Comprehensive Research for a Full View of Barriers for Residential Hard-to-Reach customers

Tracy Dyke-Redmond, Eversource
Shawn Bodmann, DNVGL
Laura Schauer, Illume Advising
Doug Bruchs, Cadeo
Robert Wirtshafter, Wirtshafter Associates, Inc.

ABSTRACT

As part of their 2019-2021 Energy Efficiency Plan, program administrators (PAs) in Massachusetts are expanding their efforts to serve all customers, including moderate-income customers, renters, and customers with limited English proficiency. A key part of this effort is a commitment to better understand existing patterns of non-participation and explore the characteristics of customers with relatively lower historical participation rates. The PAs worked with an independent evaluator to analyze residential participation rates between 2013 – 2017. The analysis examined the relationship between past participation in residential energy efficiency programs and characteristics such as customer income, ownership status, primary language spoken, building type, and age of the home. Evaluators then conducted additional primary research, including more than 1,500 customer surveys via email, phone, mail, and door-to-door outreach, to identify barriers to participation and determine how to make energy efficiency programs more accessible for all customers. The research found that moderate-income households, renter households, and limited English-speaking households participated at a lower rate than other populations in 2013 – 2017. Customer surveys revealed that the biggest difference in participation among groups of interest was between renters and homeowners, where participation rates differed by about 10 percentage points. The research also identified barriers to participation such as lack of trust in government and landlords, a desire to live anonymously among immigrants, a need for better understanding of program benefits, and a focus on fundamental priorities (e.g., food and shelter). The PAs are using the results of the research to refine their program design and improve community outreach.

Introduction

At a time when states are scaling up their efforts to promote energy efficiency in response to the climate crisis, policy makers and energy efficiency program administrators are redoubling their efforts to expand participation in efficiency programs. Energy efficiency is an essential resource to save energy and save customers money, and it is important to make sure all customers have the opportunity to receive the benefits of the efficiency programs that they help fund via system benefit charges. Regulators have increasingly sought to ensure that energy efficiency programs serve customers equitably (York, Nowak and Molina 2016).

Previous studies on equity have shown that certain subsets of customers, such as renters and low-income households, have participated in energy efficiency programs at lower rates than other customers due to various financial, geographic, and knowledge-based barriers (Belknap, et al. 2019). Studies on energy efficiency programs in California, Oregon, Rhode Island,

Washington and Florida found rural households, renters, non-English speakers, low- to middle-income households and those living in older homes are underrepresented in energy efficiency programs (Navigant 2017, Marti and Nowak 2016, Rubado, et al. 2018, NWPCC 2018, Zhao, et al. 2012). A meta-data study of California energy efficiency program evaluations found participants in general residential programs (e.g., those not targeted to low-income customers) are disproportionately higher-income, white, English-speaking, college-educated homeowners as compared to the ratio of the same groups within the general population (Marti and Nowak 2016). For example, the study found that college-educated people are overrepresented in energy efficiency programs run by investor-owned utilities; they comprise 74% of participants but only 39% of the total population in the service territory based on American Community Survey (ACS) data from the U.S. Census (Marti and Nowak 2016). A study by the Energy Trust of Oregon in 2018 showed that participation rates across its energy programs were lowest in the least affluent areas (Rubado, et al. 2018).

The lack of participation of underrepresented groups can be attributed to several financial, geographic and access-based barriers. Low-income households often lack access to credit, capital to cover high upfront costs, and information about programs (Belknap, et al. 2019, Marti and Nowak 2016). Renters lack control over home improvements and their landlords are often reluctant to invest in upgrades due to the "split incentive" issue, in which energy efficiency upgrades are paid for by the landlord but benefit the tenant (Marti and Nowak 2016). Rural households experience physical distance from resources, difficulties in accessing financing, a lack of contractors to implement energy efficiency measures, and a lack of knowledge since traditional marketing media don't reach them as effectively (Belknap, et al. 2019).

Despite many efforts to serve hard-to-reach customers, PAs and the Massachusetts Energy Efficiency Advisory Council[1] recognize that persistent barriers to participation exist. To assess current participation levels and develop a deeper understanding of these barriers, the PAs engaged independent evaluators to undertake two evaluation studies in 2019. The first of these studies, the *Residential Nonparticipant Customer Profile Study* (DNVGL, 2020), used PA billing and program tracking data and secondary data sources to assess the relationships between past participation in energy efficiency programs and selected customer characteristics. The second study, the *Residential Nonparticipant Market Characterization and Barriers Study* (Navigant, Illume, and Cadeo, 2020), conducted a large-scale quantitative and qualitative research effort to characterize residential nonparticipants and provide insight into market barriers for selected customer populations. Given stakeholder interests, both studies place a primary focus on certain customer groups: low- and moderate-income customers, renters, and non-English speaking customers. This paper highlights selected elements of both studies and summarizes the strategies PAs are using in their ongoing efforts to serve hard-to-reach customers.

[1] The Massachusetts Energy Efficiency Advisory Council (EEAC) guides the development of state- and nation-leading energy efficiency plans by the Commonwealth's investor-owned gas and electric utilities and energy providers. Voting members of the EEAC represent a diverse array of stakeholders, including several state agencies as well as advocates for residential customers, organized labor, environmental protection, business, housing and community development, energy efficiency small businesses, non-profits, and others. For more information see http://ma-eeac.org/about/.

