

Exploring the Characteristics of Low-Income Households with the Highest Energy Burdens: One Size Does Not Fit All

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ABSTRACT

Low-income energy programs serve income-eligible households with a variety of free efficiency upgrades, discounted rates, and energy education. Nationally, these programs have spent billions of dollars to ensure that struggling households can afford their basic energy needs while maintaining health, comfort, and safety. Eligibility depends on individual program criteria; in some states, more than a third of the residential population qualifies for these programs.

California, a populous state with mature low-income energy efficiency programs and aggressive participation goals, completed an assessment of low-income households' needs in 2016. The study incorporated multiple methods including a telephone survey of 900 low- and moderate-income households, focus groups of households with high energy burden, and analysis of utility data and payment practices.

This paper presents results on one of the key objectives of the study, which was to highlight characteristics of households with the highest energy burdens (due to low income or elevated usage). Results include descriptions of these households' income levels, resources used to make ends meet, relative degrees of struggle to pay energy bills, variation in energy consumption, practices to save energy, and self-identified needs for efficiency measures. This paper draws on 2016 data, as well as secondary data, to provide a deeper understanding of the circumstances, needs, and opportunities to assist households. The paper will be especially useful for utilities and administrators of low-income programs and evaluators in need of baseline data and market characterizations to inform low-income program design, policy, and evaluations.

Introduction

Low-income energy programs across the United States serve low-income households in a variety of ways including free efficiency upgrades, discounted rates, and energy education. Nationally, these programs have spent billions of dollars to ensure that struggling households can afford their basic energy needs while maintaining health, comfort, and safety. Eligibility depends on individual program criteria; in some states, more than a third of the residential population qualifies for these programs.

While these programs broadly address low-income households, the California-based research we present in this paper focused on understanding the needs and challenges of the low-income population, high burden population. Household energy burden is calculated by taking the dollar amount of household energy costs and dividing this number by household income. Specifically, the research presented here defines households with high energy burden as those whose energy burden places them in the upper quartile of low-income households. In temperate California, this threshold is approximately 6 percent of household income, while those with comparatively high energy burden in other parts of the country tend to spend a proportionately higher share of income on energy and, depending on the region, face comparatively less financial strain from other necessities.

Households can have high energy burdens due to very low incomes, very high energy usage and costs, or a combination of both. By looking at high energy burden customers, we are looking at customers with arguably the greatest needs (due to very low incomes) and with higher potential for energy savings (due to possible high energy use).

Lower incomes and higher energy costs (and usage) seem to work together more or less equally to cause high energy burden. A statewide survey of low- and moderate-income households (up to 200 and 400 percent of the federal poverty level, respectively) in California conducted as part of our study revealed that households with higher energy burdens, on average, have both lower incomes and higher energy bills (as shown in Table 1). While either low income or high energy costs can lead to a high energy burden for any given household, neither seems to be the singular factor driving energy burdens across the population.

Table 1. Average energy burden, income, and bill cost by burden category

Energy burden category	Average energy burden	Average annual income	Average annual energy bill
High burden households (n=138)	13.5%	\$15,336	\$1,689
Moderate burden households (n=130)	4.9%	\$22,947	\$1,140
Low burden households (n=245)	2.4%	\$29,024	\$733
Very low burden households (n=46)	0.7%	\$29,256	\$233

Source: 2016 telephone survey for California Low Income Needs Assessment. Household-reported data.

This paper explores the needs of low-income households with comparatively high energy burdens to understand what program approaches may work best for helping these households save energy. Through our research, we learned that these households are willing to take action to save energy, but only up to a certain point. That point differs from household to household and is related to lifestyle, needs, and household member preferences, which may vary. Through our discussions with high energy burden customers, we were also able to identify existing strategies that these households use to save energy and pay their bills, along with misconceptions about energy usage that reveal where additional education may be beneficial.

