## Understanding the Needs, Attitudes and Behaviors of Low Income Customers with Unusually High Electric Usage

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# ABSTRACT

California's Low Income Energy Efficiency (LIEE) program provides qualified customers with energy-related services including weatherization, refrigerator and HVAC replacement, as well as installation of other eligible measures. This paper summarizes one of six studies conducted for the program during the program cycle.

The primary objective of Southern California Edison's High Usage Needs Assessment study was to understand and identify potential causes and needs of high-tier low income customer (electric) energy use. The study employed extensive quantitative and qualitative data collection and analyses. Numerous variables were examined in comparing high usage to low/moderate usage households.

Contrary to expectation, it was not a poorly functioning fridge or air conditioner that was the culprit for unusually high usage. Rather, a variety of demographic, behavioral, knowledge or attitude-based, as well as circumstantial factors related to the household or home itself contribute to high electricity usage. High usage households are characterized as being larger (both in physical size and number of occupants), having greater income, more appliances and electronics, less knowledge of what to do, and less concern for, and ability to save energy – in part because they struggle with gaining cooperation of others in the home.

The results of the study informed Southern California Edison's 2012-14 Low Income Energy Savings Assistance Program Application filed on May 15<sup>th</sup> 2011. In particular, a new measure, increased emphasis on the educational component of the program, as well as refined and targeted marketing and outreach practices were proposed.

### Introduction

Southern California Edison (SCE) is one of four major investor-owned utilities regulated by the California Public Utilities Commission through legislation of the State of California. In California the utilities are responsible for administering various mandated energy efficiency programs. In order to optimize program design and performance, SCE's Energy Efficiency Division regularly conducts studies funded by the ratepayers via the Public Goods Charges.

In addition to the residential energy efficiency programs, the Utilities' administer several low income programs designed to assist low-income customers in lowering energy costs, reducing the financial burden of energy bills, and improving physical comfort and safety. Reducing the energy burden on this group of customers is also expected to serve the overall goals of the state to reduce greenhouse gas emissions. The two primary programs offered include: (1) The California Alternate Rates for Energy (CARE) program which offers discounted utility rates to qualifying low-income customers in order to reduce financial burden and avoid threatened or actual service disconnection, and (2) The Low Income Energy Efficiency (LIEE)<sup>1</sup> program which provides qualified customers with energy-related services including refrigerator replacement, evaporative cooler installation, central and room air conditioner replacements, home weatherization, lighting measures such as compact fluorescent bulbs and porch light fixtures, as well educational materials that promote energy efficiency practices. Historically, the LIEE program has been implemented in recognition of the limited financial resources and access that might hinder low-income customer participation in conventional energy efficiency programs. Both the CARE and LIEE programs are available to low-income customers who meet the qualifying guidelines based on household size and income.

During the 2009-11 program cycle, The Commission Decision 08-11-031 authorized the Utilities to manage and/or participate in multiple research studies designed to assess, understand, and improve the LIEE program. This paper summarizes the results of Southern California Edison's High Usage Needs Assessment study.

## **Background & Research Objectives**

The High Usage Needs Assessment Study was initiated by Southern California Edison in order to better understand and identify potential causes and needs of high energy (electric)<sup>2</sup> consuming households in the low- income customer sector, in temperate climate zones. In particular, Edison's "Energy Savings Assistance" program managers were interested in finding out if there were "other" measures or services that they might propose to do for their high usage income qualified customers specifically located in temperate climate zones. This was of specific interest for two key reasons: First, households with the highest energy usage among the eligible population represent greater potential for achieving higher energy savings per participating household, and greater program impact for the costs of implementation. The high usage in temperate climate zones was of particular interest to Edison since customers in these mild climate zones are often determined to be ineligible for the program when they do not qualify for a refrigerator or air conditioner. In California, a home is eligible to be "treated" by the program if it either meets the 3 measure minimum rule (which prohibits the Investor Owned Utilities (IOUs) from installing measures in a home that does not require at least three measures) OR the home is eligible for one or two measures if the measures achieve savings of at least either 125 kWh or 25 therms annually. SCE can typically only achieve these savings thresholds when the home is eligible for a fridge, pool pump, torchieres, or air conditioner.

