

New York Home Performance with ENERGY STAR Program (HPwES) Contractor and Customer Reports on Market Transformation¹

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ABSTRACT

The purposes of this research are to understand contractor and customer motivations for participating in the Home Performance with ENERGY STAR (HPwES) Program; to assess the extent to which HPwES contractors are delivering whole house energy services; and to examine whether participating and nonparticipating contractors report using HPwES standards when installing measures outside the program. The study makes use of information developed for NYSERDA's HPwES Market Characterization and Assessment Study completed in 2009, including analysis of program databases, telephone surveys with participating and nonparticipating contractors, and telephone surveys with homeowners.

Introduction

NYSERDA has the nation's largest HPwES Program; in 2007 over 4,000 homes received Home Performance Services. In 2009, NYSERDA completed a Market Characterization and Assessment study of the HPwES Program. Specifically, the purpose of the study was to identify awareness of the HPwES Program and energy efficiency measures; satisfaction and perceived value; availability of contractors and energy efficiency equipment; project profitability and cost allocations; measure installation practices; changes in energy efficiency practices and program influences; and contractor promotion, training/education, quality assurance, advertising and outreach. This paper examines key issues related to the HPwES Program and discusses the implications for program planning in New York State and for other HPwES programs around the country.

Background

NYSERDA is interested in improving the efficiency of existing homes. Rather than offer rebates for individual energy efficiency measures, NYSERDA has chosen to use a market transformation approach in which contractors are trained to offer homeowners a comprehensive set of cost-effective energy efficiency services. While NYSERDA offers financing incentives for market-rate customers (i.e., non low-income customers) and significant rebates for "Assisted" customers (households with income at or below 80% of NYS median income), NYSERDA's investment has focused on the development of the contractor infrastructure and on creating a market for program services through program advertising. The long run market transformation goals of the New York's HPwES Program are:

1. To create a market in which contractors offer and customers purchase high efficient energy-related improvements to existing homes; and,

¹ The views expressed in this paper are those of the authors and do not necessarily reflect the views of the New York State Energy Research and Development Authority.

2. To encourage contractors to go beyond their area of specialization (e.g., heating systems, insulation, or windows) to offer customers whole house energy efficiency improvements. This approach has consistently guided the actions of the HPwES Program since its inception in 2001.

Scope

NYSERDA's 2009 Market Characterization and Assessment Study of the HPwES Program was the third in a series of market studies on the HPwES Program. The study updated market indicators that assess the extent to which the program has been successful in transforming the energy efficiency market for existing homes. The study analyzed key indicators to compare market trends to program participation rates, track changes in program penetration, perception and value, and identify shifts in the primary and sub-markets that would signal market transformation progress over time. In this effort, pertinent market indicators, previously identified through the HPwES Program logic model, were prioritized and assessed with respect to their contributions to an understanding of program performance. Specific areas of research included:

- Awareness of the HPwES Program and Energy Efficiency measures
- Satisfaction and perceived value
- Availability of contractors and energy efficient equipment
- Project profitability
- Measure installation practices

This research discusses the specific indicators that can be used to assess the extent to which the HPwES Program is meeting its key market transformation goals.

Methodology

Among other research activities, the HPwES Market Characterization and Assessment Study included interviews with participating and nonparticipating contractors, as well as homeowners who received a Comprehensive Home Assessment (CHA) through the program. The surveys with these market actors furnish the most direct information on Market Transformation and are the subject of this research study. Table 1 furnishes information on the market actors interviewed for the study, including a definition of the target population, the sample frame, the survey topics, the number of completed interviews by quota group, and the key data processing issues.

The surveys for the HPwES Market Assessment Surveys presented important challenges to the data collection team. To cover all of the areas of interest, the contractor surveys were quite lengthy. While the participating contractors were willing to invest that time in order to provide feedback to the program, incentives had to be paid to the former and nonparticipating contractors to gain their cooperation. Special weighting procedures were developed to ensure that the three groups of contractors could be compared in terms of the amount of production that they represent.

