THE CADMUS GROUP, INC.

Process Evaluation: New Hampshire Home Performance with ENERGY STAR® Program

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Executive Summary

This report presents the results of the process evaluation of the 2009-2010 fuel-neutral New Hampshire Home Performance with ENERGY STAR® (HPwES) program conducted by the Cadmus team. The project team conducted this evaluation for EnergyNorth (National Grid Gas), Public Service of New Hampshire (PSNH), and Unitil, hereafter referred to as the program administrators (PAs). The process evaluation was based on in-depth interviews with PA staff, program audit and implementation contractors ("contract coordinators"), National Grid's lead vendor for the program, and a third party quality assurance (QA) contractor. The interviews conducted with program staff and contractors covered a variety of topics including program goals, design, delivery, cost-effectiveness, marketing, and program effects. The team also conducted telephone surveys with program participants, partial participants who received a home energy audit but did not implement any measures, users of the Home Heating Index (HHI) screening tool who did not proceed with the home energy audit, and non-participants. The participant, partial participant, and HHI user surveys focused on customer satisfaction and areas for improvement, and the non-participant survey focused on program awareness and reasons for not participating. The project team also conducted a meta-analysis, reviewing the process results from evaluations of several similar programs in order to provide findings and recommendations for the HPwES program.

Research Objectives

The PAs have been operating the HPwES program as a fuel-neutral program since 2009. This evaluation was intended to help the PAs evaluate the results to date and to provide recommendations for the program going forward. The process project team examined:

- Cost effectiveness and program design of the HPwES program
- Reasons for participation in the program
- Customer satisfaction with the program and areas for improvement
- Non-participant awareness of the program, means of improving marketing or communication channels, and reasons for not participating
- Market barriers and how the HPwES program has transformed the market for energy efficiency measures
- Program design and implementation issues from similar programs
- Meta-analysis of the process results from evaluations of several similar programs

Overall Findings

This section presents key findings from the process evaluation of the NH HPwES program.

Program Performance and Delivery

The 2009-2010 HPwES program has been successful and effective. Overall, the program is delivered very smoothly, helping customers implement energy saving measures with relative ease. It is administered by a few program staff members who track projects and manage relationships with customers and contractors. Contractors liked working with each of the utilities and indicated that program processes generally worked well.

Participants exhibited very high satisfaction with the program:

- 93% satisfied with program overall
- 95% satisfied with the energy efficiency upgrades made to their homes
- 83% generally satisfied or very satisfied with the first energy audit
- 77% generally satisfied or very satisfied with program communications and marketing
- 86% generally satisfied or very satisfied with the report and recommendations received
- 91% generally satisfied or very satisfied with work done to the home
- 87% generally satisfied or very satisfied with the incentives provided
- 81% generally satisfied or very satisfied with the final QA review

Program Design

The PAs are successfully working toward establishing a unified, consistent approach to delivering the HPwES program. Program staff and contractors appreciated the "house as a system" approach; and program staff, contractors and participants generally felt that the program works well as a single program with multiple measures rather than as multiple programs that offer separate, stand-alone measures. Some program staff mentioned a challenge in determining the measures to include in the program based on cost-effectiveness, specifically citing spray foam as a key example because it is an expensive product.

The decision in 2011 to reduce the customer incentive from 75% to 50% of measure cost up to $4,000 was appropriate and does not appear to have had a material impact on customer response. Because the program was over-subscribed at the 75% incentive level, program staff decided to use the available budget to reach more customers by offering a lower incentive. Based on the interviews with program staff, contractors, and participants, the program continues to be attractive at a 50% incentive level so far in the 2011 HPwES program. In the participant survey, over one-half of respondents (54%) indicated that they would have been likely or very likely to have installed the exact same type and quantity of measures at the 50% incentive level. PSNH and Unitil began offering zero percent on-bill financing in mid-2010 and program staff and contractors believe that this helped offset any impacts of reducing the incentive level. Contractors said that the rebates and the financing are the greatest strengths of the program.

Marketing and Outreach

Survey findings show that utility communications and word-of-mouth are the most common sources of program awareness for both participants and non-participants.

PSNH and Unitil marketing activities and word-of-mouth marketing brought in more customers than their pilot programs could serve, while National Grid managed promotions of the program to match available program funding and did not need to waitlist customers. Despite HPwES being a pilot program for PSNH and Unitil, there is notable awareness of the program with nearly one-third of non-participants (31%) indicating unaided and aided awareness of HPwES.

Financial issues are both the primary motivation and the primary barrier to program participation and the installation of energy efficiency measures. The primary reason that participants (63%) and partial participants (80%) were interested in having their homes audited was that they wanted to save on their energy bills. Over two-fifths of participants said the reasons the measures

were not planning to install any or some of the other recommended measures was that they were too expensive (29%) or they did not have the needed cash (14%).

Non-participants who had heard of the HPwES program cited the following top reasons for not participating in the program: "I have already installed most measures" (14%), "Not interested in installing measures" (10%), "Too expensive/Don't have the money to install measures" (10%), "Too much hassle to participate in the program" (10%). Two-fifths of these non-participants (43%) said that they did not know why they did not participate in the program.

Program Effects

For some contractors, the HPwES program provided the bulk of their business, while for others it was only a small percentage of their work. Contractors reported that 14% to 90% of their business in 2010 came from the HPwES program. Prior to the HPwES program, contractors said that customers would contact them directly regarding energy efficiency measures, particularly when fuel prices spiked. However, they also indicated that customers implemented fewer measures because they had no incentives at the time.

Three contractors provided information on how much their business would decrease without the HPwES incentive and they stated that their business would not decrease by much. Yet, contractors consistently pointed to the benefits of the incentives in getting customers to move forward on installing energy efficiency measures. Additionally, one contractor depends so much on the program that when funds run out his project volumes decline and that hurts his business.

Six of the eight contractors stated that the most significant benefit of the HPwES program to their business is that the incentives get customers to take action on energy efficiency measures. According to contractors, the key factors that drive customer participation are program rebates and high energy bills.

When asked about things the program could do other than simply reaching more customers, contractors typically pointed to the importance of consumer education regarding energy efficiency issues. The QA contractor indicated that the program goal of market transformation will be facilitated by testimonials which will provide customers with greater confidence in the energy savings that could be achieved.[1]

Successful Program Elements and Recommendations

We suggest that the PAs focus on the following top priorities for a full-scale HPwES program:

1) Ensure that proper funding is available for a full-scale program.
2) Develop a plan for staff resources needed to scale the program. Create controls and procedures to streamline program administration in terms of customer intake and application processes, contractor approval and communications, and marketing and outreach to match program resources.

[1] The HPwES program, as a pilot, has not been in the field long enough to have had a significant influence on market demand for energy efficiency measures in New Hampshire.

3) Continue dialogue with contractors on program administration, addressing the best measures to install and how to best install them, program pricing, and customer education.

Table E-1 summarizes six current program elements that have been successful, as well as six recommendations for the program.

Table E-1. Program Successful Elements and Recommendations

Successful Program Elements	Recommendations
Program Administration and Design	
Operating as a comprehensive (whole house) program.	Consider moving forward with a full-scale program, providing the necessary resources to fully deliver the program to a wider participant base.
Efforts to create a program that is consistent across the utilities.	Continue efforts to streamline program administration.
Customers are effectively screened before audits, and program has a high closure rate.	Monitor the market response to on-bill financing of energy efficiency measures to determine if it should be offered in future program years.
Program Delivery	
Good communication between program administrators and contractors.	Continue to instruct contractors on the importance of installing CFLs to achieve expected savings.
	Consider options for allowing customers to pay the difference for energy efficiency products that might better suit their needs.
Marketing and Outreach	
Effective program marketing, reaching customers through a variety of channels.	In program marketing materials, more strongly emphasize the benefits of improving home comfort and reducing energy bills, and include supporting customer testimonials.
Offering complementary customer education paths: training program contractors to educate customers, and providing customers with more general energy efficiency education.	

Introduction

Program Description

The HPwES program is offered jointly by the U.S. Environmental Protection Agency (EPA) and Department of Energy (DOE).

The 2009-2010 Home Performance with ENERGY STAR® (HPwES) program was administered by EnergyNorth (National Grid Gas), PSNH, and Unitil's gas and electric companies to encourage homeowners in New Hampshire to improve the energy efficiency of their houses. The New Hampshire HPwES program is a fuel-neutral program, which was approved in filings with the New Hampshire Public Utilities Commission (PUC).[2,3,4]

PSNH and Unitil offered HPwES as a pilot program in 2009-2010 and have been approved by the PUC to continue in that mode through 2012.[5,6] National Grid is offering HPwES as a full-scale program.

PSNH and Unitil serve one to four family buildings, while National Grid also serves individually metered multifamily facilities with five or more units.[7]

The CORE NH Energy Efficiency Program sets out goals for the program, as shown in Table 1.

Table 1. HPwES Goals[8]

	2009-2010
Estimated number of customers to be served	1,628
Projected lifetime kWh savings	11,494,725

In June 2009, PSNH and Unitil received authorization to serve 200 and 100 customers, respectively through the pilot HPwES program. In 2010, the Commission again approved continuation of the pilot with PSNH and Unitil serving 200 and 100 customers respectively. The 2009 National Grid budget proposed a target of 450 participants in 2009 and 900 in 2010.[9]

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[2] Northern Utilities, Inc. d/b/a Unitil, *Gas Energy Efficiency Program Proposal for the period May 1, 2009 — December 31, 2010*, filed in New Hampshire Public Service Commission's Docket No. DG 09-053, March 16, 2009.

[3] EnergyNorth Natural Gas, Inc. d/b/a National Grid NH, *Energy Efficiency Plan, May 1, 2009 through December 31, 2010*, filed in New Hampshire Public Service Commission's Docket No. DG 09-049, May 8, 2009.

[4] New Hampshire Electric Utilities, *2010 CORE New Hampshire Energy Efficiency Programs*, filed in New Hampshire Public Service Commission's Docket No. DE 09-170, September 30, 2009.

[5] New Hampshire Electric Utilities, *2011-2012 CORE New Hampshire Energy Efficiency Programs*, filed in New Hampshire Public Service Commission's Docket No. DE 10-188, August 1, 2010.

[6] EnergyNorth Natural Gas, Inc. d/b/a National Grid NH and Northern Utilities, Inc. d/b/a Unitil, *Energy Efficiency Plan, January 01, 2011 through December 31, 2012*, filed in New Hampshire Public Service Commission's Docket No. DE 10-188, August 2, 2010.

[7] *National Grid Revised Energy Efficiency Plan May 1, 2009-Dec 31, 2010.*

[8] Data extracts received from PAs during 2011 evaluation of NH HPwES Program.

[9] Page 17, National *Grid Revised Energy Efficiency Plan May 1, 2009-Dec 31, 2010.* The 5/1/2008-4/30/2009 Energy Audit and Home Performance (RCS) program had a goal of 200 participants (Appendix A, page 6).

For Unitil's electric program, actual results for 2009-2010 were 91 customers; an additional 27 customers were served with RGGI funds, and 34 gas customers went through Unitil's gas HPwES program. For PSNH, actual results for 2009-2010 were 433 participants, with an additional 246 customers served through RGGI funding. National Grid's actual results for 2009-2010 were 1,068 participants.

Overview of HPwES Program Flow

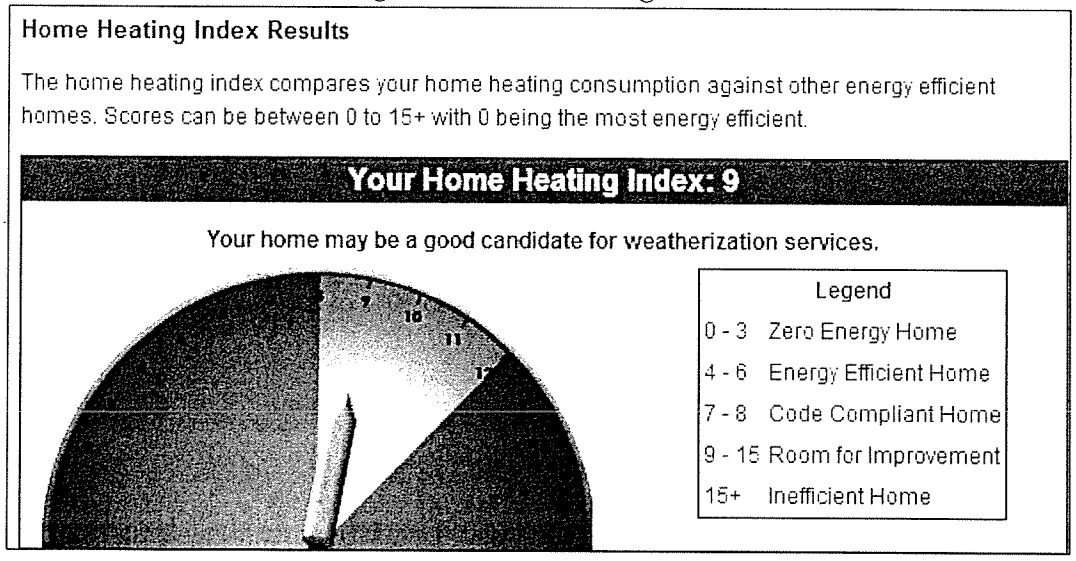
While a detailed analysis of the program logic of the HPwES program is beyond the scope of this document, we draw upon New Hampshire Public Utility Commission Docket No. DE 10-188, which provides program flow diagrams for the 2009-2010 CORE electric programs and gas programs. These diagrams can be found in Appendix D (Figure 7 and Figure 8). National Grid ran a prescriptive program in 2009-2010 and did not utilize a Home Heating Index (HHI) screening tool. For PSNH and Unitil, participation in the program consists of four phases:

1. HHI screening and application
2. Audit
3. Implementation
4. Quality assurance (QA) audit

1. Home Heating Index and Program Application

To participate in the 2009-2010 program, PSNH and Unitil customers completed the HHI on the nhsaves.com website, or worked with program staff to complete the index. Participants' homes are screened on a scale from zero to 15, where zero to three is a zero energy home and 15+ is an inefficient home. Homes ranked eight or higher on the index qualify for the program (Figure 1).

Figure 1. Home Heating Index



2. Home Energy Audit

Once a homeowner is qualified for the program, program staff assign a Building Performance Institute (BPI) certified contractor who schedules and conducts an audit at the home for a $100 fee. In 2009-10, PSNH and Unitil customers paid this fee, while National Grid offered a free audit; starting in 2011 all program administrators (PAs) charge customers the same $100 audit fee. The audit consists of a comprehensive review of the house, including a blower door test to determine its air tightness. The evaluator also collects information such as insulation levels, type of doors and windows, and type of heating and hot water systems. At this time, the customer is provided with up to six compact fluorescent light bulbs (CFLs), water saving devices and educational materials. After visiting a home, the auditor produces a customized report for each participant that assigns the house an EnerGuide rating and rates the effectiveness of optional upgrades.

PSNH typically enters applications into OTTER, a program tracking tool that is accessible by contractors and program staff. Contractors for PSNH typically use a program called Surveyor to upload audit information to OTTER. Unitil used an in-house project tracking solution in 2009-2010, but switched to OTTER in 2011. National Grid uses a proprietary project tracking solution called InDemand.

3. Implementation of Energy Efficiency Measures

After the audit, homeowners can schedule a contractor to install some or all of the recommended energy efficiency measures. For PSNH and Unitil customers, either the same contract coordinator, or a sub-contractor installs the measures. For National Grid customers, the lead vendor that conducted the audit performs free air sealing in a separate visit and provides a list of contractors that the customer can choose from to implement additional measures.

4. Quality Assurance Audit

According to ENERGY STAR requirements, at least 10% of projects must be evaluated by a QA contractor. During the audit, the QA contractor verifies that the agreed-upon measures have been implemented properly. The QA contractor also addresses any potential, missed, or future opportunities and develops a report based on the findings.

5. Program Incentives

The program offered customer incentives that covered between 75% and 100% of the cost of each measure up to a maximum total of $4,000, as shown in Table 2. In 2011, the program reduced the incentives that covered 75% of measure cost to 50% of measure cost.

Table 2. 2009-2010 New Hampshire HPwES Incentives[10]

HPwES Incentives[a]	
Hot Water Measures	
Showerhead	100%
Faucet Aerators	100%
Tank Wrap	75%
Pipe Insulation	75%
Electric Measures	
Refrigerator Brush	75%
Compact Fluorescent Light Bulbs (up to 6)	100%
Compact Fluorescent Light Fixtures	75%
Thermal Package[b]	
Air Sealing	75%
Duct Sealing	75%
Strategic dense pack cellulose	75%
Attic insulation	75%
Wall insulation	75%
Basement Insulation	75%
Electronic Thermostat+ Set-Back	75%

[a] Heating and Hot Water System Replacements — Prescriptive
Health & Safety Measures — Up to $300 at 75%

[b] Must prove cost effective for rebate to apply

[10] Source: *Contractor Coordinator Implementation Manual – revisions Final 3-12-11.* In 2011, the program reduced the incentives that covered 75% of measure cost to 50% of measure cost.

Evaluation Methods

This process evaluation of the 2009-2010 New Hampshire HPwES program drew upon in-depth interviews conducted with program staff and contract coordinators (audit and implementation contractors), a lead vendor, and a QA contractor, as well as a survey of program participants, partial participants, and non-participants.

In-depth Interviews

The project team conducted a total of 16 in-depth interviews with stakeholders, including six with program staff, eight with contractors, one with the National Grid lead vendor and one with a QA contractor.

Program Staff

The project team conducted in-depth interviews with six program staff members in March 2011. The program staff interviews covered topics including the program delivery process, tracking and reporting, satisfaction with procedures, and suggestions for improvement. These interviews took an average of one hour each.

Contractors, Lead Vendor, and Quality Assurance Contractor

The team conducted interviews with eight audit and implementation contractors (contract coordinators), one lead vendor, and one QA contractor.[11] The interviews were conducted in April 2011, and took an average of 40 minutes to complete. They covered the program delivery process, tracking and reporting, satisfaction with procedures, and suggestions for improvement. The interviews also addressed program effects in order to understand market barriers for energy efficiency services and gauge how the HPwES program has transformed the market for those services.

The seven contractors who answered questions about their firm reported having a single location in New Hampshire. These contractors have an average of 20 full time employees, with a minimum of two and a maximum of 107, and they have been doing business in New Hampshire for an average of 12 years. Six of the contractors are independent companies. One reported having sister companies, one for auditing and one for implementation. The seventh contractor has five offices across the United States. The contractors interviewed reported that they completed between eight and 100 HPwES projects in 2010.

Participant and Nonparticipant Surveys

In April 2011, the project team completed a telephone survey with a sample of 70 program participants from 2009-2010. The sample was drawn from lists of participants provided by the PAs, which included 1,554 participants with contact information who had installed at least one energy efficiency measure through the program. The survey included questions about various aspects of program satisfaction, sources of information, motivations and barriers, program value, and recommendations for improvement.

[11] In Appendix E, Table 63 details the number of locations that contractors had in New Hampshire, the number of full time employees, or full time equivalents, and the number of years doing business in New Hampshire.

The project team also completed a telephone survey with a sample of 54 customers who had not participated in the HPwES program, drawn from customer data provided by the PAs. These interviews also were conducted in April 2011 and the survey included questions about awareness of the program and reasons for not participating.

As Table 3 shows, for both participants and nonparticipants, the sample sizes for each utility generally matched the corresponding population proportions.

Table 3. Distribution of Population and Survey Sample Sizes*

Utility	Participants		Non-Participants	
	Population	Sample	Population	Sample
PSNH	28%	27%	72%	67%
National Grid	65%	64%	15%	15%
Unitil Electric	7%	7%	9%	11%
Unitil Gas	2%	1%	4%	7%
Total	100%	100%	100%	100%

* Note that due to rounding errors the percentages may not add up to exactly 100%.

The project team also completed five interviews with partial participants—customers who had home energy audits but installed no measures (other than air sealing that was free for National Grid customers)—and 11 interviews with customers who completed the HHI tool on the nhsaves.com website but did not move forward with an audit. The partial participant and HHI surveys included questions about various aspects of program satisfaction, sources of information, motivations and barriers, reasons for not implementing energy efficiency measures, program value, and recommendations for improvement.

Sampling Error

Table 4 shows the estimated population, sample size and sampling error for the telephone survey. For the participant survey, the sampling error was ±9.6% at the 90% confidence level and for the non-participant survey, the sampling error was ±11.6% at the 90% confidence level.

Table 4. Sample Size and Sampling Error

Participants			Non-Participants	
Population	*Sample Size (n)*	Sampling Error at 90% Confidence Interval	*Sample Size (n)*	Sampling Error at 90% Confidence Interval
1,554	70	±9.6%	50	±11.6%

Meta-Analysis

The project team conducted a meta-analysis, reviewing and analyzing process evaluations of the following home performance programs: the National Grid EnergyWise program in Rhode Island, the New York State Energy Research and Development Authority (NYSERDA), Wisconsin Focus on Energy (FOE), the California Building Performance Contractors Association (CBPCA), Ameren Illinois, and the Energy Trust of Oregon (ETO). The process meta-analysis addressed program design, program management, and program implementation. All of the findings presented in the meta-analysis section are dated as of the program year for which the corresponding process evaluation was completed.

