Seeing the Forest and the Trees: Taking a Geographic and Household-Level Approach to Equity

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ABSTRACT

This paper explores the importance of combining geographic and customer targeting to equitably implement and evaluate energy efficiency programs. While federal and state initiatives often target geographic areas based on demographic and environmental indicators to reach areas where customers are historically underserved, this approach alone may not reach all underserved households. Many eligible households live outside designated areas, and many households within these communities do not match the demographic indicators of being underserved. By exploring program delivery and evaluation methods for the Mass Save® programs administered by the Massachusetts Program Administrators (PAs), this paper shows that supplementing community targeting efforts with specific customer targeting more effectively reaches a larger body of underserved customers.

The paper also summarizes key takeaways for implementers and evaluators when considering community and customer targeting. For implementers, it outlines practical ways to integrate these elements into program design. For evaluators, it explores how to make the most of imperfect census and household-level data to evaluate their impact.

Mass Save Equitable Program Delivery

In a continuation of longstanding efforts to increase equity in their energy efficiency programming, the Massachusetts Program Administrators (PAs) published the 2025-2027 Energy Efficiency and Decarbonization Plan in October 2024 and a compliance plan in April 2025. Along with decarbonization and improved customer experience, equity is one of the three main priorities, with an investment of $1.78 billion, including $1.2 billion in incentives for low- and moderate-income customers and $590 million for renters.

The PAs' equity efforts focus on promoting the fair and equitable distribution of benefits and burdens across all customers, upholding the needs of historically underserved customers and those with economic challenges. These efforts have evolved to reach customers in two distinct ways: 1) targeting geographic communities, and 2) targeting customer types. Below, we explore how the Mass Save programs have implemented and evaluated these two approaches.

Community Targeting to Narrow Service Gaps

In 2022-24, the Massachusetts Department of Public Utilities (DPU) defined targeted Hard-to-Reach communities (HTR)[1] as those with historically low participation and Environmental Justice

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[1] Per the D.P.U. Order on the PAs' 2022-2024 Three-Year Plans (D.P.U. 21-120 through D.P.U. 21-129), the PAs shall use the following three-pronged test to identify communities eligible for the PAs' targeted equity investment and outreach strategies.
Eligible municipalities must:
(1) be served by an electric and/or gas Program Administrator;

characteristics. Evaluations of the Mass Save programs compared HTR to non-HTR communities to reveal how service to them has changed over time. Figure 1 shows that during the baseline period (2013-2017), participation rates[2] in HTR areas were 25% lower than in non-HTR areas. By 2023, this gap had narrowed to 16%, suggesting progress in reaching HTR communities.
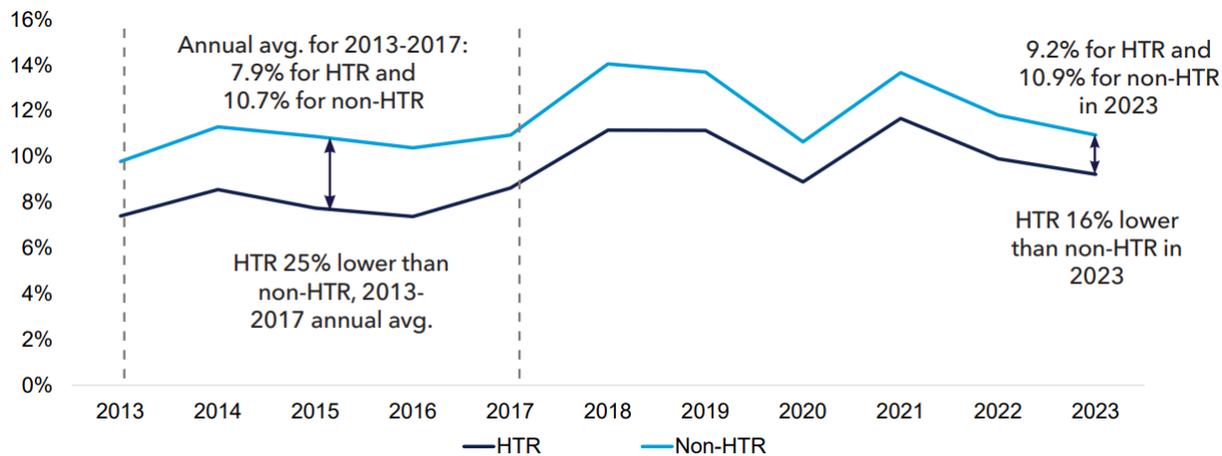