Table 1. Data Collection Statistics

Market Actor	Target Population	Sample Frame	Interviews	Survey Length	Data Processing
Participating Contractors	Have a signed HPwES agreement	NYSERDA Database	75 (Population = 142)	37 minutes	Special weighting procedures needed to develop comparable population statistics across three groups of contractors
Former Participant Contractors	Did not sign the latest agreement	NYSERDA Database	17 (Population = 51)	31 minutes (incentive)	
Nonparticipating Contractors	Never signed a HPwES agreement	Dun & Bradstreet Database	42 General Contractors 40 Specialty Contractors	27 minutes (incentive)	
Participating Homeowners	Had CHA and got HPwES Incentives	NYSERDA Database	75 Market Rate 70 Assisted	21 minutes	Obtained data on recommended and purchased measures from database and survey.
Partial Participant Homeowners	Had CHA but did not get Incentives	HPwES Contractors	67	15 minutes	

In the Market Assessment Surveys, contractors were asked to report on their installation practices to measure the adoption of HPwES practices by participating and nonparticipating contractors outside the program. While these are self-reports, not detailed inspections of completed jobs, the specific language used in the questions was designed to discourage respondents from falsely reporting adoption of HPwES practices. For example, contractors were explicitly asked “in what percent of your insulation and air sealing jobs did you do blower door guided air sealing.” In addition, the survey asked the contractor to discuss the change in the share of jobs using those procedures and rate the important of the HPwES Program in bringing about that change.

The homeowner surveys also were designed to obtain detailed information from respondents on their decision-making. The survey team used the program database to pre-code each sampled homeowner with respect to recommended and installed measures. The survey then asked the homeowner to explicitly report why they selected the program measures that were installed and why they rejected the program measures that were not installed.

Results

Marketing Energy Efficiency

The first goal of the HPwES Program is to create a market in which contractors offer and customers purchase high efficiency energy-related improvements to existing homes. At one level, the HPwES Program statistics are evidence that the program is achieving this objective. In 2007, 144 contractors completed 4,301 HPwES jobs, including 2,963 market rate and 1,338 assisted projects. Cumulatively, from program inception through December 2007, 18,158 homes have been treated through NYSERDA’s HPwES Program. For the overall service territory, this represents market penetration of about 12% (from an annual basis, market penetration in 2007 ranged from 2.2% to 3.6%).

In certain market areas of the state, the program penetration has been even greater. Based on a review of national statistics, approximately one-third of HPwES jobs in the United States are completed in New York.

The NYSERDA HPwES Program has achieved these production levels despite having low incentive levels compared to resource acquisition programs implemented in other jurisdictions. In NYSERDA's program, "market rate" customers are eligible for reduced rate financing or a 10% rebate if the customer has an existing financing mechanism. "Assisted" customers are eligible for a 50% rebate on installed measures. HPwES contractors are eligible to participate in cooperative advertising with NYSERDA and are also eligible for other program-related incentives, such as equipment incentives and training incentives. By comparison, based on typical rebates offered through utility residential in-home services programs in Connecticut, Massachusetts and New Hampshire, rebate levels up to 75% and 100% of installed costs are often provided to market rate and assisted customers respectively. Such programs also offer contractors direct customer lead development support and full payment for comprehensive home energy assessment costs.

Other jurisdictions have been successful in reaching high participation rates for certain measures using moderate rebates. For example, in 2007, the New Jersey Clean Energy Program installed over 25,000 units of high efficiency heating and cooling equipment with incentives of less than \$500 per unit. While over two-thirds of the New York HPwES jobs include insulation and/or air sealing done to HPwES standards, in New Jersey, the HVAC installations are done without assessing how improved air sealing and/or insulation could reduce the housing unit's heating or cooling load.

The HPwES Market Assessment surveys furnish further specific evidence that the HPwES Program has been successful in creating the local market for energy efficiency services. Survey responses from Participating Contractors (PCs), Former and Nonparticipating Contractors (FNPCs), and Participating Homeowners (PHOs) all indicate that contractors are offering and customers are purchasing HPwES energy efficiency measures, and that while most of the measures are installed through the HPwES Program, there are a significant number of measures being installed without incentives from the HPwES Program.

Both PCs and FNPCs report that a significant part of the work that they do is done to Home Performance standards – both with and without program incentives. Figure 1 presents information on the responses of PCs to questions about what they install and what installation practices they use, both inside and outside the program. For example, PCs report that they install insulation and/or do air sealing in approximately 60% of their jobs. About 44% of their jobs are insulation/air sealing jobs done through the HPwES Program ("with HPP"). However, another 12% of their jobs include insulation/air sealing that is done without HPwES Program Incentives, but with the use of blower door guided procedures ("non-HPP w/Standards"). In 5% of their jobs, they do insulation/air sealing without using a blower door (non-HPP w/o Standards"). Similarly, PCs report that about 30% of their jobs include installation of heating equipment, with 21% done as part of the HPwES Program, 4% done without HPwES incentives but including duct testing, and 5% done without HPwES incentives and not including duct testing. When viewed across all measure categories, PCs appear to be conducting the majority of their measure installation activities to HPwES standards through the HPwES Program, but they are also installing measures using HPwES standards without accessing HPwES Program incentives.

