **#** | **%** | |
| **Total**1 | **20** | | |
| Extremely Important (5) | 5 | | 21% |
| Very Important (4) | 6 | | 31% |
| Moderately Important (3) | 3 | | 12% |
| Slightly Important (2) | 0 | | 0% |
| Not At All Important (1) | 11 | | 52% |
| Don’t Know | 2 | | 9% |
| **Weighted Average**2 | **3.2** | | |

Note: Respondents selected a response for each non-HPwES measure they reported implementing.

1 Only respondents who indicated implementing a non-HPwES measure were asked these questions.

2 Mean weighted by frequency of responses, excluding “Don’t Know,” “Refused,” and “Not Applicable.”

**Table C-37**

**Reason for Non-HPwES Measure**

|  |  |  |  |
| --- | --- | --- | --- |
| **Why did you not apply for and receive a**  **rebate or financing for the non-HPwES measure?** | | | |
| **Reason** | **#** | **%** | |
| **Total**1 | **20** | | |
| Unaware if Financing Available | 16 | | 75% |
| Ineligible Product | 4 | | 19% |
| Did Receive Rebate | 4 | | 17% |
| Other | 2 | | 8% |
| Don’t Know | 1 | | 6% |

Note: Respondents selected a response for each non-HPwES measure they reported implementing.

1 Only respondents who indicated implementing a non-HPwES measure were asked these questions.

**Table C-38**

**Energy Efficiency Information Sources for Non-HPwES Measures**

|  |  |  |  |
| --- | --- | --- | --- |
| **How did you know that the non-HPwES measure was energy efficient?** | | | |
| **Source** | **#** | **%** | |
| **Total**1 | **20** | | |
| Contractor | 12 | | 55% |
| Sales Associate | 6 | | 30% |
| HPwES Participation | 5 | | 23% |
| NJNG Marketing | 5 | | 23% |
| Internet | 3 | | 13% |
| Research/Experience | 2 | | 10% |
| Other | 1 | | 4% |
| Don’t Know | 2 | | 11% |

Note: Respondents selected multiple responses for each non-HPwES measure they reported implementing.

1 Only respondents who indicated implementing a non-HPwES measure were asked these questions.

**Table C-39**

**Year Non-HPwES Measure Installed**

|  |  |  |  |
| --- | --- | --- | --- |
| **In what year did you purchase and install the non-HPwES measure?** | | | |
| **Year** | **#** | **%** | |
| **Total**1 | **20** | | |
| 2021 | 10 | | 47% |
| 2022 | 15 | | 69% |
| Don’t Know | 1 | | 4% |
| Refused | 1 | | 6% |

Note: Respondents selected a response for each non-HPwES measure they reported implementing.

1 Only respondents who indicated implementing a non-HPwES measure were asked these questions.

**Non-Energy Impacts**

**Table C-40**

**Non-Energy Impacts of Improvements**

| **Have you noticed any changes in your home**  **since the energy efficiency improvements were done?** | | |
| --- | --- | --- |
| **Changes** | **Participants** | |
| **#** | **%** |
| **Observations** | **92** | |
| More Comfortable | 53 | 58% |
| Less Comfortable | 1 | 1% |
| Reduced Energy Use | 35 | 39% |
| Improved Hot Water Temperature | 6 | 6% |
| Worsened Hot Water Temperature | 2 | 1% |
| Improved Air Quality | 5 | 6% |
| Less Noise | 3 | 2% |
| Other | 2 | 19% |
| No Change | 8 | 8% |
| Don’t Know | 10 | 12% |
| Refused | 1 | 1% |

Note: Respondents could select more than one response.

**Table C-41**

**Non-Energy Impact Value Relative to Energy Savings**

|  |  |  |
| --- | --- | --- |
| **Think about the value you experienced from these changes – would you say it is much more value, somewhat more value, the same value, somewhat less value, or much less value, as the energy savings you may have received from the program?** | | |
| **Relative Value** | **Participants** | |
| **#** | **%** |
| Much More Value (1) | 27 | 28% |
| Somewhat More Value (2) | 31 | 33% |
| Same Value (3) | 5 | 6% |
| Somewhat Less Value (4) | 1 | 1% |
| Much Less Value (5) | 3 | 3% |
| Don’t Know | 6 | 7% |
| No Changes Observed1 | 19 | 21% |
| **Total** | **92** | **100%** |
| **Weighted Average**2 | **1.9** | |

1 Only respondents who indicated changes to their home were asked this question.2 Mean weighted by frequency of responses, excluding “Don’t Know” and “Refused”

**Satisfaction and Recommendations**

**Table C-42**

**Participant Satisfaction**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **How satisfied are you with the improvements, contractor, program?**  **Would you say you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?** | | | | | | |
| **Satisfaction** | **Improvements** | | **Contractor** | | **NJNG HPwES Program** | |
| **#** | **%** | **#** | **%** | **#** | **%** |
| Very Satisfied (1) | 50 | 56% | 61 | 68% | 56 | 60% |
| Somewhat Satisfied (2) | 27 | 28% | 18 | 19% | 31 | 35% |
| Somewhat Dissatisfied (3) | 7 | 8% | 9 | 9% | 3 | 3% |
| Very Dissatisfied (4) | 4 | 4% | 4 | 4% | 1 | 1% |
| Don’t Know | 4 | 5% | 0 | 0% | 1 | 1% |
| **Total** | **92** | **100%** | **92** | **100%** | **92** | **100%** |
| **Weighted Average1** | **1.6** | | **1.5** | | **1.5** | |

1 Mean weighted by frequency of responses, excluding “Don’t Know” and “Refused”

**Table C-43**

**Reasons for Dissatisfaction with Improvements**

|  |  |  |
| --- | --- | --- |
| **What about the improvements dissatisfied you?** | | |
| **Reasons** | **Participants** | |
| **#** | **%** |
| **Observations**1 | **92** | |
| Equipment Performance | 6 | 6% |
| Installation | 5 | 5% |
| Cost | 4 | 4% |
| Aesthetics | 2 | 2% |
| Don’t Know | 1 | 1% |
| No Dissatisfaction | 81 | 89% |

Note: Respondents could select more than one response.

1 Only respondents who indicated dissatisfaction with improvements were asked for reason.

**Table C-44**

**Reasons for Dissatisfaction with Contractor**

|  |  |  |
| --- | --- | --- |
| **What about your contractor dissatisfied you?** | | |
| **Reasons** | **Participants** | |
| **#** | **%** |
| **Observations**1 | **92** | |
| Did Not Clean After Installation | 6 | 6% |
| Not Responsive | 6 | 5% |
| Poor Communication | 5 | 5% |
| Quality of Work | 5 | 5% |
| Time to Install Equipment | 2 | 2% |
| Recommendations Not Comprehensive | 2 | 2% |
| Too Expensive | 1 | 1% |
| No Dissatisfaction | 79 | 87% |

Note: Respondents could select more than one response.

1 Only respondents who indicated dissatisfaction with contractor were asked for reason.

**Table C-45**

**Recommendations for Contractor**

| **What recommendations would you make**  **to improve your contractor’s services?** | | |
| --- | --- | --- |
| **Reasons** | **Participants** | |
| **#** | **%** |
| **Observations** | **92** | |
| Increase Communication | 20 | 20% |
| Decrease Time Between Audit and Service | 14 | 14% |
| Make Scheduling Easier | 9 | 10% |
| Improve Quality of Work | 8 | 8% |
| More Caution During Home Visits | 5 | 4% |
| No Recommendations | 50 | 57% |
| Don’t Know | 2 | 2% |

Note: Respondents could select more than one response.

**Table C-46**

**Reasons for Dissatisfaction with Program**

|  |  |  |
| --- | --- | --- |
| **What about the NJNG Home Performance**  **with Energy Star program dissatisfied you?** | | |
| **Reasons** | **Participants** | |
| **#** | **%** |
| **Observations**1 | **92** | |
| Failed to Improve Efficiency | 2 | 2% |
| Low Financial Assistance | 1 | 1% |
| Lack of Informational Materials | 1 | 1% |
| No Dissatisfaction | 88 | 96% |

Note: Respondents could select more than one response.

1 Only respondents who indicated dissatisfaction with contractor were asked for reason.

**Table C-47**

**Recommendations for Program**

| **What recommendations would you make to improve**  **the NJNG Home Performance with Energy Star Program?** | | |
| --- | --- | --- |
| **Reasons** | **Participants** | |
| **#** | **%** |
| **Observations** | **92** | |
| Improve Communication | 8 | 8% |
| Increase Incentives | 4 | 5% |
| More Eligible Equipment | 4 | 3% |
| More Participating Contractors | 2 | 2% |
| Reduce Timeline | 2 | 2% |
| Consolidate Program | 2 | 2% |
| Increase Financing Options | 2 | 3% |
| Other | 4 | 4% |
| No Recommendations | 26 | 30% |
| Don’t Know | 38 | 41% |
| Refused | 3 | 3% |

Note: Respondents could select more than one response.