Program and Study Background

This research stems from a broader needs assessment of low-income households in California to help the California investor-owned utilities (IOUs)¹ improve two statewide low-income programs that aim to serve income-eligible utility customers: the California Alternative Rates for Energy (CARE) Program and the Energy Savings Assistance (ESA) Program (Evergreen 2016).

The CARE Program is offered by all four of the state's IOUs and provides a monthly discount on energy bills for income-qualified households. The household income eligibility requirement for CARE is based on 200 percent of federal poverty guidelines. In 2016, the CARE Program budget across the four IOUs surpassed \$1.2 billion (CPUC 2014). Enrollment includes self-certification with mandated verification by the IOUs for a certain percentage of the total CARE residential population annually. Customers can enroll online, by mail, over the telephone, or through a community-based organization (CBO). Through categorical eligibility, customers who are enrolled in one of several public assistance programs are also eligible for automatic enrollment in CARE, regardless of whether they meet the

¹ The IOUs are: Southern California Edison, Southern California Gas, San Diego Gas & Electric, and Pacific Gas & Electric.

income guidelines. Households enrolled in CARE must recertify their eligibility every two years, or every four years if they are on a fixed income.

The Energy Savings Assistance (ESA) Program is offered by all four IOUs and provides no-cost weatherization, energy efficient appliances, and energy education services to low-income households that meet the program's income and other household eligibility requirements. Total program budget across all four IOUs in 2016 exceeded \$390 million. The ESA Program served over 346,000 households (both qualified renters and homeowners, in all housing types); services provided may include attic insulation, energy efficient refrigerators, evaporative coolers, air conditioners, weather stripping, caulking, low-flow showerheads, water heater blankets, and door and building envelope repairs. The program also provides referrals to other income-qualified programs. The ESA Program's objective is to help income-qualified customers reduce their energy consumption and costs while increasing their health, comfort, and safety in the home.

Methods

Understanding unique needs and circumstances of customers with high energy burdens was one of the study's research objectives. To inform program administrators' understanding of customers with high energy burdens, we drew primarily on two data sources: (1) focus groups of low-income households with energy burdens that fell in the upper quartile in the two geographic areas selected for the discussions (the Central Valley and the South Inland regions of California), and (2) responses to our telephone survey from the subset of low-income respondents who are in the top quartile of energy burden (compared to those who are not in the top quartile). The telephone survey provided quantitative data from a large and representative sample of California customers in selected zip codes with a wide range of energy burdens, including those at the high end. The focus groups were intended to provide a deeper, qualitative understanding from a smaller sample of high energy burden households in warmer regions.

We conducted four focus groups with a total of 29 low-income customers with high energy burdens in Riverside and Fresno (two focus groups in each location) during the week of June 20, 2016. Our geographic selections were based on:

- The availability of focus group facilities;
- Likely concentrations of sufficient eligible households within convenient commuting range of the focus group facilities;
- Inclusion of varied geographic areas and demographic targets in the state;
- Inclusion of several IOU service territories; and
- Inclusion of some groups in the San Joaquin Valley.

The focus groups covered health, comfort, and safety concerns; concerns about energy use and bills; interest in and ability to take action through program participation or self-directed efforts; insights into ways to engage customers in the programs; and measure needs.

We used a three-step process to develop and pull the sample and recruit high burden customers for the focus groups. We began with a sample of customers on the CARE rate in the Fresno and Riverside areas, which was provided by two IOUs that serve these areas, Southern California Edison and Pacific Gas and Electric Company. We narrowed that sample to households with an elevated probability of experiencing high energy burden based on data provided by the IOUs, Census data, and some simple modeling. Then, we recruited from that list with some additional screening to ensure our focus group participants faced high energy burdens and represented a mix of household types.

We also conducted 905 telephone surveys with households in geographic areas with elevated concentrations of low-income and moderate-income IOU customers. We defined low-income

households as those whose income and household sizes place them at or below 200 percent of the federal poverty level (FPL), consistent with the ESA and CARE guidelines, and moderate-income as between 200 and 400 percent of the FPL. We utilized Athens Research data to select a stratified random sample of customers from zip codes known to have high percentages of low-income and moderate-income households (Athens 2015). We developed a sample design that maximized the concentration of low- to moderate-income households, minimized cost, and encompassed a wide enough geographic area to be representative of the state’s low- to moderate-income households.

