

The Truth Hertz: Barriers to Equitable Electrification in the San Francisco Bay Area

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We explored potential barriers to electrification to develop an effective and equitable strategy for implementing building electrification in MCE's service area. This poster will present findings from a customer survey and energy consumption analysis conducted with particular focus on historically underserved populations, such as low- and moderate-income households, renters, and residents in multifamily and manufactured homes.

The customer survey focused specifically on space and water heating, cooking, and clothes dryers, and gathered information about the potential for electrification, interest in electrification, key features considered for appliance purchases, and barriers to purchasing and installing new appliances. By asking customers directly about their ability to and interest in replacing existing gas appliances with electric ones, the research sought to provide a more comprehensive understanding of the barriers that program administrators will face when recruiting customers for electrification programs.

Our analysis reveals that electrification faces multiple barriers in underserved communities, including general lack of interest, knowledge gaps, cost concerns, and a reactive replacement cycle of equipment. Specific findings include:

- Respondents are most likely to replace their heating system and water heating system when their system breaks or becomes unsafe, indicating that these purchases may be primarily driven by necessity, leaving little time for researching alternatives, resulting in a reactive replacement cycle.
- The majority of survey respondents have not seriously considered replacing their current appliances with electric versions. Of those who have given it some thought, most of them have not taken further steps to make the change. This suggests that respondents tend to have a more passive interest rather than active interest in electrification.
- The main barriers to electrification are cost and affordability and the lack of knowledge or time to research different electric appliance offerings.
- There is limited interest from residents in participating in a program that would help them replace their gas appliances with electric ones, with only a small portion of respondents extremely interested in such an offering.

We also used residential building simulation models developed by the National Renewable Energy Laboratory to estimate the impact of electrifying key appliances on energy consumption by customer segment. We applied current rates and greenhouse gas emissions multipliers to estimate the associated change in bill costs and carbon emissions. This analysis helped us identify which customer segments would be best suited for electrification, based on the relative increase or decrease in energy costs. We observed a cumulative bill decrease for fuel-switching electrification scenarios overall, with mobile home and low-income groups exhibiting the greatest potential for savings out of all customer segments. Replacing a gas water heater with a heat pump water heater led to the largest overall bill decrease.

This research gathered a diverse spectrum of perspectives, providing a valuable framework for assessing equity concerns during the design and implementation of electrification programs.