## Partial Participant Interview Guide

Interviewee Group: HPwES Partial Participants (audit but not measure installation)

Evaluation: Process Evaluation

Research Topics

* Why they did not move forward with program participation?
* Challenges faced
* Response to recommended measures

Hello. This is {INTERVIEWER} calling from APPRISE on behalf of New Jersey Natural Gas for {NAME}. I’m calling to ask you about your experience with the New Jersey Natural Gas Home Performance with Energy Star program. This program provides rebates and on-bill financing to install energy efficient upgrades in your home such as air sealing, insulation, heating or cooling equipment, or water heating equipment. You had an assessment for the program but did not move forward with the installation. APPRISE has been contracted by NJNG to speak with you about the program. The interview will take approximately 5 minutes.

Can I please speak to someone knowledgeable about the initial assessment you had completed on your home to determine what energy efficiency measures were needed? It was completed by **[CONTRACTOR]** in **[MONTH,YEAR].**

**Customer Name:**

**Interviewee Name**:

**Telephone number:**

**Email address:**

**Length of interview:**

1. [Interviewer: DO NOT READ, to whom are you speaking?]
2. NAME
3. SPOUSE/PARTNER
4. CARETAKER/GUARDIAN
5. OTHER/DON’T KNOW [GO TO S2]
6. **[ASK S2 IF S1 = 04]** When can I call back to speak with {NAME} or the spouse or partner of {NAME}?
7. \_\_\_\_\_\_\_\_\_\_\_\_\_ [WRITE DATE AND TIME FOR CALLBACK]
8. DON’T KNOW
9. REFUSED
10. **You had an assessment completed on your home by [CONTRACTOR] but did not participate in the Home Performance with Energy Star Program. Why did you decide not to move forward?**

Open ended response:

Code (circle all that were mentioned)

* Cost
* Not approved for financing
* Did not understand program
* Did not trust/like contractor
* Planning to move

1. **What challenges did you face to participating in HPwES?**
2. **What work did the contractor recommend for your home?**

Open ended response:

1. **Did the contractor recommend?**

* Air sealing: Y / N
* Insulation: Y / N
* Duct Sealing: Y / N
* New Heating System: Y / N
* New Cooling System: Y / N
* New Hot Water Heater: Y / N
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Did you move forward with any of this work?**

Open ended response:

Ask about each measure that the contractor recommended if not already noted. If noted above, circle without asking:

* Air sealing: Y / N / NOT RECOMMENDED
* Insulation: Y / N / NOT RECOMMENDED
* Duct Sealing: Y / N / NOT RECOMMENDED
* New Heating System: Y / N / NOT RECOMMENDED
* New Cooling System: Y / N / NOT RECOMMENDED
* New Hot Water Heater: Y / N / NOT RECOMMENDED

1. **If they moved forward with any of the work:**

**Was it with the same contractor, [CONTRACTOR] who performed he assessment?**

Open ended response:

Code: Y / N / DON’T KNOW

1. **If Heating, Cooling, or Hot Water Systems; Were these high-efficiency systems?**

Open ended response:

Code: Y / N / DON’T KNOW

1. **Do you have any other feedback or recommendations for NJNG’s Home Performance with Energy Star Program?**

## Partial Participant Feedback

APPRISE conducted telephone interviews with customers who had a home energy assessment but did not move forward with participation in New Jersey Natural Gas’s (NJNG) Home Performance with Energy Star (HPwES) program. These interviews were designed to obtain information on why customers chose to not continue with HPwES participation, challenges to program participation, and recommended and adopted measures.

The sample was comprised of 35 customers received an initial home energy assessment but did not complete installation through the program. Outreach to the sample was conducted in the following manner.

* Advance Email: Customers were sent an email on 7/25/22 that explained the purpose of the interview, notified them that they would be called, and provided the option to call a toll-free number to complete the survey at their convenience.
* Outbound Calling: Telephone calls were made to the full sample during weekday business hours beginning on 7/25/22. Customers were called no more than five times.

The interview administration period ended on July 29, 2022.

Interviews were completed with 23 HPwES partial participants, 66 percent of the selected sample.

**Reasons for Partial Participation**

Customers’ reasons for not moving forward with the NJNG HPwES program were varied. While some did not qualify for the loan or rebate, others chose not to participate, often due to the cost. Some stated more than one reason for lack of participation.

* Thirteen customers stated that cost was a barrier to their participation in HPwES. For some households, the out-of-pocket cost was higher than anticipated or desired, while others felt that the potential energy savings did not justify the upfront cost.
  + Five stated that the incentives were not enough, and the cost of participating would be too expensive. In one case, the customer expected to have no out-of-pocket costs but received an estimate of $7,000. Another customer did not want to utilize financing.
  + Three customers stated that their proposal was much more expensive than their neighbors’ jobs. One specifically mentioned receiving an estimate of $8,500 while a neighbor had this work completed for $5,000.
  + Three customers felt that the level of insulation recommended by the contractor was too high. For one, the contractor recommended 7.5 inches of insulation rather than the three inches their neighbors had received. For another, the contractor recommended 12 inches of insulation, and the customer installed only four inches.
  + Two customers stated that the improvements would not provide enough energy savings to justify the expense of the program.
  + Two households received recommendations for equipment replacement but chose to only install air sealing and insulation, due to the additional cost of equipment replacement. One of these customers used financing from their electric utility, while the other did the work outside the program.
  + Two customers were able to receive a better price for insulating their homes and replacing their equipment through a different contractor outside of the HPwES program.
  + One customer’s existing equipment would have required replacement of both the furnace and water heater, which was more work than they were able to afford.
* Three customers failed to meet program requirements. One of these customers was able to obtain NJ Clean Energy rebates through their electric utility.
  + One household was unable to participate because their energy savings would be too low to qualify, as they were only looking to repair incorrectly installed insulation rather than install new insulation.
  + One customer’s HVAC system failed the efficiency standards required by HPwES, but they did not want to replace it since it was recently purchased.
  + Two households had water heaters which presented safety hazards due to the potential for back drafting.
* Three customers did not understand the program. One customer was unsure if they could receive the rebate after switching contractors, while others were confused about the benefit of the program’s rebates versus financing.
* Three customers were not approved for financing through HPwES. These customers were denied financing due to prior bankruptcies and large outstanding bills with NJNG. One household was able to secure HPwES financing through their electric utility instead of NJNG.
* Two customers did not trust their contractor. They felt that the contractors were recommending more insulation or measures than were necessary and did not trust the cost estimate provided by their contractor. One respondent thought the contractor increased the cost estimate for the project by the rebate amount.
* Two customers decided not to move forward with HPwES improvements at the current time. One of these customers was too busy to undergo improvements at the time, while the other wanted to wait until their current HVAC system stopped working before purchasing a replacement.

**Other Challenges**

Customers occasionally faced additional challenges with the NJNG HPwES program which did not prevent them from participation but were an inconvenience.

* Two customers stated that the financing approval process was long and drawn out. One was required to wait a month before applying to meet the minimum one-year tenure requirement with the utility.
* One respondent had difficulty finding a contractor for the project, as they did not receive responses from many contractors, and they felt some contractors did not know enough about the program. This respondent felt they could have gotten better deals on the project’s cost if they had been able to compare more estimates.
* Another customer disliked the amount of sales outreach they received from vendors, estimating that ten to 15 contractors were calling and sending emails.
* One customer also felt that contractors were difficult to schedule.
* One respondent was confused by the HPwES process and felt that their contractor did not adequately explain each step.

**Work Recommended by Contractor**

Most partial participants received standard measure recommendations from contractors after their initial home assessment, such as air sealing, insulation, and new HVAC equipment. Some contractors also recommended measures that were more tailored to specific contexts, such as new windows.

While partial participants did not continue with NJNG’s HPwES program, seven of the 23 interviewed did still choose to install measures recommended by the contractor outside of the program. Most of these customers paid for the less extensive improvements without rebates or financing, but some chose to participate in HPwES through their electric utility instead of NJNG.

* Twenty-two customers received a recommendation for insulation. There was only one case where the contractor did not recommend insulation, as their company exclusively performed HVAC work.
  + Eight households chose to have insulation installed in their home. Two of these cases referenced spray foam insulation specifically, and two mentioned the attic as a particular area insulated. Two stated that they installed less insulation than recommended by the contractor.
  + Of these customers, one completed the job without a contractor, six used the same contractor, and one used a different contractor.
  + Three of these customers received financing from their electric utility.
* Nineteen customers received a recommendation for air sealing.
  + Seven households had air sealing completed.
  + Of these customers, one completed the job without a contractor, five used the same contractor, and one used a different contractor.
  + Three of these customers received financing from their electric utility.
* Six customers received a recommendation to replace their heating system.
  + One customer had a new heating system installed.
  + This customer used a different contractor.
* Six customers received a recommendation to replace their hot water heater.
  + One customer had a new water heater installed.
  + This customer used a different contractor.
* Two customers received a recommendation to replace their cooling system.
* Two customers received a recommendation for duct sealing.
* Three customers received custom recommendations, including new windows, recessed light caps, and bathroom fan ventilation.
  + One customer had a bathroom fan replacement.
  + This customer used the same contractor and received financing from their electric utility.