It was anticipated that if we could learn more about the unique needs and circumstances of these customers we may be able to expand the program offerings to include a measure or service that might (1) enable more customers to be eligible to participate, and (2) ultimately reduce the energy burden on these customers who demonstrate unusually high usage. This would serve the overall state goals of emission reduction by mitigating the consumption of customers with unusually high usage. Moreover, in addition to identifying relevant potential measure installations for this group of customers, this research sought to examine behavioral and

<sup>&</sup>lt;sup>1</sup> While in this paper, the program is referred to as the LIEE (Low Income Energy Efficiency) or EMA (Energy Management Assistance) program since these were the Statewide and SCE names of the program for the 2009-11 research cycle, forthcoming, the new statewide name for the program is "Energy Savings Assistance Program".

<sup>&</sup>lt;sup>2</sup> The study was not a statewide study as were many of the other studies executed during this program cycle. Only SCE participated in the study and the design and results are intended to address and understand electric usage as opposed to overall energy usage (including gas or other fuel sources).

communication related variables that could inform and improve program delivery with regard to communication vehicles for marketing and education, and potential recommendations regarding best energy efficient practices for this group of customers.

While the High Usage Needs Assessment focused on high usage customers in temperate climate zones, it was anticipated that the findings would inform understanding of the needs and energy-inefficient practices of low-income customers in all usage groups and climate zones in order to identify whether there are continuities in terms of the needs and energy efficient practices of "low income high usage households" that are not reflected by climate-sensitive measures. As a result, customers in both temperate and non-temperate areas were examined in the research. It was anticipated that understanding this could enable Southern California Edison's program team to address this potential finding and its implications in their recent May application filing to the California Public Utilities Commission outlining the Utilities proposed plan the 2012-14 Energy Savings Assistance program<sup>3</sup>.

It was expected that the results of the study would be predictive (e.g., how do we identify who these customers are), descriptive (e.g., what distinctive characteristics do these customers have), and prescriptive (e.g., what can we do for them?). The key objectives of the SCE High Usage Needs Assessment study were to:

- Identify energy inefficient practices and beliefs that are likely to contribute to unusually high energy usage among this group of low-income customers, particularly in temperate climate zones.
- Identify energy-inefficient appliances, electronics and household characteristics (e.g., age or condition of home) that are likely to contribute to unusually high energy usage among this group.
- Identify the barriers to changing energy inefficient attitudes and behavior.
- Outline messages, information and strategies that are likely to be successful in reaching and communicating with high usage customers.

## Methodology

The High Usage Needs Assessment study employed both quantitative and qualitative methods of data collection and analyses. These included: billing and usage data, climate data, telephone surveys, focus groups and in-home observational and interview data. By triangulating these data, sources and causes of high energy use can be identified that might not be uncovered via one of these sources alone. The "high usage" households were defined as the households within the top quintile (e.g., the top 20 percent) in each climate zone. These high usage households were profiled and compared with the moderate/lower households (e.g., bottom 80%) across *all* of the database variables. Customers with both high and moderate/lower usage were sampled in temperate and non-temperate climate zones in an effort to understand and control for climate-related differences in usage patterns. The specific methods of data collection and analyses include the following five phases.

The first phase was the creation and analyses of a dataset of service account-level information among the current CARE customers. The service account-level data set included

<sup>&</sup>lt;sup>3</sup> As noted above, new statewide program name has been adopted for the 2012-14 cycle is Energy Savings Assistance Program.

several types of data: utility customer billing and usage data, utility program participation data, geographic data, and census-derived data. The utility data included what is typical of the information used to transact utility customer business. These data were pulled from multiple SCE databases and included: monthly kWh usage (consolidated into 12 quarters), frequency of program participation (e.g., the LIEE program, the mobile home EE program, energy efficiency rebates, appliance recycling, etc.) frequency of specific payment anomalies (e.g., disconnections, contacting SCE about payments, etc.), year service account was established, year premise was established, housing type (e.g., single family, multi-family, mobile home), and language preference. The geographic appended to this data set included a climate zone indicator of the service address, physical location (city/county/zip), and an urban/rural indicator. Census-derived data that was appended included: rooms per dwelling, year built, household income, household size, density (people per square mile), and renter proportion.