We show the survey completes by income category in Table 2. The zip codes included in the sample frame included 53 percent of all seven-digit zip codes served by California’s IOUs and 71 percent of the low-income households they serve.

Table 2. Survey completes by income category

Income category	Total survey completions	Percent of total
Low (up to 100% FPL)	233	26%
Low (100% - 200% FPL)	329	36%
Moderate (200% - 300% FPL)	164	18%
Moderate (300% - 400% FPL)	68	8%
High (over 400% FPL)	111	12%
Total	905	100%

In order to boost the response rate and minimize non-response bias, we mailed out a letter in advance of the survey to explain the study and request sampled households’ participation. We also conducted the survey in both English and Spanish, and provided a \$25 incentive for all respondents. We developed sample weights for the survey data to weight the data in proportion to the population. Sample weights for each respondent were based on the ratio of survey completes to the total population in each income category.²

The study results that follow draw on the focus groups and the household survey.

Household Perspectives on Juggling Needs and Bills

Energy bills are just one of many bills that households pay each month. In order to understand what people estimate their bills to be and how they prioritize them, we asked focus group participants to complete a number of exercises that revealed their thinking behind bill payments.

To introduce the topic of how energy bills factor into their overall needs and priorities, the research team asked focus group participants to estimate their typical summer and winter bills. Almost all were able to provide plausible estimates for summer and winter, but they had an overall tendency to overestimate their bills (compared to actual amounts, based on analysis of utility data). In particular, Riverside participants overestimated their summer and winter electric bills by about a third, while Fresno participants’ estimates were closer to their actual bills. This result is consistent with other research that has compared other perceived and actual energy bill amounts (Pigg et al. 2016) and has implications for usage feedback strategies and framing of messages to customers. Informing customers that their bills are lower than they thought could potentially result in increased energy use.

² The overall response rate for the survey was 10 percent. Contact information was incorrect or insufficient for 33 percent of our utility-supplied sample (mostly due to disconnected telephone numbers), refusals and early terminations accounted for 12 percent of the sample, and 45 percent could not be reached over multiple attempts (no answer, busy signal, and voice mail).

Next, we asked focus group participants about how they prioritize various bills, including bills for cell phones, auto loans, rent, energy, and cable/internet. Focus group participants prioritized rent and auto loans before energy bills; however, energy bills were identified as a higher priority compared to cable/internet and cell phone bills. Participants seemed to be strategic in prioritizing bills for essentials such as housing and transportation for which lack of payment can result in the most serious consequences, and they seemed aware that IOUs will work with them on payment arrangements. Conversely, they do prioritize energy bills before less essential services such as cable when asked what they do if they have to leave bills unpaid (with more than half saying they would pay their energy bill before a less essential service).

We then asked focus group participants to conduct an exercise, which required placing a sticker on a chart to help them compare the difficulty of paying an energy bill to the prioritization of energy costs when they needed to cut back. Figure 1 shows that the degree to which focus group participants struggle to pay their energy bills varies, but energy usage is not often one of the first things to be cut back when money is scarce. This is especially true for gas bills, which are generally lower than electric bills in warmer regions (and therefore less impactful on household budgets). The sticker placement (shown in Figure 1) aligns with what the research team heard in subsequent discussions regarding difficulty of cutting back on gas use. Focus group participants thought of most gas end uses as either necessary or had already cut back by cooking less or using blankets. Interestingly, water heating was not often associated with gas bills when focus group participants were asked how they could reduce their gas bills.