Two customers who performed air sealing and insulation work did receive incentives but rejected their contractors’ recommendations to replace HVAC or water heater equipment. Another customer who performed air sealing and insulation work rejected their contractor’s recommendation to have duct sealing work done.

Partial participants were also asked if they performed these measures with the same contractor who performed their home assessment. Six were done with the same contractor, two jobs were done with a different contractor, and one job was done without a contractor.

**HPwES Perceptions**

Customers had varying perceptions of NJNG’s HPwES program. Those who did not participate due to cost or lack of financing generally had more negative views of the program, while customers who chose not to participate due to other issues were generally more positive. Many respondents found the process straightforward and the program staff helpful. One customer specifically mentioned the no-interest financing as a great benefit of the program. However, some respondents felt the financing was too low, were confused by each utility administering their own program, or needed help finding a contractor. One customer stated that the program served no purpose, as many companies already offer financing for improvements.

**Recommendations**

Respondents were asked about aspects of the program they would like to see changed. Their recommendations commonly touched on financing and contractors.

* Five respondents also recommended changes related to contractors. Two suggested expanding the number of contractors, and one suggested that NJNG provide assistance finding contractors.[[43]](#footnote-43) One customer needed better communication from contractors, particularly relating to why particular measures were recommended. Lastly, one respondent was bothered by the number of sales calls received from contractors and wanted to receive less solicitation.
* Three respondents recommended changes to the HPwES financing and incentive structure. One suggested an alternative form of financing for customers who are not approved for the no-interest loan from NJNG. Two respondents recommended higher rebates, with one suggesting levels that would be competitive with comparable programs in New York, such as Empower NY, that offer up to a 50 percent rebate.
* Three recommended improved communication from NJNG about elements of the program. Specifically, one respondent wanted to know if they would be able to get the rebate with a different contractor than had done their initial assessment. One of these respondents felt NJNG should be more upfront about the cost of participation, as they had not known before the assessment that the program involved financing and had expected to only receive rebates. Another household wanted better communication about the time needed to process applications, as they expected the application to be processed more quickly than it was.
* Two customers suggested more flexibility with eligible improvements. One mentioned this in regard to making less expensive HVAC equipment eligible for the program, while the other wanted less required insulation.
* One respondent stated that they would have preferred NJNG test for gas leaks prior to the insulation and air sealing work, as they only noticed a leak in their home after the installation was complete.
* One customer was upset that the contractor required them to pay for the blower door test after deciding not to move forward with participation in HPwES.

**Summary of Findings**

This section provides a summary of the findings from the partial participant interviews.

* Reasons for Partial Participation: Most partial participants chose not to pursue the HPwES program due to concerns about cost, their contractor, or inconvenient timing. A smaller number were unable to participate due to program requirements or issues getting approval for financing.
* Other Challenges: Partial participants faced other challenges to participation as well, such as a long approval process for financing and finding and communicating with contractors.
* Work Recommended by Contractor: Almost all partial participants received recommendations from their contractor for air sealing and insulation work, with a smaller number receiving recommendations for HVAC or water heater equipment replacements.
* Work Done by Partial Participants: Of the households that chose to continue with improvements outside of NJNG’s HPwES program, all but one installed air sealing or insulation measures. Most of these customers used the same contractor as conducted the original home assessment and some received funding from their electric utility.
* Perceptions of Program: Despite not participating in the HPwES program, many partial participants perceived the program as straightforward and simple and the staff as helpful. There were some customers who were confused by the program or felt it served no purpose.
* Recommendations: Most partial participants recommended improved communication from NJNG and contractors, more flexible financing and rebates, and expanded options for contractors or equipment.

## Contractor Interview Guide

**New Jersey Natural Gas**

**Home Performance with Energy Star Program**

**Draft Contractor Interview Guide**

Interviewee Group: HPwES Contractors

Evaluation: Process and Impact Evaluation

Rigor: Basic Rigor

We will conduct in-depth telephone interviews with up to ten participating contractors to assess contractor training, marketing, service delivery procedures, free ridership and spillover, and other program assessments. The contractor interview research topics are summarized in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Topic** | **Sub-Topics** | | |
| Contractor Participation | Motivation | Length of time | Challenges |
| Customer Participation | Motivation | Information | Dropout |
| Measures | Recommendations, customer uptake, rejection | Health & safety measures | Supply challenges |
| Staff Members | Hiring | Training | Challenges |
| Marketing | Methods | NJNG support | Challenges |
| Free Ridership / Spill over | Customer reports |  |  |
| Installation | Process | Timing | Quality control |
| Satisfaction | Program | NJNG |  |
| Challenges | Program requirements, incentives, other | Customer recruitment, sales, other | Staffing, supplies, other |
| Recommendations | Program | NJNG | Other |

Hi, this is \_\_\_\_ calling from APPRISE on behalf of New Jersey Natural Gas. I’m calling to talk to you about the NJNG SAVEGREEN Home Performance with Energy Star program. We have been contracted by NJNG to speak with you about the program and how it affected your work and your customers. This interview will take approximately 90 minutes.

**Contractor Company Name:**

**Interviewee Name**:

**Telephone number:**

**Email address:**

**Length of interview:**

**Contractor Participation**

* 1. How long have you been participating in HPwES in New Jersey?

Open ended response:

Length of Participation:

* 1. How did you first hear about New Jersey’s Home Performance with ENERGY STAR program?
  2. Why did you decide to participate in the program?
  3. Did you face any challenges in joining the program?

Open ended response:

Yes/No:

* 1. What are your requirements for staff members who perform services for you in NJNG’s HPwES?
  2. What BPI certifications do you require?
  3. How many staff members have you hired in the last year?

Open ended response:

Number:

* 1. Do you currently need additional staff? If yes, how many and for what roles?

Open ended response:

Yes/No:

* 1. What types of training programs do you think NJNG should offer that would be helpful to your business and your participation in HPwES?
  2. Do you have any recommendations for the format of NJNG training such as length, time of day offered, etc.? If so, what are your recommendations?

Open ended response:

Yes/No:

* 1. What workforce challenges does your company currently face?

**Marketing**

1. What marketing methods do you use to obtain potential HPwES participants?

Open ended response:

Website/Newspapers/Online Advertising/Other (mark all that apply):

1. What challenges have you faced in marketing the Home Performance program to customers?
2. Has NJNG marketing helped you enroll additional HPwES participants?

Open ended response:

Yes/No:

1. Have you reached out to leads on NJNG’s Portal? If yes, have they resulted in HPwES jobs for you?

Open ended response:

Yes/No Reached out to leads:

Yes/No Resulted in HPwES jobs:

1. What kinds of NJNG marketing has helped you with enrolling additional participants?
2. Do you think NJNG could do additional marketing that would be helpful to you in getting more HPwES participation? If yes, what type of marketing?

Open ended response:

Yes/No:

**Customer Participation**

* 1. Do customers usually come to you for HVAC systems or for HPwES?

Open ended response:

HVAC/HPwES:

* 1. Are customers aware of NJNG’s HPwES prior to your initial conversation with them? How often are they aware?

Open ended response:

Aware: Yes/No:

How Often: Always/Usually/Frequently/Infrequently/Never

* 1. If customers don’t know anything about the Home Performance program, do you educate them about the program? If so, what information do you provide?

Open ended response:

Yes/No:

* 1. Based on your conversations with customers, what are their reasons for participating in HPwES?
  2. Do customers face barriers to participating in the NJNG Home Performance program? What barriers?

Open ended response:

Yes/No:

* 1. What % of homes have specific barriers to participation?
* Mold & moisture:
* Knob & Tub wiring:
* Asbestos:
* Inaccessible attics:
* Other:
  1. How often do customers proceed with HPwES after your initial home consultation?

Open ended response:

How Often: Frequently/Infrequently/Never

**Measures**

1. What measures do you typically recommend in HPwES jobs?
2. What are your thoughts about the changes to HPwES that occurred in July 2021 when programs were transferred from the BPU to the utilities?
3. How did these changes affect the measures you would typically recommend in a job?
4. How did these changes affect the measures you would typically install in a job?
5. How do you feel about the equipment requirements and other required measures for the Home Performance with ENERGY STAR program?
6. Do you find that the qualifying equipment is readily available from your usual suppliers?

Open ended response:

Yes/No:

1. What supply chain issues have impacted your HPwES jobs?
2. Do customers usually choose to install all, most, or some of the measures that you recommend?

Open ended response:

All, most, some, none:

1. What measures are they most likely to install?
2. What measures are they most likely to reject?
3. Why do you think they choose not to install these measures?
4. How often do health and safety issues prevent you from doing certain types of weatherization?

Open ended response:

Very Often / Somewhat Often / Not Often / Never

1. What health and safety issues do you encounter that are barriers to installation?
2. Do you implement health and safety work to overcome these barriers? If yes, what measures and how often?

Open ended response:

Yes/No:

1. Other than health and safety, what other barriers do you face to installation of energy-saving measures?
2. What are the missed opportunities for saving energy that result from the barriers?
3. What are the specific measures that pose challenges? What are the challenges?
4. Are there any changes to program design that could reduce these barriers and increase the measure installation rates? If yes, what changes?