Process Evaluation Results

In-depth Interview Findings

Program staff, contractors, the lead vendor, and the QA contractor generally have very positive views about the program. They said that the program operates smoothly and has been effective in helping customers reduce their energy use. Five contractors raised concerns about the prices they can charge for measures, and two suggested that changes in the market (such as rising energy costs) may have a more profound effect on encouraging customer adoption of energy efficiency measures.

Program Design

Program Staff Perspectives

Program staff have very positive views about the program. They said that the program has helped customers reduce their energy use, and they are particularly happy that the utilities are working toward presenting a unified customer-facing approach. One program staff member mentioned that the program was selected by EPA as one of the 2011 ENERGY STAR award winners for "Promotion for Home Performance with ENERGY STAR—Emerging Markets." The program was praised by EPA for its use of HHI to screen customers and increase project closure rates, as well as for its "trained and competent contracting work force, attractive financial incentive, and simple on-bill financing."[12] The program staff member observed that this is a good indication that the program is a success from the perspective of the federal government, which oversees the HPwES program and brand.

Program staff indicated that on-bill financing, which PSNH and Unitil began offering in 2010, helped customers move ahead with a large percentage of recommended measures in the HPwES program. They thought that the financing component was particularly helpful in continuing to keep the program attractive to customers in 2011, when the utilities reduced the incentive from 75% to 50% of measure cost. A National Grid staff member said they received approval from the PUC to offer a small loan program but that the loan amount was too small to really help customers. Having witnessed the success of the financing program for the other utilities, National Grid is now actively pursuing increased financing.

Four of six PAs interviewed mentioned that they strive to achieve cost-effectiveness with the measures included in the program. One program staff member said that while he ideally wanted an approach to measuring program effectiveness and success that was more focused on cost-effectiveness for the homeowner he recognized the constraints that stem from having to use the total resource cost test.

Contractor, Lead Vendor and QA Contractor Perspectives

When asked about the goals of the program, contractors pointed to the need to save energy and reduce electrical demand as goals of the program. One contractor emphasized the fuel-neutral approach, stating, "And now that is it is fuel-neutral, [the goal is] to reduce energy demand

[12] See http://psnhenergybrief.com/index.php?option=com_content&view=article&id=125:energy-star-program-earns-epa-award&catid=1:recent-news&Itemid=3

across the board." The National Grid lead vendor identified program goals to be providing energy savings for the utilities and for the customer, and making the home comfortable. The lead vendor also identified customers served and meeting program budgets as goals of the program. Contractors and the lead vendor stated that the HPwES program takes a whole house approach to energy savings—an approach that they felt was important given the number of interconnected variables driving home energy efficiency.

Contractors said that the rebates and the financing are the greatest strengths of the program.[13] Similar to program staff, the contractors also felt that financing helps customers to maximize the number measures that they could implement through the program, even when the incentive was reduced from 75% to 50% of measure cost.

The QA contractor said that HPwES is doing the best of any program, for the vast majority of people. He noted that, "Home Star would have done a similar thing, but it didn't materialize. It is similar to home performance, but any contractor with BPI certification could approach any homeowner. It is not attached to any utility." He felt that customers were getting good savings, though he was not sure they are getting the savings projected by the program. He looks forward to the evaluation to get data to see "if customers actually got reduced fuel consumption and reduced ice dams, and got warmer rooms, more comfortable rooms—that kind of thing."

Contractors were asked if they would prefer a single program with multiple measures or multiple stand-alone programs each with separate energy efficiency measures. Most contractors stated that a single program with multiple measures makes more sense, pointing to the importance of focusing on the house as a system and the need to understand how different measures work together. In addition, one contractor said, "Whenever you are performing an in-home service—you want it under an umbrella of one program—rather than running an aerator program, a showerhead program."

Marketing and Customer Motivations and Barriers

The PAs promote the HPwES program through a variety of marketing channels, and contractors also are encouraged to promote the program. However, one program staff member and several contractors stated that program is still a pilot and is over-subscribed. This results in customer waitlists, so the program should not be over-marketed. Program staff and contractors indicate that incentives and financing are the main customer motivations for participating in the program.

Program Staff Perspectives

Program staff indicated that they promote the HPwES program through bill inserts, newsletters, ads on utility websites, internet-based communications such as Facebook and Twitter, presentations, radio shows, and call center on-hold messages. One member of the program staff said that the nhsaves.com website is the primary entry point for customers, but that it has not been well promoted. However, program marketing had been effective in that customer demand for the program exceeded the program budget for PSNH and Unitil. By contrast, National Grid was able to manage its budget without putting customers on waitlists. National Grid and PSNH promoted the program at the New Hampshire Home show, speaking events and in brochures. In 2011, National Grid sent an e-mail marketing blast to 6,000 customers that generated significant

[13] On-bill financing is not formally part of the HPwES program but can be used for HPwES improvements.

interest, and they are planning another e-mail to a similar number of customers. Unitil is starting to collect e-mail addresses from their website, but has not yet done e-mail marketing.

Program staff indicated that they are trying to reduce the burden on the utility for promoting the program, thus they encourage contractors to be lead generators. Contractors have a vested interest in bringing in clients because the auditing and installation work is referred back to them. However, another member of the program staff stated that the program is constrained in terms of the available resources for incentives, so it cannot be over-marketed because then people will be put on a waiting list. The same staff member estimated that the 2011 program would likely run out of funding in June 2011, and customers would need to be waitlisted again.

Contractor, Lead Vendor and QA Contractor Perspectives

Some contractors said they are aware of utilities' marketing efforts, notably bill inserts promoting the program and they thought that the best leads came from utilities because customers were already pre-qualified for the program. Two contractors cited marketing by the utilities as a key benefit of the program. Two of the eight contractors surveyed were unaware of marketing done by the utilities and said they marketed the program themselves. One contractor noted, "The fact that I'm in the business and I'm not familiar with any marketing—that says it all. Any marketing I've done, I've done myself at home shows and just talking to people." One contractor found success marketing the program through employers—working with companies to communicate with employees about the program and help save employees money.

The QA contractor indicated that one barrier to promoting the program is the lack of documented testimonials from customers who have participated in the program. He suggested that it is important to talk to recipients to see if they are really seeing reduced fuel consumption. Having such information will help convince others who are not confident that the contractors can reduce their energy usage.

Contractors indicated that they typically represent themselves as HPwES contractors, but that customers are generally not aware of the program. Customers are, however, commonly aware of ENERGY STAR products so the ENERGY STAR name helps provide credibility for the program. Three contractors mentioned the positive effects of working with the utilities. One contractor said that if the utility's customer relationship is good (if customers are not upset due to power outages or other problems), then having the program in partnership with the utility is beneficial. Two said that working with a utility lends credibility to the contractor, with one stating, "The customer is not just purchasing retail. It is a positive to have the utility backing the program."

Contractors acknowledge that the program should not be over-marketed because there is limited available funding for incentives and utilities do not want to put customers on waiting lists. The National Grid lead vendor indicated that matching the amount of program marketing to the available funds is important so as not to create a large backlog. From a customer service perspective, it is important to spread out resources through the year, and for National Grid, the marketing schedule is in sync with program funding.

Contractors stated that energy bills and getting rebates from the utilities are the main reasons for customer participation, while costs are the major barrier to implementing measures. The National Grid lead vendor stated that customers are interested in the program because they want energy

efficiency and more comfortable homes. Despite the "generous contribution" of 75% or 50% of measure cost, the biggest barrier that customers have is coming up with the co-pay, "for people of moderate income, it is still hard for some." The lead vendor indicated that a great deal depends on customer motivation. If energy prices increase then customers may speak to contractors who refer them to the program.

Contractors and the National Grid lead vendor indicated that customers were very satisfied with both the 75% and 50% of measure cost rebate amounts, with several noting that the lower rate has not affected their rates for closing sales. Some of the contractors noted that since the percentage rebated is lower in 2011, more people are trying to reach the maximum program amount of $4,000. Some contractors also remarked that customers are leveraging the full program incentive because of rising energy costs, which have heightened customer concern about energy efficiency. Contractors also observed that while customers were very satisfied with both the 2010 and 2011 rebate percentages, some customers were upset that they missed the program in 2010 at the 75% rate and that they got in the program at the lower rate of 50%.

Contractors indicated that homeowners typically accept most recommendations, with weatherization measures being the most frequently accepted. One contractor indicated that sidewall insulation may be least commonly done, due to customer fears about damage to siding. Customers accept heating system recommendations less commonly because they are not typically thinking about that level of investment when they have an audit, despite the energy savings benefits that a new system can bring.[14]

The QA contractor would like to do more in-depth audits but sometimes homeowners don't want to spend more time or have another blower door test done. He would like to see people try to install solar domestic hot water, which is not currently part of the program and he would like to see water consumption addressed generally. He also wanted to see contractors install more fixtures in order to have energy efficient lighting stay installed.

Program Delivery

The HPwES program is managed by a few program staff members who track projects and work with customers and contractors to deliver an effective HPwES program. Six out of eight contractors said they liked working with each of the utilities and indicated that program processes worked well. One noted that Unitil was difficult to work with during 2009-2010 due to its use of TREAT, but that the program has since gotten better in 2011. One said that he liked the National Grid staff but that the program had too many steps in the process for customers. Five contractors indicated dissatisfaction with the prices for measures and two stated that the fees they receive for audits are too low. Two contractors stated that it can be a challenge to pass the QA inspections because there may be different views on how to best install measures or because homeowners may reject installation of certain measures.

Program Staff Perspectives

Lead staff members spend 25% to 85% of their time working on the HPwES program and others assist with various aspects, such as processing invoices. Program staff may also work with

[14] Program staff have indicated that replacing existing heating systems is not always cost-effective, and as a result most customers will only replace a heating system when it is at the end of its life.

counterparts in other programs, such as low income programs, to collaborate on data analysis and other elements of the program that have similar needs.

PAs collaborate on a core set of programs that are part of their Public Utility Commission (PUC) filings each year. PAs work on all aspects of the HPwES program, including program design, and contractor training, which they address in monthly PA meetings and in interim discussions. While the 2009-2010 program offerings differed between utilities and administrative processes such as the processing of invoices may differ, program staff indicated that they are working toward the goal of delivering the program as similarly as possible. All program staff indicated that collaboration has been very positive. One PA stated, "We are a fine tuned machine—especially this year."

HPwES program staff indicated that the program worked smoothly in terms of recruiting customers, conducting audits, implementing measures and conducting QA inspections. PSNH and Unitil have similar program approaches, while National Grid had its own program approach with a lead vendor conducting free audits, providing free air sealing and arranging contractors for customers. At National Grid, a third party provided rebate processing. Staff at each of the utilities indicated that QA contractors inspected all of the first few projects completed by contractors but that overall they conduct QA reviews on at least 10% of projects. Contractors receive no advance notice on which projects will be reviewed.

PSNH and Unitil staff indicated that they had very high (80-95%) closure rates, with customers moving forward to implement measures following the audits. By contrast, National Grid staff said they had lower closure rates (40% in 2010), which was likely due to the fact that they offered free audits and did not require use of the HHI to screen homes. Several program staff members indicated that requiring customers to complete the screening tool helped to assure customer interest in the program and willingness to move forward, a point that was also made by contractors.

Four program staff members indicated that one of the challenges in delivering the program is determining what kinds of measures to include in the program. Two of the four mentioned spray foam as a key example because it is an expensive product and raises challenges for attempting to deliver cost-effective solutions.

Contractor, Lead Vendor and QA Contractor Perspectives

Contractors were generally happy with the program delivery process, though they expressed concerns regarding pricing of energy efficiency measures and program reporting requirements. Contractors reported that they follow BPI procedures when they deliver the program. They conduct the initial energy audit and look for cost-effective measures that can be implemented, reach agreement with customers on the measures to be installed, and then obtain sign-off on those measures from the utility. Five of the eight contractors interviewed indicated that they complete the work themselves, while the other three conduct only the audits and sub-contract the installation. All eight contractors worked with PSNH, three with Unitil, and two with National Grid.

Contractors indicated that the program has QA standards that they need to follow. One contractor specifically stated that he was nervous when the QA contractor reviews his projects because they perform a thorough inspection. Another contractor, though satisfied with the program, noted the

lack of clear scientific methods because "the industry as a whole has not gotten there." Accordingly, contractors and QA contractors may have different perspectives on the best ways to approach energy efficiency issues. The National Grid lead vendor indicated there can be roadblocks to implementing energy efficiency measures, such as knob and tube wiring or moisture problems.

Five out of eight contractors mentioned concerns about the prices set by PSNH and Unitil for the energy efficiency measures.[15] Two said that there is not enough profit-margin when work is subcontracted; once the 10% administrative fee is paid to the contractor, there is little money left for the subcontractors. One contractor was concerned that if the National Grid program became more similar to the other programs that it would have the same tight prices for measures that are set in OTTER, the program tracking tool that is used by PSNH and Unitil. Yet, one contractor stated that "[contract] coordinators get a chance to give input as far as cost—and [the PAs] make adjustments accordingly."

Two of the five contractors who mentioned concerns with the pricing for the energy efficiency measures also stated that they felt that the audit fee was low. As one said, "The money they pay is less than what I get for an audit anyway. I'm doing it to help out, as opposed to [having] a strong income stream." The second contractor said that he makes less money on HPwES audits, but that HPwES auditing has improved because it now takes less time.

Two of the contractors who worked with National Grid generally found its program processes to be more cumbersome, with more steps due to the use of a lead vendor and additional QA requirements.[16] However, these contractors liked the HPwES management at National Grid and found EFI to be efficient at processing rebates.

Two of the seven contractors who worked with different energy efficiency programs pointed to Efficiency Maine as having a good model with openness and flexibility. They indicated that Maine is moving toward a financing-based incentive program through Maine PACE loans. Yet another contractor said that Maine probably has lower adoption of measures given that there are no incentives.

Contractors indicated that they evaluate HVAC systems as part of their audits but that HVAC system upgrades do not occur through the HPwES program. They recommend to customers that HVAC contractors and homeowners manage that process. Homeowners can take advantage of incentives through the Gas Networks program.

The QA contractor indicated that he uses OTTER, the online database, and looks for new invoices that need to be reviewed. He reviews 15% to 20% of the jobs and picks the homes based on the measures completed. The audit takes from half an hour to one hour to complete and includes measuring the space; checking the lights, aerators, and insulation; and performing a

[15] While a significant number of contractors mentioned concerns about the program pricing of measures, the process evaluation team recognizes that PAs and contractors have ongoing discussions about pricing and program staff strive to balance fair prices for contractors with reasonable costs for program participants. A further consideration is that survey findings showed that cost was the primary barrier to the installation of additional measures. Accordingly, any increase in pricing needs to be weighed against a potential decline in adopted measures.

[16] Another contractor found the application process to be too onerous and never applied to be a National Grid contractor.

blower door test when air sealing and weatherization have been done. The QA process also includes speaking with the client to see if they are happy with the work. The QA contractor then submits a report to the utility. Occasionally, he may re-visit a customer if the contractor needed to fix something and he wants to make sure that the work was done correctly.

The QA contractor indicated that, "[The program] works well, for the most part. Sometimes there is miscommunication; but speaking with homeowners—most are happy." He looks for "potential future opportunities," stating that 10% to 12% of measures need to be fixed. Asked about typical problems, he said, "Occasionally, we find that air sealing was not done that well prior to insulating the attic.... Some attics just don't get done, all together." He also noted that testing out of the combustion devices is not always completed.

Contractor Communications and Engagement

Program Staff Perspectives

While program staff seek to bring on new contractors as the program grows, they also strive to ensure that contractors receive an adequate amount of work through the program. Program staff indicated that contractors receive good training through the BPI courses that are offered at local community colleges and that continued training is required through BPI. However, they also stated that classroom training is not enough and that experience in the field is needed before contractors can effectively do audit and implementation work.

Two program staff members said a small number of contractors have been put on probation for continued sub-standard QA evaluations or failure to respond to customers' phone calls or e-mails in a timely manner. Another concern that one program staff member identified is that some contractors do not want to get involved with the data reporting.[17]

Program staff reported that one third party contractor completes QA inspections for PSNH and Unitil, while another third party conducts QA inspections for National Grid. The QA contractors are knowledgeable about the protocols, safety rules, and local regulations, and they check that all of the measures have been installed correctly.

Contractor, Lead Vendor and QA Contractor Perspectives

Contractors indicated that BPI training was good, with some saying that it was sufficient and others indicating that auditors need additional training and more experience, "They have to start somewhere. So requiring building assessment training through BPI is a good place to start. But a person who takes building assessment training out of BPI does not come out, by any stretch of the imagination, ready to do a credible assessment. There needs to be a mentoring program. It is as simple as that." The National Grid lead vendor stated that contractors require good training, and good quality control initially to make sure they know how to install things correctly.

The QA contractor said that seven out of ten contractors are very well trained and they complete extra training through a trade group that he is involved in. He added that contractors could benefit from additional training on pressure diagnostics and air sealing work, while "some things

[17] Supporting this observation, a few contractors indicated that the program requires too much reporting—with the reporting sometimes taking more time than the actual audits. However, as noted elsewhere, reporting time has decreased significantly for those using Surveyor, rather than TREAT.

are a debate over building science—I'd like to see some slopes insulated with dense-pack cellulose, but some contractors might feel that might be problematic." He indicated that sometimes customers decide that they don't want to pay the fee for certain measures and he does not always know that when he goes out to the home. He said it may be tracked in OTTER, "that they may have proposed measures and actual measures... but that the homeowner might state right then and there that they don't want insulation in the attic because they have their Christmas stuff up there.... so that doesn't get tracked." He doesn't always ask the homeowner about every measure because it may be a fine line, and he does not want to raise customer concerns that the contractor might have missed something.

Program Tracking and Reporting

Program Staff Perspectives

Program staff at PSNH use OTTER and say that it works well, facilitating good interaction with contractors. PSNH contractors upload audit information from Surveyor to OTTER. Unitil had contractors produce datasheets from TREAT in 2009-2010 and is now evaluating Surveyor for contractor use but has concerns about the level of detail that can be provided in Surveyor. Program staff at Unitil used an internal tracking system in 2010 but switched to OTTER in 2011.

National Grid uses its own in-house tracking system called InDemand and program staff indicated that it works well, although they admitted that better integration with the other utilities might be helpful. Currently, National Grid needs to export from its system and send Excel files to the other utilities for joint reporting. Most program staff had no recommendations for improving program tracking, but one program staff member suggested having more comprehensive utility reports indicating where jobs stand, how many jobs are in the system, and the status of each one. He also suggested having more flexibility in terms of separating tracking for different energy efficiency programs.

Contractor, Lead Vendor and QA Contractor Perspectives

Most contractors use Surveyor and are very pleased with it, indicating that it is much easier to use than TREAT. Contractors said that TREAT provides a great deal of detail, potentially providing for more accurate audits, but that OTTER is much simpler to use, and works well for tracking projects or looking up customers. One contractor also indicated that they use a customer relationship management (CRM) program called Salesforce to track customers internally and that although there is some duplication in work, it generally works well for capturing additional information that they need. That contractor indicated that customer satisfaction is an important metric and that they seek to engage with customers on satisfaction. He accordingly thinks that collecting customer satisfaction information in OTTER could be a potential improvement.

Program Effects

Program Staff Perspectives

One of the program staff focused on the effect the program has had in terms of raising customer awareness about home energy efficiency. This program staff member indicated that, prior to the program, customers approached the utility with a lot of complaints about high bills. They were not focused on energy efficiency; rather, they were trying to reduce their expenses. The program staff member indicated that approximately 45% of customers knew that they were wasting

energy, but did not know how to address it. They would typically say that they need new windows, but windows are not rebated by the program because they are not a cost-effective solution. Of the remaining 55% of customers who complained about high bills, the program staff member estimated that about 25% were seeking a solution that would help them reduce their bills.

Contractor, Lead Vendor and QA Contractor Perspectives

For some contractors, the HPwES program provided the bulk of their business, while for others it was only a small percentage of their work. Contractors reported that 14% to 90% of their business in 2010 came from the HPwES program. The distribution of responses was slightly skewed toward the low end of the range. One contractor with operations in several states said that 100% of his business in New Hampshire was through the program.

Contractors were asked how customers made energy efficiency improvements prior to introduction of the HPwES program. They said that, prior to the program, customers would contact them directly regarding energy efficiency measures, particularly when fuel prices spiked. However, they also indicated that customers implemented fewer measures because they had no incentives at the time.