All of these data were combined into a single data set that was analyzed to develop a comprehensive multi-dimensional segmentation solution (not reviewed in this paper). This dataset was also used to identify high usage households in relevant regions to be examined for this research.

The second phase of the research included 6 focus groups. Several groups were done with high usage customers in a temperate climate zones, and several were done with a cross section of all low income customers. Discussion topics included: overall energy habits and use (e.g., main uses of energy in the household, households habits and practices regarding energy use), changes in energy use compared to a few years ago, knowledge about energy consuming appliances and electronics, areas of control (and lack of control), knowledge and expectations regarding outside assistance with high energy bills, and awareness, experiences, interest, and barriers with the LIEE program. The results of these discussions assisted in guiding the development of the quantitative phone survey instrument.

In the third phase, telephone interviews were conducted with 1,056 low income customers. The 22 minute phone interviews solicited information on customer beliefs, attitudes, and behaviors regarding energy use as well as other relevant descriptive and demographic data not available in the billing database. Roughly half of the interviews were conducted with "high usage" customers including an initial 350 determined by the segmentation scheme sampling and an additional oversample of 186 high usage customers.

Survey topics included: basic demographics, home characteristics (e.g., type, square footage, own or rent, energy efficient features, type and age of AC), type and number of major appliances and electronics, energy-rated awareness, knowledge, attitudes and behaviors, obstacles and motivations related to energy efficiency, marketing and information source preferences, as well as awareness and connection with utility programs.

The fourth phase involved in-home visits with 29 "high usage" households. This ethnographic component involved 2-3 hour home visits which included in-depth semistructured interviews (45-60 minutes), a paper and pencil customer survey comparable to the phone survey conducted with the larger population (15-20 minutes), and a "walk around" with the customer in which the researcher observed and recorded relevant household behaviors and circumstances that might affect usage. The visits served to both confirm and validate self-reported information gathered in the assessment as well as provide deeper, and in some cases, conflicting evidence, that might better explain high usage among this group of households.

As might be expected, these observations and interviews generated insights into behaviors that are not commonly garnered via traditional self-reported data. For example, when asked how much TV the household watches, respondents report a couple of hours, but when the observer is there, there are 3 or 4 TVs that are left on unattended with no one watching, which suggests that "how much TV is watched" is NOT the same as "how many hours are all your TVs on during the day"? These types of observational and depth-interviewing assisted in further describing some key issues related to "high usage" as well as differentiators for identifying and profiling some of the different sub-groups of "high users" as described later.

The final component included additional focus groups. These additional focus groups were conducted with several higher priority "high usage" segments. The purpose of these groups was to better understand relevant customer needs and barriers that might be addressed in marketing activities and messaging aimed at the different usage groups identified by earlier phases of the research.

### Results

The results of this work is discussed in two sections: (1) A description of the "overall" high usage low income customer (as defined by the top usage quintile) and how these customers are different from the low/moderate usage low income customers, and (2) A breakdown of the "overall" high usage customers into a number of sub-groups that are differentiated by various demographic, circumstantial, attitudinal and behavioral variables.

#### Key Differentiators between the High Usage and Moderate/Low Usage Customers

While these data reflect only electric usage, the analyses indicate that overall, "high usage customers" (in both temperate and non-temperate climate zones) are higher users of electricity across <u>all</u> times of year (based on quarterly usage), suggesting that high usage is <u>not</u> predominantly climate-related. In fact, high users' summer-winter ratio (summer energy usage divided by winter energy use) is 1.36 compared to 1.42 for the remaining 80% of the low income population (the lower 4 quintiles). High users load is heavy year-round and their summer AC usage is proportionally even a little lower than among the lower usage groups. Similarly, most differences between temperate and non-temperate high users are also found among lower usage groups – so these differences are a function of other "non-climate or geography-based" usage variables.

Based on a profile analysis with significant difference testing across all of the quantitative variables from the database and telephone survey, high usage customers are distinguished from lower usage households on a number of key dimensions. By and large, these quantitative findings are supported by the qualitative research which provides additional explanations and interpretations of these data.

**Demographic & Household Characteristics.** The overall profile of the high usage households includes the following characteristics generated by multiple sources of data.

