

**DRAFT FINAL REPORT
Low Income Energy Efficiency (LIEE)
High Usage Needs Assessment
For Southern California Edison
2009-2011**

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EXECUTIVE SUMMARY

This report summarizes research completed to understand high electricity usage among Southern California Edison's low income customer population in support of SCE's Low Income Energy Efficiency (LIEE) program¹.

Introduction and Background

During the 2009-2011 program cycle, the Commission Decision 08-11-031 authorized Southern California Edison (SCE) to conduct a study to understand and identify potential causes and needs of high-tier² CARE customer energy use in temperate climate zones. The study should inform different aspects of LIEE program delivery including: potential measure installations, 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 electricity 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 any continuity of needs and energy efficient practices among "low income high usage households" that are not reflected by climate-sensitive measures.

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?).

Methodology

To achieve the High Usage Needs Assessment objectives, the research team followed a five-phase approach that included:

- (1) Database analysis based on SCE customer data, including electricity usage, program participation, bill payment history and disconnects, climate zone, and other variables. The purpose of the database analysis was to create distinct

¹ While in this report 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 2009-2011 research cycle, forthcoming, the new statewide name for the program is Energy Savings Assistance Program.

² High usage is defined as household electricity use in the top quintile (e.g., the top 20 percent) in each climate zone in SCE's service territory. The top 20 percent were defined as high users because this creates a relatively large pool for analysis (and subsequent recommendations), yet is not too broad so as to remain undifferentiated from the rest of the low income population. High usage was also defined within climate zone because of the wide variation in climate areas and climate-driven electricity usage throughout SCE's service territory. Without this constraint, the majority of high users would be located in the hot, inland climate zones, leaving relatively few in temperate areas for analysis.

electricity usage groups, where “high usage” is defined as those in the top 20% (top quintile) within a climate zone.

- (2) Qualitative discussions completed during exploratory focus groups. The purpose of this qualitative research was to understand customer issues, concerns, attitudes, and experiences to be used to inform development of the quantitative instrument.
- (3) Quantitative telephone survey completed among a randomly drawn sample from Southern California Edison’s low income customer population to gather additional information concerning demographics, home characteristics, appliances and electronics, energy usage behaviors, and LIEE knowledge and experiences. The purpose of this quantitative telephone survey was to provide further profiling information of the customer electricity usage quintile groups in order to give a more complete and descriptive understanding of the differences between high and lower usage customer groups.
- (4) Qualitative in-home interviews designed to more clearly understand the unique circumstances and beliefs or attitudes that are the main contributors to a households high energy use, and to define subgroups among the high usage segments.
- (5) Qualitative discussions completed during confirmatory, post-quantitative focus groups. The purpose of these focus groups was to identify marketing barriers and issues specifically concerning the LIEE program among selected “high” and “moderate” interest segments.

Results, Conclusions, and Recommendations

Contrary to what was expected we did not find that it was a poorly functioning refrigerator or air conditioner that was the main culprit or 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, knowledge or 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, while in many cases these households struggle to pay their bills, they also tend to skew higher on income and to feel it is “their right” to be able to use the energy they want to and need, and as such as less likely to make personal “sacrifices” in service of comfort, as is often the case with the low income lower usage households.

In other words, the idea of reducing their electricity usage by doing without is a turn-off.

Three main conclusions or “needs” regarding reducing their electricity usage emerged. High usage low income customers may 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.
- (3) Greater reach into the household so that more household members can be informed.

The research also determined that the majority of low income high usage customers can be allocated to five main subgroups: Declining Health/Wealth, Divided Household, Hostage to Domicile, Concerned but Uninformed, and Merry Users. The existing LIEE program meets the needs of some but not all of the subgroups.

While the research did not identify a single particular “measure” we could recommend that would assist these customers in reducing their consumption, we instead recommend a variety of more educational, marketing, and lifestyle-specific program enhancements that may assist these customers in reducing their energy bills and overall usage. In addition, the program could consider measures such as power strips or other technology-based controls that can assist these households in managing or monitoring their energy usage.

Specific recommendations for program enhancements include:

- (1) Develop and target educational materials at other members of the household, such as children and roommates.
- (2) Enhance cooperation within a household through increased bill payer control, for example, smart power strips and “parental control” devices can be added to program measures.
- (3) Identify energy-related needs that a specific medical situation requires through a specialized implementation team for medically-dependent households.
- (4) 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.

Program marketing should speak more directly to these subgroups.

- (1) Each subgroup represents a unique scenario that can be the focus of different creative executions. For example:

- Messaging targeted to Divided Households can recognize that getting cooperation from others in the household is a major barrier.
- Outreach aimed at Declining Health/Wealth households could include a prepare-for-retirement message to encourage energy efficiency improvements before they reach the stage of declining health and wealth.
- Messages for the Concerned But Uninformed and the Merry Users could include factual information about the cost of leaving TVs or other electronics on, or the cost of running a Central AC when no one is home.

- (2) Tactics to reach these different subgroups can also be employed. For example:
- a. Work through county health organizations to reach Declining Health/Wealth
 - b. Work through schools for education and distribution of portable program measures to reach Divided Households, Concerned But Uninformed, and Merry Users.

I. INTRODUCTION AND BACKGROUND

In California, the Investor Owned Utilities regulated by the California Public Utilities Commission (CPUC) are responsible for administering statewide programs designed to provide our low income population with a resource that assists customers in lowering energy costs, reducing the financial burden of energy bills, and improving quality of life in terms of issues related to 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) program which provides a range of energy-related no-cost services including refrigerator replacement, evaporative cooler installation, replacement of central or room air conditioning equipment, home weatherization, and lighting measures such as CFLs and torchieres. In addition, the program provides informational and educational materials on energy efficiency practices. Both programs are available to low-income customers who meet the qualifying guidelines based on household size and income.

Historically, low-income energy efficiency programs have been implemented in recognition of the limited financial resources and access that might hinder low-income customer participation in conventional energy efficiency programs.

During the 2009-2011 program cycle, the Commission Decision 08-11-031 authorized Southern California Edison (SCE) to conduct a study to understand and identify potential causes and needs of high-tier³ CARE customer energy use in temperate climate zones. The study should inform different aspects of LIEE program delivery including: potential measure installations, communication vehicles for marketing and education, and potential recommendations regarding best energy efficient practices for this group of customers.

It was anticipated that if SCE could learn more about the unique needs and circumstances of these customers, program managers may be able to expand program offerings to include a measure or service that might enable more of these customers to be eligible to participate to ultimately reduce the energy burden on these customers and serve the overall state goals of emission reduction by mitigating the consumption of customers with unusually high usage. In addition to identifying relevant potential measure installations for this group of customers, this research sought to examine behavioral and communication related variables that could inform and improve program

³ High usage is defined as household electricity use in the top quintile (e.g., the top 20 percent) in each climate zone in SCE's service territory. The top 20 percent were defined as high users because this creates a relatively large pool for analysis (and subsequent recommendations), yet is not too broad so as to remain undifferentiated from the rest of the low income population. High usage was also defined within climate zone because of the wide variation in climate areas and climate-driven electricity usage throughout SCE's service territory. Without this constraint, the majority of high users would be located in the hot, inland climate zones, leaving relatively few in temperate areas for analysis.

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 electricity 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 any continuity of needs and energy efficient practices among “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 program teams to address this potential finding and its implications in their upcoming application.

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 are to:

- Identify energy inefficient practices and beliefs that are likely to contribute to unusually high electricity 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 style of home) that are likely to contribute to unusually high electricity 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 electricity usage customers.

The results of the research completed to achieve these objectives among Southern California Edison’s low income residential customer population are included in this report.

II. METHODOLOGY

To achieve the High Usage Needs Assessment objectives, the research team followed a five-phase approach that included: (1) analysis of SCE billing data records, (2) exploratory focus group discussions, (3) quantitative telephone surveys, (4) qualitative in-home visits, and (5) confirmatory focus group discussions (Table 1). By triangulating multiple data sources, causes of high electricity use can be identified that might not be uncovered if only one source of data were used for understanding potential determinants of high consumption.

Table 1: Data Sources and Purpose

Data Source	Type	Number	Dates	Purpose
Low Income (CARE) Customer Population	SCE Database: utility, geographic, and census data	100,000 analyzed	Aug 2010	Determine usage quintiles; profile quintile groups on additional variables
CARE Customers: temperate climate, non-temperate climate, high usage	Focus Groups	6 groups (2 high usage)	Feb 2010	Understand attitudinal and perceptual issues for quantitative survey
CARE Customers: stratified by segments	Telephone Survey	1,536 interviews	Oct/Nov 2010	Profile quintile groups based on survey data
High Usage CARE Customers: 3 temperate areas and 2 non-temperate areas	In-Home Qualitative and Observational	29 interviews	Dec 2010	Determine reasons for high usage based on observation and discussion
CARE Customers: high and moderate interest segments	Focus Groups	3 groups	Feb 2011	Discuss barriers to LIEE program and messaging

With the exception of the qualitative in-home visits, the phases of research for the High Usage Needs Assessment were completed in conjunction with the LIEE Segmentation Research. Additional details for each of the five phases include:

- (6) Database analysis based on SCE customer data, including electricity usage, program participation, bill payment history and disconnects, climate zone, and other variables. The purpose of the database analysis was to create distinct electricity usage groups, where “high usage” is defined as those in the top 20% (top quintile) within a climate zone.
- (7) Qualitative discussions completed during exploratory focus groups. The purpose of this qualitative research was to understand customer issues, concerns, attitudes, and experiences to be used to inform development of the quantitative instrument.
- (8) Quantitative telephone survey completed among a randomly drawn sample from Southern California Edison’s low income customer population to gather additional information concerning demographics, home characteristics, appliances and electronics, energy usage behaviors, and LIEE knowledge and experiences. The purpose of this quantitative telephone survey was to provide further profiling information of the customer electricity usage quintile groups in order to give a

more complete and descriptive understanding of the differences between high and lower usage customer groups.

- (9) Qualitative in-home interviews designed to more clearly understand the unique circumstances and beliefs or attitudes that are the main contributors to a household's high energy use, and to define subgroups among the high usage segments.
- (10) Qualitative discussions completed during confirmatory, post-quantitative focus groups. The purpose of these focus groups was to identify marketing barriers and issues specifically concerning the LIEE program among selected "high" and "moderate" interest segments.

Database Analysis

For the first phase of research, Southern California Edison created a dataset of service account-level information among the current CARE customer population. The utility's CARE customers are those customers who are participating in a "rate discount" program which entitles them to a 20% discount on their electric bill.

About 2 million SCE CARE customer records were examined during this phase of the project, although the actual segmentation analysis was completed using a randomly-generated subsample of 200,000 CARE customer records for more efficient data processing. At any moment in time, SCE has fewer than 2 million CARE customers, but the dataset included those enrolled in CARE at a specific residence for at least one year out of the three year period from which the data was gathered. About 865,000 of these customers were in CARE at the same residence during the entire three years. Another 530,000 moved into a new residence and/or enrolled in CARE at some point during the three-year period, and the remaining 675,000 moved out or dropped out of CARE during the same three-year period. It is possible and acceptable that a "move-out" customer is included again as a separate "move in" customer, since the relevant unit of interest is the unique combination of a household living in a specific location. For example, a family moving from one residence to another is likely to have different energy consumption levels between the two locations, just as one specific residence can have different energy consumption patterns between two different households that may have lived there.

The CARE population was used to represent the population of LIEE-eligible customers because eligibility requirements for the two programs are similar, the CARE program periodically validates participant income, and the population of CARE participants is estimated to represent almost 100% of all CARE-eligible customers. The service account-level data is of three types: utility-created, geographic, and census-derived.

The utility-created data is typical of the information that is used to transact utility customer business, and was compiled across the previous three years. These data includes: 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, home energy efficiency surveys, level payment plan, energy assistance fund, and an online account service called MyAccount), frequency of specific payment anomalies (e.g., disconnections, contacting SCE about payments, overdue notices and fee events, SCE-created credit score), year service account was established, year premise was established, housing type (e.g., single family, multi-family, mobile home), and language preference (e.g., the customer used a language gate or specified a language preference to SCE). Of note, the utility-created data (with the exception of the language preference variable) is used primarily for billing and program implementation purposes, so it is very accurate and complete for nearly all customer accounts, and can be considered “high quality” for analytical purposes.

The geographic data included a climate zone indicator of the service address (used by California’s investor owned utilities for determining energy “baseline” allocations, among other things), physical location (city/county/zip), and an urban/rural indicator. These data are also very accurate and complete for nearly all customer accounts.

Census-derived data, which is modeled from census block-level data, includes: rooms per dwelling, year built, household income, household size, density (people per square mile), and renter proportion. Because these data are promulgated at the block level, it is inherently less precise when used in this type of household-level analysis since the household-level data is essentially just the average of the entire census block. Individual household differences are not represented. Nonetheless, it is still useful information.