Open ended response:

Yes/No:

**Installation**

* 1. Does your auditor perform the full audit (e.g., blower door test) before or after the customer commits to proceeding with the work?
  2. How long is the typical gap between audit and service delivery?
  3. What is the total time to complete a job from audit to completion?
  4. Where are there backlogs in the progress of completing a job?
  5. Have you had experience with CLEAResult inspecting work you did for Home Performance?

Open ended response:

Yes/No:

* 1. **{If Yes}** Were you satisfied with the way those inspections were conducted? Do you have any comments about that process?

Open ended response:

Very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied:

* 1. How satisfied are you with the SnuggPro in-field data collection software?

Open ended response:

Very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied:

* 1. Are there any difficulties with the SnuggPro application?

Open ended response:

Yes/No:

* 1. **{If Yes}** What changes should be made to address those difficulties?
  2. Do you work at all with the iEPM platform, also known as Nexant, to enter customers into NJNG’s system, track jobs, or for any other purpose?

Open ended response:

Yes/No:

* 1. **{If Yes}** How well is that platform working? Do you have any recommendations for the platform?

**Free Ridership & Spillover**

* 1. How important do you think the SAVEGREEN rebate and on bill repayment are in the customers’ decisions to pursue the energy efficiency upgrades through the HPwES program?

Open ended response:

Very important, somewhat important, not at all important:

* 1. Do you think customers would move forward with the project if the on-bill repayment program and rebate had not been available?

Open ended response:

Yes/No/Maybe:

* 1. What factors other than rebates and financing influence customers’ decisions to make the energy efficiency upgrades?
  2. What energy-saving measures do customers install that are not rebated or financed by HPwES? Are these a result of the HPwES Program? How frequently are these installed?

**Satisfaction & Recommendations**

* 1. Overall, how satisfied are you with the NJNG Home Performance Program?

Open ended response:

Very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied:

* 1. How satisfied are you with New Jersey Natural Gas as a program administrator?

Open ended response:

Very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied:

* 1. Do you provide services for any other NJ utilities HPwES programs? If yes, is there anything unique about your experience working with NJNG?
  2. How do you feel about the level of rebates and financing that are available through the program? Do you feel they are sufficient to encourage installation of energy-saving measures?

1. What, if anything, do you think NJNG could do to improve the Home Performance program?
2. What could NJNG do to make the process easier for contractors?
3. What is the best way for NJNG to provide information to contractors about the Home Performance program, and the SAVEGREEN program more generally?

## Contractor Feedback

APPRISE conducted in-depth telephone interviews with six contractors who participated in New Jersey Natural Gas’ Home Performance with Energy Star program (HPwES). The purpose of these interviews was to develop a more complete understanding of program implementation, challenges faced, and opportunities for program refinement.

The interviews focused on the following topics.

* Contractor participation in HPwES
* Customer participation
* HPwES marketing
* Measures recommended and installed
* Free ridership and spillover
* Program challenges, satisfaction, and recommendations

Ten contractors who had served at least 12 NJNG customers in the HPwES program by May 2022 were targeted for interviews. NJNG conducted initial outreach to the contractors to inform them of the interview request and APPRISE made multiple attempts to schedule interviews by phone and email. This outreach informed contractors that they would be compensated with a $200 check if they completed the interview.

APPRISE was able to complete interviews with six of the selected contractors between June 23rd and 28th 2022. Two contractors declined to participate, and two were not reached. Interviews ranged in length from 70 to 84 minutes, with an average length of 79 minutes.

The contractors who were interviewed represented over 60 percent of the NJNG HPwES jobs completed in most of Program Year 1 (PY1) and six of the ten contractors who had completed 12 or more NJNG HPwES jobs during PY1. Additionally, these contractors had significant experience with the program over a number of years and were able to provide detailed feedback on the topics of interest to the study.

**Contractor Participation**

Contractors provided detailed information about their program participation history including their length of program participation, how they learned about the program, and why they decided to participate.

* Participation History: Contractors had a long history of HPwES program participation in New Jersey. While one had been participating for five years, the other five contractors had been participating for nine years or more.
* HPwES Information: Contractors first heard about the program by word-of-mouth from customers and from program representatives.
* Participation Motivation: Contractors said that they chose to participate to gain a competitive advantage or to attract more customers. Three contractors said that the program made energy efficiency cheaper or more affordable for their customers. Two contractors specifically stated that the financing and rebates were important. One contractor said that modeling and savings calculations from the program were useful for establishing credibility with customers. This contractor also said that education and training through the program were a significant benefit.

Four of the six contractors faced challenges when entering the program, primarily paperwork, cash flow, and frequent program changes.

* Paperwork Requirements: Three contractors said paperwork posed a challenge and one called the paperwork “painstaking” and said that whole applications would be rejected for minor errors such as a missing signature on one page.
* Cash Flow: Two contractors said that they faced cash flow challenges due to the time between completing jobs and receiving payment.
* Program Changes: One contractor said frequent program changes were challenging, specifically changes to modeling and state funding.

Contractors provided information about their recent hires and staffing needs.

* Staffing Needs: All but one of the contractors stated that they currently needed to hire additional staff, and the other contractor anticipated the need to hire additional staff following the slow summer season.
* Additional Staff: Contractors were each looking to hire somewhere between two and seven new staff members. This included both office staff such as sales or customer service representatives, and crew members or supervisors.
* Number of New Hires: Contractors had hired between one and 20 new staff members in the last year.
* Hiring Requirements: Four contractors said that BPI certifications (specifically the Building Analyst certification) were required for some staff positions. Three contractors said that new hires were required to undergo drug testing, three said that new hires were required to pass a background check, and one said that new hires were required to have a clean driving record. One contractor said that the drug testing was a challenge to hiring, as it was difficult to find people who could pass.

Contractors stated that NJNG training was valuable and recommended the following training topics that they thought NJNG should offer.

* SnuggPro saving calculations
* Building science
* Customer service and sales
* Mechanical equipment
* Combustion appliances
* Best practices

With respect to the format of NJNG trainings, contractors had various recommendations, including switching back to a single full-day course as opposed to the current two half-day courses, providing in-person training sessions in more locations, not just central New Jersey, and offering more in-person training rather than remote.

Contractors requested training times that would minimize interruptions to work hours but disagreed on the specific times. Three contractors preferred training after work, either in the afternoon (around 3 PM) following a shorter workday, or in the evening. However, one contractor said they would prefer training earlier in the morning, so employees could go to work afterwards. Two contractors said they would like weekend trainings, but one contractor said weekends were not desired.

**HPwES Marketing**

Contractors reported that they used the following HPwES marketing methods.

* Company website (three contractors)
* Word-of-mouth (two contractors)
* Print advertisements (two contractors)
* Television advertisements (two contractors)
* NJNG portal (two contractors)
* Social media (two contractors)
* Utility referrals (one contractor)
* Electronic billboards (one contractor)

Three of the contractors said that print advertising was not effective. Two said they do little or no HPwES marketing. One said that they were negatively affected when NJNG ended the co-op marketing program.[[44]](#footnote-44) They said that the current amount offered by some of the utilities ($25,000) to help with marketing is not enough compared to the previous amount ($50,000 to $75,000).

Contractors provided information about the challenges that they faced in marketing HPwES. Many focused on the complexity of the program.

* The comprehensive nature of HPwES can be difficult for customers to understand.
* Customers have trouble understanding what work will be done on their home.
* The program is not very well known by customers.
* Customers sometimes do not understand HPwES financing.
* There is a lot of competition in the market from different contractors.
* Customers are sometimes reluctant to pay for health and safety measures.

Contractors reported that they received assistance from NJNG in their marketing efforts.

* Five contractors said that they had used NJNG’s contractor portal to reach out to leads that had resulted in HPwES jobs. One contractor said that they were unaware of the portal.
* Four said that NJNG marketing had helped them enroll additional HPwES participants.
* Two said they had benefited from NJNG’s marketing reimbursement program.
* One said that NJNG’s fuel conversion marketing had helped generate customer calls.

Contractors had differing opinions about how effective NJNG’s portal was for marketing. One contractor said it was an extremely strong tool and another that it was their primary way of obtaining HPwES jobs. However, two other contractors said that while they had used the portal, the closing rate on those leads was low.

**Customer Participation**

Contractors provided information on customer interest and awareness about HPwES, as well as their decision to move forward with measure installation.

When asked whether customers usually approach them for HVAC systems or for HPwES services, four of the six said that customers are seeking HPwES services.

* One contractor explained that they primarily reach out to potential participants through the NJNG Portal, so almost all are interested in HPwES.
* One stated that all seek insulation, only 15 to 20 percent want to replace their HVAC systems, and none want only HVAC work done.
* Another said that, in NJNG service territory, it is rare that they will install mechanical equipment without also doing weatherization work and, as such, these projects qualify as HPwES.
* One estimated that 98 percent of their customers come to them for insulation since they subcontract out their HVAC work.