- Homes managed by middle-aged (45-64, probably not retired) customers
- Homes inhabited by more people including children, but also often including additional adults both related extended family members (e.g., grandparents, aunts, grown children etc) and/or other unrelated adults (e.g., boarders & roommates).
- Relative to lower usage homes, these homes report higher incomes and more education

- High users are more likely home owners of single family homes (as opposed to renters)
- Their homes are larger (in terms of square footage)
- Residents have lived in the homes longer
- Homes are *more* likely to have more energy efficient features (ceiling fans, programmable thermostats, adequate insulation and weather stripping, etc.)
- Residences have more appliances of <u>all</u> types: refrigerators, standalone freezers, clothes washers and dryers, dishwashers, window AC, plug-in electric heaters, and pools and spas).
- Residences have more electronics of <u>all</u> types including TV's, desktop and laptop computers, cable/DVR boxes, and video game consoles, etc.

**Energy Related Attitudes & Behaviors**. Key behavioral and attitudinal variables also differentiate the high user households from the low/moderate usage households.

- Relative to those who use less energy, these households tend to be less likely to say they always try to save and less likely to think they have been successful.
- Residents of these households maintain they are more interested in being comfortable and productive and less interested in improving the environment.
- In terms of obstacles or barriers to being more efficient, this group reports greater difficulty gaining cooperation of others in the household
- High usage customers are more likely to indicate that "it is their right" to use what they want, and while it would be nice to be able to save, they do not want to have to "sacrifice" personal comforts to do so whether that means maintaining a cooler temperature in the house during the winter or not using their spa or having that extra beer fridge on the back patio.
- High usage households report being more concerned about the cost of energy and being able to pay their energy bill, and subsequently also demonstrate more bill payment problems.
- This group reports they are relatively less knowledgeable about how to save energy
- As noted above, high usage customers in both temperate and non-temperate climate zones tend to be using more energy regardless of season (or geography).
- High users are less likely to follow energy efficient practices at home: turning off lights and TVs, powering down computers, unplugging chargers, and using fans on hot days.

In sum, the low income high users as a whole, in both temperate and non-temperate climate zones, are characterized by a handful of key variables that are correlated, if not in some cases causal, to high usage. In particular, larger households, slightly higher incomes, bigger physical home structures, and more appliances and electronics in the home are invariably related. In addition, these households report greater difficulties in managing their energy usage and getting cooperation of others in the home to the extent that the bill-payer or those invested in saving energy may face resistance and frustration from other members of the household who do not share their attitudes.

In terms of behavioral and attitudinal differences, while the high usage group tends to have done more "to the home" than their lower usage counterparts, they tend to report doing less (and being less successful) when it comes to many ongoing behaviors that would reduce their consumption (e.g., turning off appliances and electronics when not in use, doing full loads of laundry, powering down computers, unplugging chargers, using fans on hot days, and regulating the thermostat to keep the home cooler in the winter and warmer in the summer). Additionally, the data show that high users are relatively more concerned about the cost of energy and being able to pay their energy bill.

These concerns, combined with specific energy attitudes and behaviors such as having less overall control and awareness regarding what to do, and less vigilance about saving energy result in higher electric usage for these customers. In addition, relative to the lower usage customers, these customers consider personal comfort in the home as a dominant motivation for conserving (or in this case not conserving) energy. These results suggest that the environmental and physical condition of the home and appliances may be less relevant to understanding and addressing the needs of high usage customers than attitudinal and behavioral factors. High usage reflects a lack of understanding of what to do, a lack of cooperation among family members, and a belief that it is "more trouble" to act in ways that would reduce energy use.

## Sub-Groups among the High Usage population

Just as the low income population in general is not homogeneous, the "high usage" customers within the low income population are not homogeneous either. In order to optimize program marketing, outreach, and service delivery to this population, we examined the data on this high usage group in order to identify relevant sub-groups of the population. Five specific groups were identified that account for the bulk of the high usage population. There is some overlap among members of the segments making the percentages add to more than 100%.

**Declining Health/Wealth.** 27% of the high user population. Current energy consumption is tied to changes in the health and/or economic situation of someone in the household.