This combined dataset of utility-created, geographic, and census data was used to develop a comprehensive multi-dimensional segmentation solution (for the Segmentation Study), but was also used to identify high usage households for the High Usage Needs Assessment.

Each service account was assigned to an electricity usage quintile within its respective climate zone. The top quintile (e.g., the top 20 percent) in each climate zone was flagged as high users. The top 20 percent were defined as high users because this creates a relatively large pool for analysis (and subsequent recommendations), yet is not too broad so as to remain undifferentiated from the rest of the low income population. High usage was also defined within climate zone because of the wide variation in climate areas and climate-driven electricity usage throughout SCE’s service territory. Without this constraint, the majority of high users would be located in the hot, inland climate zones, leaving relatively few in temperate areas for analysis.

Once usage quintiles were defined, a subgroup of each quintile was created in the dataset, and then all of the quintiles were compared across *all* of the dataset variables. Distinctive characteristics of high usage customers are discussed in the results section.

Initial Focus Groups

For the second phase of the research, six focus groups were conducted, with an average of 8 customers per group. Two focus groups were completed with high usage customers living in a temperate climate zone, and four focus groups were completed among a cross section of all low income customers (two each in temperate and non-temperate climate zones).

Customers were randomly selected and recruited from SCE's population of CARE customers residing within 15 miles of the location of the group. Customers were further identified based on: (1) past LIEE (Energy Management Assistance) participation, (2) Spanish-language preference, and (3) past-year electricity usage. The High Usage groups included customers with past year usage in the top quintile (top 20%) for their climate zone. All other groups included a mix of customers across all usage levels.

During recruitment for the groups, customers were asked additional questions to ensure that each group included people in different life circumstances: number of people in the household, age, gender, owners and renters, and income (within the limits of CARE qualification).

The following table illustrates the breakdown of the groups.

Table 2: Initial Focus Group Schedule and Locations

Date	Location	Group Composition	Language
Feb 2, 2010	Long Beach	LIEE Participants	English
Feb 2, 2010	Long Beach	Non-Participants	English
Feb 3, 2010	Los Angeles	High Usage	English
Feb 3, 2010	Los Angeles	High Usage	Spanish
Feb 4, 2010	Palm Springs	Non-Participants	Spanish
Feb 4, 2010	Palm Springs	LIEE Participants	English

Customers were recruited to a central facility for a 2-hour group discussion. The discussion areas of these groups covered topics such as:

- Energy efficient and inefficient habits and behaviors
- Reasons and motivations for increases and decreases in energy use
- Reasons for high use relative to neighbors
- Barriers to adopting more energy efficient behaviors
- Gain insights into customer hardships and dealing with energy bills
- Gain insights into customer awareness and perceptions of the LIEE program (known as Energy Management Assistance or "Emma"), and barriers to participation

The information from these focus groups was used to further our understanding of this customer population, provide further insight that can help explain the differences between high electricity users and others, and develop the quantitative research instrument for the telephone survey.

Quantitative Telephone Survey

In the third phase of research, the research team completed 1,536 telephone survey interviews designed to gather additional descriptive information on the energy usage quintile groups that were initially identified via analyses of SCE’s existing database of customer data and census data. The survey inquired about key behavioral, attitudinal, circumstantial, situational, and demographic variables that were not available via these other sources but might assist in differentiating high usage from the lower usage customers within the low income population. The survey sample frame included the population of SCE’s CARE-eligible customers.

The survey was designed to serve two purposes: the low income customer segmentation and the high usage needs assessment. For this reason, the survey sample was stratified. Five of the eight segments determined by the Segmentation Study were relatively small (less than 15% of the population) given the proposed total sample size, so the survey sample was stratified across the eight segments, and sampling was done randomly within strata. An “oversample” of interviews was completed for the five smallest segments in order to boost the number of completed interviews above 170 for each segment. Results were then weighted within each segment to match population proportions. In total, each segment was represented by between 173 and 251 interviews, with oversample quotas ranging from 5 to 131 interviews. These sample sizes provide margins of error for each segment between 6.2% and 7.4% at a 95% confidence level.

Table 3: Segmentation-Based Telephone Survey Sample Sizes

Segment	Size	Proportional Sample Quota	Over-Sample	Total Sample Quotas	Margin of Error (95%)
1	21%	251	-	251	+/- 6.2%
2	17%	204	-	204	+/- 6.8%
3	16%	194	-	194	+/- 7.1%
4	14%	168	7	175	+/- 7.4%
5	14%	168	5	173	+/- 7.4%
6	9%	108	66	174	+/- 7.4%
7	5%	60	114	174	+/- 7.4%
8	5%	60	131	191	+/- 7.4%
Total	100%	1,213	323	1,536	

There were 350 interviews among high usage customers (belonging to the top usage quintile) in the sample of 1,536 of total interviews. An additional oversample of 186 interviews among high users proportional to their representation within the eight segments was completed to yield a total high usage sample size of 536. The same

weighting that was applied based on segment membership was used in the usage quintile analysis to ensure that each quintile was representative across the population. For the usage quintile analysis, unweighted and weighted sample sizes are shown below (table 4).

Table 4: Sample Sizes for Electricity Usage Quintile Analysis

Quintile	Sample Size (unweighted)	Sample Size (weighted)	Margin of Error (95%)
Top 20%	536	445	+/- 4.6%
2 nd	294	267	+/- 6.0%
3 rd	303	322	+/- 5.4%
4 th	286	320	+/- 5.5%
Bottom 20%	303	368	+/- 5.1%
Total	1,722	1,722	

The interviews were completed using a CATI system between October 12 and November 8, 2010. Because the low income population includes not only English-speaking customers but those who speak languages other than English, a variable that indicates the customer’s language preference was used to identify customers with a Spanish-language preference. These Spanish-speaking customers represent approximately 30% of SCE’s low income population, so interviews were completed in English (70%) and Spanish (30%), depending on the language preference of the respondent. The average interview length was 21 minutes in English and 24 minutes in Spanish. Refusal rates (the percentage reached by phone who refused to answer any questions) were quite low at 31% among English speakers and 21% among Spanish speakers.

Survey topics included: demographics (e.g., age, gender, education, income, ethnicity, disabled person in home, number in household), home characteristics (e.g., type, square footage, own or rent, energy efficient features, type and age of AC), type and number of major appliances, type and number of major electronics, energy-rated attitudes (overall effort made to save energy, beliefs about success, self-described obstacles, agreement/disagreement with attitude statements), energy-related behaviors (e.g., frequency of taking specific actions, HVAC temperature settings), connection with utility programs (e.g., overall opinion about utility EE programs, awareness and participation in specific EE programs), LIEE program (awareness, knowledge, participation, barriers), and information source preferences.

The telephone survey data were used to profile the five electricity usage-based quintile groups to identify key behavioral, attitudinal, circumstantial, situational, and demographic variables that differentiate between high users and the other usage level groups. In this way, the survey data was used to validate usage group differences identified by the initial dataset variables, as well as identify relevant behavioral, attitudinal and demographic variables that contribute to differences among the usage groups.

In-Home Qualitative Interviews and Observations

The fourth component of the research involved visiting 29 “high usage” homes and conducting in-depth interviews and observations with this sample of low income customers. Twenty-one interviews were completed with customers in temperate locations (clustered in four different geographic areas), and 8 interviews were completed in non-temperate areas (clustered in two geographic areas). Respondents were pre-recruited from randomly generated lists of low income households in each of the geographic clusters. All in-home interviews were conducted in English.

Table 5: In-Home Interview Schedule and Locations

Date	Location	Climate	Number	Language
Nov 23, 2010	Long Beach	Temperate	4	English
Nov 30, 2010	Lancaster	Non-Temperate	4	English
Dec 1, 2010	San Bernardino	Non-Temperate	4	English
Dec 7, 2010	Anaheim/Orange	Temperate	4	English
Dec 8, 2010	Garden Grove	Temperate	4	English
Dec 10, 2010	Oxnard	Temperate	4	English
Dec 14, 2010	Oxnard	Temperate	3	English
Dec 15, 2010	Long Beach	Temperate	2	English

Each two to three-hour session included: (1) the respondent completing a 15 page written survey comparable to the quantitative telephone survey described above (which included an inventory of the appliances and electronics present), (2) an observational walk-through to confirm and validate the self-reported information in the assessment as well as to note any apparent reasons for high electricity usage such as appliances or electronics left on, the general age and condition of these items, etc., and (3) a 45-60 minute open-ended semi-structured interview discussion with probing to provide deeper insight regarding the reasons underlying the household’s high usage.

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 reported 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 will be described later.

Final Focus Groups

A final set of three focus groups was conducted with customers from several higher usage segments, primary to better understand customer needs and barriers to participation that may be specifically tied to marketing and messaging relevant to the different types of usage groups.

Locations and group composition are described in the table below. Because the number of groups was limited to 3, the program team had identified segments that were “higher interest,” “medium interest,” and “lower interest” in terms of the team’s desire for more information from the different segments.

Table 6. Final Focus Group Schedule and Locations

Date	Location	Group Composition	Language
Feb 16, 2011	Riverside	High & Medium Interest	English
Feb 17, 2011	Los Angeles	High Interest	English
Feb 17, 2011	Los Angeles	Medium Interest	English

Customers were randomly selected and recruited from SCE’s population of CARE customers residing within 15 miles of the location of the group. Customers were further identified based on: (1) electricity usage (only customers in the top 3 quintiles were recruited), and (2) segment membership (as determined from the Segmentation Study). Segments were grouped as follows:

- “Higher interest” segments: 4 and 7
- “Medium interest” segments: 3, 5, 6, and 8
- “Lower interest” segments: 1, 2 (excluded from these focus groups)

During recruitment for the groups, customers were asked additional questions to ensure that each group included people who fit the prototypical characteristics of each segment, including: number of people in the household, age, frequency of bill payment contacts, owners and renters, and income.

Customers were recruited to a central facility for a 2-hour group discussion. Discussion topics included: overall energy habits and use (e.g., main uses of energy in the household, households habits and practices regarding energy use), efforts to conserve energy (and challenges in doing so), sources of assistance for dealing with high energy bills, perceptions and experiences concerning the LIEE program (e.g., awareness, interest, and barriers), review of LIEE outreach methods, and review of the LIEE enrollment process.

III. HIGH USAGE NEEDS ASSESSMENT: KEY DIFFERENTIATORS OF HIGH USAGE

Results are discussed in two sections: (a) a description of the overall profile of the “high usage customers” as defined by the top usage quintile and how these customers are different from the remaining 80% of low income customers, and (b) a breakdown of the “overall high usage customers” into a number of sub-groups that are differentiated in key ways which will allow program management to better identify, target and meet the unique needs of specified high usage groups.

Summary of Results: Key Differentiators between High Usage and Moderate/Low Usage Customers

Based on significant difference testing between low income high electricity users (top quintile) and moderate to low electricity users (bottom 4 quintiles) across the variables from the dataset and telephone survey, low income high users as a whole, in both temperate and non-temperate climate zones, are characterized by the following related to their energy consumption:

- More likely homeowners who live in physically larger homes (44-65 years, not retired, higher income).
- More electricity-consuming appliances and electronics of all types (extra refrigerators, dishwashers, pools, etc.; multiple TV’s, game systems, DVR’s, etc.)
- More people in the household (more children, more related and unrelated adults), and more trouble controlling others in the home.
- Not as diligent about trying to save energy – leaving things on when not using them (and among higher income customers, less willing to do without the benefits of electricity usage).
- Less knowledgeable about what to do – not knowing what uses a lot or what behaviors are problematic.
- Concerned about the cost of energy and some struggle to pay their energy bills.
- For some, a disability or medical condition of a household member imposes additional energy needs – for heating or cooling, medical equipment, more TV use, etc. – beyond simply being housebound.

Based on these distinctions, three main conclusions or “needs” regarding reducing their electricity usage emerge. In particular, high usage low income customers may 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.
- (3) Greater reach into the household so that more household members can be informed.

Moreover, based on high users' reasons for *not* participating in LIEE in the past along with some of the differentiators previously discussed, it might be that high users are less likely to have responded to LIEE marketing in the past compared to lower usage groups.

High users, with their larger homes and somewhat higher incomes, might not consider themselves qualified for or in need of the program. It is also likely that program measures do not currently address the root cause of their particularly high energy consumption – which is primarily related to having lots of appliances and electronics, lots of people in the household using these things, and a lack of cooperation (and control) over wasteful practices.

Detailed Results

Characteristics that define high users (compared to lower usage groups) regardless of their geographic location are described below. This comparison is based on the quantitative survey results. Significant differences at a 95% confidence level are indicated by < or >.

Demographics

- Householder Age and Household Size: High users are more likely to be headed by someone who is middle-aged (45-64, probably not retired), and are more likely to have larger household sizes – yet not just with those under 18 or over 65, suggesting that high users are also more likely to have other adults in the home (e.g., roommates or boarders, related extended family members such as adult children living at home).