Three of the seven contractors provided information on how much their business would decrease without the HPwES incentive, stating that their business would not decrease by much. One of the three provided an estimate of 5%; another said that it might increase. Two contractors, when asked by what percentage their business would decrease if the HPwES incentive was ended stated that it probably would not decrease:

> *We're unique. I don't think we would lose much business at all. We not hired because there is a lot of money out there to leverage. We're hired because our customers understand this is a good decision to lighten [their] energy load. It could be up to 5%—I don't know.*

One of the contractors wanted to see more market mechanisms operating in New Hampshire and thought that, if fuel prices kept rising, his work could actually increase without the HPwES program.

> *It probably wouldn't. It would probably increase. [HPwES] used to be electric only—now [there are] a whole bunch of programs.... Back when fuel prices spiked a couple years ago it was market-driven. People would pay us for an energy audit—and they would pay us $300-400 for an audit—fee for service. Then the program went fuel neutral and basically cut that whole market away. And when they opened up these programs, it opened the door to more people getting involved in energy auditing... But with auditors working through these programs they are not really making enough to make it whole. So if the programs went away and fuel prices kept going the way they are going right now—with four dollar gasoline I expect that people would be calling us to find out how they could stop the bleeding.*

This contractor went on to say:

> *From our perspective there has been fairly light revenue in it for us—that is very specific to our company—I wouldn't expect the whole program to change for our business model*

[audit only]. It might just be that it is not a good program for us to work in as a contract coordinator. But if it was just me out there in my pick-up truck—and I've talked to some guys out there who are just one-man bands—even then they've got overhead, and insurance and lots of expenses—it would be tough to run a business. And if you had 50 projects through this program that would keep you busy a good amount of the time and it would get in the way of doing more lucrative work—doing more lucrative remodeling contracts, say replacing windows.

Note, however, that while discussing the limited available funding for the HPwES pilot program, one contractor remarked on the benefits of the program to his business noting that when the funds run out and the incentives are not available his business declines.

Six of the eight contractors stated that the most significant benefit of the HPwES program to their business is that the incentives get customers to take action on energy efficiency measures. As one stated, "Those customers who sit on the border—it encourages them to [move forward]. One contractor said that he conducted an audit of a home that was already under contract to have walls insulated. When the homeowner heard about the HPwES program and had an audit, it swayed the homeowner to work with him instead because of the more thorough approach he took in his audit. Two contractors also remarked that financing helps encourage customer engagement. Two contractors mentioned the marketing through the utility company as the most significant program benefit.

When asked about things the program could do other than simply reaching more customers, contractors typically pointed to the importance of consumer education regarding energy efficiency issues.

Most of the contractors interviewed also offer audits for a fee outside of the program and said that the typical price is $400-$500, but fees can range from $49 (for one contractor who was running a special) to $1,200, depending on the level of auditing and reporting.

The QA contractor indicated that the program goal of market transformation will be facilitated by testimonials which will provide customers with greater confidence in the energy savings that could be achieved:

The budget for the program generally gets sold out.... They are serving as many people as they can, but overall, it's really market transformation—let the weatherization and building performance industry stand on its own legs. But I don't think it will until we have—I call it testimony, or customer verification, customer satisfaction, or endorsement—I think that is a crucial thing that I would like to see someone do.

Participant and Non-Participant Survey Findings

Program Awareness and Participation

Non-participant Program Awareness

The survey asked non-participants if they were aware of any programs from their utility that help them save energy. More than one in four (28%) reported that they were aware of energy saving programs (Table 5).

Table 5. General Awareness of Energy Saving Programs

	Non-Participants
Sample size	*54*
Yes	28%
No	70%
Don't know	2%
Refused	--

Fifteen non-participants mentioned specific energy saving programs that they had heard of, with five mentioning HPwES, and two mentioning ENERGY STAR lighting (Table 6).

Table 6. Specific Program Awareness

	Non-Participants
Sample size	*15*
New Hampshire Home Performance with ENERGY STAR program	5
ENERGY STAR Lighting	2
Heating financial assistance program(s)	1
To make sure windows are air tight	1
Insulation	1
Survey	1
Don't know	4

A total of 31% of non-participants reported hearing of the HPwES program. In addition to the five respondents (9% of all non-participants) who reported unaided awareness of the HPwES program, about one-fifth of non-participants (22%) did not name the HPwES program but reported that they had heard of it when the program name was mentioned to them (Table 7).

Table 7. Awareness of HPwES

	Non-Participants
Sample size	*54*
Unaided awareness	9%
Aided awareness	22%

Sources of Program Awareness

When asked how they had learned about the HPwES program, most participants and non-participants most frequently cited a utility communications channel such as direct mail (23% of participants, 24% of non-participants), utility newsletter (16% of participants, 14% of non-

participants), PSNH[18] or Energy North (22% of participants), or the nhsaves.com or utility website (18% of participants). Approximately one-fourth of non-participants (24%) and participants (26%) said that they had heard about the program through word-of-mouth (Table 8). Note that in the tables in this report the α symbol is used to indicate differences that were significant at the 90% confidence level.

Table 8. How Customers Learned About the Program
(multiple responses)*

	Participants	Non-Participants
Sample size	*70*	*21*
Word-of-mouth (neighbor, friend, co-worker, family member)	26%	24%
Direct mail from utility	23%	24%
Utility newsletter	16%	14%
PSNH	11% α	--
EnergyNorth (National Grid Gas)	11% α	--
nhsaves website	9% α	--
Utility website	9% α	--
Newspaper ad or story	6% α	--
From a contractor	6%	5%
The internet	4% α	--
Through condo association	4% α	--
Call center on-hold message	1%	--
TV advertisement	1%	5%
Governors energy recommended program	--	5%
Don't know	6% α	33%
Refused	9% α	19%

* Tables with multiple response answers add to more than 100%.
α Significantly different from the non-participant sample at the 90% confidence level.

Of the five partial participants interviewed, two reported hearing about the program from a newspaper ad or story, one each heard about it from a utility newsletter or a contractor, and one did not know.

Of the 11 HHI users interviewed, the most frequently reported sources for hearing about the program were a utility channel including website (4), a call center on-hold message (3), Unitil (1), direct mail (1), or newsletter (1). Word-of-mouth (3) also was a frequently mentioned source. Other specific sources mentioned by HHI users include newspaper (1), contractor (1), and the internet (1).

Non-Participant Information Sources for Energy Efficiency Programs

The survey asked non-participants what would be the first source they would turn to for information about programs and rebates if they were considering installing energy efficiency measures in their home. Over one-fifth of respondents mentioned the internet (22%), about one-tenth mentioned PSNH (9%), and 7% stated that they would contact a retailer that sells or installs energy efficiency measures. These non-participants also mentioned several other sources, including utilities newsletters, TV advertisements, contractors, the electric company, and government resources (Table 9).

[18] PSNH participants are significantly more likely than National Grid participants to have said that they learned about the program from PSNH. No other sources were found to be statistically different across the three utilities.

Table 9. Source to Find out about Rebates and Programs*

	Non-Participants	
	Primary Reason*	Secondary Reasons (multiple response)
Sample size	*54*	*34*
The internet	22%	16%
PSNH	9%	3%
Retailer that sells and/or installs energy efficiency measures	7%	3%
Utility newsletter	4%	--
TV advertisement	4%	--
From a contractor	4%	5%
The electric company	4%	--
Government resources/governor's office	4%	3%
Utility website	2%	--
Direct mail from utility	2%	3%
EnergyNorth (National Grid Gas)	2%	--
Newspaper ad or story	--	5%
Radio advertisement	--	3%
Don't know	37%	46%
Refused	--	14%

* Note that due to rounding errors the percentages may not add up to exactly 100%.

Participation in Other Programs

The participant and non-participant surveys asked respondents if they had participated in any other utility energy efficiency programs or had received rebates for energy efficiency measures that they have installed. About one-fourth of HPwES participants (26%) indicated that they participated in other programs (Table 10).

Table 10. Participation in Other Utility Energy Efficiency Programs

	Participants
Sample size	*70*
Participated in other programs	26%
Have not participated in other programs	74%

Three out of five partial participants and seven of 11 Home Heating Index (HHI) users responded that they participated in other programs.

Among the respondents who said they had participated in other utility energy efficiency programs, two-fifths of HPwES participants (40%) indicated that they had participated in the ENERGY STAR Appliances program. One-third of participants (33%) reported having participated in the Gas Networks program. Over one-fourth (27%) of these participants reported having participated in the ENERGY STAR Homes program. Over one-tenth of participants (13%) reported participating in the ENERGY STAR Lighting program (Table 11).

Table 11. Participation in Other Energy Efficiency Programs
(multiple response)

	Participants
Sample size	*18*
ENERGY STAR Appliances	6 (40%)
Gas Networks	5 (33%)
ENERGY STAR Homes	4 (27%)
ENERGY STAR Lighting	2 (13%)
Other	1 (7%)

Among the three partial participants who said they had participated in other utility energy efficiency programs, two reported participating in the Gas Networks program and one reported participating in the ENERGY STAR Homes program.

Among the seven HHI users who said they had participated in other utility energy efficiency programs, three said they had participated in the ENERGY STAR Appliances program, two said they had participated in the ENERGY STAR Homes program, and one said they had participated in the ENERGY STAR Lighting program.

Participation Motivations and Barriers

Reasons for Interest in HPwES

Survey respondents were asked about the reasons they had been interested in having their homes audited. The most important reason mentioned by participants was that they had wanted to save on their energy bills (63%). This was followed by 10% of participants who wanted to find out how energy efficient their home was, 7% who sought to obtain the rebate, and 6% who wanted to save energy in general (Table 12).

Table 12. Reasons for Interest in Having Home Evaluated*

	Participants	
	Primary Reason*	Secondary Reasons (multiple response)
Sample size	*70*	*70*
To save on energy costs/bills	63%	7%
To find out how energy efficient my home was/ to get my home evaluated	10%	6%
To obtain the rebate	7%	3%
To save energy—not further specified whether for cost, environment	6%	6%
It was a requirement	4%	--
To address existing problems	4%	--
I was thinking about/planning to install energy efficient measures anyway	3%	7%
To help the environment	1%	9%
Moderate temperature in home	--	3%
To get an expert's advice about what energy efficiency measures to install/how to make home more energy efficient	--	1%
No other reasons	--	55%
Don't know	1%	1%
Refused	--	3%

* Note that due to rounding errors the percentages may not add up to exactly 100%.

The most important reason mentioned by the five partial participants interested in having their homes audited was that they had wanted to save on their energy bills (4). One partial participant

mentioned wanting expert advice on the energy efficiency measures to install and how to make their home more energy efficient

Nine of 11 HHI users said that they completed the HHI because wanted to save energy in general (not further specified whether for cost or environment). One said they wanted to find out how energy efficient their home was and one said they wanted to heat their home better.

Participant Concerns about HPwES

Respondents were asked if, prior to program participation, they had any concerns about taking part in the program (Table 13). Only 6% of participants reported any such concerns. Two of four participants were concerned that their home would be very inefficient. One was concerned that the company, presumably the contractor, was reputable, and one stated general concerns. None of the partial participants expressed any such concerns.

Table 13. Concerns Prior to Program Participation

	Participants
Sample size	*70*
Yes	6%
No	94%

Reasons HHI Users Did Not Apply to HPwES

The survey asked customers who used the HHI tool if their home qualified to participate in the HPwES program. All 11 respondents stated that their homes did qualify.

These HHI users were then asked why they did not apply to the HPwES program. Four said that they were not ready, and one each stated that they had difficulty submitting the application online and had no internet access. One person mentioned the type of home heating fuel covered, one mentioned financial reasons, and one person said that they had already installed upgrades as reasons for not applying to the program (Table 14).

Table 14. Reason HHI Users Did Not Apply to HPwES

Qualification	HHI Users
Sample size	*11*
Not ready/not the right time	4
Difficulty submitting application online	1
No internet access	1
Type of home heating fuel covered	1
Financial reasons	1
Already had upgrades installed	1
No real reason	2
Don't know	-
Refused	-

HHI User Plans to Apply to HPwES

Five of the HHI users said that they plan to apply to the program in the future, while four said that they do not. When asked when they plan to apply for the program, two respondents said that they plan to apply within the next six months. One HHI user reported that they planned to apply within seven to 12 months and one planned to apply more than a year from now (Table 15).

Table 15. Future Application to HPwES

Plan to Apply	HHI Users
Sample size	*11*
Yes	5
No	4
Don't know	2
Refused	-
When Planning to Apply	**HHI Users**
Sample size	*5*
Within the next six months	2
Within seven to twelve months	1
More than a year from now	1
Don't know	1
Refused	-

Reasons for Not Participating in HPwES

The survey asked non-participants who had heard of the HPwES program why they have not participated in the program. Over one-eighth of respondents (14%) stated that they had already installed most measures (Table 16). 10% each stated that they were not interested in installing measures, that the measures were too expensive, and that it would be too much hassle to participate in the program. Note, however, that that over two-fifths of respondents (43%) indicated that they did not know why they have not participated in the program.

Table 16. Reasons for Not Participating in HPwES

(multiple response)

	Non-Participants
Sample size	*21*
I have already installed most measures	14%
Not interested in installing measures	10%
Too expensive / Don't have the money to install measures	10%
Too much hassle to participate in the program	10%
My home is already energy efficient	5%
Do not have the time / too busy	5%
I work with another utility	5%
I have never heard of program	5%
Others need the program more than I do	5%
Don't know	43%
Refused	5%

Non-Participant Interest in Participating in HPwES

The survey asked non-participants how interested they would be in participating in the program. Nearly one-third of these non-participants (30%) indicated that they were very or extremely interested and nearly one-half of participants (48%) said that they were not interested or not at all interested (Table 17).

Table 17. Interest in Participating*

	Non-Participants
Sample size	*54*
5 "Extremely interested"	13%
4	17%
3	17%
2	11%
1 "Not at all interested"	37%
Don't know	6%
Refused	-

* Note that due to rounding errors the percentages may not add up to exactly 100%.

The survey asked the non-participants who were not interested in participating in the program the reasons they were not interested in doing so. 15% each stated that their home was already energy efficient and that the measures were too expensive. 12% of non-participants each stated that they have already installed most measures and that it was too much hassle to participate in the program. Other respondents stated that they do not have the time, that they plan to buy or sell their home soon, that they are not interested in installing measures, that they spend very little time at home, and that they already know what needs to be done to their home (Table 18).

Table 18. Reasons Not Interested in Participating in the Program*

	Non-Participants	
	Primary Reason	Secondary Reasons
Sample size	*26*	*7*
My home is already energy efficient	15%	1 (14%)
Too expensive / Don't have the money to install measures	15%	-
I have already installed most measures	12%	-
Too much hassle to participate in the program	12%	-
Do not have the time / too busy	8%	1 (14%)
Plan to buy/sell home soon	8%	-
Not interested in installing measures	4%	1 (14%)
Spend very little time in home	4%	-
Already know what needs to be done to home	4%	-
Don't know	19%	2 (29%)
Refused	-	2 (29%)

* Note that due to rounding errors the percentages may not add up to exactly 100%.

Measure Recommendations and Installations

Installation of CFLs

When asked if the contractor who came to their home brought CFLs, nearly two-thirds of respondents (63%) said that the contractor did bring CFLs (Table 19). Over two-thirds of these participants (71%) stated that the contractor installed them himself; while 18% said that the contractor left them behind for the customer to install.[19]

Table 19. Contractor Brought CFLs to Install

Contractor Brought CFLs	Participants
Sample size	*70*
Yes	63%
No	29%
Don't know	9%
Refused	-
Contractor Installed CFLs in Home or Left Them Behind for Customer to Install	**Participants**
Sample size	*44*
Installed them himself	71%
Left them behind for me to install	18%
Installed some, left others behind for me to install	-
Don't know	11%
Refused	-

The survey asked participants if the same contractor who did the audit also installed the measures. Nearly one-third of respondents (31%) said that the same contractor installed the measures, while 40% said that a sub-contractor installed the measures (Table 20).

Table 20. Installation of Measures by Contractor or Sub-Contractor

	Participants
Sample size	*70*
The same contractor who did the audit	31%
A sub-contractor	40%
Some measures by the contractor, some by the sub-contractor	6%
Don't know	23%

Recommended and Installed Measures

Respondents were asked about the measures they recalled being recommended from the audit and were then asked to indicate the measures that they recalled installing (Table 21).[20] The most frequently recommended and installed measure was attic insulation—four-fifths (81%) of participants recalled this recommendation and three-fourths (76%) reported installing it. Air sealing was the second most frequently recommended (70%) and installed measure (60%). The next most commonly recommended and installed measures were CFLs (56% recommended and 51% installed), basement insulation (43% recommended and 37% installed), wall insulation

[19] A comparison of CFL installation by utility showed no statistically significant differences by utility.

[20] For a breakdown between electric and gas utility participants see Appendix F, Table 64.

(44% recommended and 36% installed), and showerheads (31% recommended and 30% installed). On average, participants accepted and installed 82% of measure recommendations.

Table 21. Recommended and Installed Measures

	Participants	
	Recommended	Installed
Sample size	*70*	*70*
Attic insulation	81%	76%
Air Sealing	70%	60%
Compact Fluorescent Light Bulbs	56%	51%
Basement Insulation	43%	37%
Wall insulation	44%	36%
Showerhead	31%	30%
Strategic dense pack cellulose	37%	29%
Pipe Insulation	34%	29%
Compact Fluorescent Light Fixtures	33%	29%
Faucet Aerators	29%	26%
Duct Sealing	24%	19%
Electronic Thermostat + Set-Back	23%	17%
Tank Wrap	14%	7%
Refrigerator Brush	4%	3%

Plans to Install Recommended Measures

Table 22 presents information on respondent plans to install recommended measures in the future. Over one-fifth (23%) of participants and said that they plan to implement all of the recommended measures. 45% of participants said that they have no plans to implement any of the other measures.

Table 22. Plans to Install Recommended Measures in the Future
(multiple response)

	Participants
Sample size	*31*
Yes, plan to implement all of the recommended measures	23%
Yes, plan to implement some but not all of the recommended measures	10%
No, have no plans to implement any of the other measures	45%
Don't know	23%

Three out of four partial participants said that they plan to implement all of the recommended measures. Note that one partial participant reported having installed all of the measures, but outside the program.

The participant survey asked respondents which recommended measures they plan to install in the future. All participants who were provided with recommendations for showerheads, faucet aerators, tank wrap, pipe insulation, air sealing, strategic dense pack cellulose, attic, wall, and basement insulation, and electronic thermostats and setback reported that they plan to install those measures in the future (Table 23). Four-fifths of participants plan to install CFLs, and two-thirds each plan to install compact fluorescent light fixtures and duct sealing. Most partial participants plan to install all of the measures that were recommended to them, but two of three partial participants plan to install compact fluorescent light fixtures and basement insulation and three out of four partial participants plan to install air sealing.

Table 23. Recommended Measures Planned for Future Installation

	Participants		Partial Participants	
	Sample size	Count	*Sample size*	Count
Showerhead	*1*	1	-	-
Faucet Aerators	*1*	1	-	-
Tank Wrap	*2*	2	*1*	1
Pipe Insulation	*2*	2	*2*	2
Refrigerator Brush	*2*	-	-	-
Compact Fluorescent Light Bulbs	*5*	4	*4*	4
Compact Fluorescent Light Fixtures	*3*	2	*3*	2
Air Sealing	*5*	5	*4*	3
Duct Sealing	*3*	2	-	-
Strategic Dense Pack Cellulose	*2*	2	*3*	3
Attic Insulation	*8*	8	*3*	3
Wall Insulation	*5*	5	-	-
Basement Insulation	*3*	3	*3*	2
Electronic Thermostat & Set-Back	*3*	3	*1*	1

Respondents who plan to install measures in the future were asked when they plan to have these additional measures installed. As Table 24 shows, two participants and two partial participants plan to install the additional measures within the next six months, two participants plan to install the additional measures within seven to 12 months, and two participants and one partial participant plan to install the measures more than a year from now.

Table 24. When Participants Plan to Install Additional Measures

	Participants	Partial Participants
Sample size	*10*	*4*
Within the next six months	2	2
Within seven to twelve months	2	-
More than a year from now	2	1
Don't know	4	1

Likelihood of Installing Recommended Measures within Next Year

Participants who indicated that they have no plans to install any or some of the measures in the future were asked how likely they would be to install any of the recommended measures within the next year if the program rebate still were available to them. Nearly one-half of participants (48%) responded that they are likely or very likely to install the measures within the next year if the program rebate still is available, while about one-fourth (24%) said that they are unlikely or very unlikely to install the measures within the next year if the program rebate still is available (Table 25).

Table 25. Likelihood of Installing Recommended Measures in the Next Year if the Program Rebate Is Still Available*

	Participants
Sample size	*17*
Very likely	24%
Likely	24%
Neither likely nor unlikely	6%
Unlikely	6%
Very unlikely	18%
Don't know	18%
Refused	6%

* Note that due to rounding errors the percentages may not add up to exactly 100%.

Only one partial participant indicated no plans to install any or some of the measures in the future, and they indicated being very likely to install the measures within the next year if the program rebate still is available.