Figure 1. Location participation rate, HTR and non-HTR

Limitations of Community Targeting

While the figure above shows that community-based initiatives can increase equity by focusing on areas with a higher concentration of specific customer groups and low participation, they have three important limitations:

First, many customers with relevant characteristics live outside the targeted communities. For example, as shown in Figure 2 below, 53% of low-income households are located outside HTR areas. This means that focusing solely on HTR areas risks excluding a significant portion of the intended audience.

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(2) contain at least one environmental justice population as defined by the EEA Environmental Justice Policy; and
(3) have historically low participation rates defined as a combined consumption-weighted participation rate of 27 percent or less. (60 municipalities)
[2] Location participation rate is the ratio of participating locations (primary addresses representing buildings) over the total locations in the population.
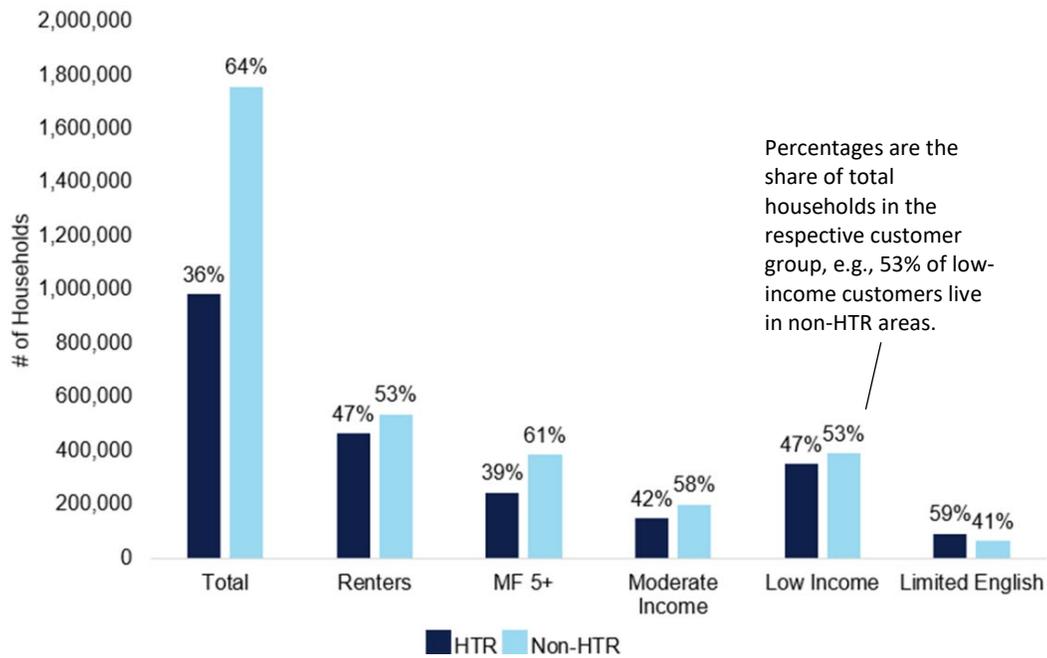
Figure 2. Number of households for key customer groups in HTR and non-HTR areas, 2022

Second, focusing on areas with a higher concentration of specific customer groups does not guarantee that customers with the characteristics of interest are the ones being served. Table 1 below provides insight to this by showing the median concentration of various customer groups in block groups across the state of Massachusetts. For example, the half of block groups with the highest concentration of low income has a minimum of only 25% low income. This indicates that areas that are more concentrated of low income, still have many non-low income households. If these block groups are served, it is not guaranteed that low income households will be served.