Table 7: High Usage Profile: Householder Age

“In what year were you born?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
18 to 44 years	33%		36%
45 to 64 years	42%	>	32%
65 years or older	21%		26%
Refused	3%		5%

Significant differences at 95% confidence indicated by < and >

Table 8: High Usage Profile: Household Size (number living in home)

“How many people live in your home at least 6 months out of the year?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Mean	4.3	>	3.2
How many are under 18 (mean)	2.3		2.3
How many are 65 or older (mean)	1.5		1.5

Significant differences at 95% confidence indicated by < and >

- Income and Education: High users have higher household income and education (although over half are still very low income with HHI under \$33,000/year).

Table 9: High Usage Profile: Household Income

“Which of the following categories best describes your annual household income?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Less than \$33,000	56%	<	67%
\$33,000 to less than \$53,000	23%	>	12%
\$53,000 or more	10%	>	6%
Refused or Don't Know	11%		15%

Significant differences at 95% confidence indicated by < and >

Table 10: High Usage Profile: Education

“Which of the following best describes your education?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
High school or less	39%	<	46%
Some college	36%	>	31%
College graduate	23%		21%
Refused	2%		2%

Significant differences at 95% confidence indicated by < and >

- Disability: High users are more likely to have a disabled person living in the home, and in particular someone with a mobility disability.

Table 11: High Usage Profile: Person with Disability Living in Home

“Do you or does anyone in your household have a permanent disability related to mobility, hearing, vision, cognitive, psychological, or chronic disease?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Yes	38%	>	28%
No	60%	<	68%
Refused	2%		4%

Significant differences at 95% confidence indicated by < and >

Home Characteristics

- Type of Home: High users are more likely owners in single family homes, so their homes are larger and they tend to have lived there a longer time.

Table 12: High Usage Profile: Type of Home

“What type of home do you live in?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Single Family	74%	>	55%
Apartment	11%	<	25%
Mobile Home	6%		6%
Duplex	2%		5%
Condominium	3%		5%
Townhouse or Row House	4%		4%
Don't know	<1%		<1%

Significant differences at 95% confidence indicated by < and >

Table 13: High Usage Profile: Size of Home

“Approximately how many square feet is your home?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Mean (square feet)	1,851	>	1,440

Significant differences at 95% confidence indicated by < and >

- EE Features: High users are *more* likely to have more energy efficient features (ceiling fans, programmable thermostats, adequate insulation and weatherstripping, etc.) and they are more likely to have installed it while living there. High users are also more likely to have taken additional actions to make their home more energy efficient, including appliance and insulation upgrades.
 - It is likely that because they tend to be homeowners and to have higher income they tend to make EE improvements to their homes more frequently than lower usage groups.

Table 14: High Usage Profile: Energy Efficient Features

“To the best of your knowledge, which of the following does your home have?” (multiple responses)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Ceiling fan	75%	>	64%
Programmable thermostat	70%	>	62%
Double pane windows	54%		50%
Attic insulation	51%	>	39%
Weatherstripping	40%	>	35%
Whole house fan	27%	>	22%
Motorized attic vents	20%	>	13%
CFL's more than 50%	54%		52%
Number of EE Features (mean)	3.4	>	2.8

Significant differences at 95% confidence indicated by < and >

- AC: High users are more likely to have central AC, and AC of any type (particularly those in non-temperate zones, but this applies to temperate as well).

Table 15: High Usage Profile: Air Conditioning Type

“What type of air conditioning does your home have?” (multiple responses)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Central AC	57%	>	44%
Window or wall AC	17%		20%
Evaporative or swamp cooler	13%		13%
Heat pump	4%		3%
Fans	20%		19%
Portable AC	3%		4%
None	11%	<	16%
Don't know	1%		2%

Significant differences at 95% confidence indicated by < and >

- All Electric: High users are more likely to be all electric, although just 16% of high users are in this category. The majority of all electric homes are apartments and condominiums located in temperate climate zones.

Table 16: High Usage Profile: All Electric or Electric and Gas

“Is your home all electric or do you have both electricity and natural gas?”	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
All Electric	16%	>	11%
Electricity and Gas	83%	<	88%
Don't know	1%		<1%

Significant differences at 95% confidence indicated by < and >

Appliances and Electronics

- Appliances:** High users tend to have more appliances of all types: refrigerators, standalone freezers, clothes washers and dryers, dishwashers, window AC, plug-in electric heaters, and pools and spas). Also, high users in non-temperate zones have more appliances of all types than those in temperate zones. Non-temperate homes tend to be newer and larger since they are in areas of more recent development, so are more likely to have more major appliances (such as a dishwasher or second refrigerator).

Table 17: High Usage Profile: Appliances in the Home

“How many of each of the following does your household have?” (means)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Refrigerators	1.4	>	1.2
Standalone freezers	0.3	>	0.2
Clothes washers	0.9	>	0.8
Clothes dryers	0.9	>	0.7
Dishwashers	0.5	>	0.4
Window AC	0.2		0.2
Plug-in electric heaters	0.4	>	0.3
Pools or spas	0.2	>	0.1
Total	4.8	>	3.8

Significant differences at 95% confidence indicated by < and >

- Electronics:** High users are also more likely to have substantially more electronics of all types: TV’s desktop and laptop computers, cable/DVR boxes, and video game consoles. Perhaps this is related to the number of people in the home as well as to somewhat higher incomes. For example, in some cases these homes have 5+ TV’s, 3 or 4 video game consoles, and multiple desktop and laptop computers, monitors, and other peripherals.

Table 18: High Usage Profile: Electronics in the Home

“How many of each of the following does your household have?” (means)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
TVs	3.1	>	2.3
Desktop computers	1.0	>	0.6
Laptop computers	0.9	>	0.5
Cable/DVR console	1.9	>	1.2
Video game console	0.8	>	0.5
Total	7.7	>	5.1

Significant differences at 95% confidence indicated by < and >

Energy-Related Attitudes

- The telephone survey data shows that relative to those who use less energy, the households that use more energy tend to be less likely to say they always try to save and less likely to think they have been successful.

Table 19: High Usage Profile: Efforts to Save Energy

“How would you describe your household’s efforts to save energy in your home?” “How successful do you think you have been?” (Top 2 Box)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Always try to save	78%	<	84%
Have been successful	54%	<	68%

Significant differences at 95% confidence indicated by < and >

- High users are also more interested in being comfortable and productive and less interested in improving the environment (especially those in non-temperate zones) when compared to lower usage quintiles. These results suggest that high users are a bit less motivated to save and they have more barriers to success when they try.

Table 20: High Usage Profile: Motivational Priorities

“Tell me which of the following is more important to you by allocating 10 points between each of the three options.” (means – 10 point allocation)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
Save money on the bill	5.2		5.1
Improve the environment	2.7	<	3.0
Be comfortable and productive	2.2		2.0

Significant differences at 95% confidence indicated by < and >

- Qualitative data supports this idea with some high usage customers indicating it is their “right” to use what they want if they pay for it, and while saving energy would be nice, they do not want to sacrifice personal comforts – so they keep their house cool in the summer, their spa hot, and their beer cold in the spare refrigerator.

- Regarding obstacles to saving energy, high usage households (with more people) report that cooperation from others is their main obstacle to saving energy – suggesting the bill payer may face resistance from other members who do not share their attitudes.

Table 21: High Usage Profile: Obstacles to Saving Energy

“What obstacles do you face in trying to save energy in your home?” (multiple responses)	High Users (n=445)		Low/Moderate Users (n=1,277)
Cooperation of others	29%	>	16%
Condition of home	11%		9%
Cost	9%		9%
Too many things	8%		8%
Heating or cooling	9%		8%
Renting	4%		3%
Don't know what to do	2%		3%
Age of home	4%		3%
Construction of home	3%		2%
Lack of time	1%		1%
Medical needs	3%		1%
Pool or spa	2%		<1%
Work at home	<1%		<1%
Other	11%		10%
Don't know	25%		40%

Significant differences at 95% confidence indicated by < and >

- Additionally, high users are: more concerned about the cost of energy and being able to pay their energy bill, more likely to think about how much energy they use at home , and less likely to think they have done all they can to save energy – which implies that energy use weighs on their minds.
- At the same time, they are less knowledgeable about how they can save - suggesting that they recognize their high usage situation but don't have all the information needed to make a change.

Table 22: High Usage Profile: Attitudes About Energy

“How much do you agree with the statement ... “ (% Strongly Agree)	High Users (n=445)		Low/Moderate Users (n=1,277)
Cost of energy makes me want to conserve	79%	>	72%
I am very concerned about the environment	63%	<	68%
I am very knowledgeable about things I can do to save	56%	<	61%
I've already done everything I can to save energy	47%	<	56%
I sometimes worry if there is enough money to pay my energy bill	59%	>	52%
I do more than most people to reduce my impact on the environment	35%	<	48%
I don't often think about how much energy I use in my home	15%	<	24%
Someone in my household is dependent on energy for health reasons	27%	>	21%
I am often the first among family and friends to purchase new appliances	26%	>	22%

Significant differences at 95% confidence indicated by < and >

Energy-Related Behaviors

- **Energy Usage:** High usage customers (in both temperate and non-temperate climate zones) are higher users of electricity across all times of year (based on quarterly usage), suggesting that high usage is not 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. 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.

Table 23: High Usage Profile: Electricity Usage

Electricity Usage (average monthly kWh from SCE data)		High Users (n=445)		Low/Moderate Users (n=1,277)
Winter	(Q1 2009)	908	>	358
Spring	(Q2 2009)	840	>	334
Summer	(Q3 2009)	1234	>	507
Fall	(Q4 2009)	912	>	365
Overall	(2009)	925	>	386

Significant differences at 95% confidence indicated by < and >

- **Behaviors Within the Home:** Consistent with their self-described lack of knowledge, 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. This suggests that high usage is not just because of their environment or the physical condition of their home and appliances. It is also about their behaviors. Across high usage households, it reflects a lack of understanding of what to do, a lack of cooperation among household members, or it can be “more trouble” to act in ways that would reduce energy use (e.g., turning off TV’s that are not in use or only washing full loads).

Table 24: High Usage Profile: Energy Efficient Behaviors

“How often do you ...” (% who “always” do this)	High Users (n=445)		Low/Moderate Users (n=1,277)
Turn off lights	73%	<	79%
Power down computer	61%	<	68%
Unplug chargers	54%		59%
Turn off TV	69%	<	76%
Run appliances full	77%		74%
Use fans on hot days	40%	<	45%
Raise/lower thermostat	33%		32%
Clothing for warmth	59%		59%
Close ducts	51%		52%
Lower hot water temp	29%		31%

Significant differences at 95% confidence indicated by < and >

- Energy Bill Payment Events. High usage customers have more bill payment problems. This is likely a reflection of their relatively higher usage as well as a number of different things related to energy attitudes and behaviors. In part, this group is less “conscious” and less vigilant about saving energy, with “comfort” as the dominant motivator relative to “saving” as is the case with other low income customers. In addition, this group includes larger households that have other demands for their resources as well, including the needs of children and household members with disabilities.

Table 25: High Usage Profile: Bill Payment Events

Bill Payment Events (means – from 3 years of SCE data)	High Users (n=445)		Low/Moderate Users (n=1,277)
Number of payment-related contacts with SCE	2.42	>	0.74
Number of overdue fees	0.54	>	0.31
Number of disconnects	0.24	>	0.13

Significant differences at 95% confidence indicated by < and >

- Participation in Utility Programs. High users tend to have higher participation in the Summer Discount Plan, perhaps because they are more likely to have central AC and because they are motivated to try to lower their energy bill. Non-temperate high users also have higher participation in ARP and EE Rebates – probably related to their higher ownership rates for appliances.

Table 26: High Usage Profile: EE Program Participation⁴ (Survey)

“Which of the following programs have you participated in?” (if ever participated)	High Users (n=205)		Low/Moderate Users (n=587)
Appliance Recycling	44%	>	37%
EE Rebates	38%	>	27%
Home Energy Surveys	34%	>	27%
Summer Discount Plan	34%	>	24%
Energy Management Assistance (EMA/LIEE)	36%	>	32%

Significant differences at 95% confidence indicated by < and >

⁴ EMA/LIEE participation includes customers who say they have participated in the LIEE program at any time in the past. The data do not reflect participant customer data from a specified program year.

Information Source Preferences

- Probably related to their demographics and socio-economics (higher income levels compared to lower usage groups), high usage low income customers more likely to be online and to want to interact with SCE online (they are more likely to want information from SCE through the Internet and email, and they are more likely to be “My Account” users).