Participant Reasons for Not Installing Recommended Measures

The participant survey asked respondents the reasons they were not planning to install any or some of the other recommended measures. Over two-fifths of participants said that the measures were too expensive (29%) or they did not have the needed cash (14%). About one-fifth of participants (21%) said that they do not think they really need them. Slightly over one-eighth of participants (14%) stated that they want to install other measures that are not covered by the program (Table 26).

Table 26. Reasons for Not Planning to Install Other Recommended Measures*

	Participants Not Planning to Install Any/Some of the Other Recommended Measures	
	Primary Reason	Secondary Reasons (multiple response)
Sample size	*16*	*15*
Too expensive	29%	-
Don't think I really need it	21%	-
Don't have the cash needed	14%	-
Want to install other measures that aren't covered	14%	-
I'm going to change my tank very soon	7%	-
Too busy	-	7%
Too expensive	-	7%
Payback too long	-	7%
Incentive not big enough	-	7%
Few of the recommended measures apply to our house	-	--
No other reason	7%	93%
Don't know	7%	-

* Note that due to rounding errors the percentages may not add up to exactly 100%.

Partial Participant Reasons for Not Installing Recommended Measures

The survey asked partial participants the most important reason that they had not installed any of the recommended measures. Three responded, all of them revealing difficulty paying for the measures—the measures were too expensive (2) or they didn't have the cash needed (1).

The survey also asked partial participants who were not planning to install some or all of the recommended measures the reasons why they were not planning to do so. One partial participant reported that the reason they were not planning to install the recommended measures was that they were too expensive. Two partial participants installed recommended measures outside of the program. One said that he just thought he could do it himself and the other did not give a reason.

Other Energy Savings Changes Made by Participants

The participant survey asked respondents if, since having a HPwES audit, there were any other energy saving changes that they had made to their home in addition to what was recommended by the HPwES program (Table 27). Over one-fifth of participants (21%) reported replacing their heating/water heating system, and one-eighth (13%) each reported installing new doors, replacing windows, or adding insulation.

Table 27. Other Energy Saving Measures Implemented in Addition to Program Recommendations
(multiple response)

	Participants
Sample size	*31*
Replaced heating/water heating system	21%
New doors	13%
Replaced windows	13%
Additional insulation	13%
Weather stripping	8%
New refrigerator	8%
Behavioral changes	8%
Efficient washing machine	8%
Additional CFLs	4%
Programmable thermostats	4%
New roof	4%
Solar panels	4%
Low flow showerhead	4%
Thermal drapes	4%
Installed sheetrock	4%
Installed generator	4%
A lot—most of the stuff	4%

One partial participant reported that since having a HPwES audit, in addition to what was recommended by the HPwES program, they have purchased a new refrigerator and added new siding.

Energy Savings Measures Installed by Home Heating Index Users

Five customers who used the HHI tool but did not participate in the program indicated that they have installed energy saving measures in their home since completing the HHI. Two said that they replaced windows, two added additional insulation, one filled in every space, one replaced the heating system, and one worked on their foundation.

Perspectives on Program Financing and Rebates

PSNH & Unitil Participant Perspectives

The participant survey asked PSNH and Unitil respondents if they were offered financing to cover the cost of their co-payment for installed measures. One-fifth of participants (20%) reported that they were offered financing and one participant reported taking advantage of the financing. The respondent who took financing was very satisfied with the financing terms and said that the financing was very important in the decision to install the measures that they chose to install. Two participants who were offered financing said that they did not need it; one said that they did not like having bills. Three PSNH and Unitil respondents who were not offered financing would have been likely or very likely to have taken it, while 10 would have been unlikely or very unlikely to have taken it (Table 28).

Table 28. Financing for PSNH and Unitil Customers

Offered Financing	PSNH & Unitil Participants
Sample size	*25*
Yes	20%
No	68%
Don't know	12%
Would Have Taken Financing	**PSNH & Unitil Participants Not Offered Financing**
Sample size	*17*
Very likely	6%
Likely	12%
Neither likely nor unlikely	12%
Unlikely	35%
Very unlikely	24%
Don't know	12%
Received Financing	**PSNH & Unitil Participants Offered Financing (count)**
Sample size	*5*
Yes	1
No	4

One PSNH partial participant was not offered financing to cover the cost of her HPwES co-payment for installed measures. She indicated that she would have been neither likely nor unlikely to have taken the financing.

National Grid Participant Perspectives

The survey asked National Grid participants how likely they would have been to take financing to cover their co-payment. Nearly one-fourth of these respondents (23%) said that they would have been likely to have taken financing, while over one-half said that they would have been unlikely to have taken financing. Among the National Grid respondents who were unlikely to take financing, over one-third each said that they did not need financing (36%), and that they did not like paying interest (36%). 9% of these participants indicated that they believed that the interest rate would be unreasonable (Table 29).

Table 29. Financing for National Grid Customers*

Likelihood to Have Taken Financing	National Grid Participants
Sample Size	*45*
Very likely	16%
Likely	7%
Neither likely nor unlikely	13%
Unlikely	22%
Very unlikely	29%
Don't know	13%
Refused	-
Reasons Unlikely to Have Taken Financing	**National Grid Participants Unlikely to Have Taken Financing**
Sample Size	*22*
Didn't need it	36%
Dislike paying interest	36%
Believe that interest rate would be unreasonable	9%
Prefer to finance through bank rather than utility	5%
Because it is just a finance thing	5%
They have subsidized; they would pull everything from pocket	5%
It is a rented property	5%

* Note that due to rounding errors the percentages may not add up to exactly 100%.

Note additionally that four National Grid partial participants indicated that if the HPwES program had offered financing to cover weatherization measures they would have been very likely to have taken advantage of that option.

Likelihood of Installation if Rebate Share Had Been Lower

The survey asked participants how likely they would have been to install the exact same type and quantity of energy efficiency measures if the program had instead rebated only 50% of the cost of the measures up to $4,000. Over one-half of respondents (54%) indicated that they would have been likely or very likely to have installed the exact same type and quantity of measures (Table 30).

Table 30. Likelihood of Having Installed Measures with Lower Rebate Share

	Participants
Sample size	*70*
Very likely	27%
Likely	27%
Neither likely not unlikely	7%
Unlikely	13%
Don't know	10%
Refused	4%

Experience and Satisfaction with the Program

Impact on Comfort Levels

Four out of five participants (80%) indicated that there has been a noticeable change in the comfort levels in their homes as a result of installing the energy efficiency measures recommended by the program (Table 31). Nearly four out of five of these participants stated that

the measures provided even temperatures throughout their homes. Three out of 10 stated that it made it more convenient to control the temperature automatically. Over one-eighth of participants (14%) stated that there were noticeably fewer drafts throughout their homes. Participants also mentioned reduced noise of the replaced appliances, using less fuel to heat to a comfortable level, and decreased energy bills.

Table 31. Change in Comfort

Noticed Change in Comfort Levels	Participants
Sample size	*70*
Yes	80%
No	19%
Don't know	1%
Changes Noticed	**Participants (multiple response)**
Sample size	*56*
Provided even temperatures throughout the home	79%
Made it more convenient to control temperature automatically	30%
Noticeably fewer drafts throughout home	14%
Reduced the noise level of replaced appliances	7%
Use less fuel to heat to comfortable level	7%
Decreased energy bill	4%
Don't know	7%

Impact on Energy Bills

About four out of five participants (79%) had the program measures installed seven or more months before the survey. About six out of ten participants (59%) stated that their energy bills had gone down and one-fifth said that there had been no change in their bills (20%). The majority of participants (84%) were satisfied with the impact of the measures on their bills (Table 32).

Table 32. Effects of Program Measures on Energy Bills

Time Since Installation	Participants
Sample size	*70*
Less than one month	1%
One to six months	19%
Seven months to a year	49%
More than one year	30%
Don't know	1%
Refused	-
Impact on Energy Bills	**Participants**
Sample size	*70*
Bills have gone down	59%
Bills have gone up	4%
No change in the bills	20%
Hasn't been long enough to know	7%
Don't know	10%
Refused	-
Satisfaction with Impacts on Bills	**Participants**
Sample size	*63*
Very satisfied	49%
Satisfied	35%
Neither satisfied nor dissatisfied	5%
Dissatisfied	5%
Don't know	5%
Refused	2%

Overall Participant Satisfaction

Respondents exhibited very high satisfaction with the program overall.[21] The majority of participants (93%) said that they were either very satisfied or satisfied with the program overall (Table 33). All five partial participants were very satisfied or satisfied with the program.

The two participants who were dissatisfied with the program were asked why they were dissatisfied. One stated that "the rebate thing is a joke." The other stated, "Two separate companies—the way they did the installation. The dining room was a nightmare—didn't treat us well."

Table 33. Overall Satisfaction with the Program

	Participants
Sample size	*70*
Very satisfied	62%
Satisfied	31%
Neither satisfied nor dissatisfied	3%
Dissatisfied	3%
Very dissatisfied	-

[21] For a breakdown between electric and gas participants see Appendix F, Table 66.

Participants were asked to rate the overall value of the program to themselves as well as to the other occupants of their homes. Based on a scale of one to five, where one is little value and five is immense value, the large majority of participants (87%) gave the program a rating of four or five (Table 34).

Table 34. Overall Value of the HPwES Program

	Participants
Sample size	*70*
Immense Value/High Value	87%

Nearly all the participants (95%) were satisfied with the energy efficiency upgrades that were made to their homes (Table 35).[22] One participant was dissatisfied with the energy efficiency upgrades, saying that the house was cold.

Table 35. Satisfaction with Energy Efficiency Upgrades

	Participants
Sample size	*70*
Very Satisfied/Satisfied	95%

Participant Satisfaction with Specific Aspects of Program

Table 36 shows respondent satisfaction with specific aspects of the program.[23] The majority of participants were satisfied with the first energy audit overall, program communications and marketing, and the report about the homes current energy use and recommendations for energy efficiency measures. Participants were also satisfied with the work done to the home, the incentives provided overall, and the final QA review overall.[24] Note that participants were most satisfied with the work done to their home (91%) and least satisfied with program communications and marketing (77%).

Three participants were dissatisfied with the first energy audit. Their comments were:

- *"The first auditor found a different review than what the contractor had found."*
- *"They couldn't do a thorough energy audit because of asbestos in the cellar."*
- *"[I] think I was given false information."*

One participant was dissatisfied with the work done to his home, saying, "I feel it wasn't done properly." One participant was very dissatisfied stating, "1) The people who did the work messed up the house; they didn't take care of everything; 2) the house is cooler and cold." One participant was dissatisfied with the incentives provided overall, stating, "It was a question of the rebate on the insulation work, the contractor did not fill out the forms correctly and I did not get

[22] For a breakdown between electric and gas participants see Appendix F, Table 67.
[23] For a breakdown between electric and gas participants see Appendix F, Table 68.
[24] We analyzed participant satisfaction with work done to the home for customers who had work done by contractors and sub-contractors. We found no statistically significant differences between the two groups.

the rebate." One customer stated that "the idea of two different companies" was the reason for his dissatisfaction with the final QA.[25]

Table 36. Satisfaction with Specific Aspects of the Program
(% Very Satisfied or Satisfied)

	Participants
Sample size	*70*
The first energy audit overall	83%
Program communications and marketing	77%
The report and recommendations received	86%
The work done to home	91%
The incentives provided overall	87%
	Participants Whose Homes Received a QA Review
Sample size	*37*
The final quality assurance review overall	81%

All five partial participants surveyed were satisfied with the first energy audit overall and the report received about the home's current energy use and recommendations for energy efficiency measures. Four out of five partial participants were satisfied with program communications and marketing as well as the incentives provided overall.

Satisfaction with Home Heating Index

The survey asked the 11 utility customers who only used the HHI how satisfied they were overall with the HHI. Six out of the 11 HHI users indicated that they were satisfied or very satisfied with the HHI (Table 37). Two of them were dissatisfied with the HHI. One stated, "Because we couldn't get any help to help us to pay for the installation and things we needed done." The other said she "did not get a response back."

Table 37. Satisfaction with HHI

	HHI Users
Sample size	*11*
Very satisfied	1
Satisfied	5
Neither satisfied nor dissatisfied	2
Dissatisfied	1
Very dissatisfied	1
Don't know	1

Single Program versus Stand-alone Programs

The survey asked participants and partial participants if they would prefer a single program that includes multiple energy efficiency measures or multiple stand-alone programs for different energy efficiency measures. Most participants (61%) responded that they preferred a single program. Respondents who preferred a single program predominantly stated that they wanted to

[25] This customer had a sub-contractor do the work and said that he was dissatisfied with the program overall, stating, "Two separate companies—the way they did the installation. The dining room was a nightmare—didn't treat us well."

take care of multiple projects at one time (65%) and that they would be able to organize financing for multiple projects at the same time (21%). About one-fifth of participants (19%) reported a preference for multiple stand-alone programs. Six out of 13 of these participants said that they wanted to spread costs over a greater time period, and three said that they wanted to address different projects at different times (Table 38).[26]

Table 38. Single Program versus Stand-alone Programs

Single Program vs. Stand-alone programs	Participants
Sample size	*70*
Single program	61%
Stand-alone program	19%
Don't know	16%
Refused	4%
Reasons for Single-Program	**Participants multiple response**
Sample size	*43*
Take care of multiple projects at one time	65%
Organize financing for multiple projects at the same time	21%
Fewer people to work with/more simple	9%
Get everything done quickly	2%
Reasons for Stand-alone Program	**Participants multiple response**
Sample size	*13*
Spread costs over a greater time period	46%
Address different projects at different times	23%
Specialized contractors do higher quality work	8%
More options/greater flexibility	8%
More in-depth evaluation	8%

Four out five partial participants also indicated that they preferred a single program because they wanted to take care of multiple projects at one time. One partial participant reported a preference for multiple stand-alone programs because they wanted to spread costs over a greater time period.

Program Improvement Recommendations

Overall Recommendations for Improving Program

Participants and partial participants were asked if they had any recommendations for improving the program. Of participants offering a recommendation, nearly one-third (32%) recommended more advertising and about one-tenth (11%) recommended better trained contractors or auditors. Other notable recommendations included increased incentives (7%), increased communication between auditor and installation contractors (7%), and simplifying the scheduling process (7%) (Table 39).

[26] National Grid participants (67%) indicated a strong preference for a single program. Nearly three-fifths of PSNH participants (58%) preferred a single program to a stand-alone program. Unitil participants (33%) indicated a weaker preference for a single program. However, with many Don't know and Refused responses and a sample size of only six this will be of limited statistical significance and cannot be projected to the Unitil customer population. See Table 65 in Appendix F for a breakdown between electric and gas utility customers.

Table 39. Recommendations for Improvements*

	Participants*
Sample size	*28*
More advertising	32%
Better trained contractor/auditor	11%
Increase incentives	7%
Increased communication between auditor and installation contractors	7%
Simplify scheduling process	7%
More consistent standards among the different utilities	4%
Present audit results in greater depth	4%
Ensure contractors fill out forms correctly	4%
Thermal imaging of house	4%
Third party post inspection	4%
Simplify process of claiming rebate	4%
Offer the home energy audit alone	4%
Systematic approach	4%
Electric side of it all	4%
The glue they use is poor	4%

* Note that due to rounding errors the percentages may not add up to exactly 100%.

One partial participant recommended showing before and after pictures.

Recommended Other Measures

The survey asked participants and partial participants if there are any energy efficiency measures that were not covered by the HPwES program that they would like to have had covered through the program. Nearly one-third of participants said that they wanted additional measures covered in the program and nearly one-half of them (46%) indicated wanting to have windows covered (Table 40).

Table 40. Additional Measures Wanted Covered in the Program

Additional Measures Wanted	Participants
Sample size	*70*
Yes	31%
No	60%
Don't know	9%
Refused	-
Measures Wanted Covered by the Program	**Participants (multiple response)**
Sample size	*22*
Windows	46%
Attic insulation	9%
Water heater	9%
Wall insulation	5%
Duct insulation	5%
Solar water heating	5%
Solar panels	5%
Front door	5%
Sealing in basement	5%
Switch from electric to gas	5%
Wanted to do more but couldn't because of asbestos	5%

One partial-participant said they wanted the program to cover siding.

HHI User Recommendations for Improving the Home Heating Index

The survey asked HHI users if they had any recommendations for improving the HHI. One respondent stated that it "needs more auditors." The other said, "I guess just to not offer people any help until they have money and if they don't have the money they should put out notice."

Other Non-participant Issues

Ratings of Energy Efficiency of Homes

Non-participants were asked to provide a general assessment of the energy efficiency of their homes. Nearly three out of five (59%) non-participants agreed with the statement, "My home is energy-efficient" (Table 41). Note, however, that about one-fourth of non-participants (24%) disagreed and thought that their home was not energy efficient. When asked to rate their homes' energy efficiency on a scale of zero to 10, where zero is 'not at all efficient' and 10 is 'very efficient,' nearly three out of five non-participants (58%) gave their homes an energy efficiency rating of six or higher. Note, again, that about one-sixth of participants (16%) rated their home as not energy efficient.

Table 41. Agreement that Home is Energy Efficient

Home is Energy Efficient	Non-Participants
Sample size	*54*
Strongly agree	9%
Agree	50%
Neither agree nor disagree	11%
Disagree	11%
Strongly disagree	13%
Don't know	4%
Refused	2%
Energy Efficiency of Home	**Non-Participants**
Sample size	*54*
10 "Very efficient"	2%
9	4%
8	19%
7	20%
6	13%
5	24%
4	6%
3	6%
2	2%
1	2%
0 "Not at all efficient"	-
Don't Know	4%
Refused	-

* Note that due to rounding errors the percentages may not add up to exactly 100%.

Concerns about Home Energy Bills and Comfort

Using a similar scale of zero to 10, where zero is "not at all concerned" and 10 is "very concerned"' non-participants were asked to rate their concerns regarding the size of their energy bills and the comfort of their homes. Nearly three out of five (58%) non-participants gave a

rating of six or higher to their level of concern about the size of their heating bills and 57% gave a rating of six or higher to their level of concern about the size of their electricity and gas bills. Over one-half (52%) gave a rating of six or higher to their concern about the temperature and draftiness of their homes (Table 42).

Table 42. Non-Participant Concerns About Home Energy Bills and Comfort

	Heating Bills	Electricity and Gas bills	Home Being Cold and Drafty
Sample size	*54*	*54*	*54*
10 "Very concerned"	15%	15%	13%
9	11%	7%	6%
8	6%	7%	11%
7	20%	24%	13%
6	6%	4%	9%
5	15%	19%	6%
4	2%	2%	6%
3	7%	7%	6%
2	9%	6%	6%
1	2%	-	4%
0 "Not at all concerned"	2%	2%	15%
Don't know	6%	7%	7%

Demographics

Most surveyed participants (80%) and non-participants (81%) live in single-family detached homes (Table 43). All five partial participants and nine out of 11 HHI users reported that they live in single-family detached homes.

Table 43. Type of Residence

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
Detached single-family home	80%	81%	5	9
Townhouse or duplex which share adjacent walls	6%	13%	-	1
Apartment or condo in a two, three, or four family building	6%	2%	-	1
Apartment or condo in a building with 5 or more units	9%	4%	-	-
Mobile home or house trailer	-	-	-	-
Don't know/Refused	-	-	-	-

Participants (49%) are statistically more likely than non-participants (33%) to live in a home with three bedrooms (Table 44). Three out of five partial participants and eight out of 11 HHI users reported that they live in homes with three bedrooms.

Table 44. Number of Bedrooms

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
1	-	2%	-	-
2	26%	33%	-	1
3	49%[a]	33%	3	8
4	17%	24%	1	2
5	9%	6%	1	-
6 or more	-	2%	-	-

[a] Significantly different from the non-participant sample at the 90% confidence level.

Significantly more participants (14%) than non-participants (4%) report having annual household incomes between $50,000 and $74,999 (Table 45).

Table 45. Annual Household Income

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
Less than $15,000	-	-	-	-
$15,000 - $24,999	1%	2%	-	-
$25,000 - $34,999	4%	7%	1	-
$35,000 - $49,999	7%	9%	1	2
$50,000 - $74,999	14%[a]	4%	-	4
$75,000 - $99,999	13%	9%	-	2
$100,000 or more	21%	15%	1	-
Don't know/Refused	39%[a]	54%	2	3

[a] Significantly different from the non-participant sample at the 90% confidence level.

Nearly all the respondents reported living in their homes year-round (Table 46).

Table 46. Seasonal Home

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
Year round residence	100%[a]	91%	5	11
Seasonal / vacation home	-[a]	7%	-	-
Don't know/Refused	-	2%	-	-

[a] Significantly different from the non-participant sample at the 90% confidence level.

All respondent groups indicated a wide range in the number of full time residents in the home; however over one-half of respondents in each group reported having two to three full time residents in the home (Table 47).