Methods

The authors of the *Residential Nonparticipant Customer Profile Study* began by preparing a comprehensive list of participants and nonparticipants in Mass Save programs for 2013–2017, excluding upstream programs, behavioral programs, and delivered fuel projects.[2] This data analysis involved combining program tracking data and billing data for 2013–2017, filtering out non-residential accounts, adding tax assessor information, identifying participants, and identifying the most recent account holder. The result of this process was a data file listing unique residential and multifamily accounts billed in 2017, with account and location[3] participation variables based on the 2013–2017 tracking data, and with additional location data, such as tax assessor information, appended. The data file included participation status, energy savings data for participants, and energy consumption data for all accounts. Because the data file included location information, including Census block group,[4] it could be linked to ACS data from the U.S. Census.

Next, the authors of the study flagged locations likely to be renters based on the number of accounts per location. Massachusetts PAs often assign new account numbers when someone moves in or out of a dwelling. Thus, locations with more than four accounts between 2014–2017 were identified as likely renters based on an assumption that rented dwellings have higher turnover rates. This data was compared with one PA that had an external database (Experian) that identified likely renters,[5] and the study's assignment of renters agreed with Experian 90 percent of the time.

Once the authors identified participant and nonparticipant accounts and flagged likely renters, they developed a series of statistical models to examine the relationship between participation and key demographic and housing characteristics in ACS data. This paper summarizes the block group-level models.[6] For these models, the dependent variable is participation, and predictor variables are block group-level ACS variables and US Census Urban and Rural Classification data expressed as proportions of locations or households that have certain characteristics.

The study analyzed three different types of participation for both electric and gas energy efficiency measures:

- Location participation: number of unique locations that participated at least once between 2013 and 2017, divided by the number of unique locations in the 2013–2017

[2] Upstream programs are those where the PAs subsidize the cost of energy efficiency measures by working with distributors or retailers to reduce cost at the point of sale, and therefore do not typically have the address of the buyer. Behavioral programs are those that send information to customers to influence their behavior to reduce energy usage; since customers do not opt in the concept of participation is different than other programs. Delivered fuel projects are those that provide energy efficiency measures that reduce usage of oil or propane; these are tracked differently than energy efficiency measures that reduce usage of electricity or gas.

[3] For this study, a location is approximately the same as a building.

[4] Census Block Groups are statistical divisions of census tracts, generally defined to contain between 600 and 3,000 people. For more information see https://www.census.gov/programs-surveys/geography/about/glossary.html#par_textimage_4

[5] Experian uses a combination of primary research and statistical imputation to determine its likely renter variable.

[6] The study also developed individual-level models that predict participation using individual-level variables where available. This paper focuses on the block group-level analysis because it was statewide.

billing data. Location participation measures whether a building participated. Location participation is similar to coverage rate. It is best used to answer questions such as, "How many buildings did the program touch, regardless of size?"

- Consumption-weighted participation: sum of 2017 consumption for any locations that participated at least once between 2013–2017 divided by the sum of 2017 consumption for all locations. Consumption-weighted location participation uses location participation multiplied by the total consumption associated with each location. This metric gives a sense of how much of the underlying consumption the programs addressed. It is best used to account for the impact differences between single family and multifamily locations.
- Savings/Consumption participation: sum of 2013–2017 savings divided by the average 2013–2017 consumption, both taken at the block group level. The metric indicates depth of savings. The strengths of this metric are that it shows depth of participation and locations with greater consumption (i.e., large multifamily buildings) have greater relative weight in the analyses.[7]

The analysis considered four variables which were expected to predict participation. Each of these variables was based on ACS data: [8]

- Moderate-income: The proportion of households with income between 56% and 85% of statewide median income. This variable serves as a proxy for moderate income because moderate-income eligibility for the programs was defined as 61% to 80% of state median income. Note that dollar value of state median income varies depending on the number of people in a household, so the analysis accounted for household size.
- Renter-occupied housing: The proportion of occupied households in the block group that are renters.
- Multifamily housing: The proportion of occupied households in the block group living in buildings with 5 or more units (consistent with Massachusetts' definition of multifamily).
- Limited English-speaking households: The proportion of households in the block group reporting as speaking limited English at home.

The analysis calculated zero-order correlations between each of the participation variables and each of the ACS variables. These correlations estimate the direct relationship between participation and the ACS variables of interest.[9]

The *Residential Nonparticipant Market Characterization and Barriers Study* undertook a

[7] Block groups where the metric exceeds 1.0 are excluded since these instances most likely represent substantial new construction occurring in the block group. This is because savings would only exceed consumption for 2013–2017 if consumption in some of the early years was very low, indicating substantial new construction occurred during that period. While a value greater than 1.0 is theoretically possible, it is extremely rare: 0.3% of block groups in the electric analysis were affected, and 0.1% of block groups were affected in the gas analysis.

[8] The study also examined additional ACS variables related to income, construction year, heating fuel type, and urban/rural status. The results of this analysis are not included here due to space constraints.

[9] The study also conducted regression analysis to further explore the relationship between the ACS variables and the different participation metrics, however these results are not summarized here due to space constraints.

large survey effort to compare the characteristics of program participants and nonparticipants.[10] This survey effort leveraged data on participant/nonparticipant status from 2013–2017 from the *Residential Nonparticipant Customer Profile Study* to construct a two-stage sample. In the first stage, researchers developed five strata based on participation rates, and then selected 35 of the 1,478 census tracts in Massachusetts served by electric and/or gas PAs. Four additional census tracts were selected to ensure every electric and natural gas PA was represented and to gain insight into participation in towns of interest to study stakeholders, for a total of 39 census tracts sampled. Approximately half of these 39 census tracts were selected from the two strata with the lowest participation. Note, municipal territories were not included. The researchers targeted 70 completed surveys at randomly sampled households in each of the 39 selected target census tracts. In total, the researchers distributed 2,730 completed surveys statewide, approximately 1,780 to nonparticipating households and 950 to participating households. The two-level sampling (census tracts then households within sampled tracts) sought to balance inclusivity (i.e., every customer in the state could be sampled) and focus on nonparticipating customers (i.e., oversampling tracts with lower participation rates).