## Profile based on phone survey data.

- A high proportion report that someone with a disability lives in the home, and they have the highest proportion of all the subgroups on Medical Baseline (a rate-based program for customers with a medical need for higher electricity usage).
- Declining wealth can be attributed to retirement, or related to the disability.
- They believe they try hard to save energy, and that they are successful, but they feel energy dependent.
- They are the least likely subgroup to think they could reduce their energy use further.
- They are more likely to participate in other utility energy efficiency programs.
- Demographically, they tend to be older, to have lived in their home longer, and to have lowest income.
- They have the smallest households (in terms of number of people) and the fewest electronics, but the highest electricity usage of all the subgroups, too.
- Main barriers to reducing energy use are the need to maintain heating or cooling, medical needs of someone in the home, and the cost of repairs or new appliances.

## Supporting quotes & observations.

- "My challenge is how to afford energy... I'm on fixed income... I can't tolerate hot temperatures, especially when trying to sleep [because of my sleep apnea] ... I need to use the A/C."
- "The energy bill is high. I'm trying to cut down. The pool is a big energy use....I'm recovering from a heart attack and my wife is not working. I need the A/C because of my heart attack. [The heat makes it race.]"

- Many of the respondent's consumer electronics are old, pre-Energy Star era devices, including an older plasma TV, laser disc player, turntable, stereo receiver and amplifier.
- The home is two-stories, fully appointed, with a pool and entertainment area outside, though only two people live in it. To cool both levels, the couple uses the A/C heavily.

**Divided Household**. 26% of the high user population. This sub-group is characterized most by larger households with members who act independently, and sometimes contrarily, with regard to their attitudes and behaviors related to energy use. For example, each person might watch the same show but on their own TV, or the bill payer might be the only one in the household who takes action to save energy.

## Profile based on phone survey data.

- Demographically, these are younger, larger households with children or other adults in addition to the head of household, more Spanish-speakers, and more likely to be renters.
- These households have more appliances and electronics.
- Cooperation from others in the household is the biggest barrier to reducing usage.
- They have a higher incidence of disconnects and overdue fees.

## Supporting quotes & observations.

- "Since we got teenagers with their own TVs, Ipods, video games and PlayStations, they leave things on a lot...The microwave is used a lot. I wish the kids would make a sandwich and not just heat frozen food." "The Internet [computer and Internet connection] is on all the time for them."
- "The house uses above average energy because of the borders...The more people, the more energy is used. The renters watch TV in their rooms...To achieve energy efficiency, "you must get the [boarders] to help."
- Of seven household members, five are boarders.
- This appears to be a highly dysfunctional family with each person using energy independently.

**Hostage to Domicile.** 24% of the high user population. The home's structure, condition, and/or appliances are factors that compel the household to use significant electricity in the ways they now do.

## Profile based on phone survey data.

- This subgroup resides in the oldest homes, and they have the lowest proportion of energy efficient features in their home and the oldest refrigerators and air conditioners.
- They report the main barriers to reducing energy use are the condition, construction, and age of their home, as well as the high cost of repairs and new appliances.
- Demographically, they have the second longest tenure in residence, and they are the second oldest subgroup by age and the second lowest subgroup by income.
- They have average participation but the lowest awareness among non-participants of the LIEE program.

# Supporting quotes & observations.

- "We turn off the lights, the computer... the TV to help save energy. I read energy labels before buying electronics. But refrigerator and freezer (in the kitchen) are old and probably inefficient."
- "Aging appliances and A/C are the biggest energy-related issues facing me personally. Financially, it's not a good time...The insulation and weatherizing are bad."

- "The A/C is on 24-7 because the house doesn't cool down. The insulation is inadequate..."
- The apartment is drafty and has few electronic devices. At least one of two residents is in the home 95% of the time. To keep warm during the day they spend time in the kitchen, which doubles as an "office." They let their large dog outside several times per day, losing significant kitchen heat each time the door is opened.
- The all-electric kitchen, the drafty apartment, and the weak central heat are beyond the renter's control to change or improve. She does not appear able to afford newer, more efficient appliances.

<u>Concerned but Uninformed</u>. 19% of the high user population. The household seems to desire greater efficiency using electricity, but lacks guidance or information. They are very much aware of the energy usage, but they are not conservation minded.