Table 27: High Usage Profile: Preferred Information Sources

“What is the best way for SCE to get information to you about saving energy or about their programs?” (multiple responses)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
SCE Separate Mail	69%		68%
SCE Bill or Inserts	37%	<	42%
Phone	17%		19%
Internet/Website	15%	>	11%
News: TV/Radio	5%		7%
Email	11%	>	6%
SCE Employees/In-Person	5%		5%
SCE Advertising: TV/Radio	4%		4%
SCE Website	4%		3%
Newspapers	2%		2%
Word of Mouth	2%		2%
Community/Assistance Org.	<1%		1%
Contractors	<1%		<1%
Stores/Retailers	-		<1%
None	1%		1%

Significant differences at 95% confidence indicated by < and >

LIEE Awareness and Past Participation

- High user’s awareness and participation in the LIEE program also has implications. High users are less likely to have participated in LIEE, and those who have not are less likely to know about it. Regarding reasons for not participating (among those aware of it who have not participated), higher users are more likely to think they don’t need it.

Table 28: High Usage Profile: Program Participation (SCE data)

EE Programs Participated In (SCE data)	High Users		Low/Moderate Users
	(n=445)		(n=1,277)
LIEE Participant	8%	<	12%
My Account	31%	>	22%
Medical Baseline	7%		5%
Level Payment Plan	12%	>	7%

Significant differences at 95% confidence indicated by < and >

Table 29: High Usage Profile: Heard of Energy Management Assistance (EMA/LIEE)

“Have you heard of this ‘emma’ program that includes weatherstripping, insulation, refrigerators, and such?” (among non-participants)	High Users		Low/Moderate Users
	(n=286)		(n=863)
Yes	34%	<	39%
No	63%	>	58%
Don’t know	3%		2%

Significant differences at 95% confidence indicated by < and >

Table 30: High Usage Profile: Reasons for Not Participating in EMA/LIEE

“Which of the following are reasons you’ve not signed up for the ‘emma’ program?” (among those aware who have not participated)	High Users		Low/Moderate Users
	(n=41)		(n=125)
Not sure how to sign up	41%		45%
Don’t think you would qualify	38%		39%
Don’t think your home needs it	45%	> *	32%
Someone else need it more than you do	39%		37%
Doubt the workmanship	14%		17%
Doubt appliance quality	14%		14%
Some other reason	19%		19%

*Difference is significant at 85% confidence – small sample size

- These results suggest that high users are less likely to respond to LIEE marketing. It is possible that high users, with their larger homes and somewhat higher incomes, do not consider themselves qualified for the program or they don’t think they need it. It is also possible that the program does not address the root causes of particularly high energy consumption for some high users – which is related to having lots of appliances and electronics, lots of people in the household using these things, and a lack of cooperation (and control) over wasteful practices.

Temperate vs. Non-Temperate High Users

An initial hypothesis was that temperate climate high users had different characteristics and/or needs from non-temperate high users regarding the causes of their higher electricity usage – based on the premise that while AC load drives high usage in hot inland areas, other factors must account for high usage in coastal areas.

Significant difference testing between low income high electricity users in temperate and non-temperate climate zones across the variables from the dataset and telephone survey found that there are some differences between the two groups worth discussion. Temperate high users do have lower overall electricity usage than high users in non-temperate areas across all four quarters, and this difference is greatest during the summer Quarter. These differences are likely a result of several geographic-based factors (data is contained in tables in Appendices A and B):

- Differences in housing stock. Temperate areas have older, smaller homes, and more multi-family homes so more renters.
- Household composition. Temperate areas have older householders with smaller household sizes.
- AC usage. Temperate high users are less likely to have central AC or evaporative (swamp) coolers, and are more likely to have fans and window AC units.
- Appliances. Temperate high users' homes, which are smaller, older and more likely to be occupied by renters, have fewer appliances.
- Electronics. Temperate high users, with smaller household sizes, have fewer TVs and cable/DVR boxes.
- Environmentalism. Temperate high users are more motivated by "improving the environment," while non-temperate high users are more motivated by being "comfortable and productive."
- Obstacles to reducing electricity use. Temperate high users, with smaller household sizes, are less likely to say that cooperation from others is an obstacle (although it is still the number one obstacle for them), and they are less likely to mention the need for heating or cooling as an obstacle. Temperate high users are more likely to mention that they "don't know" what their main obstacles to reducing electricity use are.
- EE behaviors. Temperate high users are more likely to use fans (since they have them and fans are more effective in temperate areas for cooling) and to unplug chargers, yet they are less likely to lower their hot water thermostat temperature. Temperate high users (with AC) tend to set their thermostats lower during the summertime as well, perhaps to achieve a greater difference between inside and outside temperature to increase their perception of cooling.
- EE program participation. Temperate high users are less likely to have participated in an SCE energy efficiency program of any type, including the LIEE program. Lower energy usage overall, and commensurately lower bills, likely reduces interest in measures to save energy. Among those who have participated in LIEE, temperate high users are more likely to mention doing so for

the light bulbs (perhaps because other measures are not so compelling to those in temperate climate areas).

However, these differences are not nearly as substantial as the differences across these same variables between the high users as a group overall compared to the moderate and low usage groups. In other words, high users in temperate and non-temperate climate zones are much more similar than they are different from each other when examined in the context of all electricity usage groups.

A main implication is that marketing strategies and program features can be relatively consistent for all high users no matter where or in which climate zone they are located – with a few possible exceptions:

- Central AC measures offered through the LIEE program should find more candidates in non-temperate areas, while window AC replacement (offered through the LIEE program) should find more candidates in temperate areas.
- An environmental message might be more effective in temperate areas.
- Control devices might have somewhat lesser appeal or impact in temperate areas (since these customers have smaller households and are less likely to need cooperation from others).

IV. HIGH USAGE NEEDS ASSESSMENT: SUBGROUPS AMONG HIGH USERS

The research demonstrates that while there is an overall profile of the high usage customers, high usage customers can be further distilled into a handful of subgroups that are differentiated by a number of the variables previously reviewed. The generalized characteristics of high users apply to *most* high users but certainly not all, so identifying unique subgroups provides deeper insight into the reasons for high usage and potential remedies for the LIEE program.

Methodology

Five specific groups were identified that account for a majority of the high usage population. A sixth group is “undetermined.” The main differentiating characteristics of these subgroups were first identified from the in-home interviews – based on interviewer observations and discussions with the customer. Characteristics most prominent in distinguishing between the in-home qualitative respondents included factual information, observed and stated behaviors, and attitudes and beliefs. Distinguishing factual characteristics are:

- Number of people in the household
- Age of the householder
- Someone in the household has a medically-based and/or age-based need for cooling, or is house-bound so is always there, etc.
- Age and condition of the home, and without the resources and/or ability (such as renters) to improve the physical condition
- The number of energy-consuming items in the household (but no specific items stood out)

Distinguishing observed and stated behaviors are:

- Leaving electronics (e.g., TVs) and appliances (e.g., air conditioning) on for extended periods vs. diligently turning things off

Distinguishing attitudes and beliefs that are major barriers to reducing usage include:

- Gaining cooperation from others in the household
- Condition of the home
- Not interested in the effort to conserve or not wanting to give up the benefits of electricity usage
- Lack of knowledge about what to do to reduce energy usage, or lack of understanding the impact of usage behaviors on the bill

In sum, these characteristics defined five subgroups. All of these characteristics are variables in the quantitative survey, so parameters for these key variables in the quantitative survey were established that divided the high user survey sample

population into these five subgroups. Each subgroup was then profiled across all the variables in the quantitative survey and from the SCE dataset (that included billing, geographic, and census data), and the subgroup proportions in the low income population were estimated. There is some overlap regarding segment membership (some customers can belong to more than one segment), so the total percentage exceeds 100. The subgroups and population proportions (among high users) are shown below (Table 31).

Table 31: High Usage Customer Subgroups

Subgroups	Percent of High User Population	Sample Size
		(n=445)
Declining Health / Wealth	27%	120
Divided Household	26%	117
Hostage to Domicile	24%	108
Concerned But Uninformed	19%	83
Merry Users	13%	57
Undetermined	26%	118

Subgroup descriptions that follow are based primarily on the quantitative survey and dataset data, and secondarily on the in-home qualitative interview summaries. Recommendations for each subgroup are also provided. .

Declining Health/Wealth (27% of the high user population)

Current energy consumption for this subgroup is tied to changes in the health and/or economic situation of someone in the household.

- A very high proportion say that someone with a disability lives there, 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.
- Demographically, they tend to be older, to have lived in their home longer, and to have the 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.
- They believe they try hard to save energy, and that they are successful, but they feel energy dependent – suggesting that they conserve in areas where they can but are constrained either by their medical needs or by characteristics of their home that are no longer affordable (e.g., a swimming pool, more rooms or square footage). They are the least likely subgroup to think they could reduce their energy use further.

- Their efforts are evidenced by the fact that they are more likely to participate in other utility energy efficiency programs. Those who know about the LIEE program do tend to participate.
- 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.

Table 32: Declining Health/Wealth Supporting Data

	Declining Health/Wealth (n=120)		High Users Total (n=445)
Demographics			
Someone with disability living in home	88%	>	38%
Household income less than \$33,000	67%	>	63%
Age (mean)	59.4	>	51.9
Number living in the home (mean)	3.6	<	4.3
Electricity Usage (SCE data)			
Quarterly usage (mean)	1044	>	975
Efforts to Save (1 to 5 scale)			
Always try to save (% rating 4-5)	89%	>	78%
Have been successful (% rating 4-5)	65%	>	54%
Energy Efficiency Program Participation			
Appliance Recycling Program (ARP)	28%	>	21%
EE Rebates	24%	>	17%
Home Energy Efficiency Surveys (HEES)	24%	>	16%
Summer Discount Plan (SDP; AC Cycling)	22%	>	16%
Energy Management Assistance (EMA/LIEE)	21%	>	17%
Obstacles to Saving Energy			
Maintain comfort / heating / cooling	12%	>	9%
Cost of new appliances	12%	>	9%
Medical needs	10%	>	3%

Significant differences at 95% confidence indicated by < and >

From the qualitative in-home visits, example verbatim comments and interviewer comments include:

Table 33: Declining Health/Wealth Supporting Qualitative

	Qualitative Comments
Respondent	“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.”
Observer	Many of the respondent’s consumer electronics are old, pre-Energy Star era devices, including a older plasma TV, laser disc player, turntable, stereo receiver and amplifier.
Respondent	“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.]”

Observer

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.

How does the current LIEE program meet their needs?

The LIEE program does address the needs of some of these households (particularly those that overlap with the Hostage to Domicile subgroup) – in so far as weatherization can reduce their heating and cooling demands, and/or replacement refrigerators can be provided.

Recommendations

Ensuring that these customers are aware of and participate in other relevant utility programs such as “medical baseline” may be beneficial. A “prepare-for-retirement” message to encourage customers to make their homes more energy efficient *before* they reach this stage of declining health/wealth could also be considered. Program marketing might work through county health organizations, which are routinely in contact and even in the homes of this low income group, in order to specifically identify more of these households. To enhance the current LIEE program offering, an implementation team that specializes in medically-dependent households might identify other energy-related needs that the household’s specific medical situation could benefit from.

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 is takes actions to save energy. Characteristics of these households include:

- Cooperation from others in the household is the number one stated barrier to reducing electricity usage, and is a defining characteristic – contributing to their low frequency of energy efficient behaviors (second only to Merry Users), and a reason why they believe they try hard to conserve but feel they have less success.
- This group includes households with more appliances and electronics, so inherently need to be more diligent to keep their energy consumption in check.
- Demographically, they are younger, in larger households with children or other adults in addition to the head of household, a high proportion are Spanish-speakers, and they are more likely to be renters.

- They have a higher incidence of disconnects, likely a result of having many other demands for their limited resources (because of the number of people in the household).

Table 34: Divided Household Supporting Data

	Divided Household (n=117)		High Users Total (n=445)
Obstacles to Save Energy			
Cooperation of others in the home	100%	>	29
Appliances and Electronics			
Number of appliances (mean)	5.1	>	4.8
Number of electronics (mean)	9.0	>	7.7
Demographics			
Age (mean)	47.9	<	51.9
Number living in the home (mean)	5.3	>	4.3
Renters	46%	>	38%
Energy Efficient Behaviors			
Turn off lights	62%	<	73%
Turn off TV	62%	<	69%
Unplug chargers when not home	42%	<	54%
Close heating / cooling ducts	42%	<	51%
Payment History			
Disconnects	0.29	>	0.24

Significant differences at 95% confidence indicated by < and >

From the qualitative in-home visits, example verbatim comments and interviewer comments include:

Table 35: Divided Household Supporting Qualitative

	Qualitative Comments
Respondent	“The house uses above average energy because of the borders...The more people, the more energy is used.” “The Internet [computer and Internet connection] is on all the time for them.”
Observer	Of seven household members, five are boarders.
Respondent	“We use a lot of energy. Most of our appliances are electric. I don’t like using a lot—it’s a necessary evil...We have three household members...and we use TVs and space heaters [in our rooms].”
Respondent	“The renters don’t have much activity. They watch TV in their rooms....To achieve energy efficiency, “you must get the [boarders] to help.”
Respondent	“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.”
Observer	This appears to be a highly dysfunctional family with each person using energy independently.