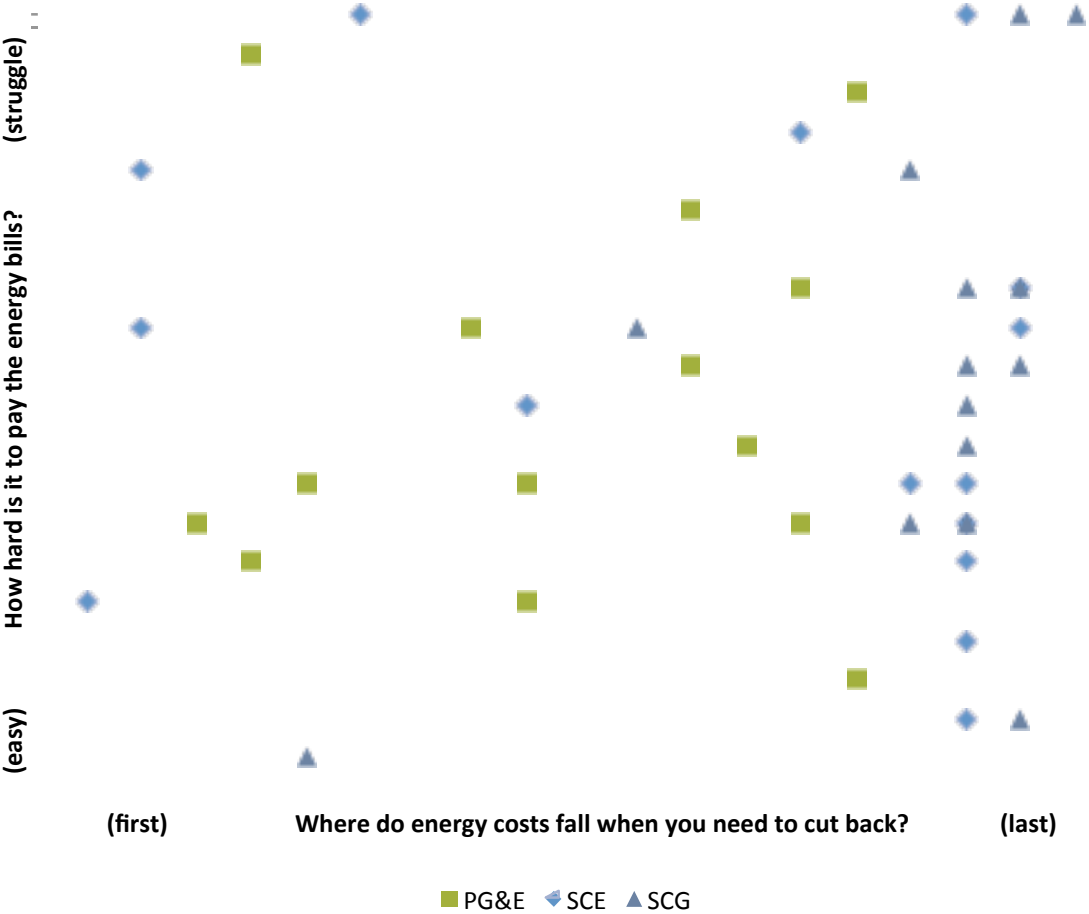


Figure 1. Difficulty paying bills and priority on energy bills when needing to cut back (focus groups, n=29)
 2017 International Energy Program Evaluation Conference, Baltimore, MD

Next, focus group participants shared a number of thoughtful approaches to paying their bills and managing resources to make ends meet. They were aware of a number of tools to help manage their bills including assistance from the Salvation Army (Relief for Energy Assistance through Community Help or REACH) to pay bills, Utility Medical Baseline programs, and IOU programs for level payments. One participant had set up her own informal level payment program in which she always pays the same amount for her household's bill based on the average of the prior year's bills.