## Profile based on phone survey data.

- Demographically, this subgroup is younger, less educated, and are more likely Spanish speakers.
- They are more likely to be renters, have the shortest tenure in their residence, and reside in more temperate climate areas.
- They have a higher incidence of disconnects and overdue fees.
- Main barriers to reducing energy use are cooperation from others, and they don't know what to do.

## Supporting quotes & observations.

- "I turn off lights and check on the others to turn off lights."
- "We all need to do our bit to save energy...I don't think we have any energy issues. We open doors to get a breeze and we don't have A/C."
- "December is the most expensive time of the year, so I decided not to put up Christmas lights...We use more than my sister, who lives two blocks away..."The kids watch TV [in their rooms] while I cook."
- All household members appear to make heavy use of the TV and attached consumer electronics, which often are left on. The home has a spa and a large number of incandescent light fixtures and bulbs.
- Many incandescent bulbs have been replaced with CFLs. Fear of gas asphyxiation has led to the habit of always keeping a window open, requiring supplemental heating & cooling. The array of consumer electronics and up-sized appliances probably draw above average amounts of power.
- Because the apartment has minimal lighting there are relatively few bulbs to turn out. But it does have five tube/plasma TVs and two game consoles. Two TVs were on during the visit with no one watching.

<u>Merry Users</u>. 13% of the high user population. The household does not pay attention to the amount of energy used, and doesn't seem to care.

## Profile based on phone survey data.

- The most affluent and educated subgroup, they are the most likely to be living in a single-family home and to reside in a temperate climate zone.
- They are the least likely to be motivated to save money on their energy bill.
- They are the least likely to try to save energy, and least likely to think they've been successful.

- They pay minimal attention to their energy usage nor do they try to conserve, evidenced by the lowest frequency of energy efficient behaviors.
- Consistent with their more affluent circumstances, they have high participation in energy efficiency (e.g., appliance) rebates, but low for other programs.

#### Supporting quotes & observations.

- "Neighbors and friends have larger houses and somewhat higher energy bills, so my bill is appropriate...We use the TVs and DVDs a lot, especially in the evening ...and sometimes leave them on when not in the room."
- "I look at the energy bills, but not too close. The bills are high, over what you'd like to spend."
  "Sometime my mother uses the TV to fall asleep... The family uses the TV and PlayStation a lot... The electronics are on about 12 13 hours a day." "They don't teach how to save energy."
- "My needs are more important than conserving. If I need it now, I'm going to use it... Why should I have to wear a sweater in my house? When my kids visit, I want the house warm... We use the clothes washer and dryer daily."
- The garage contained a 2nd refrigerator, stereo and a compressor that was used occasionally. The main TV is plasma and had surround sound; each of the four bedroom TVs is used daily, two of which were tube style.
- The home has a large number of incandescent bulbs and six TVs, , including an old, large rear projection-type, and two with game consoles. A mounted LED/LCD TV remained on during the site visit.

# **Conclusions & Recommendations**

Although the California Low Income Energy Efficiency program was built off the model of weatherization programs intended to serve low income customers in the east and midwest where more severe climates make the weatherization-related interventions significant, our milder climate make some of these types of measures relatively less meaningful. In addition, consistent with recent study results<sup>4</sup> which found that even among the general population (non-low income), California residents complete significantly fewer weatherization related home improvements than residents in the national population. Moreover, according to this research, the national population is also more likely to cite a "desire to maintain comfort in the home" and "construction of the home" as obstacles to saving energy than California residents. Hence, while things like housing stock or a poorly functioning furnace may be culprits that explain high usage patterns in other contexts, this research identifies more salient behavioral (e.g. leaving computers and TV's on) and situational (e.g. size of household, more appliances) constraints.

As an electric-only utility, the primary ways we serve our low income customers is through measures such as replacement refrigerators, various compact fluorescent bulbs and fixtures, and in some cases air conditioning units, and pool pumps, and evaporative coolers. As noted earlier, when this project was initiated we anticipated finding a "source" that would tell us how to better meet the needs of our low income customers with unusually high usage. Contrary to what was expected, however, we did not find that it was a poorly functioning fridge or air conditioner that was the reason for unusually high usage in low income households. Rather, we found that a variety of different factors contribute to high usage. These include behavioral,

<sup>&</sup>lt;sup>4</sup> 2010 California Baseline for Energy Conservation & Efficiency: Findings for Customer Marketing, Education & Outreach

knowledge and attitude-based factors, as well as circumstantial factors related to the household or home itself. By and large, high usage is driven by having physically bigger homes, more people in the homes, more appliances and electronics, and more challenges associated with controlling energy use.