Table 1. Block group median levels for key customer groups

Customer group	Median split between low- and high-concentration block groups
Renters	30%
Multifamily 5+ units	11%
Low income	25%
Moderate income	13%
Limited English*	2%

Third, using participation rates to identify underserved communities may lead to selecting communities that don't align with program goals. For instance, including historically low participation rates in the criteria for HTR communities inadvertently prioritized seasonal communities with high vacancy rates, where low participation may be tied less to a service issue than to seasonal homes' low energy use (and correspondingly lower motivation to participate in energy efficiency programs). The map in Figure 3 shows the seasonal, recreational, and occasional vacancies by block group with blue border for HTR

communities. This map illustrates that a significant concentration of seasonal homes on Cape Cod, along the east coast, and in the far western part of the state are designated HTR communities.
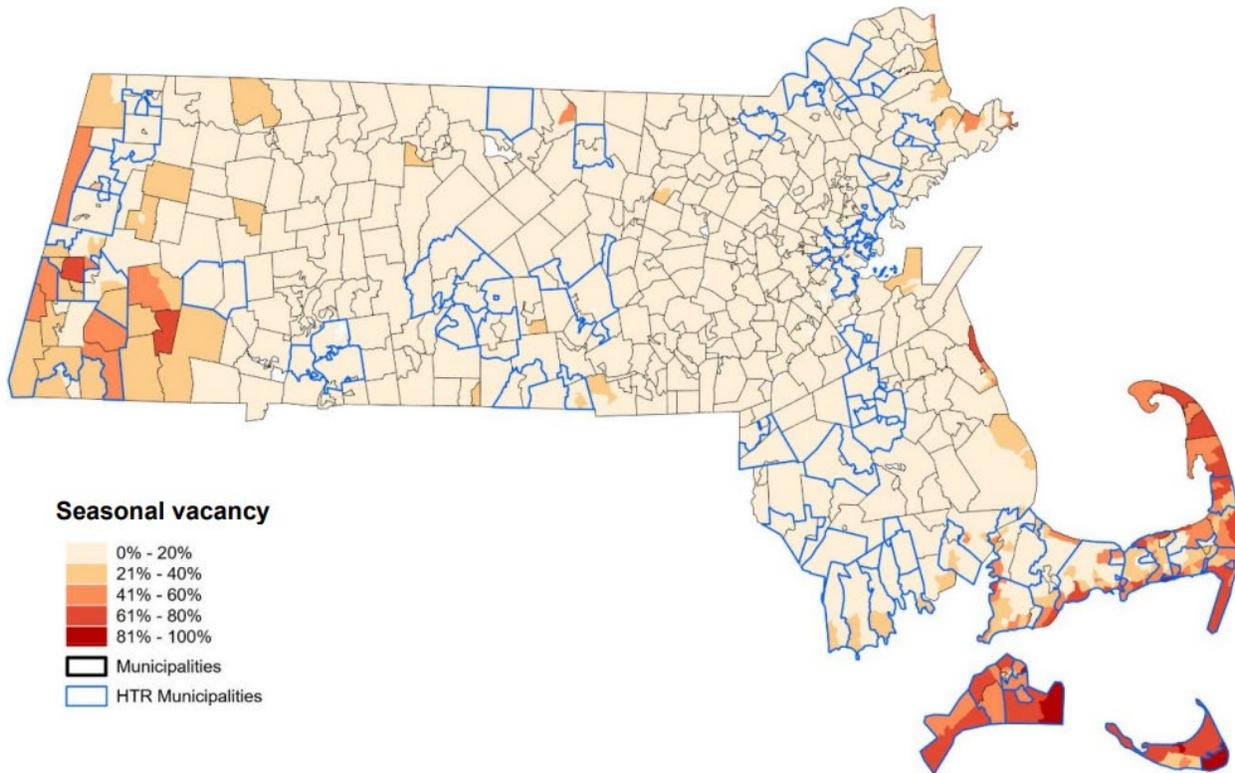

Figure 3. Percentage of households with seasonal vacancy by block group

Overcoming Limitations

Based on the findings above, in the 2025–2027 Plan, the PAs shifted their focus from HTR communities to Designated Equity Communities (DECs)[3]—areas with large renter and low- and moderate-income populations. While this approach prioritizes high concentrations of these populations and does not incorporate participation rate, it is still subject to the first two limitations above.

Targeting Customer Types

The PAs are also implementing customer-specific targeting approaches to reach underserved customers regardless of their communities of residence.