One contractor who specialized in HVAC work said that customers usually approach them to replace their old mechanical equipment, and one said that their customers were split between those who sought HPwES and those only interested in HVAC.

All six contractors said that customers tend to be aware of NJNG’s HPwES prior to their initial contact. Four stated that customers are “frequently” aware, while two said they are “usually” aware.

* Two said customers usually are aware because they come through the NJNG Portal, learned about it from contacts, or saw it on the NJNG website. However, customers often do not understand the program.
* One estimated that 70 to 80 percent of customers contact them because of the HPwES program. The rest call about insulation and are then informed about the program.
* Two estimated that about 50 percent of customers have prior awareness. One added that customers know about the program through NJNG’s website and online searches.
* Another contractor explained that customers tend to know that there is “something out there” by way of a program that offers rebates/financing for energy-efficient installations, but they are uncertain about whether they qualify and the extent of financing available. Less than half know the term “Home Performance” so they think that the HPwES program may not be well branded.

All six contractors reported that they educate customers who are unaware of HPwES. The contractors said that they provide the following information.

* Rebates, financing, and other financial information (six contractors)
  + One contractor provides the customer with an estimate of the return on investment. This contractor recommends that customers participate in HPwES if they already have to address health and safety issues, since they can get better financing options.
  + One contractor explained that they discuss rebates but do not talk about the on-bill repayment program (OBRP) at the initial contact because they have found that the repayment plan can “scare off” potential customers.
  + One contractor said that they describe the kinds of financial incentives that are available at the initial contact and the specific incentives and measures that the customer could qualify for at the audit.
* Building science and energy efficiency information (four contractors)
  + One’s salesperson (who is BPI-certified and “well versed” in HPwES) educates the customer about weatherization and measure efficiency and safety.
  + One describes how different parts of the home work together as a system and why a comprehensive job is better than just replacing an HVAC system.
  + One specified that they provide information about the air sealing and insulation work.
  + One specified that they provide information about high-efficiency equipment.
* Requirements for program participation (three contractors): They described the air sealing requirements or the health and safety checks.

When asked how often customers proceed with HPwES after their initial home consultation, three contractors said “frequently” and three said “infrequently.” Their specific comments were as follows.

* One estimated that about 80 percent of customers proceed.
* Two estimated that about 50 percent proceed, and one said NJNG’s territory was higher than others they operated in.
* One estimated that the number of customers who choose to proceed has declined from 75 percent three years ago to 33 percent now, due to HVAC rebates that are more widely available, HPwES challenges that cost more, and HPwES program changes.
* Another stated that, on average, customers choose to proceed 30 to 40 percent of the time.

**Customer Motivation and Free Ridership**

All six contractors stated that the rebates and on bill repayment (OBRP) are very important in customers’ decisions to pursue energy efficiency upgrades.

* Three said that SAVEGREEN rebates and OBRP are the most important factors in customers’ decisions to participate in HPwES.
  + One specified that the OBRP is the most important factor, while rebates are the second most important.
  + Another stated that the rebates and OBRP are why 90 percent of customers enroll in HPwES. This contractor also stated that “at the end of the day, all customers care about is new equipment,” so they only do the air sealing work to get the rebate.
* One said that, without OBRP, it would be much more difficult to sell HPwES measures.
* One noted instances in which a household cannot undertake a HPwES job because they were unable to access financing.
* One said that, at the very least, the rebates and OBRP “push” customers to participate in HPwES.

When asked if customers would move forward with the project if the rebate and OBRP had not been available, two contractors responded “yes,” one contractor said “no,” and three contractors said “maybe.”

Of the two contractors that responded “yes,” one said that customers would usually still move ahead with the project without the rebate and OBRP as these just “make the project easier and cheaper” to undertake. The other explained that customers would likely continue with the project but would “do the bare minimum” without the rebate and OBRP.

The contractor that responded “no” explained that customers would not move forward with energy efficiency upgrades without the rebate and OBRP and would instead opt for an inefficient 80 percent efficiency furnace and standard water heater.

Those that responded “maybe” provided the following justifications for their answers.

* Two said that customers would move forward with the project if they were uncomfortable or experiencing “extreme weather” in their home.
* One contractor said that some customers would still proceed with HPwES work because they would see it as a sound financial investment.
* One contractor said that about 50 percent of homeowners would not move forward without the rebates and OBRP.

Contractors noted the following factors other than rebates and financing that influence customers’ decisions to pursue the energy efficiency upgrades.

* Five referenced financial savings.
  + Three of these five said this factor is becoming increasingly important as increased fuel prices has made customers more conscious about their energy bills.
  + One said this is the primary reason for participation.
* Five stated that customers choose to pursue upgrades to increase home comfort.
  + Three referred to uncomfortable home temperatures.
  + One noted improved air quality. This contractor said that they can sell this benefit to households whose members have asthma or other respiratory issues.
  + One mentioned on-demand water heaters for the benefit of having sufficient hot water.
* Three stated that customers want to replace broken or outdated mechanical equipment.
  + One explained that if a customer is uncomfortable in their home because of broken heating/cooling equipment and they need it fixed, they will ask the company to look into repairing/replacing the equipment. At that point, the contractor will educate the customer about HPwES and tell them something along the lines of, “you can swap out your furnace, but you don’t have insulation. Let me show you how NJNG can help you with this…”
  + One said that the rebates and financing are important because they may negate the additional costs of switching to high-efficiency equipment (instead of the customer opting to buy the cheapest available equipment).
* One contractor explained that customers choose to make upgrades because they want to switch from a delivered fuel to a utility fuel.
* One stated that some customers want to “go green” and be more energy efficient for environmental reasons.

When asked what energy-saving measures customers install that are not rebated or financed by HPwES, two contractors said that there were no such measures and that the Program has “everything covered” in terms of energy-saving measures. One of the contractors said that they did not have any information about this question. The remaining three contractors provided the following information.

* One said that duct modification is the primary non-HPwES measure that is recommended and installed.
* One said they occasionally insulate non-conditioned spaces in the home (such as garages), though this is a rare occurrence. They also mentioned the installation of tinted skylights and automated door closers.
* One mentioned solar attic fan installation, the removal of attic floors for insulation, and dryer and bathroom vent replacements.

**Data Systems and Energy Modelling**

Across all utilities in NJ, contractors use the SnuggPro system in the field to collect data and model savings. NJNG was still implementing their in-house data management system, iEPM, at the time of the contractor interviews.

When asked about their satisfaction with SnuggPro one contractor said they are very satisfied, four responded somewhat satisfied, and one said somewhat dissatisfied. Five of the six contractors reported that they had difficulties with the SnuggPro application.

In terms of positive comments about SnuggPro, contractors stated the following.

* One described it as a “very cut and dry” system that is working well. They compared it favorably to the previous software.
* One said the software is “pretty good” from an “informational standpoint,” i.e., they like the reports that it generates.
* One stated that SnuggPro training from utility companies helped their staff overcome the learning curve associated with adjusting to new software.

In terms of difficulties posted by SnuggPro, five of the six contractors said that SnuggPro underestimates energy savings.

* One said that SnuggPro models energy savings (and thus rebates) in a way that does not match their staff’s expectations and that it “grossly” underestimates savings. However, this contractor said that this problem has “levelled off” because feedback has brought about corrections. While they do still think SnuggPro is underestimating savings, they think it has gotten slightly more accurate over time.
* Another said that SnuggPro restricts air leakage reduction savings estimates. SnuggPro assigns an automatic 20 percent reduction of air leakage in its modelling, while they estimate it to be closer to 40 percent.

Contractors reported specific problems with energy savings estimations related to heat pumps, fuel conversions, kneewalls, and infiltration.

* Heat pumps (two contractors): One said that they no longer install heat pumps in homes with natural gas because the calculated savings has dropped from 66 to 16 percent, and the other said that the software negated the effects of NJNG’s recent reduction in heat pump efficiency requirements.
* Fuel conversions (two contractors): They were confused about total energy savings calculations.
* Knee walls (one contractor): One stated that the software does not assign accurate savings to the treatment of knee walls in attics.

Other than the underestimation of energy savings, contractors had the following complaints about SnuggPro.

* One contractor stated that SnuggPro does not allow natural gas pool heaters as an input in the system and assigns lower energy savings to households with this equipment that are looking to upgrade their heating equipment (due to the assignment of a high gas baseload usage).
* Another said that there are occasions where the house has more windows than SnuggPro’s input allows.
* Newer homes appear more efficient in SnuggPro, resulting in fewer rebate opportunities.

Contractors had the following recommendations for how to address difficulties with SnuggPro.

* Underestimation of energy savings: Review savings, increase the payback period, allow more flexibility in estimating air sealing benefits, and assign more savings to knee wall treatments.
* Additional SnuggPro inputs: add option for natural gas pool heaters and recessed light coverings.
* Training: NJNG training on SnuggPro manual inputs versus defaults, specifically with respect to overhang depth, window measurements, lightbulbs, and refrigerator age; and training on SnuggPro modifications to ensure that they can be efficient in its modelling.