In general, focus group participants seemed to understand that they could work with these various resources (including the IOUs) to help them manage payments. One went as far as to say that part of the reason they are willing to prioritize paying their electric bill is due to Southern California Edison's ability to extend payment due dates. *"What I like about Edison is that they will give you an extension. The reason I'd prefer to pay first is that they're working with you rather than flat out cutting your electricity so it is better to meet that commitment."*

Taking Action but Drawing a Line — Efficiency Needs and Opportunities

The focus group setting allowed for participants to openly share their strategies for lowering their energy bill. These discussions revealed that participants have taken a number of steps to reduce their usage, but that there are limiting factors in their approach, including less attentive household members, a need for a certain level of comfort (which varied from person to person), and a need for additional energy education surrounding high energy using activities. The research team found the same to be true for low-income customers in our telephone survey who are in the top quartile of energy burden (compared to those who are not in the top quartile); these customers are taking action in their homes, but there is a minimum threshold of comfort and convenience which they choose not to cross.

To get an overview of what low-income customers already do in their households that saves energy, we asked telephone survey respondents to let us know if they do the following activities always, sometimes, or never:

- Turn down or turn off the heat at night or when they leave the home.
- Turn down or turn off the air conditioning at night or when they leave the home (if they have air conditioning).
- Turn off lights when not in use.
- Turn off electronics like TVs and computers when no one is using them.
- Limit showers to five minutes or less.

Each respondent was given a score based on how many of these activities they do and if they do them always, sometimes, or never. About 20 percent of all low-income respondents reported routinely taking all (or nearly all) of these steps, 24 percent routinely conduct most of these steps, 50 percent take these steps just some of the time, and 5 percent do so irregularly at best.³ Differences in self-reported practices were insubstantial for households at different energy burdens except for those with the lowest energy burdens.

Differences in these energy conservation efforts between households with higher or lower energy burdens were small, suggesting that those with higher energy burden levels are not doing more

³ In classifying survey respondents into categories, we assigned respondents who reported always engaging in all of the activities (unless they did not have an air conditioning unit) in the "high" category. The "elevated" category contains those who answered 'sometimes' to one item (usually shower length) but 'always' to all remaining energy-saving actions. Those who answered, on average, that they do an activity sometimes, were put in the "medium" category. The remainder of respondents with valid responses were placed in the "low" category.

or less to conserve energy using the basic conservation strategies included in the survey. Focus group discussions lend themselves to a more granular discussion of activities customers are willing to perform.

Heating and Cooling

Focus group participants reported a number of approaches to managing the heating and cooling needs within their homes. This included limiting the spaces in which household members spend time in order to minimize the area needing to be heated or cooled, using blankets or jackets, closing blinds, and switching between air conditioning, open windows, and fans. Focus group participants shared some specific strategies they use with each other, such as adding ice to an evaporative cooler to increase efficiency, visiting a friend's house to avoid additional energy expense from cooling, and getting equipment serviced to work more efficiently.

Cooking

Cooking came up as a topic during the focus groups in two ways: as an activity to cut back in order to limit gas use, and as an activity that could be leveraged to keep the home warmer or cooler. Participants reported changing their cooking habits to use less energy and keep the home cool, including grilling outside, using appliances such as a toaster oven or an electric grill to avoid using the oven, cooking early in the day before it gets warm, and making meals that can last for multiple dinners.

The focus group participants generally focused on concerns related to keeping the home cool, likely due to the timing of the focus groups (during the summer of 2016), but a few also mentioned that cooking helps to keep the home warm in the winter. One focus group participant reported that they *"...don't have to heat as much because everything is baked [in the winter]"* and another said, *"about cooking... it is great in the winter. It does heat up the house."*

Despite mentioning changing cooking habits as a way to reduce gas costs or heating and cooling costs, focus group participants acknowledged that cooking at home helps them to save money that they would have spent eating out (which was generally acknowledged to be the more expensive option). Eating out is an example of an energy saving behavior that can help reduce one expense, but may increase another.

Household Member Challenges

Focus group participants reported challenges in saving energy related to behaviors of other residents in or visitors to their households. Many shared how other members of their households affect their energy usage.

Some said they worked to change behaviors of others to match theirs:

- *"My grandkids... love taking showers so if I allow them to, they will use up all the hot water, so I shut off the hot water heater while they're in the shower... They don't pay the bill so they don't conserve."*
- *"My kids are always moving around... leaving the lights on, radio on, TV on, not closing the door when the AC is on. I don't know how to keep telling them and they keep doing it."*
- *"I'll just tell my kids to put a sweater on."*

Others accepted that some of their household members have different preferences than they do themselves.