The surveys were administered using multiple modes: web, telephone, mail, and in-person. Web surveys were administered to the entire sample. All sample points were invited to participate in a web survey through email (where email was available) and advanced letters (sent to all sampled respondents). Respondents received a $20 prepaid Visa gift card for completing the entire survey, which took between 15 and 20 minutes to complete. Telephone surveys targeted people who did not respond to the web survey, and prioritized customers flagged as nonparticipants. The telephone survey was the same as the web survey instrument, and respondents received a $20 prepaid Visa gift card for completing the entire survey. Abbreviated mail surveys were sent to all non-respondents to the web and phone surveys. A $5 pre-incentive was included with the mail survey. In addition, respondents received a $20 prepaid Visa gift card for completing the mail survey. The researchers attempted to conduct in-person, door-to-door surveys for nonresponsive nonparticipants in the eight census tracts with lowest survey response. Three teams of two researchers completed the in-person surveys, with two of the three teams comprised of Spanish or Portuguese speakers. Respondents received a $20 Visa gift card onsite for completing the abbreviated survey.

The team provided all survey materials in English and translated into three languages: Spanish, Portuguese, and Chinese (Mandarin dialect). These languages were selected based on publicly available documentation of the predominant non-English languages spoken in Massachusetts homes.

The survey asked about awareness of and participation in Mass Save energy efficiency programs and investigated barriers to participation. The survey also asked about home characteristics (e.g., when the home was built and number of units in the building), customer characteristics (e.g., home ownership, length of time in the home, demographics, and income), experience with household bills and finances, and language proficiency.

The survey achieved an overall response rate of 24%, with a total of 1,609 survey

[10] The study also undertook qualitative research, including interviews with PAs, community groups, customers, landlords, and property owners, as well as intercept surveys with customers at community organization sites. This research is not described here due to space constraints.

responses. Survey responses were weighted such that the collective set of survey responses was statistically representative of Massachusetts overall.[11] In addition to accounting for sampling at the census tract and household level, the team's weighting approach also accounted for the common response bias of households identified as program participants responding to the survey at a higher rate than nonparticipants. The team's weighting scheme rebalanced the proportion of responses from sampled participants and nonparticipants within each tract such that it reflected the overall participant/nonparticipant split for the entire census tract.

Findings

This section presents the results of the *Residential Nonparticipant Customer Profile Study* and *Residential Nonparticipant Market Characterization and Barriers Study.* The studies found consistent trends in participation rates among the hard-to-reach groups of interest, with the *Nonparticipant Market Characterization and Barriers Study* uncovering reasons for lower participation rates among these groups, including barriers such as fear of scams, fear of sharing personal information, a focus on fundamental needs, and a lack of information about programs.

Residential Nonparticipant Customer Profile Study: Key Findings

The *Residential Nonparticipant Customer Profile Study* found statistically significant negative correlation between location participation rates for 2013–2017 and all four variables of interest: moderate-income households, renter households, customers that reside in 5+ unit multifamily buildings, and limited English-speaking households. In addition, the analysis considers low-income and average or higher-income variables. Definitions for the variables of interest are below:

- **Low-income:** Defined as the proportion of households with less than 56% statewide median income. This variable is a proxy for low income, which is officially defined as less than or equal to 60% of state median income.
- **Moderate-income:** The proportion of households with incomes between 56 and 85% of statewide median income. This is a proxy for true moderate income in two different ways; moderate income is defined as 61% to 80% of state median income, factoring in household size. The researchers had only block-group level data. Therefore, they chose income ranges available in the ACS data that most closely approximated the eligibility ranges set by Mass Save for a household size of two.
- **Average or higher-income:** Defined as the proportion of households with greater than moderate income. Note that this definition may not be considered truly high income by other standards. This variable is included as a comparison point for moderate income.
- **Renter-occupied housing:** The proportion of occupied households in the block group that are renters.

[11] The weighting does not represent 105 census tracts in the state that were not served by an electric or gas PA, were too sparsely populated to meet the per-tract survey target, or were located in Lawrence, Andover, and North Andover because customers in these towns were affected by fires in September 2018 and have since been subject to higher levels of PA communication.

- **Multifamily housing:** The proportion of occupied households in the block group living in buildings with 5 or more units.
- **Limited English-speaking households:** The proportion of households in the block group reporting as speaking limited English at home.

The study modeled electric and gas participation separately and the analysis found consistent results by fuel type. The key results from each of these fuels are described below.

Results by Electric Measures

Researchers found that block groups with higher concentrations of the ACS variables of interest had lower participation rates for electric energy efficiency measures:

- **Program participation is lower among renters.** The study found a strong negative correlation between renter status and location participation. As the proportion of households in a block group that rent increased, the number of locations that participated relative to total number of locations (i.e., location participation) decreased.
- **Program participation is also lower among households with limited English proficiency, but to a slightly lesser degree than among renters.** As the proportion of households in the block group with limited English speaking increased, participation rates decreased.
- **Program participation is also somewhat lower for moderate-income and multifamily households,** but the strength of the correlation is less than with renters and households with limited English proficiency. Moderate-income and multifamily had the third and fourth correlation strengths. Note that moderate-income was analyzed separately from low-income.
- **Patterns are similar for two measures of participation**. The researchers found similar correlations for location participation and consumption-weighted location participation for all variables except for the proportion of multifamily buildings. In the case of multifamily buildings, as the proportion of multifamily buildings in a census block group increased, location participation tended to decrease, but consumption-weighted location participation tended to increase. This difference was most likely caused by the fact that multifamily buildings were weighted very heavily because they had high consumption, which caused participation in those buildings to count very heavily.