Figure 1. Participating Contractors' Measure Installations/Practices Breakdown

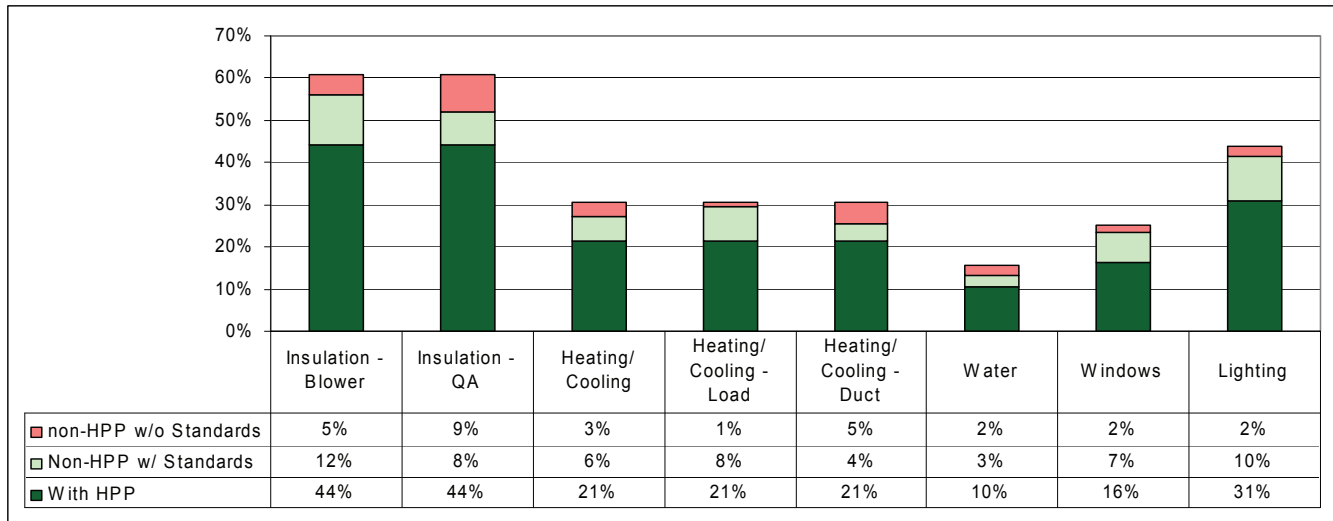
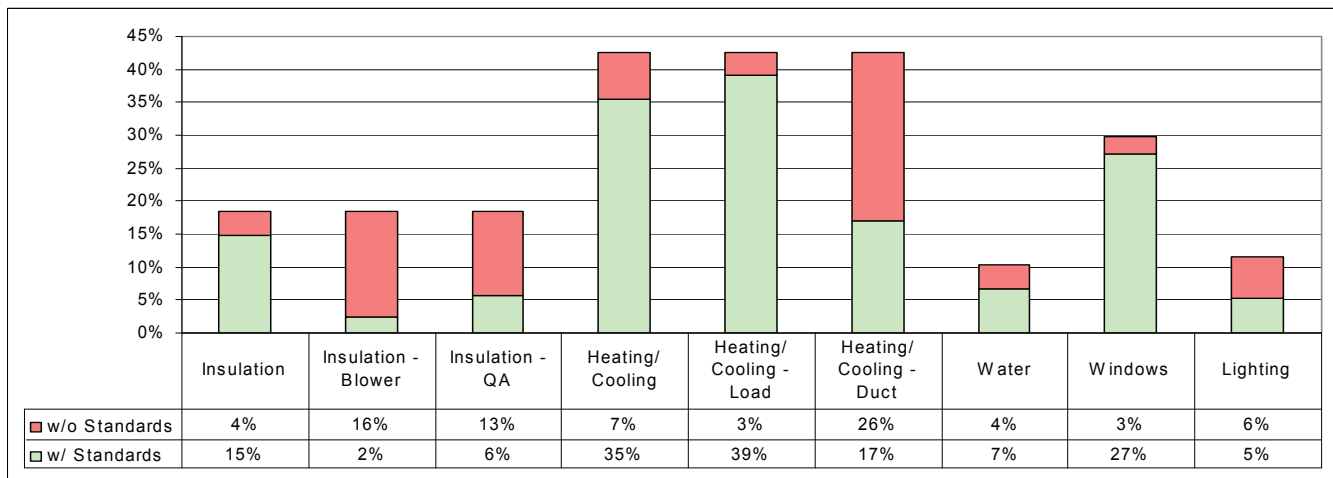