- *“My wife keeps the TV on, and since I pay all the bills, she kind of is like whatever, you know? I used to [say something] but... you know, that’s my wife. What can I do?”*
- *“If it is just me, I put it at 80. With my grandson there I put it at 77.”*

A couple of participants noted that they adopted energy saving habits from other people in their past living situations, including one who had an uncle who would always make them turn off the lights, and one who had a mother who passed along energy saving habits to him, who now works to engage his roommates in energy-saving behaviors.

The Extent of Behavioral Changes

The focus group format allowed for participants to express what types of behaviors they were or were not willing to adopt to save energy. This varied from person to person, and focus group participants justified their unwillingness to take on certain behaviors while acknowledging that they were aware that their actions would affect their energy costs. The tradeoffs between household harmony, added comfort (which may be related to health), and convenience were all worth the higher bill for some participants:

- *“If it is too hot, you want to turn the air on, and if it is hot everyone gets grouchy, you don't want everyone like that.”*
- *“AC to me is important, but the way I see things is I don't drink, smoke, ... I try not to eat out... I save in other stuff. I don't buy expensive clothes. But AC to me, I like that.”*
- *“I’m sure everyone could unplug everything, but realistically none of us are going to come back home and plug it all in.”*
- *“If I don’t use the AC then I can’t sleep.”*
- *“I don’t make a lot of money and I don’t see where we could cut back. I’m not willing to be miserably hot and I need to wash my clothes.”*

The telephone survey results are also helpful in understanding if low-income respondents feel like they have already done all that they can do. The telephone survey responses to questions about attitudes concerning energy conservation suggest that at least a share of households recognize that there is room left for additional conservation. For example, 84 percent of low-income respondents agreed that they have to conserve energy at home because they cannot afford to pay higher utility bills, but only 64 percent agreed that they only use electricity when it is really needed. (Responses were not different across energy burden categories.) The focus group format allowed us to get households to describe the kinds of energy-saving practices they currently *do*, those they think they *could do* but are not *willing* to do, and those they think are *infeasible*.

Usage Dictated by Medical Need

A third of the focus group participants had someone with a health issue in their household. Most who reported having someone in their home with medical needs were aware of or were on the medical baseline program, which provides financial assistance to residential customers that have special energy needs due to qualifying medical conditions. Many of the medical needs we heard about required the home to be conditioned to a certain temperature; this was true for a variety of medical issues including asthma, diabetes, and seizures. Although issues related to age did not emerge prominently in the focus groups, tolerance for temperature tends to be reduced for young children and older adults. Indeed, our statewide survey found that households were more likely to report that family health would suffer if they heated their homes less (50% among households with seniors compared to 39% percent of

those without), although we did not see a comparable result for cooling, where the share of both groups reporting an inability to cool less was in the mid-40 percent range.

Medical equipment was reported to limit the ability to take advantage of the ESA Program evaporative cooler measure that was offered to one participant due to their child's asthma (since the evaporative cooler would bring in outside air). One focus group participant reported that the oxygen machine that a household member uses heats up the space that it is in. They keep it in one room with the doors closed whenever possible.

Similar to the focus groups, a third of the telephone survey respondents had someone in their household with a permanent disability related to mobility, hearing, vision, development or psychological conditions, or chronic disease. To help the evaluation team better understand how certain disabilities may require additional energy use through heating and cooling, the telephone survey included a question about how the disability may require a home to be heated or cooled more than would be necessary otherwise. Between 59 and 77 percent of households with disabilities (varying by disability) reported that the disability required additional heating and cooling.