Figure 1. Block group-level electric participation correlations with ACS variables. *Source:* Residential Nonparticipant Customer Profile Study

However, the *Residential Nonparticipant Customer Profile Study* found that when electric savings/consumption (depth of savings) was considered as the metric of participation, rather than location participation or consumption-weighted location participation, the direction of the correlation changed for four key variables. Specifically, as the proportion of low-income households in a census block increased, the depth of savings increased. Researchers observed the same type of positive correlation between depth of savings and three other variables: proportion of buildings that were multifamily, the proportion of renter-occupied housing units, and proportion of households with limited English proficiency. These positive correlations with depth of savings are shown in Figure 2. This pattern suggests that while the electric PAs might have lower participation in block groups with more low-income, renters, multifamily, and limited English households in terms of number of participants, those participants have a relatively high depth of savings (and accordingly, a high savings-to-consumption ratio). The large multifamily locations, where PAs are able to treat many sub-units within a building at once, are most likely driving this pattern. Such large multifamily buildings count as only a single location in the
location participation metric and have the potential to have a large savings/consumption value.

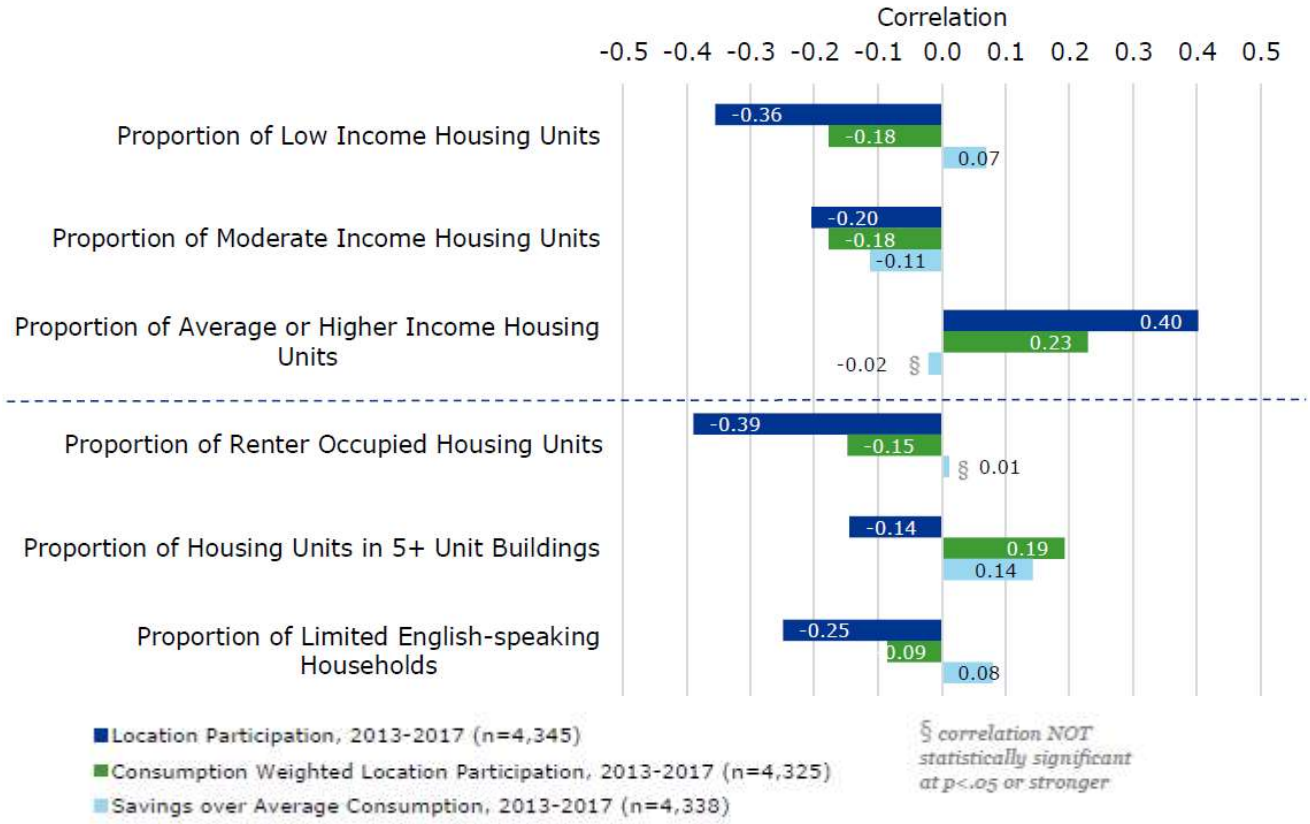

Figure 2. Block group-level electric participation correlations, including savings/consumption (savings over average consumption), with ACS variables. *Source:* Residential Nonparticipant Customer Profile Study

Results by Gas Measures

The findings for gas energy efficiency measures were similar to the findings for electric measures. Correlations between location participation rates and the proportion of households with key demographic variables (low- and moderate-income, renters, homes in multifamily buildings, and households with limited English proficiency) were all negative and statistically significant. The same trends held true for consumption-weighted location participation. However, the correlation was positive for savings/consumption and the proportion of homes that are multifamily, as shown in Figure 3. This suggests that PAs achieved greater depth of savings in high-multifamily areas.