Table 47. Number of Full Time Residents*

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
1	20%	15%	1	1
2	43%	43%	2	2
3	19%	22%	1	4
4	14%	15%	1	1
5	4%	4%	-	1
6 or more	-	2%	-	2

* Note that due to rounding errors the percentages may not add up to exactly 100%.

About three out of five participants (62%) and about three out four non-participants (74%) were over 45 years old (Table 48).

Table 48. Respondent Age*

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
18 to 24	-	-	-	-
25 to 34	17% [a]	7%	1	2
35 to 44	16%	13%	-	2
45 to 54	23%	24%	-	3
55 to 64	23%	17%	2	1
65 or over	16% [a]	33%	2	2
Don't know/Refused	6%	6%	-	1

[a] Significantly different from the non-participant sample at the 90% confidence level.
* Note that due to rounding errors the percentages may not add up to exactly 100%.

Overall, participants and non-participants reported similar levels of education—about three out of five participants (63%) and over one-half of non-participants (54%) reported having at least a bachelor's degree (Table 49).

Table 49. Educational Attainment*

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
Less than HS	1%	6%	-	-
Graduated HS	6% [a]	19%	2	1
Some college	26%	17%	2	4
Bachelor's degree or higher	39%	41%	1	1
Grad or professional degree	24%	13%	-	5
Don't know/Refused	4%	6%	-	-

[a] Significantly different from the non-participant sample at the 90% confidence level.
* Note that due to rounding errors the percentages may not add up to exactly 100%.

Slightly over one-half of participants and non-participants responding to the survey were male (Table 50).

Table 50. Gender

	Participants percent	Non-Participants percent	Partial Participants count	HHI Users count
Sample size	*70*	*54*	*5*	*11*
Male	54%	54%	2	4
Female	46%	46%	3	7

Process Meta-Analysis

The process meta-analysis section of this report reviews the process evaluations of other home performance programs in order to provide comparisons for the New Hampshire HPwES program. We review the key findings and present the key recommendations for those programs as considerations that the New Hampshire PAs should keep in mind for their program.[27]

Key elements of HPwES include:

- A whole-house home performance assessment performed by a certified specialist
- A list of recommended renovations based on the home performance assessment
- Assistance in identifying contractors to implement the recommended renovations
- Verification that the work performed improved home performance and that the home is operating safely
- QAe of work performed

HPwES programs are currently offered in 33 states. The HPwES platform was formalized by ENERGY STAR in 2001. Because many HPwES programs are new, there have been relatively few process evaluations of these programs. Formal process evaluations have been conducted for HPwES programs in New York, Wisconsin, California, Rhode Island, and Oregon. This section highlights key findings and recommendations from these process evaluations with regard to program design, program management, and program implementation.[28]

Home Performance Programs with Process Evaluations

The following PAs have conducted process evaluations of their home performance programs: National Grid[29], the New York State Energy Research and Development Authority (NYSERDA), Wisconsin Focus on Energy (FOE), the California Building Performance Contractors Association (CBPCA), Ameren Illinois, and the Energy Trust of Oregon (ETO). Several process evaluations have been conducted for the Wisconsin FOE HPwES program, which is one of the longest running HPwES programs. Table 51 displays the program name, the year in which each of the home performance programs was established, and the program years for which process evaluations have been conducted. All of the findings presented in this report are dated as of the program year for which the corresponding process evaluation was completed.

[27] Note that due to the diversity of programs and the different evaluators conducting each of the process evaluations sometimes contradictory findings and recommendations may be shown; accordingly this information should serve to frame the continued development of the New Hampshire program, rather than indicate specific changes that the New Hampshire program needs to make.

[28] None of the other evaluations reviewed in this meta-analysis addressed the cost-effectiveness tests that are used for screening Home Performance program measures.

[29] National Grid is the PA for the EnergyWise program in Rhode Island.

Table 51. Home Performance Programs with Process Evaluations

Program Administrator	National Grid (Rhode Island)	NYSERDA	FOE	CBPCA	Ameren Illinois	ETO
Program name	EnergyWise	HPwES	HPwES	California Retrofit Home Performance	Home Energy Performance	HPwES
Year program established	1998	2001	2001	2002	2008	2006
Program year(s) evaluated	2008	2004	2001-2002, 2009, 2010	2004-2005	2009-2010	2007-2008

The home performance program for each of these six PAs contained the key elements of the national HPwES platform, including a home performance assessment or audit, recommended improvements, assistance in contracting for recommended improvements, and QAe activities. However, there were notable differences with respect to each program's primary objective, design, and other major implementation elements. Some PAs identified market transformation as the primary objective of the program, with promotion of energy saving measures often identified as a secondary objective. These programs sought to support market development such that customers demand and contractors are qualified to perform whole house energy efficiency services. Market transformation was the primary objective of the programs administered by NYSERDA, Wisconsin FOE, Ameren Illinois, and the CBPCA. The primary objective of the National Grid EnergyWise and the Energy Trust of Oregon HPwES programs was the installation of energy efficiency measures in the residential retrofit market.

There were two design models in these programs: the contractor model and the consultant-contractor model. The Wisconsin FOE and Ameren Illinois programs employed the consultant-contractor model.[30] The consultant path involves an initial home performance assessment by a qualified consultant, followed by installation of recommended improvements by a qualified contractor, then a second visit by the consultant to verify that the work performed improved home performance. In contrast, the home performance programs administered by National Grid, NYSERDA, CBPCA, and ETO employed the contractor model, wherein both the initial home performance assessment and the installation of the recommended improvements are performed by an installation contractor.

Other major implementation elements that vary between the programs include program incentives, marketing, and QA activities. Most of the home performance programs included some combination of cash incentives and financing offers to participants for recommended improvements, although the CBPCA California Retrofit Home program only offered cash incentives to contractors for diagnostic equipment. While NYSERDA's program emphasized mass marketing to homeowners in order to drive demand for home performance services, programs such as Wisconsin's FOE and CBPCA relied more heavily on contractor outreach and referrals. ENERGY STAR certification requires that a minimum of 10% of each participating contractor's completed jobs are inspected by the PA or a subcontractor. To enhance QA, some

[30] In the Wisconsin FOE program, homeowners could participate through either the consultant path or the qualified contractor path.

PAs such as National Grid, NYSERDA, Ameren Illinois, and ETO contracted exclusively with BPI-accredited contractors. Table 52 displays the primary objectives, design models, financial incentives, and marketing and QA activities for the home performance programs included in this meta-analysis. The key elements of the New Hampshire HPwES program administered by National Grid, PSNH, and Unitil have been included in this table to facilitate comparison.

Table 52. Key Objectives, Design, and Implementation Elements

Program Administrator	National Grid (Rhode Island)	NYSERDA	FOE	CBPCA	Ameren Illinois	ETO	PSNH and Unitil	National Grid (New Hampshire)
Primary objective	Promote installation of energy efficiency measures	Market Transformation	Market Transformation	Market Transformation	Market Transformation	Promote installation of energy efficiency measures	Promote installation of energy efficiency measures and market transformation	Promote installation of energy efficiency measures and market transformation
Model	Contractor	Contractor	Consultant-Contractor	Contractor	Consultant-Contractor	Contractor	Contractor	Consultant-Contractor
Incentives	Cash incentives to participants	Cash incentives and financing to participants	Cash incentives and financing to participants	Cash incentives to contractors only Financing to participants	Cash incentives to participants	Cash incentives and financing to participants	Cash incentives to participants On-bill financing	Cash incentives to participants, Limited On-bill financing
Primary marketing channels	Bill inserts	Mass marketing: print, radio, television advertising	Contractor/ consultant referrals	Contractor referrals	Targeted mailers	Bill inserts and cooperative advertising with contractors	Bill inserts, newsletters, Internet, WOM, contractor referrals, etc.	Bill inserts, email blasts, Internet, WOM, etc.
Quality Assurance	BPI-accredited contractors[31]	BPI-accredited contractor and inspections conducted for 10% of jobs	Inspections conducted for 10% of jobs	Inspections conducted for at 5% of each contractor's jobs	Work performed by BPI-accredited contractor. Periodic inspections conducted.	Work performed by BPI-accredited contractor	Work performed by BPI-accredited contractor. Inspections conducted for 10% of jobs.	Work performed by BPI-accredited contractor. Inspections conducted for 10% of jobs.

[31] At the time the process evaluation was completed, National Grid had plans to initiate third party inspections of a percentage of completed jobs for its EnergyWise program in Rhode Island.

Table 53 show satisfaction levels for the New Hampshire HPwES program as compared to other programs with available information. Though the other satisfactions scales are not directly comparable, each of the programs had good to very good satisfaction levels.

Table 53. Satisfaction Levels for Home Performance Programs

Satisfaction	NH HPwES	National Grid (Rhode Island) EnergyWise	NYSERDA HPwES	FOE HPwES	CBPCA California Retrofit Home Performance	Ameren Illinois Home Energy Performance	ETO HPwES
Satisfaction with Program Overall	93% of participants were satisfied with the program overall	Average satisfaction rating (on a scale from 0 to 10) of 8.3 46% of respondents reported a satisfaction level of 10	"The program is achieving high levels of consumer satisfaction."	98% of FOE HPwES participants and 96% of WPS participants were satisfied with overall program	"Respondents who purchased retrofits were asked a set of questions related to satisfaction with the work performed by the contractor In general, respondents agreed with positive statements (and disagreed with negative statements) regarding their contractor."	"Most participants were satisfied with the program. Both the participating Energy Advisor and the HEP Program Ally were ranked eight or higher (on a scale of 0 to 10), more than 80% of the time on a number of questions, including those regarding overall satisfaction, program value, quality of explanation of the leave-behind report, and insulation measure installation."	"HP participants appear incredibly satisfied with the service, as 89% would recommend it to a friend or neighbor."
Satisfaction with Measures Installed/Work Performed	95% of participants were satisfied with the energy efficiency upgrades made to their homes	Average satisfaction rating exceeding 8.0 (on a scale from 0 to 10) for each measure type		97% of FOE HPwES participants and 94% of WPS participants were satisfied with the quality of work done			

The National Grid RI EnergyWise reported that 58% of recommended measures were installed by participants and FOE HPwES WPS (2011) reported 55% in the WPS territory and 52% in the Focus territory. [32]

Program Design

Cost Considerations and Incentive Elements

The process evaluations reviewed in this meta-analysis identified several cost considerations and incentive elements in home performance program design. The key expenses are participant costs for audits and recommended improvements and the costs to contractors for equipment and training. The evaluations suggest that effective program design can aid in overcoming these cost barriers.[33]

1. Audit Costs

Four of the program process evaluations presented findings and offered recommendations pertaining to participant costs, including the cost of the initial home performance assessment or audit. For example, the audit for the Rhode Island EnergyWise program sponsored by National Grid was free and there was no requirement for installation of recommended improvements. 30% of participants were unable to state why they did not install the measure, indicating a lack of interest in installing any measures. The following recommendation was proposed to address this finding:

> *National Grid [should] consider a two-tiered approach to audits – a free audit with an overview of potential savings and a more in-depth audit to identify additional energy saving opportunities, with both providing free CFLs and water saving devices. The more costly audits would be performed only for homeowners who elected to have them and could include blower door or infrared camera testing. The more in-depth audit option could also rebate the audit fee if follow-up measures are installed. Other utilities charge up to $250 for a detailed audit, which could yield better follow-through on recommended measures.* [34]

2. Installation Costs

As with the New Hampshire program, in the other home performance programs both customers and contractors identified cost as a major barrier to the installation energy efficiency measures.

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[32] New Hampshire HPwES compares favorably with 82% of recommended measures installed by participants.

[33] Most process evaluations that were reviewed in the meta-analysis did not include information on the incentive levels and prices for energy efficiency measures. The sole exception was the FOE program in which WPA participants who installed at least three measures could chose either triple rewards or reduced interest-rate financing plus $250 in cash.

[34] The National Grid HPwES program in New Hampshire also offered free audits but these resulted in lower project closure rates. By contrast, the $100 audit fee charged by PSNH and Unitil appears to have been effective in screening out customers who are not likely to install energy efficiency measures.

Participants in the Ameren Illinois Home Energy Performance program indicated that the main reason they did not pursue recommended shell measures was the cost of the installation. To address this low installation rate, the Ameren program evaluator recommended examining whether shell measure incentives could be increased and considering on-bill financing for shell measures such as insulation. Unlike any of the other home performance programs, the CBPCA California Retrofit Home program did not offer any cash or financing incentives to participants. This program design element restricted the participant pool to affluent homeowners and limited the program's ability to serve hard-to-reach customers. It was recommended that the CBPCA consider the use of participant incentives including loan buy-downs, subsidies, incentives, and rebates. In the FOE program in Wisconsin, WPA participants who installed at least three measures could chose either triple rewards or reduced interest-rate financing plus $250 in cash.

3. Contractor Costs

Contractors incur costs as a result of participating in home performance programs, including the costs of diagnostic equipment, training, and time taken off from work to attend training sessions and perform other required tasks. The direct out-of-pocket cost of obtaining BPI certification was identified as a barrier to contractors participating in both NYSERDA's HPwES and Ameren Illinois' Home Energy Performance program. NYSERDA addressed this barrier by offering a 75% cost reimbursement for the training. The ETO program provided incentives for contractor training during the first year of participation. However, recognizing that one year may be insufficient for contractors to adjust their business models, the ETO process evaluator recommended extending first year contractor incentives into the second year or moving some of the first year incentives into the second year in order to allow for a longer start-up time for contractors. [35]

4. Financing

Most of the programs offer financing to participants, though none of the process evaluations indicated that on-bill financing was offered. The FOE program offered reduced-rate financing. However, according to the process evaluation, few participants (17%) were aware of the reduced-rate financing offer and only one consultant/contractor reported that the reduced-rate financing offer is influential in encouraging participants to install recommended measures. Hence, the FOE process evaluation recommended increased promotion of the financing offer both by contractors and customer marketing campaigns. The WPS part of the FOE program also offered a cash-back rewards option and "some WPS participants reported selecting the cash-back rewards because they did not need financing." The NYSERDA program offered ENERGY STAR financing at 5.99% with a maximum loan amount of $20,000 and contractors provided the information to the participant. Participants could also use a New York Energy $martK loan through participating Loan Fund lenders, provided the work was conducted by a BPI-certified contractor. The Homeowner Financing Incentive (HFI) is another option for NYSERDA participants. For participants who are self-financing their projects, HFI provides an incentive of 10% of the eligible measures, up to $2,000.

[35] In New Hampshire, the utilities have subsidized BPI courses through their education program budget and program staff indicate that this was effective in reducing the cost to contractors. One contractor was proud to note that he was invited to participate in the program and take courses through BPI as such an invitation reflected well upon his skills.

5. Minimum of Three Installed Measures Required

In order to increase project completion rates, an Increased Incentives pilot program was initiated within the Wisconsin Public Service (WPS) territory as part of the Wisconsin FOE HPwES. The pilot program offered increased incentives for a package of cost-effective measures, requiring participants to install a minimum of three recommended measures. Interviews with participating consultants and contractors revealed that the primary reason why participants who had an initial audit did not meet the program requirements was because their homes did not need three or more targeted measures. This indicated that there may not be a large pool of homes that require three or more of the targeted measures within the Increased Incentives pilot territory. The following recommendation was presented in the 2011 WPS Territory-wide HPwES Increased Incentives Program Evaluation:

> *The program could relax the three measure requirement, or add more targeted measures in order to increase the pool of potential participants. HVAC equipment and water heating equipment may be potential options—most consultants/contractors indicated that the WPS program would benefit from the inclusion of bonus rewards for HVAC and water heating measures. While the WPS HPWES program already offers bonus rewards for boilers and furnaces through the Heating Equipment Bonus program, water heaters are not eligible for bonus rewards. Inclusion of these measures in the three measure requirement would increase the pool of eligible customers.*[36]

Consolidation of Multiple Programs

Home performance programs sometimes arise from consolidation and refinement of existing programs. For example, the Wisconsin FOE HPwES program resulted from the combination of the ENERGY STAR Ratings and HouseWorks programs in 2001. Sometimes resources can be leveraged by combining programs under one umbrella program. The NYSERDA HPwES process evaluators concluded that the HPwES and its low-income sister program Assisted Home Performance (AHP) are "virtually the same in terms of the vast majority of services, features, delivery agents, and processes." AHP offered a subsidy to income-eligible participants and was subject to separate reporting requirements than HPwES. It was recommended that NYSERDA dissolve the distinction between AHP and HPwES in order to reduce administrative costs.

On the other hand, consolidating multiple programs can lead to added complexity and confusion in the marketplace. This concern was raised in the 2003 evaluation of the Wisconsin FOE HPwES process evaluation. With regard to the incorporation of the Heating and Cooling Initiative into FOE's HPwES, the process evaluators noted that this particular program's resource acquisition objectives diverged from the market transformation objective of HPwES, and that "the whole-house component alone is quite complex in terms of the different market actor groups that are targeted and used to deliver the program." As a result, the evaluators recommended assessing the advantages and disadvantages of separating the Efficient Heating and Cooling Initiative from HPwES by interviewing market actors to determine whether program complexity represents a barrier to contractor participation.

[36] By contrast, in the New Hampshire program, there is no required number of measures and regardless of whether customers adopt other measures, program participants can receive up to six CFLs and water savings devices.

Economies of scale can often be achieved in the form of reduced administrative costs by consolidating multiple programs that share similar delivery processes and delivery agents. However, care must be taken to ensure that consolidating multiple programs does not lead to added complexity and confusion in the marketplace. When assessing whether to consolidate multiple programs into one home performance program, PAs should consider whether consolidation can reduce administrative costs, whether the programs share similar objectives and delivery processes, and the effect consolidation may have in the marketplace.

Consultant-Contractor Model Findings

The majority of the home performance programs included in this meta-analysis employed the contractor model. The exceptions were Ameren Illinois Home Energy Performance program and the FOE HPwES program. Moreover, the FOE HPwES program allowed participants to take either the consultant-contractor or the contractor path. Findings from the Ameren Illinois and FOE HPwES program's process evaluations relevant to the consultant-contractor path are discussed in this section.

The 2010 memorandum summarizing the results from a Wisconsin FOE HPwES participant survey provides insight into the consultant-contractor model, particularly with regard to how the different paths (the consultant path versus contractor path) influence customers. The evaluators found that "participants that engage in the program through the consultant path were more likely to be in an early planning stage, looking for the consultant to provide recommendations, providing a greater potential for influence in their installation decisions." In contrast, the customers who worked with contractors were further along in the process of specifying measures than those going through the consultant path.

Key findings from this report are presented below:

- *Projects completed through the qualified contractor path result in lower net savings estimates than projects completed through the consultant tract.*
- *Among those using a consultant, nearly all participants (98%) recalled the consultant providing a written report regarding the Home Performance evaluation. Significantly fewer participants that received services through a qualified contractor recalled receiving such a report (82% recalled receiving a report).*
- *A higher percentage of participants recall the consultant mentioning a rebate than qualified contractors do (100% compared with 90%, respectively). In fact, several respondents served by qualified contractors said they first knew of the rebate when they received their invoice for the project. Overall, the percentage of respondents that recalled receiving rebate information (either before or after the fact) was high (98%).*

The Ameren Illinois Home Energy Performance program also employed the consultant-contractor model. Stakeholders, program allies, and participants all indicated there were issues

with the explanation of shell measure incentives. Shell measure incentives were not integrated into the payback calculation in the leave-behind report, were not well understood by participants, and sometime were not explained at all by energy advisors. The process evaluators recommended that the energy advisors spend additional time explaining the recommendations at the end of the audit, and that shell measure incentives be integrated into the leave-behind reports with payback calculations.

Process evaluations of home performance programs that employ the consultant-contractor model suggest that energy savings may be greater for participants who take the consultant-contractor path because these participants are looking to the consultant to make recommendations. In addition, consultants may be more likely to present customers with a home energy report than contractors, likely due to the more specialized nature of their role. The FOE process evaluation indicated that consultants were more likely to inform participants about available rebates than contractors. In contrast, the Ameren Illinois process evaluators found that incentives were not well understood by participants and sometimes were not explained at all by consultants. These findings suggest that regardless of who performs the initial home energy audit (consultant or contractor), that individual should be sufficiently trained to explain incentives to participants.[37]

Program Management

Roles and Communication

Many PAs subcontracted program implementation while maintaining in-house oversight. For example, at the time the process evaluations included in this meta-analysis were conducted, Conservation Services Group (CSG) was the implementation contractor for NYSERDA, Ameren Illinois, and ETO. Wisconsin FOE subcontracted program implementation to Wisconsin Energy Conservation Corporation (WECC), and National Grid subcontracted implementation to RISE. Clear definition of roles and effective communication between PAs and implementation contractors are essential to achieving program goals.