Because the iEPM platform was just beginning implementation, five of the six contractors said that they do not work with it. The contractor that worked with the iEPM platform uses it to upload, send, and receive documents, as well as to track job progress. They feel that the platform is not user friendly, but that it is not bad. They preferred the old software, EnergySavvy, because it was more user friendly and had more filters.

**HPwES Measures**

Contractors provided information about measures recommended and accepted. They reported that they typically recommend air sealing and insulation (five contractors), HVAC measures (four contractors) and health and safety measures (four contractors). Specific HVAC measures noted were furnaces, air conditioners, water heaters, and heat pumps. Health and safety measures included ventilation (four contractors), crawlspace dehumidifiers, and vapor barriers.

Three contractors said that the recent HPwES changes when the program transferred to the utilities affected the measures they typically recommend.

* Two stated that they recommend fewer heat pumps because of lower modeled savings. One no longer recommends heat pumps in natural gas main heat households and the other recommends fewer mini-split heat pumps and AC to heat pump conversions.
* One said that they include more mechanical equipment because they no longer need to reach a particular energy savings percentage to include such measures.

When asked how the transfer of the program from the BPU to the utilities affected the measures they install, three contractors said that it did not have an effect. One stated that it had initially changed the measures they installed (because of updated energy savings modelling in SnuggPro), but they could not think of a specific example of a measure. The other two contractors noted comments similar to those about recommendations.

* One no longer installs heat pumps in natural gas main heat.
* One installs fewer mini splits and heat pumps. This contractor instead offers to install these measures on a separate contract to avoid bringing the estimated energy savings down and thus lowering the rebate the customer receives from HPwES.

The interviewees were asked their opinion of HPwES equipment and measure requirements. Five of the six contractors indicated that they believe the requirements are reasonable. However, two of these five expressed some concerns.

* One said that the standard tank for a water heater just falls short of the efficiency requirement, so customers must either purchase a smaller or more expensive tank.
* Another said that though NJNG recently reduced the efficiency requirements for heat pumps, energy modelling negated this change.
* One would like an update from NJNG about how new Seasonal Energy Efficiency Ratio 2 (“SEER2”) efficiency standards will affect the program in the next two fiscal years. They have seen manufacturers send out bulletins about this and want to prepare for any program changes in advance.

One contractor stated that the strict program requirements make it difficult to obtain the appropriate equipment and adequately incentivize participants. They explained that with supply chain issues, customer costs increased from $16,000 a few years ago to $26,000. They recommended an easing of efficiency requirements until it is easier to acquire equipment. Since higher efficiency equipment is unavailable or too expensive, customers decide to forego participating in the program and instead install lower efficiency equipment that is readily available.

Five of the six contractors said that customers usually choose to install most of the measures that they recommend. Of these, one explained that some customers feel that there are too many recommendations and thus choose not to install some measures. One contractor said that customers usually choose to install some of their recommended measures. The latter stated that they typically make recommendations based on customer interest and estimated that about 40 percent of the measures they recommend are installed by customers.

When asked what measures customers are most likely to install, four contractors mentioned air sealing and insulation measures. One said heating equipment is most likely to be installed but specified that it depends on what the customer is looking for. Another contractor said that HVAC equipment is the most commonly installed. Two also mentioned that tankless/on-demand water heaters are very likely to be installed.

The contractors provided a diverse set of answers when asked what measures customers are most likely to reject and why.

* Two said that customers are least likely to install water heaters because they tend to have been recently replaced. As such, customers are reluctant to install new ones, even if the contractor recommends a higher efficiency unit.
* One said that customers are most likely to reject mini splits because they are expensive (approximately $15,000 compared to $8,000 to $9,000 for a traditional furnace and air conditioning system), removing a customer’s existing HVAC system creates additional work, and aesthetic concerns due to more components that are visible on the home exterior.
* One said air conditioners, because of the high price.
* One said insulation measures because customers are less likely to understand the benefits and it can decrease their home storage space.
* One contractor said that it is unlikely for customers to reject entire measures, rather they are more likely to reject the installation of a specific measure in an area of their home to save money. For example, a customer may choose to only have air sealing/insulation measures installed in their attic instead of also in their crawlspace (or vice versa).

**Service Delivery**

Contractors were asked several questions about their approach to the work, the timing of the jobs, and the quality control inspections.

Four of the six contractors perform a full audit (including a blower door test) before the customer commits to proceeding with HPwES work. Of these, one performs a full audit both before and after the customer commits and another performs a second full audit after the completion of weatherization work for quality assurance.

The other two contractors only perform a full audit after the customer commits to proceeding with HPwES work. One of these contractors offers a paid energy audit option that includes a blower door test regardless of whether the customer chooses to proceed with any work at the conclusion of the audit. Otherwise, this contractor offers the customer an “estimate walkthrough” that does not include a blower door test, and only performs a full audit after the customer commits to proceeding with HPwES work.

In terms of job timing, contractors were asked to estimate the typical time between the audit and measure installation. Their estimates ranged from two to eight weeks.

* Two contractors said the gap is approximately two weeks long.
* One estimated that this takes three weeks.
* One said this could take between two and six weeks, depending on how busy they are.
* One stated that this could take between six to eight weeks.
* One estimated that this takes eight weeks on average.

Contractors were then asked to estimate the total time to complete a job (i.e., from audit to completion). Estimates ranged from three weeks to three months.

* Two contractors estimated one month or less. One clarified that their estimate presumes that they do not run into issues with acquiring equipment. The other specified that the installation part of the job itself usually only takes two to three days.
* Two stated that this takes up to two months on average. Of these, one explained that this highly depends on the type of job they are performing. For example, completing an insulation job can be as short as three weeks.
* One said that this takes about ten weeks in total.
* One stated that the full length of a job can be anywhere between three weeks and three months. They said that HVAC jobs can take much longer than an insulation job due to time spent waiting for equipment.

Contractors identified and explained where backlogs occur.

* Financing application and approval (four contractors): The delay can be on the utility side, waiting for customers to prepare the paperwork, or because the contractor is missing equipment serial numbers and needs to call the supplier.
* Town building permits (two contractors): Townships have different requirements and can take three weeks to several months.
* Subcontracting (one contractor)
* Staff shortages (one contractor)
* Gas meter installation (one contractor)

All six of the contractors had experience with third party quality control inspections on the NJNG HPwES jobs. When asked about their level of satisfaction with the inspections, two were very satisfied, three were somewhat satisfied, and one was somewhat dissatisfied.

Of the two contractors that were very satisfied with the inspections, one said the inspectors were fair and the other contractor felt that the inspectors were straightforward and usually happy with the quality of their work.

Contractors had the following complaints.

* Four contractors characterized the inspectors as particularly “strict” or “difficult”.
  + One felt that the inspectors would sometimes key in on details that were “not necessary” or “way over the top.” The inspectors would, for example, complain about a measurement being slightly inaccurate or fail a quality control check because the spray foam was “half an inch short.”
  + Another found the inspectors as “rigid” and “too harsh” on what they perceived to be minor items. They believed that other inspectors would have been more flexible in these instances, and that the “level of detail between inspectors should be uniform.”
  + One contractor said that some of the inspectors “were more difficult to deal with than others.”
* One contractor said they would prefer to receive advance notice of an inspection so as to understand and address issues without having to meet the homeowner again. Though they made this preference known to the inspector, they were not notified of inspections until after they occurred.

**Challenges**

Five of the six contractors interviewed stated that customers face barriers to participating in the NJNG HPwES program relating to financing, home issues, calculated energy savings, and health and safety issues.

* Program cost and financing (four contractors): Two stated that some customers are denied based on credit histories and two based on NJNG bill payment. One contractor explained that price is the key barrier to installation, specifically when they model a job, and it does not hit the necessary energy savings level to qualify for the program. In these cases, they have to add insulation to the project, which makes it more expensive for customers. Other customers may not be able to afford the costs to overcome health and safety barriers.
* Home and fuel barriers (four contractors): There may be no opportunities because the home is tight and has sufficient insulation, combustion appliances may fail the health and safety check, apartments are not eligible, homes may be unfinished or under construction, customers can be concerned about the inspection due to existing nonpermitted construction work, lack of landlord approval, and use of a delivered main heating fuel.
* Low calculated energy savings estimates (two contractors): These low estimates lead to ineligibility or low rebates that dissuade participation.
* Customer Availability (one contractor): If customers are unable to be at home during the initial audit, this can be a barrier.
* Customer confusion (one contractor): Customers can be confused after speaking to multiple contractors who may provide them with differing descriptions of how the program works and its requirements. They believe that this can make customers reluctant to proceed with the program.

Contractors were asked how often they encounter health and safety issues that prevent them from completing certain types of weatherization work. They responded in the following ways:

* “Not often” (four contractors): One estimated about ten percent of the time because they can fix health and safety issues and one estimated that four percent of homes have such barriers.
* “Somewhat often” (two contractors): One estimated they face health and safety barriers in ten to 15 percent of their jobs.

Contractors were asked whether the following issues were specific barriers to participation in HPwES.