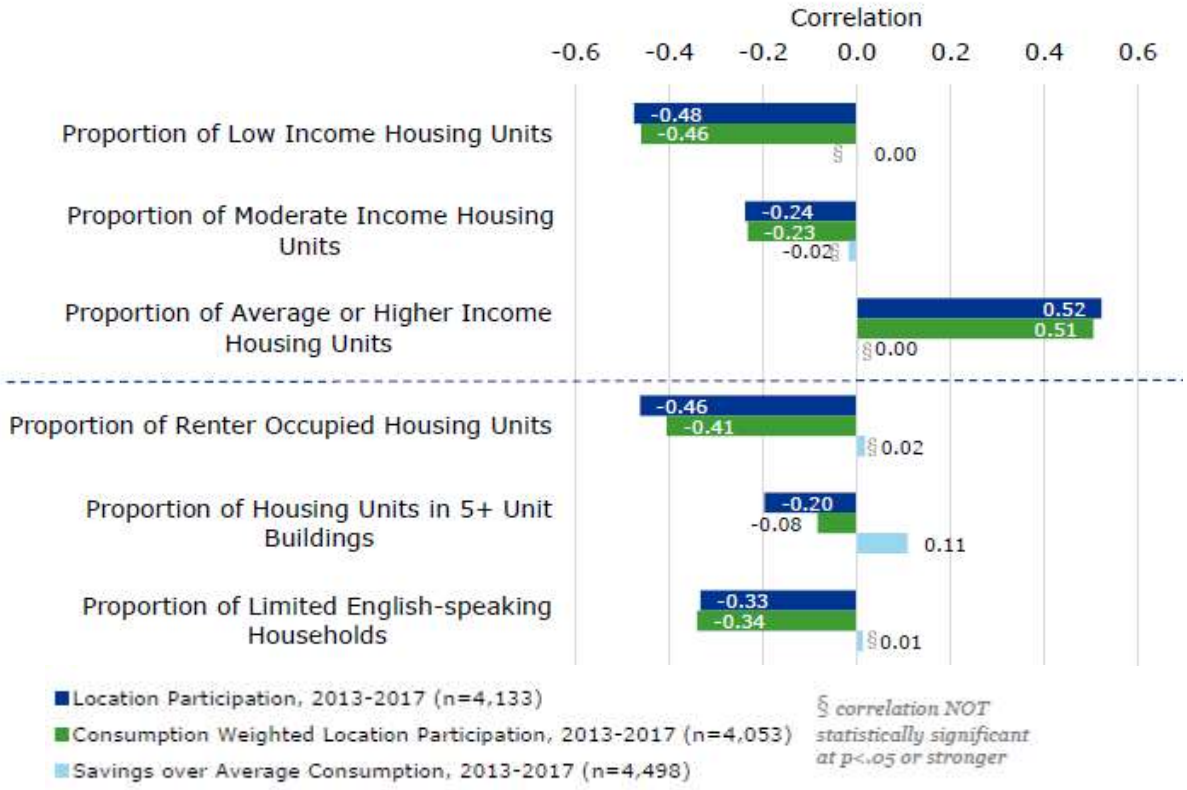

Figure 3. Block group-level gas participation correlations, including savings/consumption (savings over average consumption), with ACS variables. *Source:* Residential Nonparticipant Customer Profile Study

Overall, these results demonstrate that moderate-income households, renter households, and limited English-speaking households participated at a lower rate than other populations in 2013–2017. This finding is confirmed in Figure 4, which shows location participation levels for block groups with low vs. high concentrations of three demographic variables of interest: renters, low-/moderate-income households, and limited English-speaking households. Low concentration is defined as block groups with lower than median percentage of the demographic variable in question, while high concentration means block groups with higher than median percentage of the demographic variable in question. The magnitude of the difference in participation rates ranges between one and six percentage points, with the highest difference in the electric participation rate for block groups with low vs. high concentration of renters.