How does the current LIEE program meet their needs?

The existing LIEE program, which offers weatherization, efficient lighting, and new refrigerators along with some educational information, does meet the needs of this subgroup, but with opportunities for enhancement.

Recommendations

While there may be a number of things that can be addressed and modified in the current program to better meet the needs of these customers, one aspect in particular stands out. Customers from this group complain that they cannot get cooperation from other members of the family or household, so there may be creative and innovative ways to address this issue. For example, consider creating targeted educational and marketing materials that are written to or for the children and teenagers in the household in a manner and format that *they* identify with. Provide tips and strategies for the bill-payers (aka parents) that might get uncooperative teenagers, roommates, or boarders on board. One customer gave an example of how she “incentivized” her teenager to be more energy efficient in the home by telling the teen that every time she found that the TV was left on she would take \$5 off what she agreed to pay for her daughter’s cell phone bill. This creative mom applied similar strategies to her other children to improve cooperation and thereby reduce her energy bill.

The program may also be able to assist this group with improving cooperation through increased bill payer control – smart power strips and “parental control” devices (e.g., programmable thermostats that require an access code) could be added to program measures. It also may be possible to create educational materials or measures that assist the other uninformed or disinterested adults in the home in reducing energy use.

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.

- 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 – all after Declining Health/Wealth.
- Not surprisingly, they are in the oldest homes, they have the lowest proportion of energy efficient features in their home, and the oldest refrigerators and air conditioners.
- Likewise, 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.
- They have average participation but the lowest awareness among non-participants of the LIEE program – suggesting that those who know about LIEE tend to participate, but they are less likely to know about it.

Table 36: Hostage to Domicile Supporting Data

	Hostage to Domicile		High Users Total
Demographics	(n=108)		(n=445)
Household income less than \$33,000	71%		63%
Age (mean)	53.2		51.9
Years in home (mean)	15.0		13.8
Home Characteristics			
Year home was built (mean)	1964	<	1970
Age of refrigerator (mean)	8.7	>	6.4
Age of AC 10+ years old	40%	>	27%
Obstacles to Saving Energy			
Condition of home	44%	>	11%
Cost of new appliances	13%	>	9%
Age of home	15%	>	4%
Construction of home	10%	>	2%
Energy Efficiency Program Participation			
Appliance Recycling Program (ARP)	18%		21%
Energy Management Assistance (EMA/LIEE)	15%		17%
EE Rebates	11%		17%
Summer Discount Plan (SDP; AC Cycling)	12%		16%
Aware of EMA/LIEE	(n=73)		(n=286)
Yes	29%		34%

Significant differences at 95% confidence indicated by < and >

From the qualitative in-home visits, example verbatim comments and interviewer comments include:

Table 37: Hostage to Domicile Supporting Qualitative

	Qualitative Comments
Respondent	“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.”
Observer	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.
Respondent	“I’m trapped. There’s not much I can do. There’s energy being wasted.”
Observer	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.
Respondent	“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.”
Observer	Customer says he’s facing a layoff and can’t afford more efficient

	appliances. He doesn't want to jeopardize his landlord relationship by asking for upgrades.
Respondent	"The A/C is on 24-7 because the house doesn't cool down. The insulation is inadequate... The fridge is old."
Observer	The homeowners intend to divorce, but neither wants to invest more in the house because the other will benefit. So, they accept the house and its appliances as they are.

How does the current LIEE program meet their needs?

At its core, the low income weatherization programs were designed for this customer group, so by and large, the program meets the primary energy-related needs of this group.

Recommendations

While for the most part the program meets the needs of these customers, increasing the relevance and knowledge of what can be done (from a behavioral standpoint) would be beneficial for this group as well, as is the case with many of the "high usage customers." Moreover, since this group shows only "average" LIEE program participation rates relative to the other groups, it would be advantageous to increase customer awareness of the program and target these "ideally suited" customers. One caveat, however, is that SCE, as an electric-only utility, is limited in the weatherization measures that can be provided, so these customers might be better candidates for the regional gas utilities who provide services for the gas/heating related measures.

Concerned But Uninformed (19% of the high user population)

These households seem to desire greater efficiency using electricity, but lack knowledge, guidance, or information. They are very much aware of their energy usage and might even believe that they are energy conservers, but they are not conservation minded in the sense that they do not really know what they can do to reduce their usage.

- Demographically, this subgroup is younger, less educated, and they tend to be Spanish speakers.
- They are more likely to be renters and to have the shortest tenure in their residence.
- They have a higher incidence of disconnects and billing related contacts with SCE – suggesting greater energy burden as well.
- Main barriers to reducing energy use are cooperation from others, and they don't know what to do.

Table 38: Concerned But Uninformed Supporting Data

	Concerned But Uninformed		High Users Total
Demographics	(n=83)		(n=445)
Age (mean)	47.1	<	51.9
Spanish speakers	25%		24%
College graduate or higher	18%		23%
Years in home (mean)	10.3	<	13.8
Home Characteristics			
Renters	52%	>	38%
Billing Issues (SCE data)			
Number of disconnects (mean)	0.27		0.24
Number of billing contacts (mean)	25	>	21
Obstacles to Saving Energy			
Cooperation from others in home	40%	>	29%
Don't know what to do	11%	>	2%

Significant differences at 95% confidence indicated by < and >

From the qualitative in-home visits, example verbatim comments and interviewer comments include:

Table 39: Concerned But Uninformed Supporting Qualitative

	Qualitative Comments
Respondent	"I turn off lights and check on the others to turn off lights." Strongly agrees: "I am very knowledgeable about things I can do around my home to save energy."
Observer	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.
Respondent	"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."
Observer	The home has a spa and a large number of incandescent light fixtures and bulbs.
Respondent	"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."
Observer	All household members appear to make heavy use of the TV and attached consumer electronics, which often are left on.
Respondent	"I'm very particular about not leaving lights on when not in the area. I've replaced old bulbs with CFLs."
Observer	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.

How does the current LIEE program meet their needs?

This group warrants more attention. Similar to the Divided Household subgroup, existing LIEE program measures are likely to have minimal impact with the Concerned But Uninformed.

Recommendations

Enhanced education may be considered. In particular, educational materials that are relevant and especially meaningful to the needs of this group may assist in generating greater “concern,” greater understanding about “cause and effect” (e.g., leaving a TV on for 6 hours costs \$x.xx), 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 and that it was not going to significantly impair their lifestyle to make relevant efficiency changes.

This group may also benefit from the addition of measures that are more appropriate for this more transient renter population. Portable or plug-in energy control devices (e.g., timers, smart power strips) that don’t require landlord approval and CFL’s with the ability to receive replacement CFLs (when the original bulbs burn out) are two ideas.

Merry Users (13% of the high user population)

The household does not pay attention to the amount of energy used, and doesn’t seem to care.

- 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. As such, they are the least likely to be motivated to save money on their energy bill.
- They are the least likely to try hard to save energy, and least likely to think they’ve been successful. They do not pay 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, including LIEE.

Table 40: Merry Users Supporting Data

	Merry Users		High Users Total
Demographics	(n=57)		(n=445)
College graduate or higher	32%		23%
Household income \$53,000 or more	31%		12%
Home Characteristics			
Single family home	78%		74%

Temperate climate zone	63%		55%
Efficiency Effort			
Number of EE behaviors endorsed as “always”	3.9		5.2
Effort to save energy in home (% 4-5 rating)	56%		78%
Energy Efficiency Program Participation			
Appliance Recycling Program (ARP)	14%		21%
Energy Management Assistance (EMA/LIEE)	11%		17%
EE Rebates	19%		17%
Summer Discount Plan (SDP; AC Cycling)	13%		16%
Home Energy Efficiency Surveys (HEES)	10%		16%

Significant differences at 95% confidence indicated by < and >

From the qualitative in-home visits, example verbatim comments and interviewer comments include:

Table 41: Merry Users Supporting Qualitative

	Qualitative Comments
Respondent	“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.”
Observer	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.
Respondent	“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.”
Respondent	“I don’t give energy use a second thought. I think of my grand kids. I leave it on for my puppies...when I’m gone.” She somewhat agrees that “having the benefits I get from using energy is more important than saving energy.”
Observer	Home has a large number of incandescent bulbs and six TVs, two with game consoles.
Respondent	“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.”
Observer	The home has six TVs, including an old, large rear projection-type with PlayStation. A mounted LED/LCD TV remained on during the site visit.

How does the current LIEE program meet their needs?

The current program can do little to address the crux of the issues with this group, since their particularly high usage is driven primarily by attitude and behavioral choices.

Recommendations

While this group may be considered a relatively lower priority in terms of a target group, to the extent that the program can enhance the educational and marketing materials to increase relevance, awareness and knowledge it may be possible to interest these customers in making more energy efficient choices that are beneficial to them. Again, we found in the focus groups that sometimes the “merry users” or “unconcerned” could be moved to a place of interest and concern (and behavior change) if given information in a way that was relevant and meaningful to them. Since they overlap with Divided Households, some Merry Users might be served through the recommendations for this other subgroup. Marketing will need to break through their lack of interest or motivation – perhaps through tie-ins with home improvement or appliance retailers.

V. CONCLUSIONS

Contrary to what was expected we did not find that it was a poorly functioning refrigerator or air conditioner that was the main culprit or 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, knowledge or 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, while in many cases these households struggle to pay their bills, they also tend to skew higher on income and to feel it is “their right” to be able to use the energy they want to and need, and as such as less likely to make personal “sacrifices” in service of comfort, as is often the case with the low income lower usage households. In other words, the idea of reducing their electricity usage by doing without is a turn-off.

Three main conclusions or “needs” regarding reducing their electricity usage emerged. High usage low income customers may benefit from:

- (4) More control since they have more people, more appliances and electronics, and more space (for heating and cooling).
- (5) More education about what they can do to manage and reduce their energy use.
- (6) Greater reach into the household so that more household members can be informed.

The research also determined that the majority of low income high usage customers can be allocated to five main subgroups: Declining Health/Wealth, Divided Household, Hostage to Domicile, Concerned but Uninformed, and Merry Users. The existing LIEE program meets the needs of some but not all of the subgroups.

Recommendations

While the research did not identify a single particular “measure” we could recommend that would assist these customers in reducing their consumption, we instead recommend a variety of more educational, marketing, and lifestyle-specific program enhancements that may assist these customers in reducing their energy bills and overall usage. In addition, the program could consider measures such as power strips or other technology-based controls that can assist these households in managing or monitoring their energy usage.

Specific recommendations for program enhancements include:

- (5) Develop and target educational materials at other members of the household, such as children and roommates.
- (6) Enhance cooperation within a household through increased bill payer control, for example, smart power strips and “parental control” devices can be added to program measures.
- (7) Identify energy-related needs that a specific medical situation requires through a specialized implementation team for medically-dependent households.
- (8) 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.

Program marketing should speak more directly to these subgroups.

- (3) Each subgroup represents a unique scenario that can be the focus of different creative executions. For example:
 - Messaging targeted to Divided Households can recognize that getting cooperation from others in the household is a major barrier.
 - Outreach aimed at Declining Health/Wealth households could include a prepare-for-retirement message to encourage energy efficiency improvements before they reach the stage of declining health and wealth.
 - Messages for the Concerned But Uninformed and the Merry Users could include factual information about the cost of leaving TVs or other electronics on, or the cost of running a Central AC when no one is home.
- (4) Tactics to reach these different subgroups can also be employed. For example:
 - a. Work through county health organizations to reach Declining Health/Wealth
 - b. Work through schools for education and distribution of portable program measures to reach Divided Households, Concerned But Uninformed, and Merry Users.