Figure 2 shows that Former and Nonparticipating Contractors also report that some of their work is done to HPwES Standards. Installations of heating and cooling measures are the most common projects completed by FNPCs (42%). Many installations are done to HPwES Program standards (39% of which included load calculations to ensure proper sizing of the equipment and 17% of which included duct system testing and sealing). According to FNPCs, it appears that a significant share of insulation, heating and cooling, windows and appliance installations meet HPwES Program standards.

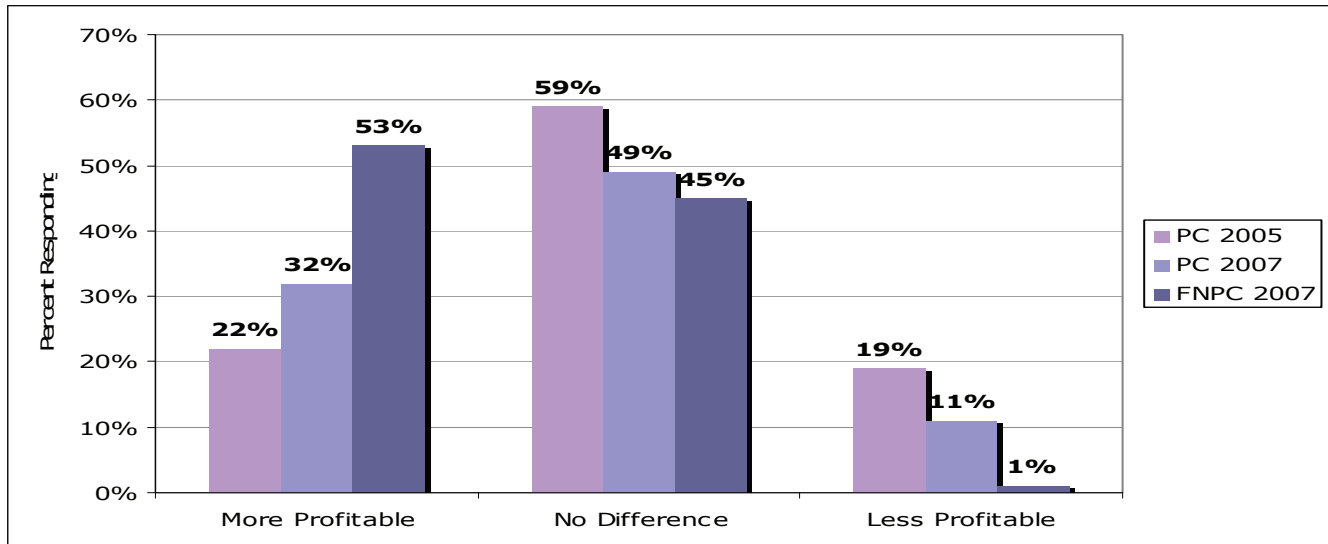
Figure 2. Former and Nonparticipating Contractors Measure Installations/Practices Breakdown



Both Participating and Former and Nonparticipating contractors report that the amount of work being done to HPwES standards outside the program is increasing. Almost 80% of PCs report an increase in high efficiency work being done outside the program and 75% of those say that the HPwES Program was very or somewhat important in bringing about the change. Similarly, about 80% of FNPCs also report an increase in high efficiency work being done outside the program. About one-third of those reporting an increase say that the HPwES Program was very or somewhat important in bringing about the change.