A Need for Education — Misconceptions About Energy Using Equipment and Behaviors (TVs, ACs, and Time of Use (TOU) Rates)

The focus group discussions revealed that while participants had a fairly strong understanding of their energy usage and ways to reduce bills, they also identified a need for education that would help to clarify some misconceptions. These misconceptions included:

- **How much electricity is used by televisions.** Many reported that television sets were one of the main contributors to their energy usage. In reality, televisions are estimated to be a relatively low percentage of all residential usage.
- **How to best use air conditioning.** Some thought it best to keep air conditioners at a higher setting, while others had a variety of other perceptions about the best (and most efficient) way to manage air conditioning. Others also made an effort to use more localized air conditioning in lieu of central systems. *"I use the portable one to save energy. I want to know if it saves energy to put it in the room where you're sleeping."* Another also had questions about which is best, and asked *"Is it better to leave it on or turn it off and turn it back on? I want them [the utilities] to tell me what is best."* Due to the timing of our focus groups (summer), the participants concentrated their discussion on air conditioning, but we believe there may be a similar level of uncertainty around heating in the winter.
- **How water and gas usage are tied together.** When focus group participants were asked about what activities and end-uses accounted for their gas usage and bills, some brought up cooking and space heating but left out water heating. *"I don't know how you could waste gas."* This was not the case across the board, as some focus group participants reported gas usage due to hot water used for showers, laundry, and washing dishes.
- **How some items use electricity when plugged in, even if "off."** There was confusion among some participants when other participants shared tips about unplugging equipment when not in use. Many reported that unplugging items is inconvenient, specifically if they are hard to reach. *"I unplug things under the counter or toasters or things that are easy to do. I'm not going to get behind a TV..."* Education about tools such as smart power strips that make it easier to reduce plug load (as well as education about which devices are most likely to use meaningful amounts of electricity when off and which are not) could be beneficial to this group.

The same discussions that revealed the misconceptions about energy usage also exemplified the types of word-of-mouth information sharing (about programs, opportunities, tips, etc.) that were

revealed in other parts of the study (involving discussions with community-based organizations about hard-to-reach audiences). When one participant would bring up a resource that others did not know about, other participants would actively ask questions and show interest in the topic. This may be indicative of how they approach information sharing in neighborhoods and in other social settings. In fact, prior research involving the federal Weatherization Assistance Program had found that word-of-mouth was a key vehicle for information sharing among eligible households (Rose, Hawkins, and Tonn 2015).

Past reports on energy education and behavior change helped inform our thinking about opportunities to provide customized energy education that is more likely to lead to reduced energy consumption and bills.

In looking at behavioral literature, there are existing recommendations regarding how to best engage customers, including regular interaction and communication and customer pledges and goals to create greater commitment by the household (Schick and Goodwin 2011). The same literature also included recommendations that community-based interventions be used to leverage social engagement and motivate households, and suggested that customer information-sharing (as we saw in the focus groups) about discoveries on how to save energy can be effective. Another study (Westberg and Richardson 2013) recommended that assessors pick a limited number of energy-saving suggestions for each household and that households get follow-up information in the form of newsletters or texts.

Program Design by High Burden Customers

The focus group moderator asked all participants to imagine they were on a panel for the California Public Utilities Commission (CPUC). They were then asked to help brainstorm ideas to help serve the low-income community and to react to ideas that the focus group moderator presented to them.

There was a high level of appreciation for existing utility programs and a sense that the current offerings meet a lot of needs. Ideas and feedback provided by the focus group participants included additions to current programs, high interest in usage alerts, additional energy education, solar power offerings, and tips on where the utilities could advertise.