The process evaluation of the Rhode Island HPwES program uncovered a lack of consistent quantitative goals and comprehensive program description documentation by the implementation contractor, RISE. Due to the maturity of the program and long-term relationship of National Grid and RISE, direct communications between the two firms were limited. In fact, National Grid relied on RISE when deciding to expand the program to include gas measures in 2007 and no formal contract between the two was prepared, creating a potential liability risk for National Grid and the opportunity for misunderstandings. To address these issues, Cadmus recommended that National Grid prepare a detailed program description including specific installation guidelines and strategies and energy savings assumptions about installed measures. Further, regular contact between National Grid and the auditors was recommended to track progress towards goals and

[37] Additional research will be needed to gain insights into the effectiveness of the lead vendor approach used by National Grid in New Hampshire versus the audit and implementation contractors used by PSNH and Unitil. Because National Grid had a different model in 2009-2010 with no audit fee it is difficult to draw comparisons on the effectiveness of the lead vendor approach in getting participants to move forward on implementing measures. As noted in the in-depth interviews, one New Hampshire contractor felt that National Grid process required too many steps with the use of a lead vendor.

facilitate resolution of any issues. Moreover, Cadmus recommended that National Grid and RISE create a formal contract documenting expectations around the gas program.

Communication between the PA and trade allies was also addressed in the ETO process evaluation. Trade allies experienced difficulties in finding the appropriate people in the organization to speak with. Additionally, some trade allies reported being overwhelmed with information at times and subsequently being unable to distinguish the most important messages from the less important ones. The majority of trade allies interviewed preferred to be contacted via email. Recommendations proposed to address these communication issues with trade allies include the following:

- *Ensure that trade allies are getting the assistance they are looking for, whether over the phone or in person, or clearly explain to them if such assistance is not available*
- *Ease access to higher level managers in the organization, especially when a decision needs to be made*
- *Track communication preferences – primarily contact trade allies through email but allow them to opt into a different communication preference*
- *Ensure that the most important information disseminated stands out from the rest – consider two-day, marked or priority mail for key pieces of information*

The ETO process evaluation discovered significant overlap in marketing efforts between ETO and the program implementer, CSG. The process evaluator attributed this to fundamental problems with internal communications. Interviews with members of each organization revealed that two distinct groups described developing and designing marketing materials among their responsibilities. Specific process recommendations presented to address these issues are presented below:

- *Develop a better "Start Up" process. Within the HES program, there are several pilot efforts, communication materials, and other initiatives that attempt to expand participation and look for additional ways to get energy savings. Our initial interviews indicate that there is need for a more formal (and collaborative) process to initiate new efforts or changes in the program.*
- *Create a more collaborative process between the Program Staff and the Marketing Staff within CSG (and facilitate the marketing review process). In delivering HES, field staff bring technical expertise to the program, while the marketing team brings expertise crucial to delivering messages to customers. Bringing these two groups together is important (especially in developing marketing materials). Other suggestions for facilitating the marketing review process include:*

- *Find time for the two groups to sit down at the beginning of the process and work together on the language in the materials.*
- *Ensure that the targets and goals of each marketing piece are explicitly laid out. As mentioned above, marketing has recently initiated a "job start" process for each marketing piece. This is a form that is intended to help ensure that the targets and goals for each marketing piece are explicitly laid out prior to initiating the marketing effort. This is an important effort that will help facilitate the creation of new marketing pieces.*

NYSERDA's strong working relationship with its implementation contractor, CSG, was credited with contributing to program success in the most recent process evaluation of NYSERDA's HPwES program. However, the evaluator observed that during the development phase of the program, CSG had been tasked with numerous information requests and other issues which diverted resources from core implementation tasks and added to program administrative costs. The following recommendation was proposed to address this finding:

> *Now that the program is at a relatively mature stage, it may be possible to limit use of implementation contractor resources for special tasks and information requests so that more attention can be placed on core tasks, such as production and inspection of jobs and recruiting of contractors, in order to successfully meet the challenge of recent program expansions into new markets and to build contractor participation.* [38]

Data Tracking

Effective data tracking is integral to measuring program effectiveness and facilitating program evaluation. During the evaluation of the Rhode Island EnergyWise program, Cadmus encountered challenges analyzing and interpreting program data, and for some segments, found estimated energy savings to be significantly different from the PAs planning assumptions. The data analysis difficulties that the evaluators encountered include inconsistent account identifiers, measure information with missing account numbers, and lack of a data dictionary. Participant data and deemed savings for the EnergyWise program were recorded in a data tracking system called InDemand. A review of the tracking system resulted in the following process recommendations:

- *One participant or facility identification number should be used to track across all data files.*

[38] By comparison, the New Hampshire program appears to have had good communication between program staff and contractors, though ongoing discussions sessions may be needed to keep program staff, contractors and the QA contractor aligned on the best approaches to installing measures and tracking measures, and marketing the program. The program should continuing to encourage contractors to market the program, as appropriate to available program funding for incentives.

- *InDemand should not include variable names that are the same as or very close to variable names in National Grid's customer account system unless those fields house the same data. If an implementer assigns an ID code unique to InDemand or other tracked data, it should have a different variable name than any ID code used in the billing system.*

- *All data associated with a customer must include an account number, ideally, or at least one common and consistent identifier to link back to billing data.*

- *A data dictionary should be developed to describe all variables used in the tracking process and any formulas when applicable. When contractors receive data they should receive a list of the descriptions of all variables sent, as well as a list of available variables that were not sent but could be sent if needed for the analysis.*

ETO used two databases to track customer information and to calculate energy savings: Goldmine and FastTrack. Goldmine, a relational customer database, was used to manage incoming calls and incentive applications and to record customer complaints. FastTrack was used to monitor program goals and manage incentive payments. The process evaluation uncovered incorrect labeling of program data, duplicate entries of data, and missing data. Moreover, the evaluator noted that "several measures (such as duct sealing) are entered under a variety of fields, and the differences between these fields are not explicitly laid out (e.g., duct test/seal, duct sealing, duct seal, etc)." The following recommendations were presented to address data tracking issues:

- *Ensure that FastTrack meets program needs. HES staff do not trust the accuracy of reports generated by FastTrack. Numbers of measures installed or processed are close, but often do not match reports generated by different people.*

- *Ensure that Goldmine still provides value to the program. Staff complain that Goldmine is old, difficult to use, and challenging to pull information from; many staff outside the Contact Center use it grudgingly, and only when pressed. Revisiting the time spent maintaining Goldmine, and the value of this database, may be of interest to the program.*

- *Provide a data dictionary that provides the specifics about each measure. Currently in the database, the duct test measure sometimes has energy savings and sometimes does not, and this may lead to errors in how people account for actions in the database. During our initial investigation of the database, it was difficult to determine HER[39] participants since this was listed as both a measure*

[39] Home Energy Review (HER) is one of several components of the ETO Home Energy Solutions program, which also includes HPwES. Participation in HER is a channel for recruiting HPwES participants.

and a track. Notably, Energy Saver Kits are also included in HER. Details on how to interpret this part of the database will prove valuable for future evaluation efforts.

Incentive applications were submitted to ETO in paper form and were frequently completed for homeowners by contractors. Some trade allies expressed dissatisfaction with the paperwork requirements of the program, describing multiple phone calls to fix paperwork errors. In fact, at the time of the process evaluation, 50-75% of incentive forms were incorrect or incomplete. Although an e-mail submittal process was available, interviews with trade allies revealed that some were not aware of this online option, and others expressed dissatisfaction with it because a separate e-mail was required for each form. Program staff considered conversion to web-based forms in order to minimize data entry errors and improve quality control. Nearly two-thirds (65%) of single-family rebate participants reported that they would have submitted their forms online had the option been available. However, in order for an electronic submittal process to be secure from identity theft, participants would still be required to either mail or scan their work receipts. With these considerations in mind, the ETO process evaluators presented the following recommendations with regards to processing incentive forms:

- *Ensure trade allies are aware of the online submission process.*
- *Ensure trade allies are aware of the universal forms and whether there is an option to still use individual forms for certain measures.*
- *Provide appropriate Energy Trust e-mail addresses and contact information for those who are experiencing problems.*
- *Encourage trade allies to complete paperwork for customers.*
- *Consider a general follow-up process (for applications without problems) and improve the follow-ups for applications with problems so as not to alienate customers or trade allies.*
- *For online submissions, consider an automatic reply that their forms were received and being processed and that average processing takes x days.*
- *Work towards providing an option of submitting forms online for all participants.*

Managing Program Changes

Program changes are often implemented as PAs strive to improve program services, streamline processes, and minimize program costs. Two of the process evaluations reviewed for this meta-analysis addressed the topic of managing program change. For example, NYSERDA instituted changes to program features, processes, and requirements as needed throughout the year. However, key actors interviewed for the process evaluation reported that communications among all parties involved in these changes have been challenging. A proposed solution was to limit

program changes to once per year. Additionally, trade allies interviewed for the ETO process evaluation expressed a desire to be involved in policy changes. The interviews revealed that two weeks was sufficient for trade allies to comment on proposed policy changes and that trade allies required 90 days before changes go into effect. As a result, the process evaluators recommended involving trade allies in policy changes from an early point, providing two weeks for comment and at least 90 days before changes go into effect. Furthermore, the evaluators recommended communicating with trade allies regarding policy changes via email, mail, or roundtables.

Development of Contractor Network

A lack of qualified contractors in the market is a commonly identified barrier in the home performance literature.[40] HPwES programs rely on the existence a network of local installers who are committed to high standards. Key to developing this network is contractor recruitment and training.

Contractor Recruitment

The process evaluation of CBPCA's California Retrofit Home program illustrates the importance of recruiting skilled, motivated contractors. CBPCA invested considerable resources in the development and deployment of an extensive training curriculum. However, only one-half of the trained contractors went on to actively pursue home performance contracting. In recognition of potential barriers to active involvement in home performance contracting, the program evaluators presented the following recommendations for contractor recruitment:

> *Identify and recruit successful, mid-sized contractors among the HVAC and remodeling/building communities. Look for market actors who are already opinion leaders and have the organizational capacities to add Home Performance contracting as at first a peripheral element in their businesses, with eventual integration across all of their activities. Screen out, to the extent possible, "shot in the arm" trainees, even if this means offering fewer training cycles or perhaps charging fees for training. Invest strategically in contractors with high success potentials and provide close mentoring support (with high quality feedback and real time information from mentors). Continue efforts to use industry networks (e.g. HVAC manufacturer distribution channels) to recruit contractors who have high success potentials.*

The recent process evaluation of NYSERDA's HPwES program reported that a few larger firms dominated program activities, and that Community Based Organizations (CBOs), smaller firms, and independent contractors would like participate to a greater extent, but perceived the needs of the larger contractors to be of higher priority to NYSERDA than their own. These smaller players reported feeling uninvolved in decision making about program changes. Furthermore, various program changes implemented in 2004 caused some of these firms to drop out of the program. The following recommendation was presented as a result of these findings:

[40] By comparison the New Hampshire HPwES program has been successful in recruiting qualified contractors and has additional contractors interested in joining the program.

Efforts should be made to bring a broader group of contractors into the program so more small firms, CBOs and independent contractors can compete in the expanding infrastructure being created by HPwES and AHP. Support for marketing might be made available to increase the participation by other types of firms who do not have their own marketing resources.

Contractor Training

The issue of inadequate contractor training was addressed in the ETO process evaluation. Satisfaction with contractors (ratings of nine or 10 on a scale from zero to 10) ranged from 58% to 72%, and several participants mentioned issues with contractors. Trade allies interviewed perceived that the contractors were not adequately trained and that their recommendations were not always in the best interests of homeowners. The following recommendations were presented to address these training issues:

- *Provide needed training. Based on our review of trade ally responses, trainings are seen as valuable, and contractors are asking for more trainings. There were requests for training sessions in outlying areas, for Energy Trust to provide more notice of training sessions, and to provide more training materials. Specific training topics suggested include sales and marketing, external tax credits related to Energy Trust incentives, and technical field training.*

- *Perform contractor screening and/or training as frequently as necessary to remove inadequate ones from the list.*

- *Institute a higher level of QC for new contractors with little or no track record.*

While the recent process evaluation of the Rhode Island EnergyWise program did not necessarily uncover problems regarding contractor training, it did point to the need for the contractors to spend more time with the homeowner reviewing recommendations, behavioral tips, and additional brochures about saving energy. Participant responses regarding whether or not certain measures were installed were sometimes inconsistent with the measure tracking database. This was more prevalent with smaller measures such as CFLs or water saving devices and does not appear to be a significant problem. However, almost 10% of participants receiving CFLs, water saving devices, or duct or pipe insulation reported that the materials were handed to them to install themselves, rather than RISE installing the measure directly. Further, approximately one-third of those audited either did not recall or were dissatisfied with the Home Energy Action Plan (HEAP). Customers remembered very few of the many behavioral tips provided in handouts and brochures. When asked by interviewers to report the tips, many customers responded with a recommendation for an equipment change rather than a behavioral tip. The participant survey indicated relatively low scores for customers' perceptions of energy savings after installation relative to their expectations (an average of 5.7 out of 10). A significant portion (21%) had no idea what savings to expect. In light of these findings, the following recommendations were proposed:

Cadmus recommends that the auditors set aside time in the audits to review and obtain homeowner agreement with the HEAP. One idea may be to include a signature page at the end of the HEAP, to be signed by both the homeowner and the auditor, confirming that the auditor reviewed the recommendations with the homeowner. If this is not already happening, we recommend the auditors show homeowners each measure installed in the home and where it is identified on the HEAP. We also recommend keeping a copy or scanned versions of the HEAP to assist in future evaluations. Cadmus recommends low cost measures be installed directly by the auditor, rather than left behind for homeowner installation. We recommend that expected energy savings be described in the HEAP for each measure and behavioral tip. As discussed above, these estimates should be formally reviewed with the customer to set realistic savings expectations and encourage the behavioral changes.

Contractor training and reporting issues were addressed in the CPBCA process evaluation. Interviews with contractors recruited and trained for the CBPCA program revealed that comprehensive home performance testing and modeling was not common. CBPCA used TREAT simulation software to record home performance test results; however, contractors were not trained in the use of TREAT simulation software but instead were provided with a fourteen page form in which to enter home inspection data for CBPCA to later run through TREAT. The form was not consistently used by contractors and contractor reporting of home performance assessments was sporadic. Furthermore, the level of detail contained within reports varied significantly from case to case. The following recommendations regarding contractor training were presented in the process evaluation of the CBPCA California Retrofit Home program:

- *Stress the importance of fully competent and comprehensive building science perspectives. Encourage and support testing wherever possible. Work to streamline testing and recording of results (e.g., using field friendly data collection/input devices such as PDAs and laptops). To the extent possible, make the estimation of energy savings an important aspect of Home Performance diagnosis and sales. Create a culture that supports reporting (as a professional activity) and encourages close communications between the contractors and the program implementers. The use of contractor chat rooms and list serves is a move in the right direction.*

- *Reporting of Home Performance diagnostics and retrofits are critical for program management and evaluation. Contractors must be rewarded in whatever ways are possible (e.g., incentives, requirements, awards, etc.) and sanctioned for non-reporting (e.g., withholding recognition, participation, incentives, professional disapproval, advertised contributors and non-contributors in contractor networks, etc.). Failure to report work can simply be due to competing claims on time and attention. But it can also indicate lack of serious interest in the*

> *enterprise and possibly lack of commitment to doing Home Performance work at any level. It is important to be able to know if the latter two cases are true.*

In addition to the CBPCA process evaluation, the ETO HPwES process evaluation also addressed the topic of home performance software. ETO HPwES contractors used an energy savings calculating program called HomeCheck. HomeCheck was developed by CSG and produced a cost and savings report for participants. Contractors interviewed for the process evaluation generally expressed dissatisfaction with HomeCheck, and some even refused to use it. Prior to transitioning to the TREAT software, NYSERDA's HPwES program used HomeCheck and experienced similar acceptance problems among contractors. In light of the difficulties contractors experienced with HomeCheck, it was recommended that ETO either consider adopting an alternate to HomeCheck, or allow contractors to choose the software they use (provided that the software is capable of meeting the information needs of customers and the program).

Findings from home performance program process evaluations emphasize the importance of well-planned contractor recruitment and training. In order to maximize recruitment efforts, PAs should target skilled, motivated contractors who exhibit potential to successfully incorporate home performance into their businesses for recruitment. As a home performance program matures and a larger group of contractors has been recruited, care should be taken not to alienate smaller firms and independent contractors with demonstrated success records. Contractors recruited to perform home energy assessments must be sufficiently trained to perform whole-house assessments, review and explain results to participants, and consistently record and submit the results to PAs. Contractors must also be sufficiently trained in the use of the home performance software selected for a HPwES program, as contractor acceptance of the software is critical to consistent reporting. While technical field training is critical to program success, training in home performance program incentives and marketing should not be overlooked. Finally, contractor training should be performed as frequently as necessary to ensure quality work.

Contractor Marketing

In the FOE HPwES program, most participants became aware of the program from a contractor or insulation vendor (32% for WPS Participants, 26% for Focus participants).[41] Only 11% of WPS participants and 5% of Focus participants reported learning about the program through their energy auditor.

The CBPCA program encouraged contractors to market the program and provided them marketing materials. The program evaluation recommended specialized sales training, "including strengthening the contractor's understanding of the retrofit value proposition, the use of options to meet budget needs, and assistance in the use of the best available financing mechanisms."

In the ETO program, a cooperative advertising program was available, but many trade allies were unaware of it. In that program, 16% of participants reported that they heard about the program from their contractor.

[41] In the NH HPwES program, 6% of participants and 5% of non-participants who had heard about the program said that they learned about the program from a contractor.

Quality Assurance Procedures

QA is an integral component of any PA-sponsored program, and having QA procedures in place is an ENERGY STAR requirement for HPwES programs. Each of the programs included in this meta-analysis employed QA procedures in the form of inspections of a certain percentage of jobs, BPI certification requirements for contractors, or both. The NYSERDA HPwES is among the more mature HPwES programs included in this meta-analysis and was the only program for which detailed QA procedure recommendations were presented. At the time of the 2004 HPwES process evaluation, NYSERDA program staff were considering eliminating or reducing certain QA activities, including the requirement that 100% of jobs have a Comprehensive Home Assessment (CHA), pre-approval of all scopes of work prior to the installation of recommended measures, and inspecting 10% of HPwES jobs. However, surveys with contractors and customers provided support for keeping the comprehensive assessment and pre-approval requirement for all jobs. In recognition of the existence of opportunities for reducing the administrative cost of inspections, the process evaluation of the NYSERDA program provided the following recommendations:

> *Maintain the requirement of CHAs and pre-approved work scopes for all jobs. Consider reducing the proportion of jobs inspected for well-performing program contractors. Finally, consider leveraging the role of the Building Performance Institute (BPI) as the certifying and accrediting agency in conducting annual contractor inspections. Since BPI already has a responsibility for ensuring that contractors are performing to its certification/accreditation standards and is obligated to verify this annually, BPI's role could be strengthened as a program quality-control feature.*

Market Transformation

While most process evaluations reviewed in the meta-analysis devoted little attention to market transformation, the NYSERDA evaluation identified short-term, medium-term, and long-term objectives. The NYSERDA evaluation found that the proportion of homes with measures installed through the program increased from 0.21-0.34% in 2001 to 1.69-2.74% in 2004. The report also indicated that the "number of BPI-accredited firms increased from 52 in 2001 to 137 in 2004." The process evaluation estimated a minimum of 9 years for market transformation to take place and reported that a long term outcome would be to have contractors promote whole-house assessments without the program. The evaluation indicated that a barrier to contractors promoting whole-house assessments on their own is uncertainty of the value to the contractor of investing in BPI certification. The report also identified other long-term outcomes, including increased sales of ENERGY STAR products, consumer demand for greater home energy and comfort performance, participants recognizing benefits and creating positive word-of-mouth communications, increased numbers of efficient homes, and energy savings and environmental benefits. The CPBCA report indicated that the "longer-term objective seeks to accelerate the spread of the concept and to generate financial support both internally (contractors and suppliers) and externally (foundations and local governments) as a means of systematically moving away from CPUC funding."

Meta-Analysis Findings and Implications

In this section, the key findings and implications from the process studies of home energy performance are summarized in tables.[42]

Program Design

Participant costs are common barriers in home performance programs. Participants incur the costs associated with installing recommended measures. Depending on the program, participants may also incur the cost of the initial home performance assessment. Contractors incur costs for diagnostic equipment, training, and/or time taken off from work to attend training sessions. PAs face the challenge of selecting incentive structures that meet their participant and contractor recruitment goals and energy savings targets (Table 54).

[42] As noted above, these findings and implications should be understood as lessons learned from the other programs, rather than specific recommendations for the New Hampshire HPwES program.