In addition, high usage households are characterized by having less concern and less knowledge with regard to implementing more energy efficiency practices – which can include daily behaviors such as turning off lights and TVs or making decisions regarding new appliance purchases or getting rid of ill-performing appliances and electronics. Financially speaking, in many cases these households struggle to pay their bills, yet they also tend to skew higher on income and feel it is "their right" to be able to use the energy they want to and need. For this reason, relative to their lower usage counterparts, they may make fewer personal "sacrifices" with respect to comfort and convenience (e.g., setting the Air Conditioner a few degrees warmer, powering down a computer when not in use).

Based on these distinctions, three main conclusions or "needs" regarding reducing their energy usage emerge. High usage low income customers would benefit from: (1) more control since they have more people, more appliances and electronics, and more space (for heating and cooling), (2) more education about what they can do to manage and reduce their energy use, and (3) greater reach into the household so that more household members can be informed.

Given the contributors to the high usage patterns previously mentioned, we recommend a variety of educational, marketing, and lifestyle-specific program enhancements that may assist these customers in reducing their energy bills and overall usage including: (1) provide more appealing and varied educational materials that address areas in which customers lack information or knowledge (e.g., outlining the cost of running the extra fridge in the garage or the fish tank in the living room, or the amount of energy consumed by 3 old TV's that are on for 8 hours), (2) target educational materials to other members of the household, such as children or boarders; (3) enhance cooperation within a household through increased bill payer control, for example, by adding smart power strips and "parental control" such as passcode protected or locked thermostat controls and other devices to program measures; (4) identify energy-related needs that the specific medical situation requires through a specialized Home Energy Survey for medically-dependent households; and (5) add measures that are more appropriate for the more transient renter population that do not require landlord approval, such as portable or plug-in energy control devices and replacement CFLs.

In addition to an overall profile of the high usage households, the research identified a handful of subgroups with even more distinct profiles. It is anticipated that program services, outreach, and marketing could be customized to better serve these groups. With regard to marketing, for example, each subgroup represents a unique scenario that can be the focus of different creative executions. In some cases, messaging can recognize that getting cooperation from others in the household is a major barrier. Tactics to reach these different subgroups can also be employed. Similarly, services and potential new measures may be especially beneficial for certain subgroups.

For high usage customers who appear to be less aware or knowledgeable about "what" to do, the program can provide more directed educational materials, perhaps in different formats, and promote other energy efficiency programs such as the Home Energy Efficiency Survey which assists customers in identifying simple and cost-effective things that they can do to their homes (beyond what they program may provide). In some cases the program may create materials that generate greater "concern," increased personal action, and ultimately savings on

energy bills and reductions in energy usage. Interestingly, while it may seem futile to attempt to move the unconcerned to concerned, some "unconcerned" customers reiterated that while they were not very concerned about doing much to save energy, it was in part because they did not realize the effect it could have on their savings or that it was not going to significantly impair their lifestyle to make relevant efficiency changes.

For the high usage customer groups with higher percentages of elderly or disabled, it will make sense to work through county health organizations and senior centers to reach these customers. Marketing and educational materials that assist and educate these customers on other relevant programs such as the "medical baseline" may be beneficial. A prepare-for-retirement program to encourage customers to make their homes more energy efficient before they reach this stage of declining health/wealth may also be considered.

The results of the study informed Southern California Edison's 2012-14 Low Income Energy Savings Assistance Program Application which was filed on May 15<sup>th</sup> 2011. In particular, power strips were introduced as a potential new measure for the program. In addition, the forthcoming program cycle will have an increased emphasis on the educational component of the program, which is noted by (1) a proposal to conduct an educational needs assessment study, (2) revisiting and revising educational materials, and (3) modified and increased contractor training with regard to education delivery. Finally, refined targeting and outreach strategies are being employed based on these data that we anticipate will increase program interest and participation in the Energy Savings Assistance program.