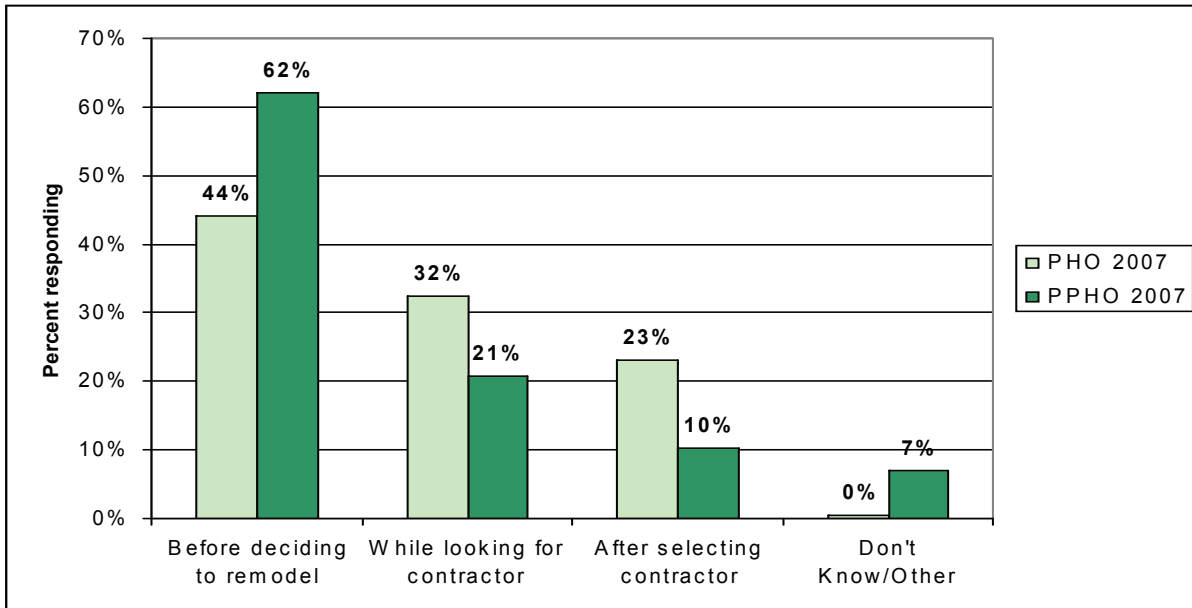
Figure 3 shows that PCs and even FPCs also report that they find that their HPwES jobs are more profitable than those done outside the program. Moreover, the figure shows that a greater percentage of PCs reported that in the 2007 survey (32%) than in 2005 survey (22%).

Figure 3. Profitability of HPwES vs. Standard Jobs



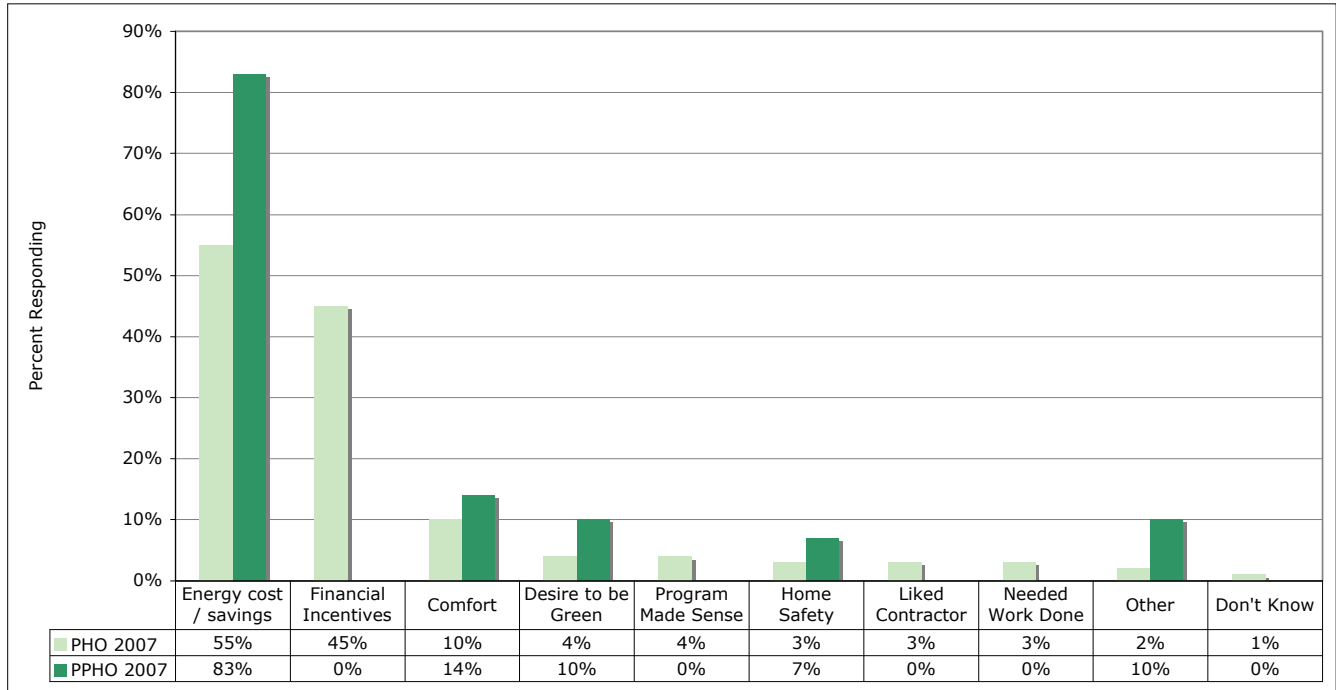
The Market Assessment survey results for Participating Homeowners (PHOs) also support the idea that the program is transforming the market. Figure 4 shows that 44% of the PHOs learned about the HPwES Program and then contacted a contractor to perform the work, while the other 56% learned about the HPwES Program from their contractor. In addition, a significant amount of partially participating homeowners (PPHOs) learned about the HPwES Program before deciding to perform work on their homes (62%). These findings illustrate that a significant share of homeowners set out to purchase home efficiency improvement services based on program marketing.