Table 54. Cost Barriers and Incentive Elements

Program	Findings	Implications
ETO HPwES	Customers are required to pay the full $400 cost of the initial energy assessment for the ETO program representing a barrier to participation.	Offer an incentive for the cost of the initial audit.
National Grid EnergyWise	The audit for the Rhode Island EnergyWise program sponsored by National Grid program is free. 30% of participants were unable to state why they did not install the measure, indicating a lack of interest in installing any measures.	Implement a two-tiered approach to audits – a free audit with an overview of potential savings and a more in-depth audit to identify additional energy saving opportunities. The more costly audits would be performed only for homeowners who elected to have them. Other utilities charge up to $250 for a detailed audit, which could yield better follow-through on recommended measures.
CBPCA California Retrofit Home	The program does not offer any cash or financing incentives to participants. This restricts the participant pool to affluent homeowners and limits the program's ability to serve hard-to-reach customers.	Consider the use of participant incentives including loan buy-downs, subsidies, incentives, and rebates.
Ameren Illinois Home Energy Performance	Shell measure installation rate was only 1.2%. Participants indicated that the main reason they did not pursue recommended shell measures was the cost of the installation.	Examine whether shell measure incentives can be increased. Considering shell measures, particularly insulation, for on-bill financing.
NYSERDA HPwES	The direct out-of-pocket cost of becoming BPI-certified is as a barrier to contractors participating in NYSERDA's HPwES program.	Offer contractors a 75% cost reimbursement for the BPI training.
ETO HPwES	The program provides incentives for contractor training during the first year of participation. However, one year may be insufficient for contractors to adjust their business models.	Extend first year contractor incentives into the second year or move some of the first year incentives into the second year in order to allow for a longer start-up time for contractors.
FOE HPwES	A pilot program initiated in a portion of the territory offers increased incentives for a package of cost-effective measures, requiring participants to install a minimum of three recommended measures. However, the primary reason why participants who have an initial audit do not meet program requirements is because their homes do not need three or more targeted measures.	Relax the three measure requirement, or add more targeted measures in order to increase the pool of potential participants. HVAC equipment and water heating equipment may be potential options.

HPwES programs sometimes grow out of consolidation and refinement of existing programs. There may be opportunities to reduce administrative costs for separate programs that share similar processes and delivery agents. However, care must be taken to ensure that consolidating multiple programs does not lead to added complexity and confusion in the marketplace. When assessing whether to consolidate multiple programs into a single home performance program, PAs should consider whether consolidation can reduce administrative costs, whether the programs share similar objectives and delivery processes, and what effect consolidation may have in the marketplace (Table 55).

Table 55. Consolidation of Multiple Programs

Program	Findings	Implications
NYSERDA HPwES	The HPwES and the low-income Assisted Home Performance are virtually the same in terms of services, features, delivery agents, and processes. The basic difference is that Assisted Home Performance participants qualify for a subsidy.	Drop the "Assisted" distinction and separate reporting requirements for AHP. It appears to add unnecessary administrative costs whereas AHP is a subset of HPwES activity.
FOE HPwES	The Heating and Cooling Initiative was incorporated into HPwES. This particular program's resource acquisition objectives diverge from the market transformation objective of HPwES. The whole-house component alone is complex in terms of the different market actor groups that are targeted and used to deliver the program.	Assess the advantages and disadvantages of separating the Efficient Heating and Cooling Initiative from HPwES by interviewing market actors to determine whether program complexity represents a barrier to contractor participation.

The design that a HPwES program employs may have implications for outcomes with regard to the measures installed in participants' homes. For example, the FOE HPwES program allows customers to participate through either the consultant-contractor path or the contractor path. Small sample in-depth interview findings from the program indicate that participants who take the contractor path often already have ideas about which measure(s) they want installed, whereas participants who take the consultant-contractor path are in an earlier planning stage and look for the consultant to provide recommendations. Regardless of who performs the initial home energy audit (consultant or contractor), that individual should be sufficiently trained to explain the available incentives for recommended measures to participants (Table 56).

Table 56. Consultant-Contractor Model Findings

Program	Findings[a]
FOE HPwES	Participants that engage in the program through the consultant path are more likely to be in an early planning stage, looking for the consultant to provide recommendations, providing a greater potential for influence in their installation decisions. The potential for influence is less likely for customers that are served through qualified contractors; they are further along in their specification process than those going through the consultant path.
FOE HPwES	Projects completed through the qualified contractor path result in lower net savings estimates than projects completed through the consultant tract.
FOE HPwES	Among those using a consultant, nearly all participants (98%) recalled the consultant providing a written report regarding the home performance evaluation. Significantly fewer participants that received services through a qualified contractor recalled receiving such a report (82% recalled receiving a report). Similarly, a higher percentage of participants recall the consultant mentioning a rebate than qualified contractors do (100% compared with 90%, respectively).
Ameren Illinois Home Energy Performance	Stakeholders, HEP Program Allies, and participants all indicated there were issues with the explanation of shell measure incentives. Shell measure incentives were not integrated into the payback calculation in the leave-behind report, were not well understood by participants, and sometime were not explained at all by Energy Advisors.

[a] The Wisconsin and Illinois reports did not issue recommendations on Consultant-Contractor models.

Program Management

Many PAs subcontract program implementation while maintaining in-house oversight. Clear definition of roles and effective communication between PAs and implementation contractors are essential to achieving program goals. Lack of written goals and program descriptions, communication barriers between trade allies and PA staff, and duplication of efforts between PA staff and implementation contractors have been found to negatively impact the effectiveness of home performance programs. As home performance programs mature and internal processes are streamlined, PAs may be able to reduce administrative costs by limiting special tasks and information requests from implementation contractors (Table 57).

Table 57. Roles and Communication

Program	Findings	Implications
National Grid EnergyWise	The implementation contractor RISE was not consistently writing quantitative goals and comprehensive program description documentation.	Prepare a detailed program description including specific installation guidelines and strategies and energy savings assumptions about installed measures. Additionally, facilitate regular contact between PA and program implementer to track progress towards goals.
ETO HPwES	Trade allies experienced difficulties in finding the appropriate people in the organization to speak with.	Ensure that trade allies are getting the assistance they are looking for, or clearly explain to them if such assistance is not available. In addition, ease access to higher level managers in the organization, especially when a decision needs to be made.
ETO HPwES	Some trade allies reported being overwhelmed with information at times and subsequently being unable to distinguish the most important messages from the less important ones.	Ensure that the most important information disseminated stands out from the rest – consider two-day, marked or priority mail for key pieces of information.
ETO HPwES	Significant overlap in marketing efforts between ETO and the program implementer CSG was discovered. Both Marketing Staff within CSG and Program Staff at the PA described developing and designing marketing materials among their responsibilities.	Develop a more formal "Start Up" process to initiate new efforts or changes in the program. Additionally, create a more collaborative process between the Program Staff and the Marketing Staff within CSG by ensuring that the targets and goals of each marketing piece are explicitly laid out, and finding time for the two groups to sit down at the beginning of the process and work together on the language in the material.
NYSERDA HPwES	During the development phase of HPwES, the implementation contractor has been tapped, on an hourly rate basis, to address many issues and information requests in addition to carrying out the core workload of program implementation tasks. These activities, while important, add to program administrative costs and sometimes have diverted implementation team resources from core tasks.	Now that the program is at a relatively mature stage, it may be possible to limit use of implementation contractor resources for special tasks and information requests so that more attention can be placed on core tasks, such as production and inspection of jobs and recruiting of contractors, in order to successfully meet the challenge of recent program expansions into new markets and to build contractor participation.

Effective data tracking is integral to measuring program effectiveness and facilitating program evaluation. Inconsistent account identifiers, measure information with missing account numbers, and the lack of a data dictionary have been shown to hinder program evaluation efforts. Additionally, PAs must ensure that the data systems they employ are both user-friendly and effective in terms of tracking program data. Programs may have opportunities to streamline the process of submitting incentive application data. Having trade allies complete customer paperwork may reduce the number of application errors and therefore the time and resources committed to resolving those errors. Moving from a paper to online form submission process can minimize the duplicative efforts associated with multiple paper forms and improve quality control by minimizing data entry errors (Table 58).

Table 58. Data Tracking

Program	Findings	Implications
National Grid EnergyWise	Three datasets, including measure data, participant data, and billing data, needed to be integrated in order to conduct the process evaluation. However, there was no common identifier across all three datasets.	One participant or facility identification number should be used to track across all data files.
National Grid EnergyWise	A variable with the same name in all three data sets that did not have common values. This problem arose because RISE had one identifier for each customer, and National Grid had a different identifier.	InDemand should not include variable names that are the same as or very close to variable names in National Grid's customer account system unless those fields house the same data. If an implementer assigns an ID code unique to InDemand or other tracked data, it should have a different variable name than any ID code used in the billing system.
National Grid EnergyWise	Gas account numbers were missing for some participants. These data did not have any other identifier included, except for street name and city, which were used for the data merge. As such, the billing analysis was likely missing some accounts and billing histories for customers who installed measures.	All data associated with a customer must include an account number, ideally, or at least one common and consistent identifier to link back to billing data.
National Grid EnergyWise	The evaluators were not provided with a data dictionary. The result was that the data needed additional review before analysis to decipher the variables, and the evaluators needed to send multiple questions to National Grid to ensure that they understood the various fields.	A data dictionary should be developed to describe all variables used in the tracking process and any formulas when applicable. When contractors receive data they should receive a list of the descriptions of all variables sent, as well as a list of available variables that were not sent but could be sent if needed for the analysis.
ETO HPwES	In the database the duct test measure sometimes has energy savings and sometimes does not, and this may lead to errors in how people account for actions in the database. Additionally, it was difficult to determine HER participants since this was listed as both a measure and a track.	Provide a data dictionary that provides the specifics about each measure. Details on how to interpret this part of the database will prove valuable for future evaluation efforts.
ETO HPwES	Incentive applications are submitted to ETO in paper form. 50% to 75% of the incentive forms were incorrect or incomplete. Filling out multiple forms when numerous measures are installed results in duplication of efforts.	Encourage trade allies to complete paperwork for customers. Additionally, work towards providing an option of submitting forms online for all participants.

Program changes are implemented from time to time as PAs strive to improve program services, streamline processes, and minimize program costs (Table 59). However, PAs must ensure that program changes are implemented at a frequency that does not prove challenging to all parties involved. Moreover, trade allies should be involved in the discussion of program changes that may affect them.[43]

Table 59. Managing Program Changes

Program	Findings	Implications
NYSERDA HPwES	NYSERDA institutes relatively frequent (i.e., multiple times per year) changes to program features, processes, and requirements. Interview contacts report that communications among all parties involved in these changes have been challenging.	Limit program changes to one time per year.
ETO HPwES	Trade allies interviewed expressed a desire to be involved in policy changes.	Involve trade allies in policy changes from an early point, providing two weeks for comment and at least 90 days before changes go into effect. Communicate with trade allies regarding policy changes via email, mail, or roundtables.

Program Implementation

Lack of program awareness is a commonly identified barrier in the HPwES literature (Table 60). The mix of marketing activities that a HPwES program administrator employs should reflect program objectives and strategies. Programs that rely on marketing through contractors for referrals should reach out to the types of contractors who have historically recruited the largest number of participants in order to raise program awareness. Furthermore, contractors need to be trained to effectively communicate the HPwES program including its various incentive components, and to utilize marketing materials provided by PAs. PAs that offer both a HPwES program and other programs involving an "audit" face the unique challenge of ensuring that the distinction between the programs is clear to trade allies and participants. Using the terms "building science", "technical expertise", and "whole house approach" can help to set HPwES apart. Bill inserts sent only to customers within a specific territory and other forms of targeted advertising can be effective in raising program awareness within a specific territory, such as one designated for a pilot program to be tested out prior to implementation in the entire service territory. More mature HPwES programs may consider a broader marketing approach in order to increase participation levels.[44]

[43] NH HPwES program staff indicated that they currently schedule program changes and the program permits contractors to enter "custom measures" that can be tested or used in special circumstances. Program staff then review these measures as potential prescriptive measures the following year.

[44] The New Hampshire utilities do rely heavily on word-of-mouth advertising and contractors have a built-in incentive to market the program because program work gets referred back to them. Furthermore, NH HPwES survey findings show notable program awareness, with nearly one-third of non-participants (31%) indicating unaided and aided awareness of HPwES.

Table 60. Program Marketing

Program	Findings	Implications
FOE HPwES	The program relies on its consultant-contractor network for participant recruitment. 31% of the 2003 case study customers were referred to the program by roofing, siding, and remodeling contractors, indicating that this group is an important source of program referrals.	Target roofing, siding, and remodeling contractors to promote the program and provide referrals. Use all opportunities including Wisconsin ENERGY STAR Homes and other Focus program training activities and coordination with professional associations to raise awareness of the program to this group and to other groups that provide home improvement services.
FOE HPwES	Consultants and contractors attributed the lower than anticipated number of initial audits for the Wisconsin Public Service (WPS) territory-wide Increased Incentives HPwES pilot program to a lack of customer awareness of the WPS increased incentives.	Market directly to WPS customers through bill stuffers or an advertising campaign targeted to the WPS region. Coordinate marketing efforts with consultants and contractors, and consider training them on how to persuade customers to install recommend measures.
FOE HPwES	The WPS territory-wide Increased Incentives HPwES pilot program's reduced-rate financing offer was not effective.	Convince consultants and contractors to promote the reduced-rate financing offer. Additionally, more prominently include the reduced-rate financing offer in customer marketing campaigns.
Ameren Illinois Home Energy Performance	The program relies primarily on targeted mailers to recruit participants. Some participants mentioned that the Energy Advisor did not recommend any shell measures because their homes already are well-insulated.	Direct mailing should be better targeted to avoid newer neighborhoods that may not need insulation.
National Grid EnergyWise	The program relies primarily on bill inserts for participant marketing and recruitment. It may be desirable to increase program participation in the future.	Should National Grid wish to increase program participation it should consider a broader marketing approach, which would involve general approaches of television, radio, and news releases followed by targeted direct mail solicitations. A targeted solicitation for single-family homes could focus on zip code areas with higher incidences of older homes and a further focus on homes with annual energy consumption greater than average residential customers.
ETO HPwES	The distinction between the Home Energy Review (HER) and HPwES programs offered by ETO is unclear to trade allies and participants.	Use the terms "building science", "technical expertise" and "whole house approach" to set HPwES apart from the free HER audit. Moreover, expand HP information on the website to include more detail and specificity, not only of the comprehensive home assessment, but of the entire process for assessment, installation, and close-out. In addition, ensure that auditors and trade allies are properly trained to be able to explain the difference between HER and HPwES. Lastly, leverage customer feedback and testimonials to promote the program to others.

Table 60 - continued

Program	Findings	Implications
ETO HPwES	HPwES participants come in from a variety of sources, including internet, utility, mass media, and Energy Trust in general.	Continue to employ multiple forms of advertising for HPwES. Additionally, track and report outcomes from marketing efforts to better understand where program collateral was disbursed, and to what extent specific pieces influenced customers to take action. Adding promotional codes to program collateral, asking callers to the Contact Center to identify where they heard about the program (and which promotional pieces they had), and placing a higher effort on monitoring collateral distribution and circulation could help provide feedback.
ETO HPwES	ETO offers a cooperative advertising program to HPwES trade allies. However, trade ally interviews revealed that many of them were unfamiliar with the cooperative advertising program and that few had participated in it.	Ensure that trade allies are aware of the cooperative advertising program and proactively raise their awareness of the range of marketing materials and marketing support available.

A lack of qualified contractors in the market is a commonly identified barrier in the home performance literature. HPwES PAs should target skilled, motivated contractors who exhibit potential to successfully incorporate home performance into their businesses for recruitment. Contractors recruited to perform home energy assessments must be sufficiently trained to perform whole-house assessments, review and explain results to participants, and consistently record and submit the results to PAs. Contractors must also be sufficiently trained to use the home prformance software selected for a HPwES program. While technical field training is critical to program success, training in home performance program incentives and marketing should not be overlooked. Ongoing training should be provided as programs change and evolve (Table 61).

Table 61. Development of Contractor Network

Program	Findings	Implications
CBPCA California Retrofit Home	CBPCA invested considerable resources in the development and deployment of an extensive training curriculum. However, only one-half have of the trained contractors went on to become active in pursuing home performance contracting.	Selectively recruit successful, mid-sized contractors who have the organizational capacities to integrate home performance contracting into their businesses.
NYSERDA HPwES	A few larger firms dominated program activities. Smaller firms and independent contractors would like participate to a greater extent but perceive that the needs of the larger contractors are of higher priority to NYSERDA than a concern for inclusiveness of the broad base of the home improvement market. They feel uninvolved in decision making about program changes, and various program changes implemented in 2004 caused some of these firms to drop out of the program.	Efforts should be made to bring a broader group of contractors into the program so more small firms, CBOs and independent contractors can compete in the expanding infrastructure being created by HPwES and AHP. Support for marketing might be made available to increase the participation by other types of firms who do not have their own marketing resources.
ETO HPwES	Satisfaction with contractors ranged from 58% to 72% and several participants mentioned issues with contractors. Trade allies interviewed perceived that the contractors were not adequately trained and that their recommendations were not always in the best interests of homeowners.	Provide needed training. Specific training topics suggested by contractors include sales and marketing, external tax credits related to Energy Trust incentives, and technical field training. Perform contractor screening and/or training as frequently as necessary to remove inadequate ones from the list.
Rhode Island EnergyWise	Approximately one-third of participants either did not recall or were dissatisfied with the Home Energy Action Plan (HEAP). Participant responses regarding whether or not certain measures were installed were sometimes inconsistent with the measure tracking database.	Auditors should set aside time to show homeowners each measure installed in the home, where it is identified on the HEAP, and obtain homeowner agreement with the HEAP. Low cost measures should be installed directly by the auditor.
CBPCA California Retrofit Home Program	Contractors were not trained in the use of TREAT simulation software but were provided with a form in which to enter home inspection data to later be run through TREAT. The form was not universally adopted by contractors, resulting in sporadic reporting of home performance assessments.	Stress the importance of fully comprehensive building science perspectives to contractors and work to streamline testing and recording of results. Consider using field friendly data collection/input devices such as PDAs and laptops. Sanction contractors for non-reporting.
ETO HPwES	Contractors expressed dissatisfaction with HomeCheck software and some refused to use it.	Consider adopting an alternate to HomeCheck, or allow contractors to choose their own software.

QA is an integral component of any PA-sponsored program. Having QA procedures in place is an ENERGY STAR mandated requirement for the HPwES program. To get the most out of quality control efforts, PAs should focus QA activities on newer, less experienced contractors (Table 62).

Table 62. Quality Assurance

Program	Findings	Implications
NYSERDA HPwES	At the time of this process evaluation, NYSERDA staff were considering eliminating or reducing the following program steps: the requirement of 100% of jobs having a Comprehensive Home Assessment (CHA); pre-approving all scopes of work before customers proceed to having recommended measures installed; and inspecting 10% of HPwES jobs and 20% of AHP jobs. Findings from surveys with contractors and customers provide support for keeping the CHA and pre-approved job scopes for all jobs and opportunities exist for reducing the administrative cost of inspections.	Maintain the requirement of CHAs and pre-approved work scopes for all jobs. Consider reducing the proportion of jobs inspected for well-performing program contractors. Finally, consider leveraging the role of the BPI as the certifying and accrediting agency in conducting annual contractor inspections. Since BPI already has a responsibility for ensuring that contractors are performing to its certification/accreditation standards and is obligated to verify this annually, BPI's role could be strengthened as a program quality-control feature.

Summary of Meta-Analysis

The review of process evaluations of other home performance programs suggests that the New Hampshire program is fairly well aligned with the best practices recommended for the other programs. Some of the key issues discussed in other programs need continued monitoring in the New Hampshire program as well.

Program Design

Meta-Analysis Finding: Participant costs are common barriers in home performance programs. Participants incur the costs associated with installing recommended measures and in some programs participants may also incur the cost of the initial home performance assessment. Contractors incur costs for diagnostic equipment, training, and/or time taken off from work to attend training sessions. PAs face the challenge of selecting incentive structures that meet their participant and contractor recruitment goals and energy savings targets.

NH HPwES Implication: The New Hampshire program appears to have arrived at a good compromise incentive structure in offering a 50% incentive, along with free CFLs and water measures, and a $100 audit fee. In addition, New Hampshire utilities have subsidized contractor training, which helps to reduce barriers to getting good contractors to join the program. The PAs should continue to monitor the effectiveness of the incentives, balancing cost reduction for program participants with the potential for increased reach of the program.

Alignment with Other Programs

Meta-Analysis Finding: HPwES programs sometimes grow out of consolidation and refinement of existing programs. There may be opportunities to reduce administrative costs for separate programs that share similar processes and delivery agents. However, care must be taken to ensure that consolidating multiple programs does not lead to added complexity and confusion in the market place. When assessing whether to consolidate multiple programs into a single home performance program, PAs should consider whether consolidation can reduce administrative costs, whether the programs share similar objectives and delivery processes, and the effect consolidation may have in the marketplace.