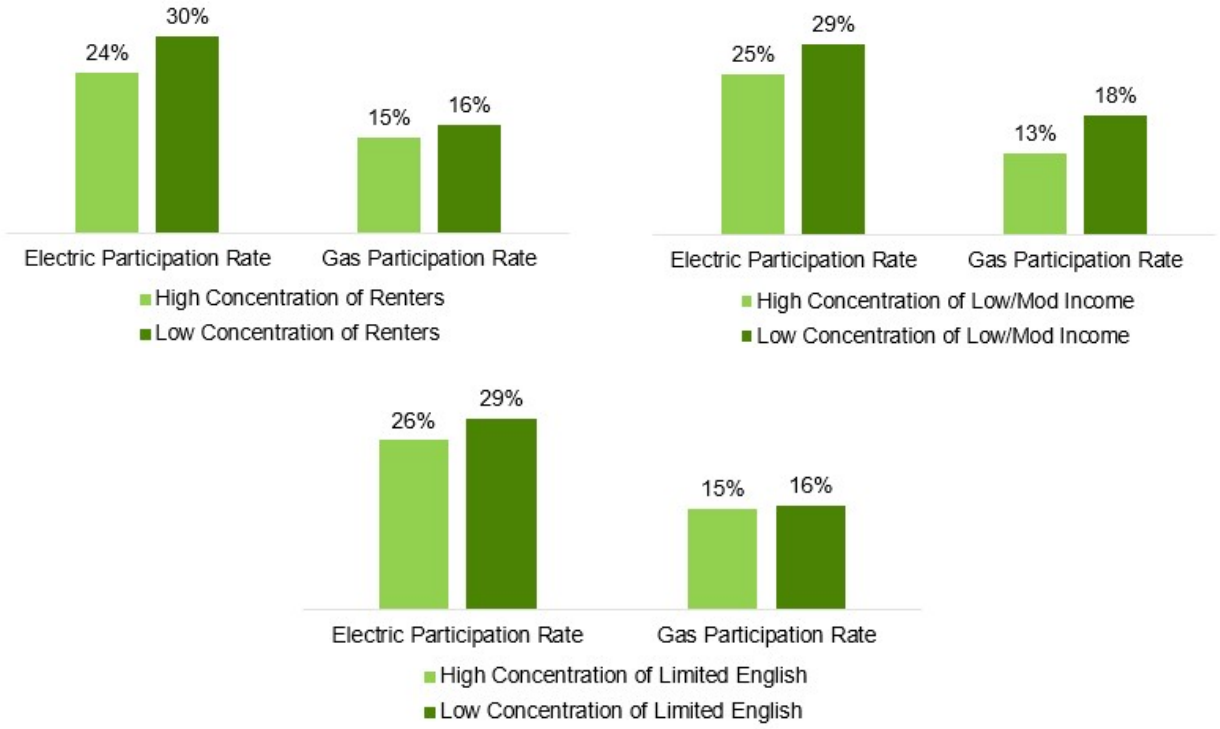

Figure 4. Participation rates for block groups with lower than median vs. higher than median concentrations of ACS variables. *Source:* Residential Nonparticipant Customer Profile Study

When analyzing depth of savings (savings/consumption), the researchers found that for electric measures, savings rates were higher in areas with higher concentrations of multifamily and low-/moderate-income customers (see Figure 5). Savings rates for gas measures were similar for areas with low and high concentrations of multifamily and low-/moderate-income customers.

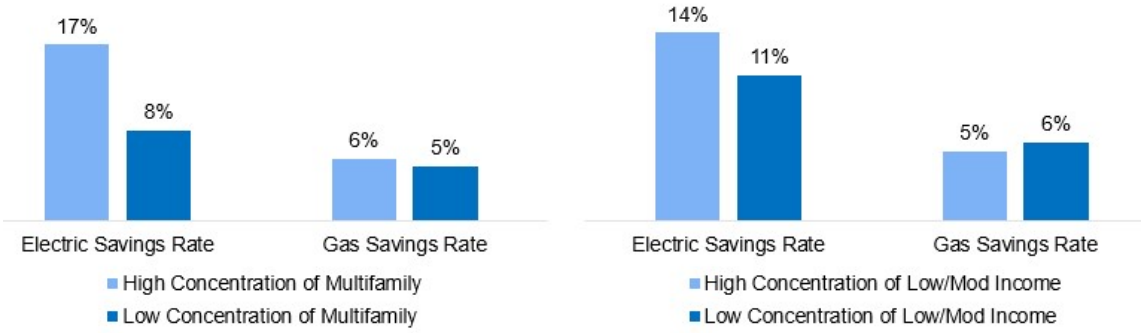

Figure 5. Savings/consumption for block groups with lower than median vs. higher than median concentrations of ACS variables. *Source:* Residential Nonparticipant Customer Profile Study

Note that gas savings rates are lower than electric savings rates. While the reason for this difference was not analyzed as part of this study, PAs hypothesize that the cost of gas energy efficiency upgrades is typically higher than electric energy efficiency upgrades, and there are fewer barriers to adoption for electric upgrades. For example, a key source of electric efficiency upgrades is associated with efficient lighting, which is less expensive and easier to install than gas upgrades like heating equipment.

Residential Nonparticipant Market Characterization and Barriers Study: Key Findings

The *Residential Nonparticipant Market Characterization and Barriers Study* had findings consistent with the *Residential Nonparticipant Customer Profile Study.* In particular, as shown in Figure 6, the survey showed that renters, low-/moderate-income customers, and those with limited English proficiency participate at a lower rate than other residents. The survey also shows that this discrepancy is largest for renters vs. owners, where there is a 10 percentage point difference in participation. The survey found that differences in awareness of Mass Save programs were larger than differences in participation. For example, the difference in awareness between renters and owners is 31 percentage points, compared to the 10 percentage point difference in participation. This suggests that awareness is not necessarily the most important limiting factor to participation. In addition, the survey found that nonparticipants were more likely to reside in small multifamily buildings (3-9 units) compared to participants and were more likely to rent compared to participants.

Exploratory statistical analysis found interactions of different variables that predict whether a survey respondent was a participant or nonparticipant. For example:

- Although renters are more likely to be nonparticipants, renters with college degrees are more likely to be participants.
- Customers who moved in the past five years are more likely to be participants, particularly if they own their home.
- Customers who participated in an assistance program (such as food stamps, Medicaid, or Supplemental Security Income) were more likely to be participants in Mass Save.
- The survey also found that education is a strong predictor of participation, and customers with post-secondary education are more likely to participate.