APPENDICES

Appendix A: Database Analysis Results by Quintiles

Table A1. DATABASE DATA: ELECTRICITY USAGE, PAYMENTS

High Usage customers (in temperate and non-temperate zones) are higher users of electricity across all times of year (quarters), and have more SCE bill payment problems.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Energy Usage (SCE)									
Winter (Q1 2009)	451	838	999	908	358	554	424	302	181
Spring (Q2 2009)	421	745	962	840	334	523	383	287	173
Summer (Q3 2009)	632	965	1,562	1,234	507	822	592	435	241
Fall (Q4 2009)	455	828	1014	912	365	576	431	324	190
Overall (2009)	483	841	1140	925	386	622	458	339	194
Payments (SCE)									
Nr. Payment Contacts	0.98	2.81	1.93	2.42	0.74	1.33	0.81	0.63	0.34
Nr. All Contacts w/SCE	13.09	17.78	25.06	20.96	11.59	16.31	13.05	10.29	8.05
Mean SCE Credit Score	806	771	747	760	817	787	812	824	836
Number Overdue Fees	0.36	0.54	0.53	0.54	0.31	0.50	0.40	0.32	0.09
Number of Disconnects	0.15	0.24	0.23	0.24	0.13	0.25	0.11	0.15	0.04
Overall Payment Problems		High	High	High	Moderate	High	Moderate	Low	Very Low

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table A2. DATABASE DATA: HOME CHARACTERISTICS

Temperate High Users are in older, smaller homes (and more likely in multi-family), but this is a function of their coastal location.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Dwelling Characteristics (SCE and Census)									
Number of Rooms (census)	4.6	4.7	5.3	4.9	4.5	4.8	4.6	4.4	4.2
Year Built (census)	1970	1964	1979	1970	1970	1971	1970	1971	1969
Year of Service Acct (SCE)	2002	2000	2002	2001	2002	2002	2002	2003	2003
Housing Type (Census)									
Single Family	45%	66%	52%	60%	42%	53%	48%	39%	31%
Tract	18%	15%	34%	23%	17%	23%	21%	19%	9%
Multiple	32%	19%	6%	13%	36%	19%	24%	37%	57%
Mobile	5%	1%	7%	4%	5%	5%	6%	5%	3%
All Others	<1%	-	1%	<1%	<1%	-	-	-	<1%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table A3. DATABASE DATA: HOME CHARACTERISTICS

High users (temperate and non-temperate) are less likely to be renters, and they move less often.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Geographic (Census)									
<i>Percent Renters</i>	46%	40%	31%	36%	48%	40%	45%	48%	56%
<i>People per Sq. Mile</i>	9,583	10,399	3,614	7,387	10,664	8,849	9,941	10,212	10,933
<i>Not Moved (SCE)</i>	65%	81%	65%	74%	63%	69%	69%	61%	56%
<i>Households <175% Poverty</i>									
<i>Rural</i>	22%	6%	45%	24%	22%	23%	22%	22%	21%
<i>Suburban</i>	7%	3%	9%	6%	7%	7%	7%	4%	8%
<i>Urban</i>	70%	87%	45%	68%	70%	69%	69%	71%	70%
Climate Zones (SCE)*									
	* Usage Quintiles are defined within climate zones								
<i>Extreme Coastal</i>	9%	16%	-	9%	9%	8%	7%	11%	11%
<i>Inland Coastal</i>	23%	44%	-	24%	23%	22%	26%	20%	24%
<i>Inland Coastal Valleys</i>	18%	37%	-	20%	18%	18%	19%	16%	17%
<i>Inland Valleys</i>	23%	-	48%	21%	23%	24%	25%	23%	20%
<i>Southern Central Valley</i>	8%	-	16%	7%	8%	8%	5%	12%	8%
<i>High Desert</i>	14%	-	29%	13%	14%	16%	14%	15%	13%
<i>Low Desert</i>	4%	-	7%	3%	4%	4%	3%	2%	5%
<i>High Mountains</i>	2%	3%	-%	2%	2%	1%	2%	2%	2%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table A4. DATABASE DATA: SCE PROGRAM PARTICIPATION

High users are less likely to have participated in LIEE⁵, but they are more likely to participate in My Account, the Level Payment Plan, and other EE programs (ARP, EE rebates, and HEES). LPP is targeted to customers with bill payment problems. Lower participation in LIEE is counterintuitive. The program has targeted customers with bill payment problems and those with higher usage, yet still has “underserved” the high usage population in both temperate and non-temperate areas.

	High Users					Lower Users			
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Programs (SCE) (Percent Participants)									
LIEE Participant	11%	5%	11%	8%	12%	15%	9%	11%	11%
My Account	23%	29%	33%	31%	22%	23%	22%	22%	21%
Medical Baseline	5%	6%	9%	7%	5%	7%	4%	3%	4%
Level Payment Plan	8%	9%	14%	12%	7%	10%	8%	9%	4%
Programs (SCE) (Mean Number of Times)									
Appliance Recycling	0.06	0.08	0.12	0.10	0.05	0.08	0.08	0.04	0.02
EE (Appliance) Rebates	0.01	0.03	0.03	0.03	0.01	0.00	0.01	0.01	0.00
Home Energy Surveys	0.02	0.01	0.07	0.04	0.02	0.03	0.03	0.01	0.01

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

⁵ EMA/LIEE participation includes customers who say they have participated in the LIEE program at any time in the past. The data do not reflect participant customer data from a specified program year.

Appendix B: Telephone Survey Results by Quintiles

Table B1. DEMOGRAPHICS: AGE, GENDER, HOUSEHOLD SIZE

High users are middle aged, and are more likely to have larger household sizes – yet not with those under 18 or over 65, suggesting they are more likely to have other adults in the home.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Age (D1)									
18 to 44 years	36%	32%	34%	33%	36%	34%	35%	39%	38%
45 to 64 years	33%	41%	44%	42%	32%	38%	32%	30%	28%
65 or older	25%	22%	20%	21%	26%	21%	27%	28%	28%
Refused	5%	5%	2%	3%	5%	6%	7%	4%	6%
Gender (D8)									
Male	31%	35%	37%	36%	30%	30%	28%	29%	33%
Female	69%	65%	63%	64%	70%	70%	71%	70%	67%
Household Size (mean) (S4, S5, S6)									
Total	3.4	4.4	4.3	4.3	3.2	3.8	3.5	3.1	2.7
Under 18	2.3	2.2	2.5	2.3	2.3	2.5	2.3	2.2	2.1
65 or older	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.4

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B2. DEMOGRAPHICS: EDUCATION AND INCOME

High users have higher income and education (although over half have HHI under \$33,000/year).

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Education (D2)									
High school or less	76%	75%	76%	75%	76%	78%	71%	81%	75%
Some or college grad	22%	23%	22%	23%	21%	19%	26%	17%	22%
Refused	2%	3%	1%	2%	2%	3%	3%	2%	2%
Income (D5)									
Less than \$33,000	65%	53%	59%	56%	67%	61%	61%	70%	74%
\$33,000 to < \$53,000	14%	20%	26%	23%	12%	15%	16%	13%	6%
\$53,000 or more	7%	13%	7%	10%	6%	7%	9%	2%	6%
Refused	14%	13%	9%	11%	15%	16%	15%	15%	14%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B3. DEMOGRAPHICS: ETHNICITY AND LANGUAGE SPOKEN

Temperate high users are more likely Hispanic (and less likely to speak English) while non-temperate high users are more likely white English-speakers.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Ethnicity (D3)									
Hispanic or Latino	44%	48%	27%	38%	45%	47%	45%	43%	46%
White or Caucasian	36%	28%	52%	39%	35%	31%	36%	40%	33%
African American	9%	11%	11%	11%	9%	9%	9%	7%	10%
Asian	3%	6%	1%	3%	3%	2%	3%	3%	3%
American Indian	1%	1%	1%	1%	1%	2%	4%	1%	1%
Other	4%	4%	6%	5%	4%	5%	4%	3%	3%
Refused	4%	2%	3%	2%	4%	5%	2%	3%	5%
Languages Spoken In Home (D4)									
English	70%	71%	86%	78%	69%	72%			65%
Spanish	31%	31%	16%	24%	33%	32%	33%	33%	34%
All Other	3%	4%	1%	3%	3%	1%	5%	3%	3%
Refused	2%	1%	<1%	1%	2%	2%	2%	2%	2%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B4. DEMOGRAPHICS: DISABILITIES

High users are more likely to have a disabled person living in the home, and in particular someone with a mobility disability.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Disabled Person Living in Home (D6)									
Yes	30%	35%	42%	38%	28%	30%	30%	28%	25%
No	67%	63%	57%	60%	68%	66%	66%	69%	72%
Refused	4%	2%	2%	2%	4%	5%	4%	3%	4%
Type of Disability (if disabled person living in home) (D7)									
Mobility	31%	37%	37%	37%	29%	27%	33%	23%	34%
Chronic Disease	28%	25%	22%	24%	29%	30%	25%	34%	29%
Hearing	11%	11%	14%	12%	10%	4%	16%	16%	3%
Psychological	9%	8%	8%	8%	9%	14%	8%	8%	7%
Vision	9%	7%	7%	7%	9%	16%	7%	6%	7%
Cognitive	8%	6%	10%	8%	9%	6%	7%	8%	14%
Other	1%	2%	-	1%	2%	1%	-	1%	4%
Refused	3%	4%	3%	3%	3%	2%	5%	4%	1%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B5. HOME CHARACTERISTICS: TYPE, SIZE, AGE, AND OWNERSHIP

High users (in temperate and non-temperate zones) are more likely owners in single family homes, so their homes are larger and they tend to have lived there a longer time.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Type of Home (HC1)									
Single Family	59%	69%	80%	74%	55%	71%	64%	52%	39%
Apartment	23%	16%	5%	11%	25%	13%	14%	27%	41%
Mobile Home	6%	2%	11%	6%	6%	5%	7%	6%	5%
Duplex	5%	2%	1%	2%	5%	2%	3%	6%	7%
Condominium	4%	5%	1%	3%	5%	5%	6%	5%	4%
Townhouse or Row House	4%	5%	2%	4%	4%	2%	5%	4%	3%
Don't Know	<1%	-	<1%	<1%	<1%	-	<1%	<1%	<1%
Characteristics (means) (HC2a, HC2b, HC4, HC5)									
Size (square footage)	1,543	1,852	1,850	1,851	1,440	1,675	1,490	1,314	1,302
Number of bedrooms	2.6	3.0	3.3	3.1	2.5	2.9	2.7	2.3	2.0
Years lived there	12.0	15.7	11.4	13.8	11.5	11.9	12.8	11.3	10.3
Year home was built	1970	1962	1979	1970	1970	1972	1970	1971	1969
Own or Rent (HC3)									
Own	51%	58%	66%	61%	48%	60%	59%	45%	32%
Rent or lease	48%	42%	34%	38%	51%	39%	40%	54%	67%
Don't know	1%	-	<1%	<1%	1%	1%	1%	1%	1%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B6. HOME CHARACTERISTICS: EE FEATURES AND IMPROVEMENTS

High users (temperate and non-temperate) are *more* likely to have more of the energy efficient features shown below, and they are more likely to have installed it while living there.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Energy Efficient Features (HC6)									
<i>Ceiling Fan</i>	65%	71%	80%	75%	64%	67%	68%	61%	59%
<i>Programmable Thermostat</i>	63%	59%	83%	70%	62%	65%	64%	60%	58%
<i>Double Pane Windows</i>	50%	48%	61%	54%	50%	57%	56%	44%	44%
<i>Attic Insulation</i>	41%	47%	56%	51%	39%	50%	43%	36%	30%
<i>Weatherstripping</i>	36%	38%	41%	40%	35%	34%	39%	32%	35%
<i>Whole House Fan</i>	23%	28%	24%	27%	22%	24%	24%	19%	21%
<i>Motorized Attic Vents</i>	15%	19%	21%	20%	13%	20%	14%	11%	10%
<i>CFL's more than 50%</i>	53%	54%	54%	54%	52%	53%	52%	53%	51%
<i>Number of EE Features</i>	2.9	3.1	3.7	3.4	2.8	3.2	3.1	2.6	2.6
Already Installed When Moved In (if have feature) (HC7)									
<i>Ceiling Fan</i>	52%	47%	45%	46%	54%	48%	53%	56%	60%
<i>Programmable Thermostat</i>	67%	52%	58%	55%	70%	66%	64%	73%	75%
<i>Double Pane Windows</i>	61%	53%	65%	59%	62%	63%	59%	60%	66%
<i>Attic Insulation</i>	69%	55%	74%	65%	70%	66%	68%	71%	75%
<i>Weatherstripping</i>	52%	37%	54%	45%	54%	50%	54%	56%	55%
<i>Whole House Fan</i>	71%	68%	62%	66%	71%	64%	63%	85%	75%
<i>Motorized Attic Vents</i>	61%	58%	58%	58%	62%	55%	72%	62%	61%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B7. HOME CHARACTERISTICS: ALL ELECTRIC OR ELECTRIC AND GAS

High users are also more likely to have taken additional actions to make their home more energy efficient, including appliance and insulation upgrades (only the top actions are shown).