- **Usage alerts.** Usage alerts received a very enthusiastic response from focus group participants. Many compared these to alerts they get from their cell phone companies, and saw them as a way to help keep their bills consistent with prior bills and to encourage household members to help them save money on their bills. From the telephone survey, we know that 59 percent of low-income respondents reported having regular Internet access *and* that they use their cell phones as much as, if not more than, their computers to access the Internet. This shows that at least 59 percent of the targeted customers (likely more, given that this is just a subset of respondents out of all those who claimed to have regular Internet access on their phones) could use such a usage alert tool. Awareness of existing usage alerts offered by some IOUs appeared to be low, however.
- **Additional education.** Focus group participants were interested in energy education that goes beyond standard energy-saving tips that may apply to a broader group. They prefer tips that are customized to their household. *“Pamphlets you can ignore, but if someone comes in and shows them what they can save, no one doesn’t want to save money.”* One focus group participant noted that this sort of education happened during their initial ESA visit. *“We talked for two hours, and she was telling me all we can do, like putting window tinting.”*
- **Solar.** Many focus group participants were interested in customer-sited solar that is supported by the IOUs, because they think it would lower their bills. Focus group participants cited current barriers to self-funded solar including upfront costs, concerns regarding repair costs, and that

some do not own their home. One focus group participant suggested that it would be better if a utility offered them solar rather than third-party providers because “*you know they are going to be reliable.*”

- **Advertisement locations.** The Penny Saver weekly ad publication that comes in the mail was the most frequently mentioned place where participants suggested that utilities advertise their programs. Many focus group participants reported reviewing these each week. Other suggestions included a community day where a utility sponsors admission to a public pool where they can share messages about cooling off, television commercials, and having a utility representative in locations where people look for jobs or get assistance such as a Social Security office.

Conclusions

The insights from the focus group discussions and our examination of high burden telephone survey respondents highlight several implications for program design, delivery, and policy considerations. Some details of the discussions may also prove helpful to program implementers to build on their knowledge of high burden customers.

Examination of high burden customers suggests that:

- There is interest in more extensive and customized energy education. While utilities are seen as a source of information already, high burden customers expressed interest in more detailed and household-specific energy-saving suggestions. Furthermore, they expressed confusion and misperceptions about the most efficient way to cool (and heat) their homes and held some misconceptions about which end uses make up the bulk of their energy use (or, more importantly, which offer the greatest opportunities to realistically reduce consumption). There is clear interest in managing energy costs among high burden customers and in additional insights from their energy providers in practical, home-specific approaches that build on (or correct) the customers’ existing practices.
- Usage alerts generated enthusiasm among the focus group participants and are a potentially helpful energy education tool if structured with customized tips. Such usage alerts could be offered where not yet available and marketed more effectively where they are available. Usage alerts could be real-time, scheduled during billing cycles, or triggered by usage levels and customer goals (or generic goals in the absence of customer-provided usage and bill targets).
- Utilities may consider ways to establish ongoing engagement with low-income customers so participation and enrollment become a customer-utility partnership or relationship rather than a one-time transaction. Elements of this ongoing relationship could include information such as newsletters and usage alerts, and on-going services such as replacements of energy-saving light bulbs upon burnout or check-ins on appliances that were provided by a utility to ensure they are still operating efficiently. The customer-utility partnership could even be communicated in a way that establishes a reciprocal expectation that the utility help the customer with reduced rates and the customer does what he or she can to reduce usage. Commitments from customers to this effect at sign-up would leverage behavioral theory to spur behavior change and could help households where internal dynamics stand in the way of more conservation-oriented energy practices.

While general residential consumers often seem to react only modestly to inducements intended to affect their energy practices, the focus groups for this study suggest that low-income, high burden customers do respond to the various trade-offs before them with deliberation. Rate designs, program services, and payment arrangements offered by utilities do seem to affect how low-income

high burden customers navigate their efforts to balance comfort (and related health considerations), costs, and conservation. For example, lower rates through a program reduce a household's energy costs and may well prompt some households to use more energy for increased comfort. Similarly, flexibility by utilities in allowing payment arrangements reduces the imperative to pay energy bills first (as some households do with rents and car payments) and thus may increase arrearages, but also promotes cooperation from customers and supports their efforts to juggle bills and keep up on payments. Utility rates, programs, billing practices, and non-utility resources work together to drive how low-income high burden customers balance energy and non-energy needs and make trade-offs between energy conservation and usage. It is important to keep these interactions and the perspective of the customer in mind in rate and program designs.

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