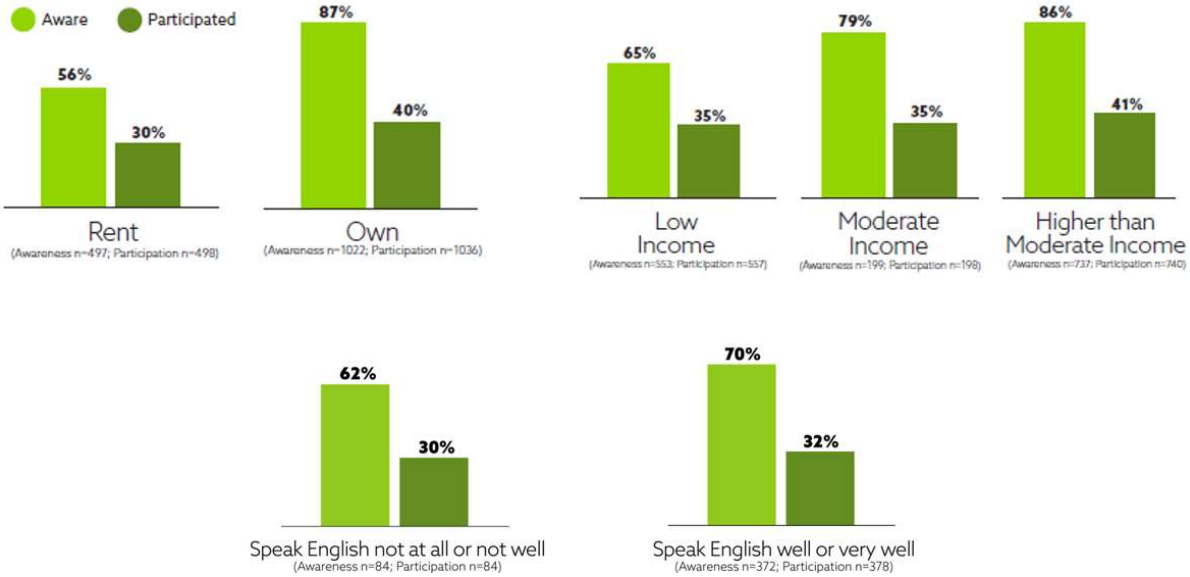

Figure 6. Awareness and participation rates for demographic groups of interest. *Source:* Residential Nonparticipant Market Characterization and Barriers Study.

The study identified found a wide range of barriers that can prevent participation:[12]

- Interviews found that trust, or lack of trust, in program legitimacy was prevalent among all hard-to-reach groups this study investigated. While customers said they think of utility companies as legitimate and trustworthy entities, most of their interactions with their utility are limited to paying their monthly bills. They think of utility companies as businesses selling power to generate profit, and therefore, struggled with the concept that a utility would encourage lower energy use. Survey respondents also expressed a lack of trust in the government and their landlords and have a fear of scams. Even if customers were interested in learning more about the program offerings, they still believed there must be hidden costs or motives. Marketing materials advertising "free" services were demotivators for these customers. Researchers suggested that PAs continue to build on efforts to leverage trusted community connectors, such as staff at community organizations that serve key groups of interest, to raise awareness and provide support throughout the program process. These organizations and individuals can be a vital bridge between the program and members of their community.
- Immigrant populations expressed a desire to live anonymously, which kept them from applying for any assistance programs, government-funded or otherwise. Community organizations the team interviewed characterized some immigrant groups as "living in the shadows," either because of their own citizenship status or that of family members or friends.
- Survey respondents also prioritized their time and resources on needs that they considered fundamental to living. Customers, especially those from lower-income households, described prioritizing basic needs (food, shelter, jobs/income, child or parent care, regaining custody of children, etc.) before they could begin to think about energy efficiency.
- Many survey respondents also said they needed more information or understanding of Mass Save offerings, participation processes, and benefits. While awareness of Mass Save programs is generally high, survey respondents often did not understand how programs were relevant to them.
- Some customers explained that, although their home was drafty or not well insulated, it was livable, or normal, as is, and taking any action to improve it was unnecessary. These sentiments kept some customers from investigating Mass Save offerings or home improvements in general.
- Some potentially income-eligible customers indicated they did not apply for income-eligible services believing they would not qualify because their income was either too high or because they were previously denied different assistance programs. Customers who have applied for assistance programs and were denied may be more likely to have a moderate income or be among those who fluctuate between moderate-income and low-income status.

[12] The full research paper also includes results of a survey of landlords, property owners, and managers, which includes barriers such as lack of a detailed understanding of how the programs work, as well as limited influence of property managers.

- Some customers expressed a belief that Mass Save is government-funded, like MassHealth, and therefore thought of it as an assistance program. Few understood it was funded by ratepayers like themselves. This misconception led some interviewed customers to think Mass Save funds were reserved for people in most need.

PA Activities in Response to Findings

The Massachusetts PAs are using the findings from these two studies to inform ongoing improvements to their programs. They plan to tailor marketing messages to groups with historically lower participation, coordinate with trusted community-based organizations, improve program processes, and work with landlords to improve the energy efficiency of rental housing units. PAs are using their prior experience to inform which aspects of the evaluation to prioritize first: for example, PAs have years of experience partnering with municipalities and community organizations and are working to expand upon and scale up these efforts.

Tailoring marketing messages. With regard to marketing, PAs are working to promote the relevance of energy efficiency programs. Mass Save marketing has traditionally highlighted energy efficiency programs' money and energy savings, and now PAs are also beginning to market improved comfort and home value. In addition, PAs are exploring how to tailor marketing messages to individual customers, highlighting the benefits most relevant to them based on engagement through an online energy profile tool. In addition, as part of the effort to show customers how energy efficiency is relevant to them, PAs are also exploring how to most effectively communicate the health benefits of energy efficiency. Evaluation studies in Massachusetts demonstrate that energy efficiency can result in significant health benefits, particularly for low-income customers, but it is difficult to generalize this impact to every customer (Three[3] and NMR Group, 2018).

Reinforcing and establishing partnerships with community and nontraditional partnership organizations. The evaluations found that community organizations and other organizations not traditionally targeted for energy efficiency can be valuable, trusted resources to inform customers about Mass Save offerings. PAs have a long history of working with community-based organizations to promote energy efficiency and have used the results of the research presented in this paper to further those efforts. For example, in the past, PAs partnered with non-profit organizations and municipalities to develop community-focused initiatives. One effort in Boston focused on the Chinese community, and PAs partnered with a trusted local organization, the Chinese Progressive Association, to encourage residents to participate in Mass Save. This effort successfully addressed the trust barrier, but community-based outreach is typically resource intensive and is not always cost-effective.