* *Mold and Moisture:* Five contractors said that mold and moisture was a barrier in between five and ten percent of homes. One contractor said that mold and moisture was rarely a barrier and was encountered in fewer than one percent of homes.
* *Knob and Tube Wiring:* Three contractors said that knob and tube wiring was a barrier in between three and ten percent of homes. Two other contractors said that this was a barrier in fewer than one percent of homes. One contractor said this was not a barrier that they encountered.
* *Asbestos:* Three contractors said that asbestos was a rare barrier in fewer than one percent of homes, and one contractor said it was not a barrier they encountered. However, two of the contractors said that this was a somewhat frequent barrier that they encountered in ten to 15 percent of homes.
* *Inaccessible Attics:* Some contractors said that they encountered inaccessible attics (one saying as many as 25 percent of homes). However, this was not seen as a barrier by contractors when performing jobs, as they were able to provide access as necessary.
* *Other Issues:* These included the water heater failing the combustion test, high carbon monoxide readings, a crawlspace that cannot be sealed, and crawlspaces that would require a fire barrier (each cited by one contractor).

Half of the contractors implement health and safety work to overcome these barriers. Of the three contractors who do not, two said that they recommend other contractors that can fix these issues and one offers to subcontract the health and safety work. Additionally, one contractor that does implement health and safety work said that they have an asbestos subcontractor that they use on occasion.

The three contractors that implement health and safety work do the following measures.

* Ventilation (two contractors)
* Water heater replacement (two contractors)
* Insulation removal when vermiculite insulation is present in the home (one contractor)
* Moisture control measures (one contractor)

When asked about missed opportunities, two contractors said that not having installed weatherization measures is the primary missed opportunity.

The interviewees were asked to identify the specific measures that pose challenges. Two noted the heat pump savings calculation that was previously reported, and one said that dryer flex is a measure that can be very challenging due to limited space in laundry rooms for its installation.

All six contractors said that supply chain issues have impacted their HPwES jobs.

* Four stated that supply chain issues have resulted in increased equipment prices and thus increased job costs.
  + One stated that price increases have caused their HPwES jobs to decrease. They explained that the financial incentives are now less valuable compared to the full cost of a job. They estimated that insulation and water heating equipment prices have increased the cost of a HPwES job by 50 percent on average.
  + One said that they find it difficult to pass on the increased costs of supplies to customers.
  + Another said that the increased costs of supplies have increased their business expenses anywhere from ten to 100 percent.
  + One specified that refrigerant has quadrupled in price (approximately $90 to $400 per jug), which has increased the cost of cooling equipment.
* Contractors said that they have had trouble acquiring the following equipment.
  + HVAC equipment (four contractors)
    - Furnaces (two contractors)
    - Air conditioners (one contractors)
    - Multi-zone mini splits (one contractor)
  + Insulation equipment and materials (three contractors)
    - Blown-in insulation equipment (one contractor)
    - Two-inch rigid insulation (one contractor)
    - Polyiso insulation (one contractor)
    - Foam insulation (one contractor)
  + Dryer flex (one contractor)
* One said they have, in some instances, had to change the measures they recommended to customers because their preferred equipment was unavailable.
* Two clarified that their supply chain issues have improved over time and that this is no longer a significant problem for them.

**Contractor Satisfaction and Recommendations**

Contractors were asked about their satisfaction with the program and with NJNG.

While four of the six contractors said that they are very satisfied with the program, the other two said that they are somewhat satisfied.

In terms of positive opinions of the program, the contractors said the following.

* Four said that their satisfaction with the NJNG HPwES program is due to their positive experiences working with NJNG.
  + One said that they appreciate that NJNG’s operations are fully in-house. They compared this to other utilities that use external implementers, which they believe tends to complicate the process.
  + One praised the ease with which NJNG approves customers’ OBRP financing.
* One said they like the program’s “comprehensive approach” and “everything that it encourages.”
* One said that the introduction of SnuggPro has made its paperwork more streamlined. They also believe that the HPwES program has been much smoother since it was transferred to the utilities.

Contractors had the following complaints.

* One said that the SnuggPro savings estimates could be more accurate.
* One said that the program’s efficiency requirements should be lowered.
* One would appreciate “improved communication” from program leaders at the utility companies, as they currently only hear from them when there is a problem.

The contractors were also asked how they feel about the levels of rebates and financing that are available through the program. Specifically, they were asked if they think the levels are sufficient to encourage the installation of energy-saving measures.

* Four of the six contractors said that the current level of rebates and financing are sufficient.
* Two said that the current level of rebates and financing are insufficient.

Five of the six contractors stated that they are very satisfied with NJNG as a program administrator, and one said they are somewhat satisfied. In qualifying their answers, the contractors said the following.

* Two stated that NJNG is the best utility program administrator they work with.
* Four praised NJNG’s supportiveness and willingness to provide good answers to their questions.
  + One said that NJNG’s representatives will go out of their way to find answers to their questions and get back to them.
  + One appreciates how NJNG likes to “participate in the program” and how they get “a good answer” whenever they contact an NJNG representative over the phone.
  + Another is very satisfied with how NJNG is always very quick to get back him when there is a problem.
  + One feels that NJNG is “there for” their company and is “very helpful.”
* One noted that NJNG should increase funding for the co-op marketing program.

All six contractors said that they provide services for other NJ utilities’ HPwES programs. The contractors said the following when asked if there is anything unique about their experience working with NJNG.

* Two stated that NJNG’s HPwES program is uniquely smooth. One specified that this is because have long-established relationships with their contacts at NJNG.
* One said that NJNG is unique because they have a better lead source than other utilities in the form of their Portal.
* One stated that the difference between NJNG and other utilities is that NJNG “does things willingly” that other utilities just do “because they’re required [to].”
* One contractor appreciates how NJNG hosts training sessions at its offices, whereas other utilities do not do this.

All six contractors said that there are changes to program design that could reduce barriers and increase measure installation rates. They made the following recommendations.

* Two stated that the financial incentive levels should be increased.
  + One specified that the program should allow up to $20,000 for financing, and $7,500 for rebates. This contractor believes that these levels should be increased to increase customers’ access to mechanical equipment “without destroying the insulation part of the program,” and to help increase the probability of the contractor in the context of increasing job costs.
  + The other believes that increasing these levels would make it easier to sell the program to potential customers.
* One stated that the efficiency requirements should be reduced to more “realistic” numbers for the equipment that is available at the program’s price points.
* One stated that it would be helpful if NJNG assisted customers in remedying their health and safety barriers. For example, HPwES contractors cannot deal with asbestos themselves (because you need a license to do so in New Jersey). If the utility partnered with a mold/asbestos company and “made them available” to HPwES contractors, they feel this could “open up” jobs for them and increase program participation.

Contractors made additional recommendations for NJNG.

* Two contractors said that NJNG should improve their communication to their customers about HPwES.
  + One thinks that NJNG should “spread the word out” about the program amongst its customers more, informing them about what the program is and that it is available to them.
  + The other said that NJNG should make it clearer to their customers that they have thoroughly vetted their participating contractors. They believe that by communicating the reputability of the contractors to customers, the customers would be more likely to go ahead and contact the contractors.
* One contractor would like improved communication between NJNG and the contractors, as well as “more sociable relationships” between NJNG auditors and HPwES contractors. They proposed limiting the number of HPwES participating contractors and organizing simple social events, such as a quarterly conference call, to improve the contractor-auditor relationships. They mentioned that their positive relationships with the auditors of a non-NJ utility gives them a “better connection” with the auditing process.
* One contractor said that they would like the co-op marketing program to have more funding.
* One recommended that NJNG establish a protocol for the amount of time between when they a send a contract out and when NJNG sends the promissory note out to the customer. They feel that customers would appreciate knowing when their check is going to arrive.

Four of the six interviewees did not have any recommendations for how NJNG could make the HPwES process easier for contractors. Two specified that they do not know how NJNG could shorten or “cut anything out” of the process. Another one of these four said that the program is already easy to participate in and has been improving since its transition to the utilities. The other two contractors offered specific recommendations for how NJNG could make the process easier:

* One said that NJNG should reduce the paperwork and data entry requirements. They think that it is overwhelming, contractors can easily make small errors in the paperwork, and this can be tedious to correct.
* One said that NJNG should change the point at which customers are required to provide utility bills to contractors. They would prefer that utility bills be required at the final submission of HPwES paperwork, rather than prior to the contract being signed. They think this would help improve customers’ interactions with the contractors since customers feel reluctant to hand over their bills to a contractor that they have just met.

Contractors were asked what they think is the best way for NJNG to provide information to contractors about the HPwES program and the SAVEGREEN program more generally.

* All six contractors said that emails are the preferred mode of communication.
* Two specified that phone calls would be preferable in the event that something pressing or a major change to the program needs to be communicated.
* Another said that communicating information through the NJNG Portal is acceptable.
* One also added that it would be a good idea for NJNG to conduct a quarterly webinar, preferably in concert with the other NJ utilities, to relay information about the program.

**Summary of Findings and Recommendations**

This section provides a summary of the findings and recommendations from this research.