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Other Action Taken (to make home more efficient) (HC11)									
Yes	16%	14%	24%	19%	15%	19%	16%	13%	14%
No	81%	82%	73%	78%	82%	77%	81%	84%	84%
Don't know	3%	3%	3%	3%	3%	4%	4%	3%	2%
Type of Action (if other action taken) (HC12)									
Refrigerator/Appliances	24%	25%	18%	21%	24%	23%	18%	26%	30%
Insulation	13%	11%	5%	8%	13%	16%	14%	10%	13%
Weather Stripping	11%	12%	7%	9%	12%	6%	22%	7%	14%
New Doors	7%	8%	5%	6%	8%	8%	5%	3%	14%
All Electric or Electric and Gas (HIN4)									
All Electric	12%		10%	16%	11%	11%	12%	9%	13%
Electricity and Gas	87%		89%	83%	88%	89%	87%	91%	86%
Don't know	<1%	<1%	1%	1%	<1%	<1%	<1%	<1%	<1%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B8. HOME CHARACTERISTICS: AC

High users (temperate and non-temperate) are more likely to have central AC, and AC of any type, particularly those in non-temperate zones.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Air Conditioning Type (HC9)									
Central AC	46%	41%	76%	57%	44%	54%	48%	39%	37%
Window or Wall AC	19%	22%	11%	17%	20%	19%	19%	21%	20%
Evap or Swamp Cooler	13%	5%	24%	13%	13%	14%	12%	15%	11%
Heat Pump	3%	5%	4%	4%	3%	3%	3%	1%	3%
Fans	18%	24%	16%	20%	19%	19%	18%	17%	21%
Portable AC	4%	3%	2%	3%	4%	4%	4%	3%	4%
None	15%	19%	1%	11%	16%	12%	17%	17%	17%
Don't know	2%	1%	1%	1%	2%	1%	2%	4%	1%
Age of Air Conditioner (if have some type of AC) (HC10)									
Less than 10 years	57%	57%	60%	59%	56%	59%	55%	57%	54%
10 years or older	26%	28%	27%	27%	26%	28%	30%	25%	23%
Don't know	17%	15%	13%	14%	18%	13%	15%	18%	23%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B9. APPLIANCES

High users (temperate and non-temperate) are more likely to have more appliances of all types. Interestingly, high users in non-temperate zones have more appliances than those in temperate. High users in non-temperate zones are more likely to have newer refrigerators, but high users in temperate zones have refrigerators about the same age as the rest of the low income population.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Appliances in the Home (means) (HIN1)									
Refrigerators	1.2	1.3	1.4	1.4	1.2	1.3	1.2	1.1	1.1
Standalone Freezers	0.2	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.1
Clothes Washer	0.8	0.8	1.0	0.9	0.8	0.9	0.8	0.7	0.6
Clothes Dryer	0.7	0.8	0.9	0.9	0.7	0.9	0.8	0.7	0.6
Dishwasher	0.5	0.4	0.7	0.5	0.4	0.5	0.5	0.4	0.3
Window AC	1.1	1.2	1.4	1.3	1.0	1.2	1.0	1.0	0.9
Plug-in Electric Heater	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3
Pool or Spa	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1
Total	4.0	4.5	5.2	4.8	3.8	4.4	4.1	3.6	3.3
Age of Primary Refrigerator (HIN3)									
Less than 5 years	51%	50%	58%	53%	51%	53%	47%	51%	53%
6 years or older	43%	45%	40%	42%	43%	43%	48%	43%	38%
Don't know	6%	6%	2%	4%	6%	5%	4%	6%	10%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B10. ELECTRONICS

High users (temperate and non-temperate) are also more likely to have substantially more electronics of all types – perhaps related to the number of people in the home.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Electronics in the Home (means) (HIN1)									
TV's	2.5	3.0	3.2	3.1	2.3	2.7	2.6	2.2	2.0
Desktop Computers	0.7	0.9	1.0	1.0	0.6	0.7	0.7	0.5	0.5
Laptop Computers	0.5	0.9	0.9	0.9	0.5	0.6	0.6	0.5	0.3
Cable/DVR Boxes	1.3	1.8	2.2	1.9	1.2	1.7	1.4	1.0	1.0
Video Game Console	0.5	0.8	0.9	0.8	0.5	0.6	0.5	0.5	0.4
Total	5.5	7.3	8.2	7.7	5.1	6.2	5.8	4.7	4.2

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B11. ENERGY-RELATED ATTITUDES: EFFORT MADE

High users (temperate and non-temperate) are less likely to say they always try to save and less likely to think they have been successful. High users are also more interested in being comfortable and productive, especially those in non-temperate zones. These results suggest that high users are a bit less motivated to save and they have more barriers to success when they try.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Efforts to Save (1 to 5 scale) (AT1, AT2)									
<i>Always try to save (4-5)</i>	84%	78%	78%	78%	84%	84%	83%	85%	84%
<i>Have been successful (4-5)</i>	66%	57%	51%	54%	68%	61%	66%	66%	75%
Importances (means – 10 point allocation) (AT3)									
<i>Save money on bill</i>	5.1	5.2	5.1	5.2	5.1	5.1	5.0	5.2	5.0
<i>Improve environment</i>	3.0	2.9	2.5	2.7	3.0	2.8	3.1	2.9	3.2
<i>Comfortable and productive</i>	2.0	2.0	2.5	2.2	2.0	2.3	1.9	2.0	1.8

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B12. ENERGY-RELATED ATTITUDES: OBSTACLES

In part related to their larger household sizes, high users (temperate and non-temperate) are more likely to mention cooperation from others as an obstacle. High users in non-temperate zones also mention heating or cooling as a barrier more often than other low income customers.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Obstacles to Saving Energy (AT4)									
<i>Cooperation of others</i>	19%	26%	33%	29%	16%	27%	16%	14%	10%
<i>Condition of home</i>	9%	11%	10%	11%	9%	8%	10%	10%	7%
<i>Cost</i>	9%	8%	11%	9%	9%	13%	8%	8%	6%
<i>Too many things</i>	8%	7%	7%	8%	8%	7%	9%	10%	7%
<i>Heating or cooling</i>	8%	7%	12%	9%	8%	9%	11%	5%	6%
<i>Renter</i>	3%	4%	4%	4%	3%	2%	2%	5%	4%
<i>Don't know what to do</i>	3%	3%	1%	2%	3%	3%	3%	4%	2%
<i>Age of home</i>	3%	4%	3%	4%	3%	4%	2%	4%	2%
<i>Construction of home</i>	2%	2%	3%	3%	2%	2%	4%	<1%	2%
<i>Lack of time</i>	1%	2%	1%	1%	1%	2%	1%	3%	-
<i>Medical needs</i>	1%	3%	2%	3%	1%	1%	2%	1%	<1%
<i>Pool or spa</i>	1%	2%	2%	2%	<1%	1%	<1%	-	-
<i>Work at home</i>	<1%	-	1%	<1%	<1%	<1%	-	-	<1%
<i>Other</i>	10%	11%	11%	11%	10%	11%	12%	7%	10%
<i>Don't know</i>	37%	29%	20%	25%	40%	26%	33%	43%	53%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B13. ENERGY-RELATED ATTITUDES: AGREEMENT WITH STATEMENTS

Regarding their attitudes, high users are more motivated by the cost of energy and less by the environment. They also admit being less knowledgeable about how they can save.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Attitudes About Energy (percent strongly agree) (AT6)									
<i>Cost of energy makes me want to conserve</i>	73%	78%	80%	79%	72%	77%	72%	71%	69%
<i>I monitor my electricity bills very closely</i>	71%	72%	71%	72%	71%	68%	70%	72%	71%
<i>New technologies can help me use energy more efficiently</i>	69%	72%	71%	71%	69%	68%	75%	67%	67%
<i>I am very concerned about the environment</i>	67%	62%	64%	63%	68%	69%	67%	65%	70%
<i>Energy I use has an impact on future generations</i>	66%	64%	65%	65%	67%	69%	72%	61%	65%
<i>I am very knowledgeable about things I can do to save</i>	61%	53%	60%	56%	61%	57%	61%	62%	63%
<i>Saving on bill is worth sacrificing some comfort & convenience</i>	57%	59%	57%	58%	57%	60%	56%	52%	59%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B14. ENERGY-RELATED ATTITUDES: AGREEMENT WITH STATEMENTS

High users (temperate and non-temperate) are less likely to think they have done all they can to save energy, and they are more likely to worry about being able to pay their energy bill.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Attitudes About Energy (percent strongly agree) (AT6)									
<i>I've already done everything I can to save energy</i>	55%	48%	45%	47%	56%	53%	53%	53%	63%
<i>I sometimes worry if there is enough money to pay my energy bill</i>	53%	58%	59%	59%	52%	62%	51%	50%	48%
<i>I regularly try to convince others to use less energy</i>	52%	57%	52%	55%	51%	54%	50%	49%	51%
<i>I do more than most people to reduce my impact on the environment</i>	45%	33%	38%	35%	48%	46%	45%	47%	51%
<i>If I wanted to I could use less energy than I use now without sacrificing too much</i>	41%	44%	34%	39%	41%	40%	43%	41%	41%
<i>My actions have little effect on global warming</i>	30%	28%	24%	26%	30%	31%	29%	26%	34%
<i>Having the benefits of using energy is more important than saving energy</i>	24%	22%	16%	19%	25%	21%	21%	29%	28%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B15. ENERGY-RELATED ATTITUDES: AGREEMENT WITH STATEMENTS

Among high users, their energy use does weigh on their minds, and they are more likely to agree that someone in the home is dependent on energy for health reasons.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Attitudes About Energy (percent strongly agree) (AT6)									
<i>I don't often think about how much energy I use in my home</i>	23%	15%	15%	15%	24%	23%	23%	20%	28%
<i>Someone in my household is dependent on energy for health reasons</i>	22%	26%	29%	27%	21%	21%	24%	18%	19%
<i>I am often the first among family and friends to purchase new appliances</i>	22%	27%	24%	26%	22%	24%	19%	20%	24%
<i>I usually buy used rather than new appliances</i>	15%	15%	12%	14%	15%	11%	16%	16%	15%
<i>If I were to buy a new appliance I would buy a less expensive one even if it used more energy</i>	10%	8%	7%	8%	10%	10%	10%	10%	11%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B16. ENERGY-RELATED BEHAVIORS

Suggesting that high usage is not just because of their environment, high users are less likely to follow energy efficient practices at home: turning off lights and TVs, etc.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Energy Efficient Behaviors (percent "always" do this) (EB1)									
<i>Turn off lights</i>	78%	72%	75%	73%	79%	76%	76%	79%	83%
<i>Power down computer</i>	67%	60%	61%	61%	68%	72%	63%	69%	69%
<i>Unplug chargers</i>	58%	58%	50%	54%	59%	56%	60%	59%	60%
<i>Turn off TV</i>	75%	69%	69%	69%	76%	76%	73%	74%	80%
<i>Run appliances full</i>	74%	78%	77%	77%	74%	83%	76%	66%	72%
<i>Use fans on hot days</i>	45%	44%	36%	40%	45%	45%	48%	41%	47%
<i>Raise/lower thermostat</i>	32%	32%	35%	33%	32%	37%	32%	31%	29%
<i>Clothing for warmth</i>	59%	58%	60%	59%	59%	64%	56%	58%	60%
<i>Close ducts</i>	51%	53%	48%	51%	52%	48%	58%	50%	51%
<i>Lower hot water temp</i>	31%	25%	33%	29%	31%	33%	32%	33%	27%
Mean number of "always"	5.2	5.0	5.3	5.2	5.2	5.5	5.3	5.0	5.0

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B17. ENERGY-RELATED BEHAVIORS: HVAC SETTINGS

Thermostat settings are quite similar across usage groups – dependent upon climate zone rather than household energy usage.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
HVAC Temperature Settings (means) (EB2, EB3)									
<i>Hot summer days</i>	75.2	74.0	76.0	75.1	75.2	75.9	74.6	76.1	74.5
<i>Cold winter days</i>	71.5	71.7	71.9	71.8	71.4	71.4	71.2	71.2	71.9

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B18. CONNECTION WITH UTILITY PROGRAMS: OVERALL OPINIONS

High users (temperate and non-temperate) are less satisfied with SCE – in general, higher income customers tend to be less satisfied.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Satisfaction with SCE (1 to 10 scale) (CU1)									
Satisfied (%8-10)	79%	72%	67%	70%	81%	75%	77%	85%	85%
Dissatisfied (%1-3)	4%	6%	7%	7%	4%	6%	3%	3%	4%
Mean	8.5	8.1	7.9	8.0	8.7	8.4	8.5	8.8	8.8
Opinions About EE Programs (open ended) (CU2)									
POSITIVE: Total	82%	82%	79%	80%	83%	78%	80%	83%	87%
NEUTRAL: Total	13%	11%	17%	14%	13%	14%	14%	13%	11%
Don't Know	11%	8%	15%	11%	11%	11%	12%	13%	9%
Don't Care	2%	4%	2%	3%	2%	3%	2%	1%	2%
NEGATIVE: Total	9%	11%	9%	10%	9%	11%	11%	8%	6%
Not enough info	4%	5%	5%	5%	4%	5%	5%	4%	1%
Hard to qualify	2%	2%	1%	2%	2%	2%	4%	1%	1%
Rebates too small	1%								
Don't trust SCE	1%								
Need money to part.	1%								
Too much effort	<1%								
Renter	<1%								
Other	3%	7%	10%	8%	3%	5%	4%	3%	1%

Small sample size not meaningful for subgroup comparisons

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B19. CONNECTION WITH UTILITY PROGRAMS: PAST PARTICIPATION

Non-temperate high users are more likely than temperate high users to have participated in EE programs before – this difference is related to climate zone, not usage. High users (temperate and non-temperate) tend to have higher participation in the Summer Discount Plan, perhaps because they are more likely to have central AC. Non-temperate high users also have higher participation in ARP and EE Rebates – probably related to their higher ownership rates for appliances.