Currently, the PAs are engaged in a municipal partnership program focused on selected municipalities with historically low participation and high concentrations of renters, moderate-income customers, and residents with limited English proficiency. The data that informed the selection of these communities came from the *Residential Nonparticipant Customer Profile Study*. As part of this partnership program, municipalities are working with community-based organizations to support community-led outreach to nonparticipants. Municipalities set goals related to home energy assessments, home insulation, and upgrading heating and cooling equipment, and receive funding to support those efforts. PAs supply localized marketing

materials in multiple languages, offer customer services in Spanish and Portuguese, and support municipal outreach.

PAs are partnering with other companies to provide additional value to participants. For example, the PAs established a partnership with an insurance company to provide a discount on home insurance for customers who complete a home energy assessment through Mass Save. This effort may engage new customers who previously would not have considered participating in energy efficiency programs. PAs also recently completed a workforce needs assessment for Mass Save, and are striving to ensure that the energy efficiency workforce represents the customers the PAs serve in terms of demographics and geography. The PAs expect that having a diverse workforce drawn from the communities they seek to serve through energy efficiency programs will build trust with customers and encourage greater participation across all communities.

Improving support for limited English proficiency customers. PAs have been engaged in an effort to improve program processes, particularly with regard to supporting customers with limited English proficiency. PAs are going beyond providing marketing materials in multiple languages and are working towards providing more customer support for non-English speakers. For example, PAs have their Interactive Voice Response (IVR) phone system available in multiple languages. In addition, PAs recently surveyed their energy efficiency contractors to understand what languages contractors speak to plan for future program services such as home energy assessments in multiple languages.

Continuing to actively engage landlords. Lastly, PAs are seeking to engage more landlords in order to improve the efficiency of rental properties. PAs routinely make presentations at landlord associations. Based on the results of the research presented here, which highlights the particular challenge of encouraging participation in small multifamily buildings (3-9 units), PAs are making more targeted efforts to reach small landlords. The *Residential Nonparticipant Market Characterization and Barriers Study* found that these landlords are not necessarily well connected with landlord organizations, but they are attuned to considering their properties as investments. Therefore, PAs are preparing case studies with landlords that focus on energy efficiency's return on investment and promoting the value to landlords of participating in Mass Save programs.

Conclusions

Overall, the research presented in the *Residential Nonparticipant Customer Profile Study* and the *Residential Nonparticipant Market Characterization and Barriers Study* shows the challenges and remaining opportunities to engage populations that traditionally have not participated in energy efficiency programs. PAs are drawing on insights from evaluation studies and their own experience and creativity to develop new ways to engage these customers. Ensuring that energy efficiency programs serve all customers will benefit the customers themselves, and communities as a whole, as PAs work to reach ambitious energy efficiency goals. Going forward, PAs will continue to draw on the research presented in the studies described here to refine and expand their efforts to ensure access to energy efficiency programs for all customers, and to increase participation among all customer groups.

References

Belknap, S., S. MacDonald, B. Winner, L. Smith, and J. Juillerat. 2019. "Bridging the Rural Efficiency Gap: Expanding Access to Energy Efficiency Upgrades in Remote and High Energy Cost Communities." *Energy Efficiency* 1-3,9-12.

Marti, F, and S. Nowak. 2016. *Who's Participating and Who's Not? The Unintended Consequences of Untargeted Programs.* Washington, DC: ACEEE. www.aceee.org/files/proceedings/2016/data/papers/2_542.pdf

Mass Legal Services. 2011. *LEP Data Handout 1*, citing U.S. Census, American Community Survey, Detailed Languages Spoken at Home and Ability to Speak English for the Population 5 Years and Over for the United States, April 2010. https://www.masslegalservices.org/content/most-commonly-spoken-languages-massachusetts-lep-population

Navigant (Navigant Consulting Inc). 2017. *Energy Efficiency Program Customer Participation Study Prepared for National Grid.* rieermc.ri.gov/wp-content/uploads/2018/03/national-grid-2017-ri-ee-customer-participation-study-final.pdf.

NWPCC (Northwest Power and Conservation Council). 2018. *Northwest Under-served Energy Efficiency Markets.* nwcouncil.org/sites/default/files/Regional%20EE%20HTR%20Draft%20Report-NWPCC%20for%20Comment-2018-05.pdf.

Rubado, D., A. Griguhn, D. Novie, D. Menashe, F Gordon, and D. Ledezma. 2018. *2018 Diversity, Equity and Inclusion Data and Baseline Analysis.* http://www.energytrust.org/wp-content/uploads/2018/12/2018_DEI_Data_Baseline_Analysis.pdf.

Three[3] and NMR Group. 2018. *Low-Income Multifamily Health- and Safety-Related NEIs Study Preliminary Findings Report.* http://ma-eeac.org/wordpress/wp-content/uploads/TXC50-Low-Income-Multfamily-Health-and-Safety-NEI-Preliminary-Findings-Report_15OCT2018.pdf

York, D., S. Nowak, and M. Molina. 2016. *Expanding the Energy Efficiency Pie: Serving Serving More Customers, Saving More Energy Through High Program Participation.* Washington, D.C.: ACEEE. http://www.aceee.org/sites/default/files/publications/researchreports/u1501.pdf

Zhao, T., L. Bell, M. Horner, J. Sulik, and J. Zhang. 2012. "Consumer responses towards home energy financial incentives: A survey-based study." *Energy Policy.* v 47, p. 291-297.