Figure 4. When and How Homeowners First Learned about the HPwES Program



PHOs were most focused on the energy savings that they will obtain from the program. Figure 5

Figure 5. Reasons for Program Participation and Energy Saving Measure Installs (In or Out of



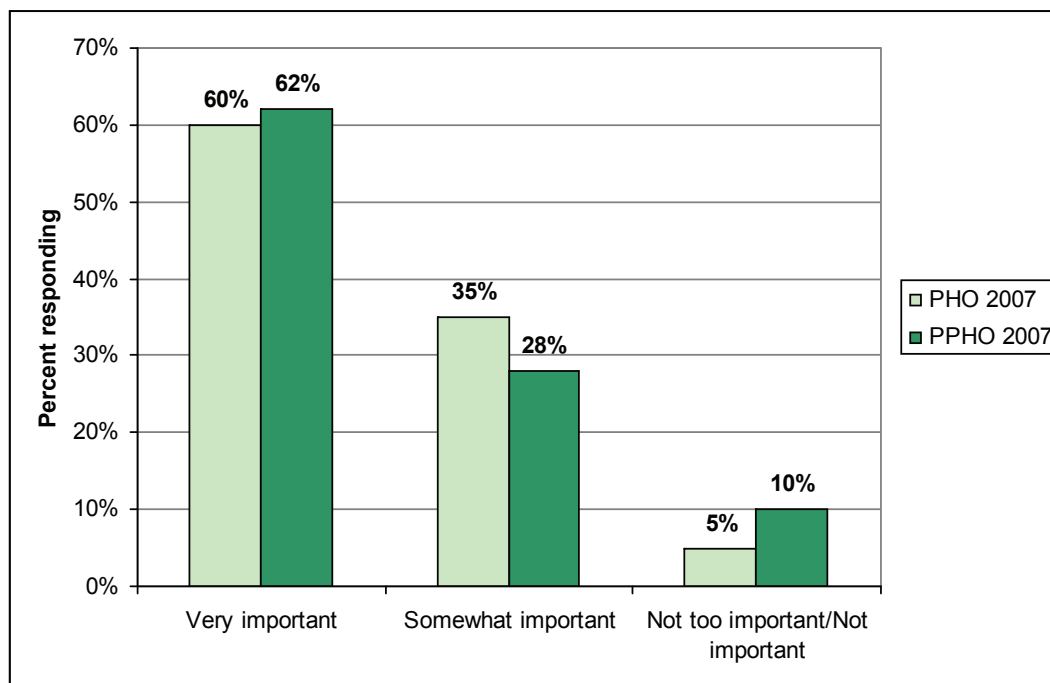
shows that 50% of the Participating Homeowners reported that they were participating in the HPwES Program due to the energy savings while only 10% reported that comfort was a major reason.

PHOs were generally satisfied that the HPwES Program is delivering both energy savings and improvements in comfort. About 60% of the PHOs report that they are seeing energy savings from the

HPwES work. Of those that have not seen savings, most report barriers to observing the savings (e.g., “it is too soon to tell” or “energy prices increased and wiped out the savings”) rather than thinking that the program did not save energy. Over 80% of PHOs report that the comfort improvements either met or exceeded their expectations.