The 2025-2027 plan provides additional offerings to renters, low- and moderate-income customers, and customers who prefer to be served in a language other than English (LOTE). Renters are provided with no-cost weatherization and enhanced incentives. Low-income customers receive comprehensive services designed to reduce their energy burden, delivered through partnerships with local agencies and blended with other funding sources to maintain cost-effectiveness. Moderate-income

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[3] 2025-2027 DESIGNATED EQUITY COMMUNITIES (21 communities).
Criteria*: At least 35% Renters, At least 8,000 Renters, At least 50% LMI
*Note: The Cape Light Compact has a unique territory with different characteristics, and therefore the criteria for selection of Cape Light Compact communities differed.

customers benefit from expanded eligibility criteria, simplified income verification, and a facilitated (or "turnkey") delivery model. LOTE customers are offered translated materials, interpreter services, and multilingual staff.

Evaluating customer targeting efforts

This paper explores two ways of evaluating these customer level program initiatives including 1) using building level data to directly compare participation between customer segments and 2). Using American Community Survey (ACS) block group demographics and participation at the block group level to compare participation rates against the concentrations of various customer segments. Both approaches can be used in evaluating 1) whether customers are underserved, and 2) the impact that targeting certain groups has on their participation. There are pros and cons to both methods in terms of complexity, availability of data, readability, and accuracy, as explored in more detail below.

These analyses look at the time frame of 2019-2022 only to show a comparison of participation across customer groups. But similar to the community analysis in Figure 1 above, customer-level targeting can also compare two time frames to evaluate changes associated with program initiatives

Household level – Low income. The first approach to evaluating the participation of customer groups is with household data. Figure 4 below compares the participation rates of low-income and market rate customers. Low income participation rate was calculated as locations participating in the Income Eligible program, divided by locations on a low-income rate code. This figure also shows that low-income participation is lower than market-rate participation.
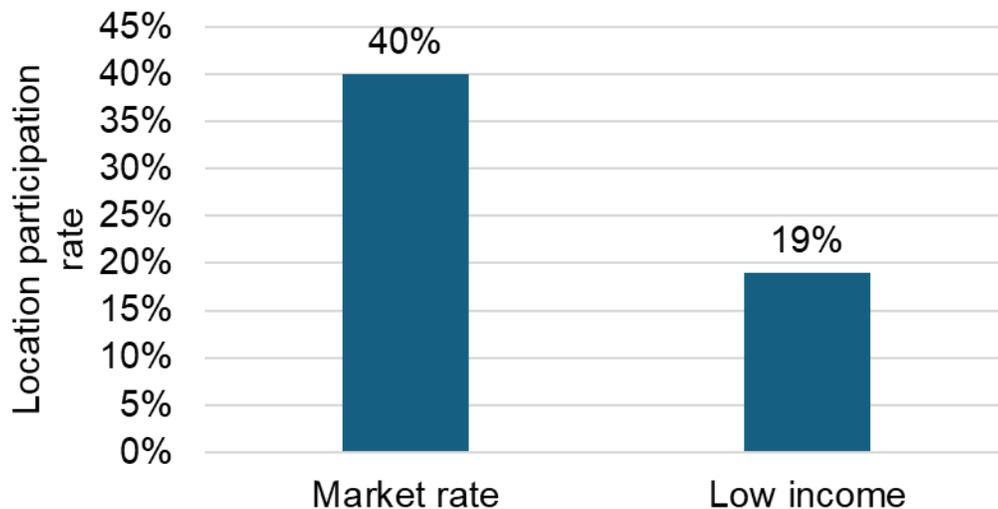

Figure 4. Cumulative location participation rate for low income vs market rate programs, electric and gas combined, 2019-2022 (2022 RNPS reference)

Using household-level data is the preferred approach when data is available, as it allows for direct and interpretable comparisons between customer groups. Data for Figure 4 is able to use only utility data, with the low-income participants flagged within program data, and total number of low-income households indicated by rate codes within billing data. If low-income rate codes are not available, another

method for determining the denominator is to use census data, which provides the total number of households by various demographic indicators.