* Contractor Participation in NJ HPwES: Contractors were long-standing participants in NJ HPwES and joined to increase their business, establish credibility with customers, and obtain education and training.

*Recommendation: These benefits should be highlighted when recruiting additional contractors.*

* Contractor HPwES Entry Challenges: Key challenges included paperwork, cashflow, and program changes.

*Recommendation: If NJNG is not successful when they begin recruiting additional contractors, they should assess how they can help contractors with paperwork and explore potential options for gap financing assistance.*

* Contractor Staffing: Most were recruiting additional staff and one stated that a lack of staff caused delays in measure installation.
* HPwES Marketing: Contractors used websites, social media, print and television advertisements to market the program. Contractors used the NJNG portal to get up-to-date information on the program. NJNG also has a contractor bidding portal where contractors can review customer audits and bid on projects. NJNG marketing, including the portal and their reimbursement, had been helpful for most.

*Recommendation: Make sure contractors are aware of the portal and consider increasing contractor marketing support to previous levels.*

* Customer Motivation: Program rebates and financing were viewed as a very important motivation for customer installations. Three of the six contractors said this was the most important factor. Improving home comfort and reducing energy bills were also noted by most of the interviewees.
* Energy Modelling: Five of the six contractors reported that they had difficulties with the SnuggPro application and complained that the software underestimates energy savings. They had particular issues with heat pumps, fuel conversions, and attic knee walls.
* HPwES Measures: Contractors were most likely to recommend air sealing and insulation (as required by the program), HVAC measures, and health and safety measures.
* Quality Control Inspections: Four of the six contractors felt that the quality control inspections were overly strict. However, only about ten inspections have been conducted to date for the program.

*Recommendation: It is important to set expectations for quality control inspections to occur. NJNG should aim to increase the frequency of these inspections as soon as possible.*

* Participation Barriers: Barriers to HPwES participation included an inability to access financing, high installation cost, and lack of opportunity or program eligibility.
* Health and Safety Issues: Only two contractors stated that health and safety issues were faced somewhat often, and the most common issues were mold and moisture, knob and tube wiring, and asbestos or vermiculite.
* Measure Challenges: Contractors reported that savings estimates for heat pumps, water heater requirements, and increased measure costs have created challenges for measure acceptance. Supply chain issues have impacted HPwES jobs but have recently eased up to some degree.
* Measure Acceptance: Contractors generally reported that customers usually install most recommended measures. Rejected measures varied by contractor, but included water heaters, heat pumps, air conditioners, and complete insulation.
* Contractor Satisfaction & Recommendations: All contractors were very or somewhat satisfied with NJNG’s HPwES program, and many specifically noted their positive experience working with NJNG. Two of the six felt that financial incentives should be increased to keep up with increasing equipment costs.

1. Partial participants had the home assessment but did not move forward with the project. [↑](#footnote-ref-1)
2. New Jersey Guidelines for Enhanced Rigor Clean Energy Program Utility Evaluations. Statewide Evaluator, July 22, 2022. [↑](#footnote-ref-2)
3. While measure calculations will differ from between the TRM and SnuggPro, the analysis will focus on large differences and values in SnuggPro that should be investigated. [↑](#footnote-ref-3)
4. While measure calculations will differ from between the TRM and SnuggPro, the analysis will focus on large differences and values in SnuggPro that should be investigated. [↑](#footnote-ref-4)
5. These were the specific types of training contractors requested during in-depth interviews. [↑](#footnote-ref-5)
6. NJNG may be able to restart in-person meetings and trainings that were halted due to COVID. [↑](#footnote-ref-6)
7. The HPwES savings are generated by the building model simulation tool. We will review the savings reported in SnuggPro and flag savings outliers for review. This may result in updates to the savings algorithm. [↑](#footnote-ref-7)
8. New Jersey Guidelines for Enhanced Rigor Clean Energy Program Utility Evaluations. Statewide Evaluator, July 22, 2022. [↑](#footnote-ref-8)
9. While measure calculations will differ from between the TRM and SnuggPro, the analysis will focus on large differences and values in SnuggPro that should be investigated. [↑](#footnote-ref-9)
10. Contractors do not receive the incentive on jobs that fail the third-party incentive. [↑](#footnote-ref-10)
11. Average pre-treatment natural gas usage was approximately 1,200 Therms. [↑](#footnote-ref-11)
12. While measure calculations will differ from between the TRM and SnuggPro, the analysis will focus on large differences and values in SnuggPro that should be investigated. [↑](#footnote-ref-12)
13. Performed according to SWE guidelines, NJ EM&V Guidelines Net-to-Gross (NTG) Guidance for Downstream Rebate Programs. May 2022. [↑](#footnote-ref-13)
14. Spillover analysis was not conducted due to reasons explained in Section IV and is expected to be very small. [↑](#footnote-ref-14)
15. Note that 26 percent of respondents did not provide the number in the household and/or the income related to the threshold needed to calculate the Federal Poverty Level. There are some concerns about the way in which the income questions were required to be asked in the participant survey. [↑](#footnote-ref-15)
16. Some of this time may be related to the quality control inspections. [↑](#footnote-ref-16)
17. This was available for 225 of the 425 jobs. The others had not had the check approved at the time of the data download. [↑](#footnote-ref-17)
18. Note that 26 percent of respondents did not provide the number in the household and/or the income related to the threshold needed to calculate the Federal Poverty Level. [↑](#footnote-ref-18)
19. NJ EM&V Guidelines Net-to-Gross (NTG) Guidance for Downstream Rebate Programs. May 2022. [↑](#footnote-ref-19)
20. Note that 26 percent of respondents did not provide the number in the household and/or the income related to the threshold needed to calculate the Federal Poverty Level. There are some concerns about the way in which the income questions were required to be asked in the participant survey. [↑](#footnote-ref-20)
21. This has not impacted program implementation to date. [↑](#footnote-ref-21)
22. Some of this time may be related to the quality control inspections. [↑](#footnote-ref-22)
23. This was available for 225 of the 425 jobs. The others had not had the check approved at the time of the data download. [↑](#footnote-ref-23)
24. Note that 26 percent of respondents did not provide the number in the household and/or the income related to the threshold needed to calculate the Federal Poverty Level. [↑](#footnote-ref-24)
25. NJ EM&V Guidelines Net-to-Gross (NTG) Guidance for Downstream Rebate Programs. May 2022. [↑](#footnote-ref-25)
26. Per “Guidelines for Enhanced Rigor Clean Energy Program Utility Evaluations” received on 7/22/2022. [↑](#footnote-ref-26)
27. Per “Guidelines for Enhanced Rigor Clean Energy Program Utility Evaluations” received on 7/22/2022. [↑](#footnote-ref-27)
28. Interviews will be conducted with less active and inactive contractors in PY2. [↑](#footnote-ref-28)
29. Contractors do not receive the incentive on jobs that fail the third-party incentive. [↑](#footnote-ref-29)
30. As of May 2022, the E-tips newsletter had approximately 230,000 NJNG customers as subscribers. However, not all customers received the E-tip that month due to some technical issues with NJNG’s migration to a new email service provider. [↑](#footnote-ref-30)
31. Municipalities can also hold meetings about HPwES to earn additional Sustainable Jersey points. [↑](#footnote-ref-31)
32. Note that 26 percent of respondents did not provide the number in the household and/or the income related to the threshold needed to calculate the Federal Poverty Level. [↑](#footnote-ref-32)
33. This was available for 225 of the 425 jobs. The others had not had the check approved at the time of the data download. [↑](#footnote-ref-33)
34. To qualify for financing, customers are required to have paid their NJNG bill on-time for the previous 12 months (new customers can provide a letter of credit from a previous utility) and have no bankruptcies in the past seven years. [↑](#footnote-ref-34)
35. Under current procedures, financial approval takes two days if NJNG has all of the required information. However, if there is a rush because there is no heat or a non-working water heater, NJNG will complete the review in one day if they have all of the required information. [↑](#footnote-ref-35)
36. Existing participating HPwES contractors that completed the minimum QC requirements were grandfathered in. [↑](#footnote-ref-36)
37. New Jersey Guidelines for Enhanced Rigor Clean Energy Program Utility Evaluations. Statewide Evaluator, July 22, 2022. [↑](#footnote-ref-37)
38. While measure calculations will differ from between the TRM and SnuggPro, the analysis will focus on large differences and values in SnuggPro that should be investigated. [↑](#footnote-ref-38)
39. Not an eligible program measure. [↑](#footnote-ref-39)
40. NJ EM&V Guidelines Net-to-Gross (NTG) Guidance for Downstream Rebate Programs. May 2022. [↑](#footnote-ref-40)
41. Some measures contribute a very small amount to overall savings and the percentage rounds to 0%. [↑](#footnote-ref-41)
42. While measure calculations will differ from between the TRM and SnuggPro, the analysis will focus on large differences and values in SnuggPro that should be investigated. [↑](#footnote-ref-42)
43. NJNG has a contractor search feature on their website. [↑](#footnote-ref-43)
44. This was offered by the NJ Clean Energy Program. [↑](#footnote-ref-44)