The high rates of satisfaction with the HPwES outcomes appear to be directly related to the quality and value of the Comprehensive Home Assessment (CHA). The CHA is designed to give the contractor insights into the energy needs of the home and to communicate these findings directly to the homeowner. Figure 6 shows that 60% of PHOs thought that the CHA was “very important” in making their decision and 35% said that it was “somewhat important.”

Figure 6. Importance of the CHA recommendations



In general, the Market Assessment Surveys found that PCs are using the HPwES Program to sell energy efficiency and that PHOs are satisfied with the program. In addition, all contractors are increasing the number of projects done to HPwES standards and are being influenced by the HPwES Program.

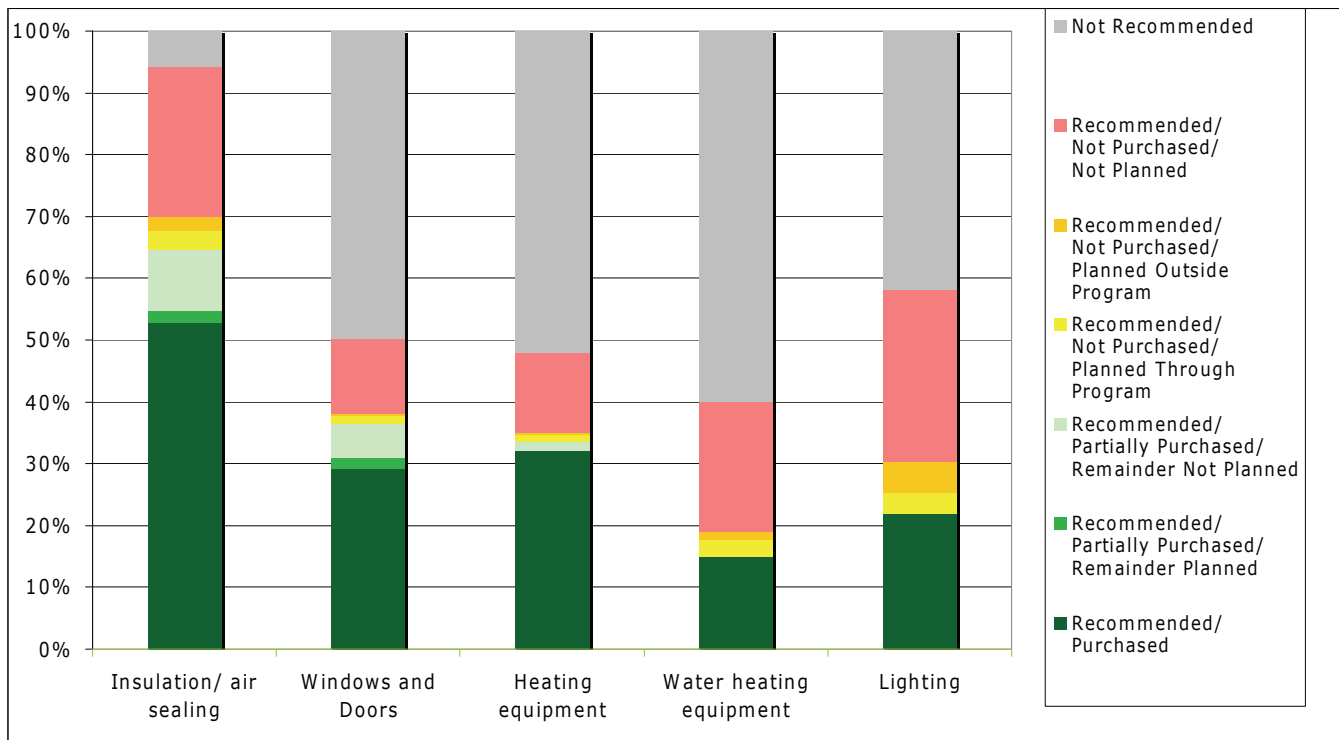
Marketing Comprehensive Energy Efficiency Services

The second goal of the HPwES Program is to encourage contractors to go beyond their area of specialization to offer customers whole house energy efficiency improvements. NYSERDA perceives that traditional rebate programs miss important opportunities to deliver substantial savings to homeowners; often a HVAC contractor will install a high efficiency furnace without considering ways to reduce the overall heating load of the home through better air sealing and insulation. The HPwES Program trains contractors to think more comprehensively about the house and to propose a package of services that meets all of the energy needs of the household.