Household level data is not always accessible and comes with its own set of assumptions. For example, this analysis assumes that all low-income participants are through the Income Eligible program, and that all low-income households are on the low-income rate code.

ACS block group analysis. The second way to evaluate the participation of customer groups is to use ACS data to estimate the number of households with specific socioeconomic indicators at the block group level. This data allows us to examine the correlation between the concentration of groups, like low-income households, and program participation. Assuming all else is equal, if low-income households have a lower participation level, we expect participation to decrease as their concentration increases, and vice versa.

Figure 5 shows electric and gas combined location participation rates from 2019-2022 divided into 2% increments of low-income concentration. This figure highlights the negative correlation between the concentration of low-income households in a block group and participation, suggesting low-income households have lower participation rate than market rate.
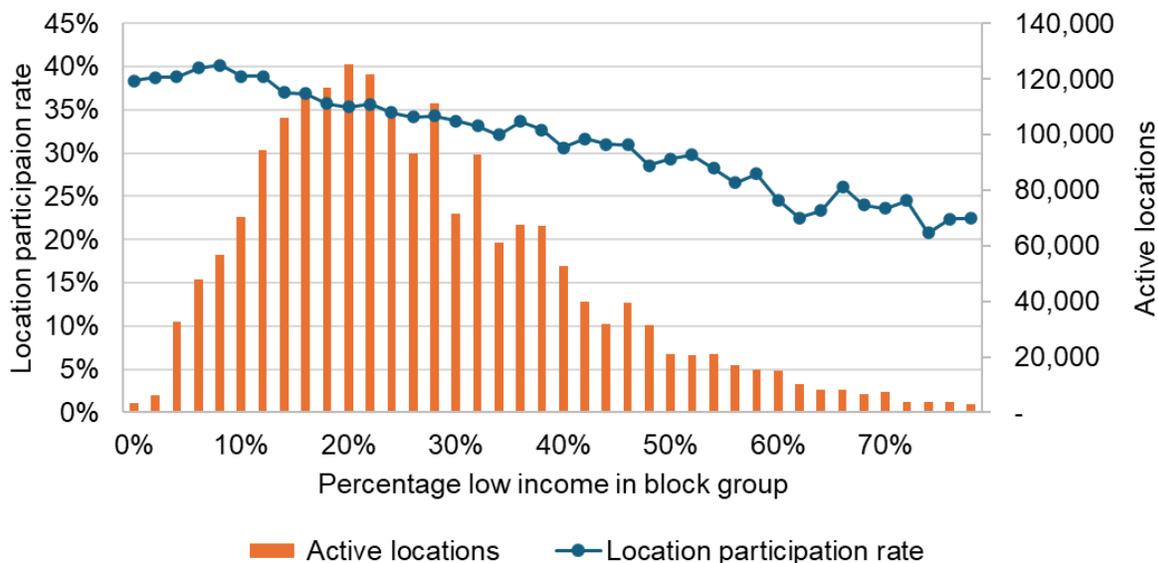

Figure 5. Cumulative location participation rate by concentration of low-income households in the block group, all programs, electric and gas combined, 2019-2022 (2022 RNPS reference)