NH HPwES Implication: The New Hampshire HPwES program offers complementary services to other energy efficiency services offered by the New Hampshire utilities and there appears to be good cross promotion of utility programs. Ongoing monitoring of the customer experience with regard to other energy efficiency programs is recommended to encourage a seamless process from the customer point of view.[45] Furthermore, other process evaluations have found opportunities for collaboration on operational processes on the back-end. New Hampshire PAs have indicated that they work with their counterparts in other programs and this evaluation recommends continued collaboration and assessment of new opportunities where appropriate.[46]

Program Management, Changes, and Marketing

Meta-Analysis Finding: The process evaluations also indicated that program changes are implemented from time to time as PAs strive to improve program services, streamline processes, and minimize program costs. The reports state that PAs must ensure that program changes are implemented at a frequency that does not prove challenging to all parties involved and that trade allies should be involved in the discussion of program changes that may affect them.

NH HPwES Implication: The New Hampshire HPwES program is well-managed and there is good communication with contractors. However, continued assessment of cost-effective measures is needed and program staff, contractors, the lead vendor for National Grid, and the QA contractor should ensure that they periodically review and agree on what measures to install and how to best install them.

Meta-Analysis Finding: The other process evaluations have recommended a range of marketing activities, including targeted marketing of neighborhoods that are more likely to benefit from energy efficiency improvements. They also suggest encouraging contractor promotion of the incentives.

NH HPwES Implication: The New Hampshire program uses a good, wide-range of marketing techniques, including promotion by contractors, and also benefits from participant screening through the HHI tool. The PAs may want to consider additional targeting through direct mail and email blasts.

[45] It was beyond the scope of this evaluation to do a detailed analysis of the customer experience with multiple programs.

[46] Some examples of potential collaboration are contractor approval, use of the same software, and data tracking processes.

Conclusion

Overall Findings

This section presents the key findings from the process evaluation of the New Hampshire HPwES program.

Program Performance and Delivery

The 2009-2010 HPwES program has been successful and effective. Overall, the program is delivered very smoothly, helping customers implement energy saving measures with relative ease. It is administered by a few program staff members who manage relationships with customers and contractors and track projects. Contractors liked working with each of the utilities and indicated that program processes generally worked well.

Participants exhibited very high satisfaction with the program (Figure 2)[47]:

- 93% satisfied with the program overall
- 95% satisfied with the energy efficiency upgrades made to their homes
- 83% generally satisfied or very satisfied with the first energy audit overall
- 77% generally satisfied or very satisfied with program communications and marketing
- 86% generally satisfied or very satisfied with the report and recommendations they received
- 91% generally satisfied or very satisfied with work done to the home
- 87% generally satisfied or very satisfied with the incentives provided overall
- 81% generally satisfied or very satisfied with the final QA review overall

Once they have made the decision to have the HPwES audit, participant propensity to install measures was high—on average, participants accepted and installed 82% of measure recommendations (Figure 3).[48]

[47] In the meta-analysis section of the report we report satisfaction levels for the New Hampshire Home Performance program and other Home Performance programs with available information. The other program evaluations used different satisfaction scales and thus are not directly comparable to the satisfaction levels reported here. However, each of the other programs also had good to very good satisfaction levels.

[48] New Hampshire HPwES compares favorably to other programs. The meta-analysis found that National Grid RI EnergyWise participants installed 58% of recommended measures and WI FOE HPwES WPS participants installed 55% of recommended measures in the WPS territory and 52 % of recommended measures in the Focus territory.

Figure 2. Satisfaction with Various Aspects of the Program
(Base: Participants (n= 70); Percent Satisfied/Very Satisfied)

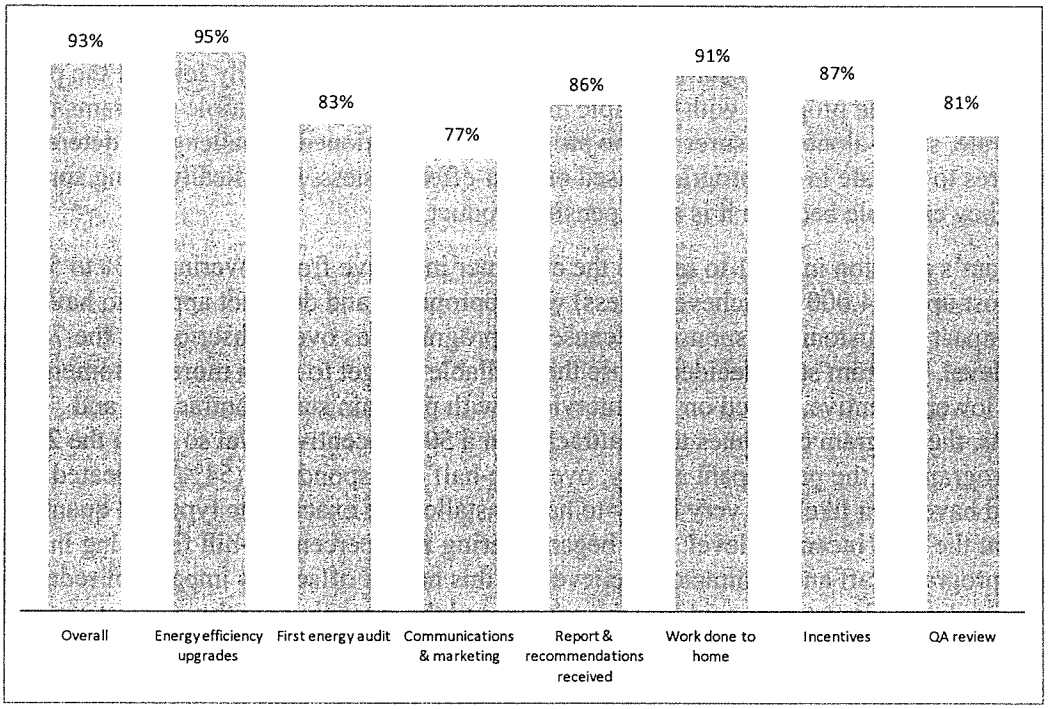
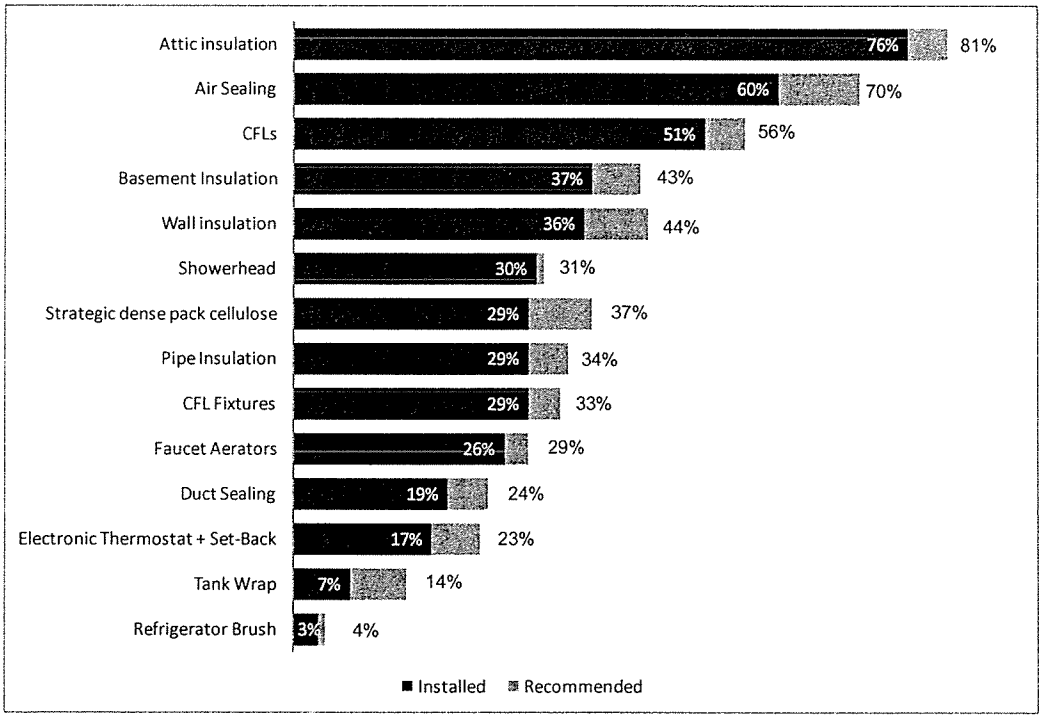


Figure 3. Recommended and Installed Measures
(Base: Participants (n= 70))



Program Design

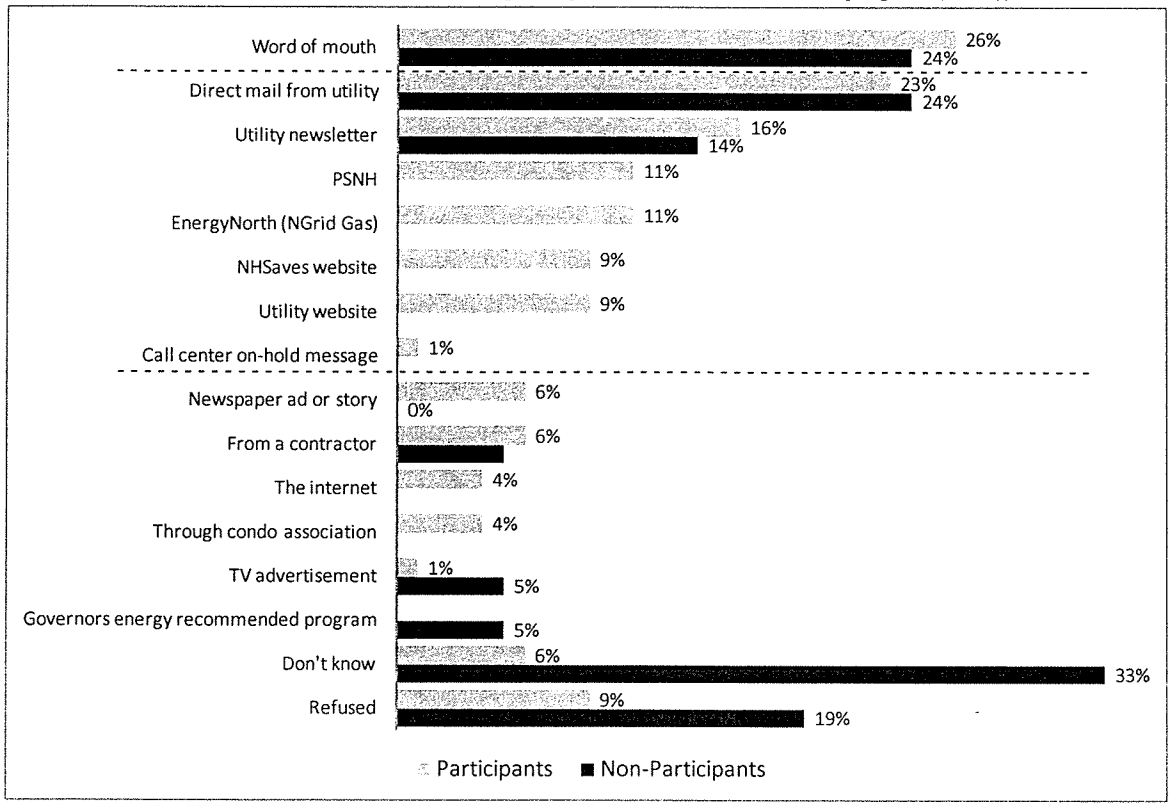
The PAs are successfully working toward establishing a unified, consistent approach to delivering the HPwES program. Program staff and contractors appreciated the "house as a system" approach; and program staff, contractors and participants generally felt that the program works well as a single program with multiple measures rather than as multiple programs that offer separate, stand-alone measures. Some program staff mentioned a challenge in determining the measures to include in the program based on cost-effectiveness, specifically citing spray foam as a key example because it is an expensive product.

The Program's decision in 2011 to reduce the customer incentive from covering 75% to 50% of measure cost up to $4,000 (whichever is less) was appropriate and does not appear to have had a material impact on customer response. Because the program was over-subscribed at the 75% incentive level, program staff decided to use the available budget to reach more customers by offering a lower incentive. Based on the interviews with program staff, contractors, and participants, the program continues to be attractive at a 50% incentive level so far in the 2011 HPwES program. In the participant survey, over one-half of respondents (54%) indicated that they would have been likely or very likely to have installed the exact same type and quantity of measures at the 50% incentive level. PAs began offering zero percent on-bill financing in mid-2010 and program staff and contractors believe that this helped offset any impacts of reducing the incentive level. Contractors said that the rebates and the financing are the greatest strengths of the program.

Marketing and Outreach

Survey findings show that utility communications are the major source of program awareness. Participants (26%) and non-participants (24%) also stated that word-of-mouth communications was the most commonly cited source (Figure 4).

Figure 4. How Customers Learned About the Program
(Base: Participants (n= 70); Non-participants who had heard of the program (n=21))

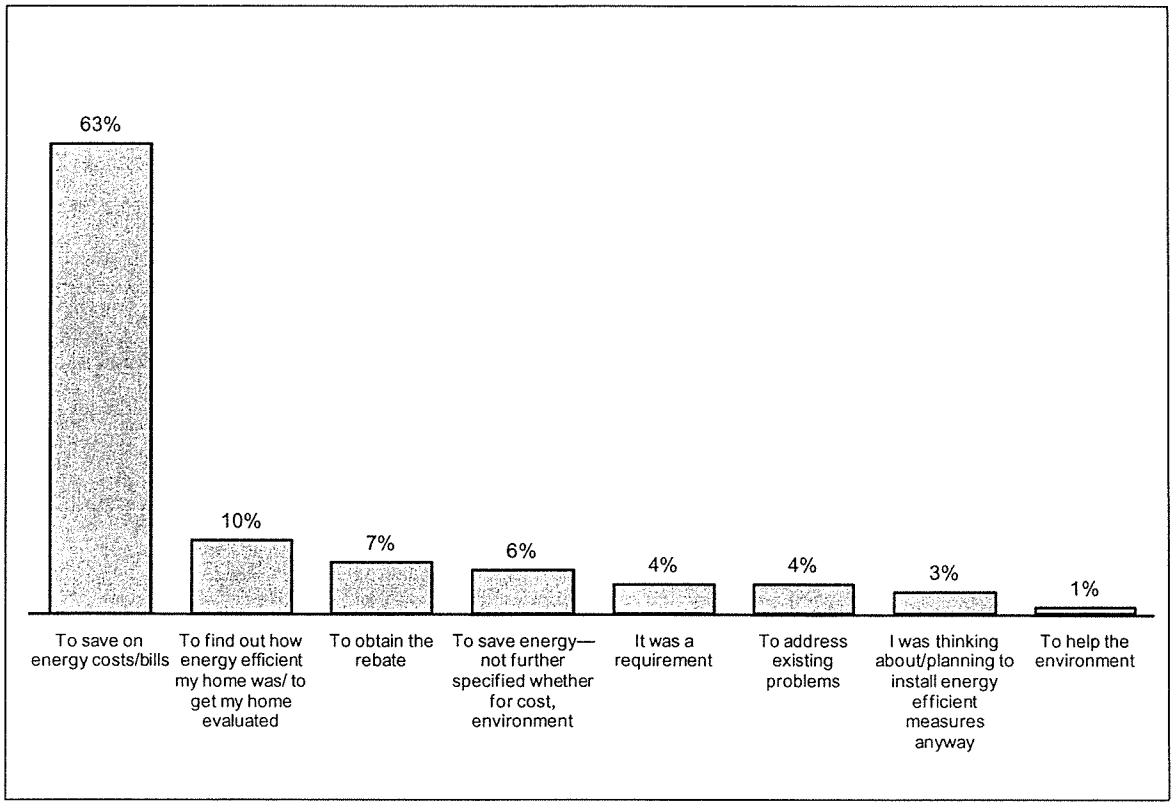


PSNH and Unitil marketing activities and word-of-mouth marketing brought in more customers than their pilot programs could serve, while National Grid managed promotions of the program to match available program funding and did not need to waitlist customers.

Despite HPwES being a pilot program, there is notable awareness of the program, with nearly one-third of non-participants (31%) indicating unaided and aided awareness of HPwES. Utility communications channels (direct mail, newsletter, customer care representatives, and websites) have been the major source of participant and non-participant awareness of the program. A substantial percentage of participants (26%) and non-participants (24%) also indicated that word-of-mouth communications was an important channel for learning about the program.

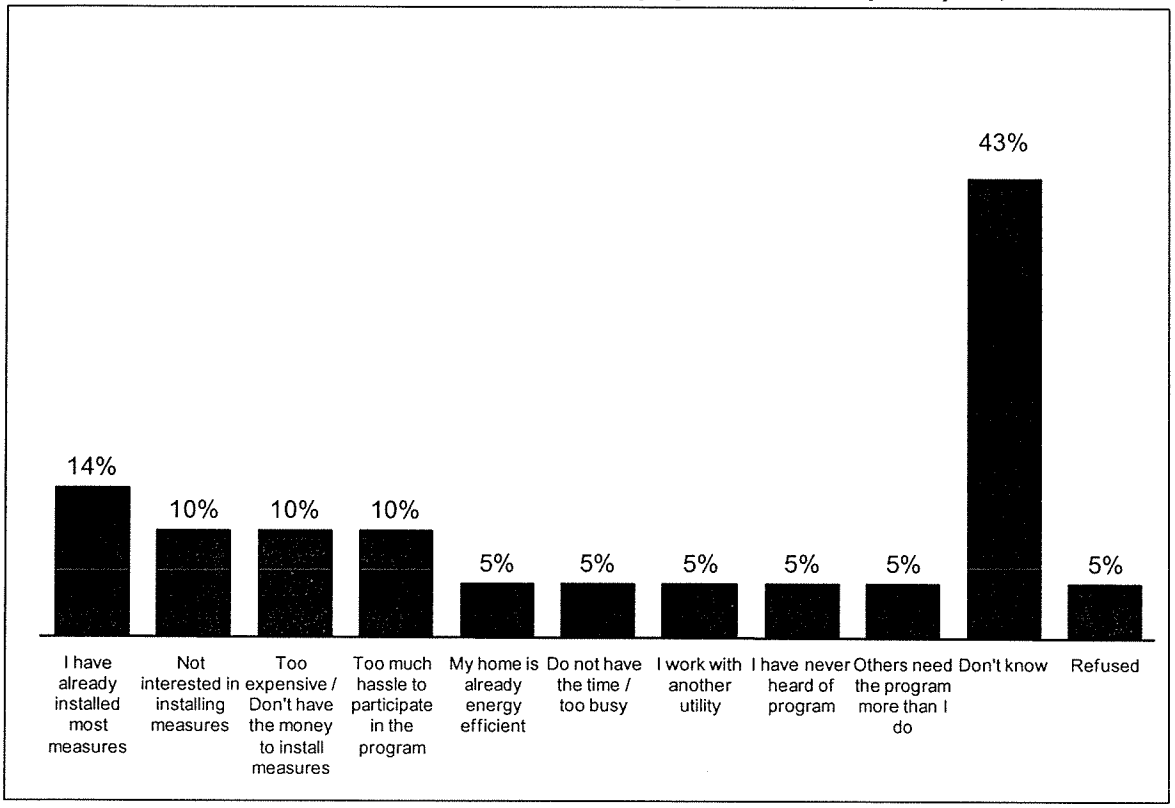
Financial issues are both the primary motivation (Figure 5) and the primary barrier to program participation and the installation of energy efficiency measures. The primary reason that participants (63%) and partial participants (80%) were interested in having their homes audited was that they had wanted to save on their energy bills. Over two-fifths of participants said the reasons they were not planning to install any or some of the other recommended measures was that they were too expensive (29%) or they did not have the needed cash (14%).

Figure 5. Reasons for Interest in Having Home Evaluated
(Base: Participants (n= 70))



Non-participants who had heard of the HPwES program cited the following top reasons for not participating in the program: "I have already installed most measures" (14%); "Not interested in installing measures" (10%); "Too expensive/Don't have the money to install measures" (10%); "Too much hassle to participate in the program" (10%). Two-fifths of these non-participants (43%) said that they did not know why they did not participate in the program (Figure 6).

Figure 6. Reasons for Not Participating in the NH HPwES Program
(Base: Non-participants who had heard of the program (n=21); Multiple Response)



Program Effects

For some contractors, the HPwES program provided the bulk of their business, while for others it was only a small percentage of their work. Contractors reported that 14% to 90% of their business in 2010 came from the HPwES program. Prior to the HPwES program, contractors said that customers would contact them directly regarding energy efficiency measures, particularly when fuel prices spiked. However, they also indicated that customers implemented fewer measures because they had no incentives at the time.

Three contractors provided information on how much their business would decrease without the HPwES incentive and they stated that their business would not decrease by much. Yet, contractors consistently pointed to the benefits of the incentives in getting customers to move forward on installing energy efficiency measures. Additionally, one contractor depends so much on the program that when funds run out his project volumes decline and that hurts his business.

Six of the eight contractors stated that the most significant benefit of the HPwES program to their business is that the incentives get customers to take action on energy efficiency measures. According to contractors, the key factors that drive customer participation are program rebates and high energy bills.