The HPwES Market Assessment surveys demonstrate that the program has been partially successful in achieving this second objective. Participating Contractors report that they offer comprehensive services to clients and the database analysis for a sample of projects supports that contention. However, for the market rate component, comparatively few households purchase more than one energy efficiency measure. In the “Assisted” component where larger incentives are available, customers are more likely to purchase a comprehensive package of services.

Figure 7 presents information on measure recommendations and purchases for five major measures – insulation/air sealing, heating equipment, window/doors, and water heating equipment for all households. For example, the figure shows that for 94% of the sampled CHAs, the contractor recommended air sealing and insulation, and 65% of the homeowners purchased or partially purchased that measure through the program.

Figure 7. PHO Measures Recommended/Installed



Overall, contractors recommended an average of 2.3 of the four major measures listed, and homeowners purchased about 1.5 measures (76% of the customers installed only one major measure). However, the market rate customers only purchased an average of 1.3 measures, while the “Assisted” customers purchased an average of 1.9 measures (57% of the customers installed two or more major measures). In addition to the increased incentive for the “Assisted” component, all “assisted” home performance projects are reviewed in-depth by the program implementation staff prior to approval. It seems that those differences may result in more comprehensive installation packages.

Some HPwES programs in other states are attempting to overcome these market barriers by offering higher percentage rebates for more comprehensive packages of services. For example, the New Jersey Clean Energy HPwES Program offers a 10% rebate if energy savings are estimated to be less than 25% and a 50% rebate if energy savings are estimated to be greater than 25%.

Conclusions

NYSERDA implemented the HPwES Program to increase the efficiency of existing homes in New York. The program attempts to transform the residential home improvement and equipment replacement market by giving contractors the tools that they need to sell high efficiency comprehensive home improvements to their customers. The 2009 HPwES Market Characterization and Assessment Study finds that the program has been successful in that endeavor.

In 2007, the New York's HPwES Program delivered energy efficiency improvements to over 5,000 homes; for about 75% of those jobs, the program incentive was modest by comparison to those offered in other jurisdictions. Many of the most successful Home Performance contractors are growing their market and increasing the number of jobs completed each year. Participating contractors report that their HPwES projects are profitable. Surveys have found that homeowners specifically purchase energy efficiency improvements to reduce their energy costs, and most participating homeowners are satisfied with the energy savings and comfort improvements in their homes.

The Market Assessment surveys demonstrate that both participating and nonparticipating contractors are affected by the program. Participating contractors do a significant amount of work outside of the program to the HPwES standards. Nonparticipating contractors report that they do some of their work to HPwES standards, presumably to compete effectively with HPwES contractors. Both participating and nonparticipating contractors report that the amount of energy efficiency work being done in the marketplace is increasing and that the HPwES Program is one reason for that increase.

However, this research raises two important issues related to the market transformation approach. First, in the short run, the approach may be missing opportunities for resource acquisition by offering incremental cost rebates for energy efficient measures. In New Jersey, modest program incentives (under \$500 per unit) have resulted in a gross installation rate (inclusive of free riders) of over 25,000 high efficiency heating and cooling units. By comparison, only about one-third of the New York HPwES jobs include heating or cooling units, about 1,500 units. Second, the Market Assessment surveys appear to illustrate that contractors may not have been as successful in selling comprehensive energy efficiency upgrades to homeowners in the market rate component. In most market rate projects, homeowners purchase only one major measure from the contractor. For the "Assisted" component, however, most homeowners purchase two or more measures.

In other jurisdictions, program planners might want to look at the NYSERDA HPwES Program model to consider how to move from a program that relies on incentives to one that helps build a healthy market for comprehensive energy efficiency services. At the same time, it appears that NYSERDA program staff need to continue to work to balance resource acquisition and market transformation objectives, and to develop an understanding of how to support sales of more comprehensive energy efficiency upgrades; once the contractor is in the home, what can they do to encourage homeowners to think more broadly about their energy needs?

References

New Jersey Board of Public Utilities, Office of Clean Energy. 2007. *New Jersey's Clean Energy Program 2007 Annual Report*.

Summit Blue Consulting, LLC. *Home Performance with ENERGY STAR Market Characterization and Assessment Evaluation*, Prepared for NYSERDA, February.