The benefit of using ACS data to target customer types is that it is readily available and does not require program data to have demographic indicators at the household level. For example, Figure 6 below shows the electric and gas combined location participation rates from 2019-2022 compared to the concentration of renters within the block group (again in 2% increments). This figure also highlights a negative correlation suggesting low rented households have lower participation rate than owners.
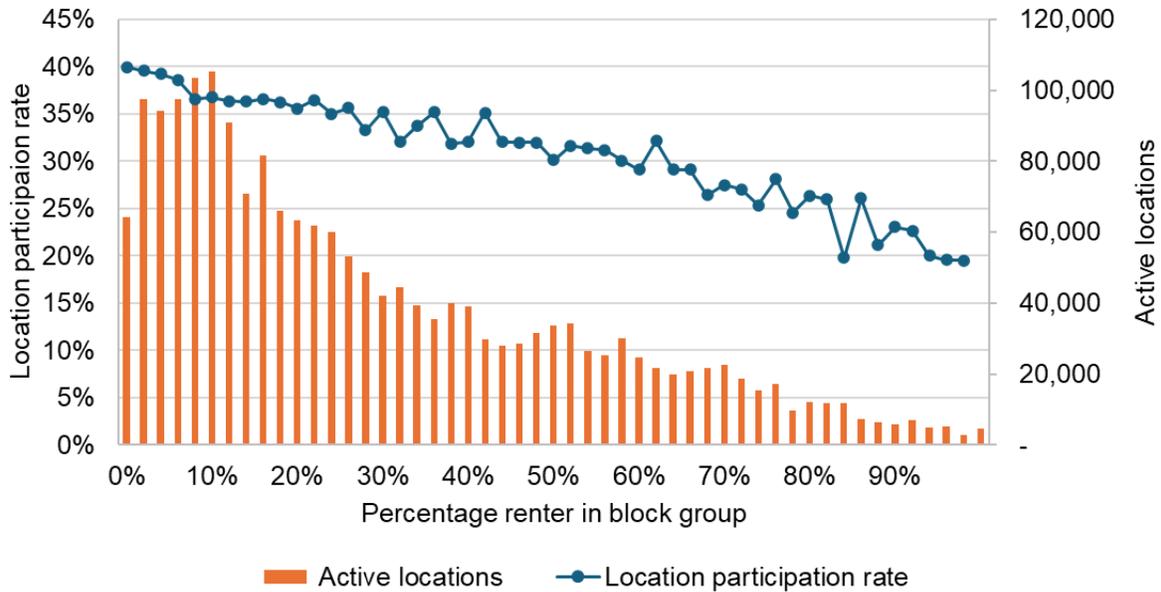
Figure 6. Cumulative location participation rate by concentration of renter occupied households in the block group, all programs, electric and gas combined, 2019-2022

While ACS data benefits from being readily available, it faces similar challenges to community targeting. One, there is uncertainty over whether customers with the targeted characteristics are the ones being served. Two, there must be an assumption of no confounding variables, or factors that influence the likelihood of program participation and the characteristics of the community, such as education levels, housing type, or access to transportation. If not accounted for, these variables can distort the analysis and lead to incorrect conclusions about who is being served. Furthermore, when looking at customer groups with lower concentrations, such as moderate income or LOTE (Table 1), the resulting correlation is likely to be less pronounced.

Conclusion

This paper finds that providing equitable program delivery involves targeting underserved communities and reaching underserved customers. Each of these approaches has limitations when used alone. Targeting communities without considering individual customer needs can leave many unserved. Focusing only on customers may leave underserved communities behind. When combined, these strategies reinforce one another to support more equitable program outcomes; both deserve attention from both implementers and evaluators.

Table 2 below summarizes key takeaways for implementers and evaluators across community targeting and customer targeting. For implementers, it outlines practical ways to integrate these elements into program design. For evaluators, it highlights the types of insights that can guide implementers in strengthening equitable program delivery.

Table 2. Driving equity: What Implementers and Evaluators can do

Key component	Implementors	Evaluators
Targeting communities	• Ensure that program goals, data availability, and equity priorities drive parameters for identifying targeted communities • Be mindful that underserved customers may exist outside these areas, and that a high concentration of priority customers does not guarantee those customers are being reached.	• Compare participation in targeted vs non-targeted areas and note any changes corresponding with program targeting efforts
Targeting customers	• Define customer-specific criteria (e.g., household income level, renter status) for enhanced incentives and comprehensive services • Track participation of priority customer groups at a measure level to support evaluation	• Use household-level data when available, as it is the most accurate way to represent customers served and validate results. • When household data is not available, use block group ACS data and program activity to estimate how various demographics are served.

References

DNV 2020. Residential Nonparticipant Customer Profile Study. MA19X06-B-RESNONPART_Report_FINAL_v20200228B

DNV 2023. 2023 Residential Customer Profile Study Results Brief. MA25X08-BR-CUSTPROFILE2023-2013-2023-RCPS-Results-Brief

Executive Office of Environmental Affairs. "Environmental Justice Populations in Massachusetts." https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts

Massachusetts Program Administrators 2024. The Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan. https://www.masssave.com/-/media/Files/PDFs/Mass-2025-2027-Energy-Efficiency-Decarbonization-Plan.pdf