	High Users				Lower Users				
	Population Total (n=1,536)	Top Quintile Temperate (n=245)	Top Quint. Non-Temperate (n=199)	Top Quintile Total (n=445)	Lower Quintiles Total (n=1277)	4 (n=267)	3 (n=322)	2 (n=320)	1 (n=368)
Ever Participated in EE Programs Before (CU3)									
Yes	46%	41%	52%	46%	46%	52%	41%	45%	47%
No	51%	55%	47%	52%	51%	46%	56%	50%	51%
Don't know	3%	4%	<1%	2%	3%	2%	4%	6%	2%
Programs Participated In (if ever participated) (CU4)									
Appliance Recycling	39%	41%	48%	44%	37%	41%	40%	31%	36%
EMA	34%	33%	39%	36%	32%	33%	28%	30%	36%
EE Rebates	28%	34%	41%	38%	27%	38%	26%	20%	25%
Home Energy Surveys	28%	33%	35%	34%	27%	33%	30%	24%	24%
Summer Discount Plan	26%	24%	44%	34%	24%	28%	19%	26%	24%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B20. LIEE SOURCES OF AWARENESS AND PARTICIPATION

Among past EMA participants, sources of learning about EMA are similar across all usage groups, except that high users are more likely to have seen an ad and less likely to get direct mail.

	High Users				Lower Users				
	Population Total (n=239)	Top Quintile Temperate (n=33)	Top Quint. Non-Temperate (n=40)	Top Quintile Total (n=74)	Lower Quintiles Total (n=189)	4 (n=45)	3 (n=37)	2 (n=43)	1 (n=63)
Current or Previous Home (EMA participants) (LIEE3)									
<i>Current</i>	78%	73%	69%	71%	80%	82%	79%	82%	77%
<i>Previous</i>	19%	17%	29%	23%	19%	18%	18%	18%	21%
<i>Don't know</i>	2%	9%	25%	6%	1%	-	3%	-	2%
Source of Learning About EMA (EMA participants) (LIEE4)									
<i>Friend/neighbor/family</i>	32%	29%	30%	29%	33%	29%	34%	36%	32%
<i>Saw/heard an ad</i>	17%	18%	27%	23%	17%	23%	14%	16%	16%
<i>Rep at my door</i>	14%	21%	5%	12%	14%	13%	15%	13%	13%
<i>Bill insert</i>	8%	9%	5%	7%	8%	2%	12%	9%	8%
<i>Direct Mail</i>	7%	3%	4%	3%	8%	8%	10%	6%	8%
<i>Phone call to utility</i>	6%	6%	10%	9%	6%	8%	6%	4%	5%
<i>Utility website</i>	3%	4%	6%	5%	3%	3%	3%	3%	2%
<i>Phone call from utility</i>	3%	1%	1%	1%	3%	5%	4%	3%	1%
<i>From another program</i>	2%	2%	4%	3%	1%	1%	1%	3%	1%
<i>County/City/Snr Center</i>	2%	<1%	<1%	<1%	2%	<1%	2%	1%	4%
<i>Landlord</i>	2%	-	-	-	2%	<1%	-	2%	5%
<i>Other</i>	5%								
<i>Don't know</i>	6%	5%	9%	7%	6%	7%	6%	3%	7%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B21. LIEE PARTICIPANT CONCERNS

Concerns about EMA are shown here – there are no significant differences between usage groups.

	High Users				Lower Users				
	Population Total (n=239)	Top Quintile Temperate (n=33)	Top Quint. Non-Temperate (n=40)	Top Quintile Total (n=74)	Lower Quintiles Total (n=189)	4 (n=45)	3 (n=37)	2 (n=43)	1 (n=63)
Concerns About EMA (EMA participants) (LIEE6)									
<i>Don't know of any</i>	53%	57%	61%	59%	52%	49%	65%	47%	50%
<i>None</i>	30%	22%	29%	26%	30%	32%	19%	34%	33%
<i>Did not believe was free</i>	7%	13%	4%	8%	7%	7%	8%	9%	4%
<i>Might be a scam / fine print</i>	3%	1%	2%	2%	3%	3%	7%	3%	-
<i>Had to document income</i>	2%	-	-	-	2%	-	-	-	6%
<i>Doubted quality</i>	1%	-	-	-	2%	4%	1%	-	2%
<i>Didn't think I'd qualify</i>	1%	-	1%	1%	1%	3%	3%	-	-
<i>Wanted more info</i>	1%	3%	1%	2%	1%	-	-	4%	1%
<i>Landlord's permission</i>	1%	4%	3%	3%	-	-	-	-	-
<i>Take too much time</i>	1%	-	-	-	1%	5%	-	-	-
<i>Other</i>	2%	-	-	-	2%	-	-	3%	4%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B22. LIEE PARTICIPATION DIFFICULTIES

Also among EMA participants, higher users (in the top 3 quintiles) are more likely to report experiencing difficulties or disappointment regarding their participation.

	High Users				Lower Users				
	Population Total (n=239)	Top Quintile Temperate (n=33)	Top Quint. Non-Temperate (n=40)	Top Quintile Total (n=74)	Lower Quintiles Total (n=189)	4 (n=45)	3 (n=37)	2 (n=43)	1 (n=63)
Difficulties or Disappointments (EMA participants) (LIEE7)									
Yes	15%	25%	20%	22%	14%	20%	21%	4%	12%
No	85%	75%	80%	78%	86%	80%	79%	96%	88%
Type of Difficulty (EMA participants) (LIEE8)									
Scheduling / wait	16%	-	42%	21%	14%	17%	5%	22%	17%
Contractor didn't finish	15%	32%	36%	34%	7%	15%	5%	-	-
Workers not professional	11%	14%	-	7%	11%	4%	17%	-	17%
Weather stripping problem	8%	12%	6%	9%	9%	22%	5%	-	-
AC problem	7%	-	-	-	10%	-	17%	-	17%
Record keeping problem	7%	-	-	-	10%	-	-	-	33%
Insulation problem	4%	-	-	-	6%	17%	-	-	-
Other	42%	42%	53%	47%	41%	30%	54%	78%	33%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B23. LIEE REASONS FOR PARTICIPATING

High users (temperate and non-temperate) are less likely to say they participated in EMA to get the free refrigerator – perhaps because they tend to have newer units already.

	High Users				Lower Users				
	Population Total (n=239)	Top Quintile Temperate (n=33)	Top Quint. Non-Temperate (n=40)	Top Quintile Total (n=74)	Lower Quintiles Total (n=189)	4 (n=45)	3 (n=37)	2 (n=43)	1 (n=63)
Main Reasons You Signed Up for EMA (LIEE5)					Benefits (EMA participants)				
Save Money	25%	17%	23%	20%	27%	30%	23%	32%	23%
Save Energy	21%	24%	20%	22%	20%	26%	25%	21%	12%
Refrigerator	16%	12%	7%	10%	18%	15%	22%	19%	17%
Light bulbs	10%	13%	1%	7%	11%	8%	14%	15%	10%
Weather stripping	9%	10%	7%	8%	9%	13%	11%	9%	6%
Swamp cooler	3%	-	7%	4%	3%	6%	6%	-	2%
Limited income	3%	-	5%	3%	4%	7%	-	4%	4%
Help environment	3%	3%	2%	2%	3%	3%	3%	6%	2%
Discount on bill	3%	-	3%	2%	3%	-	3%	-	7%
Windows	3%	1%	5%	3%	3%	3%	-	6%	2%
Medical condition	3%	6%	5%	5%	2%	1%	3%	3%	2%
Other	25%								
Main Reasons You Signed Up for EMA (LIEE5)					How Learned About It (EMA participants)				
Word of Mouth	9%	9%	8%	8%	9%	8%	9%	9%	11%
Rep came to door	5%	10%	-	4%	6%	8%	3%	9%	4%
Other									

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B24. LIEE AWARENESS AMONG NON-PARTICIPANTS

Among non-participants in EMA, awareness is higher in non-temperate climate zones, but also among the lowest usage groups.

	High Users				Lower Users				
	Population Total (n=1,149)	Top Quintile Temperate (n=155)	Top Quint. Non-Temperate (n=130)	Top Quintile Total (n=286)	Lower Quintiles Total (n=863)	4 (n=182)	3 (n=222)	2 (n=222)	1 (n=237)
Heard of EMA (not participated) (LIEE1)									
Yes	39%	28%	41%	34%	39%	31%	35%	46%	44%
No	59%	68%	57%	63%	58%	68%	62%	50%	54%
Don't know	2%	3%	2%	3%	2%	<1%	3%	2%	1%
Status with EMA (not participated but aware of EMA) (LIEE2)									
Know nothing about it	30%	32%	30%	31%	30%	23%	30%	31%	34%
Don't know enough	28%	26%	29%	28%	27%	27%	27%	28%	26%
Decided against it	10%	17%	11%	14%	9%	11%	10%	8%	9%
Attempted but unable	17%	16%	13%	14%	17%	15%	12%	21%	18%
Don't know	16%	10%	16%	13%	16%	24%	21%	12%	13%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B25. REASONS NOT TO PARTICIPATE IN LIEE

Reasons for not participating in EMA (among those aware of it) are shown here. Sample sizes are small, but it appears that higher users are more likely to think they don't need it.

	High Users				Lower Users				
	Population Total (n=150)	Top Quintile Temperate (n=18)	Top Quint. Non-Temperate (n=22)	Top Quintile Total (n=41)	Lower Quintiles Total (n=125)	4 (n=21)	3 (n=30)	2 (n=37)	1 (n=37)
Reasons Not Signed Up for EMA (know about EMA but have not participated) (LIEE9)									
Not sure how to sign up	44%	45%	38%	41%	45%	51%	54%	43%	37%
Don't think would qualify	38%	43%	34%	38%	39%	36%	42%	38%	38%
Don't think home needs it	35%	47%	44%	45%	32%	25%	34%	30%	38%
Someone else needs it more than you do	36%	31%	45%	39%	37%	40%	33%	39%	37%
Doubt the workmanship	17%	15%	14%	14%	17%	21%	9%	16%	21%
Doubt appliance quality	14%	9%	18%	14%	14%	10%	14%	8%	24%
Some other reason	19%	12%	26%	19%	19%	6%	34%	17%	17%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

Table B26. LIEE INFORMATION SOURCE PREFERENCES

High users (temperate and non-temperate) are less likely to want information about EE programs from their SCE bill or bill inserts, and more likely to want it through the Internet and email.

	High Users				Lower Users				
	Population Total (n=1,494)	Top Quintile Temperate (n=240)	Top Quint. Non-Temperate (n=197)	Top Quintile Total (n=437)	Lower Quintiles Total (n=1,239)	4 (n=256)	3 (n=314)	2 (n=314)	1 (n=355)
Information Sources (percent preferring) (IS1)									
<i>SCE Separate Mail</i>	68%	69%	69%	69%	68%	69%	70%	68%	66%
<i>SCE Bill or Inserts</i>	40%	37%	37%	37%	42%	44%	38%	42%	43%
<i>Phone</i>	18%	18%	17%	17%	19%	18%	19%	14%	23%
<i>Internet/Website</i>	12%	13%	17%	15%	11%	13%	13%	11%	7%
<i>News: TV/Radio</i>	7%	6%	4%	5%	7%	5%	8%	7%	7%
<i>Email</i>	6%	12%	10%	11%	6%	7%	8%	4%	5%
<i>SCE Employees / In-Person</i>	4%	6%	4%	5%	5%	4%	5%	5%	4%
<i>SCE Advertising: TV/Radio</i>	4%	6%	2%	4%	4%	4%	5%	4%	2%
<i>SCE Website</i>	3%	3%	5%	4%	3%	5%	3%	3%	2%
<i>Newspapers</i>	2%	2%	1%	2%	2%	1%	3%	2%	4%
<i>Word of Mouth</i>	1%	1%	3%	2%	2%	1%	1%	2%	2%
<i>Community/Assistance Org.</i>	1%	<1%	<1%	<1%	1%	-	1%	-	2%
<i>Contractors</i>	<1%	-	1%	<1%	<1%	<1%	<1%	<1%	1%
<i>Stores/Retailers</i>	<1%	-	-	-	<1%	-	1%	-	-
<i>Other</i>	2%								
<i>None</i>	1%	1%	1%	1%	1%	<1%	1%	2%	1%

Significant differences between (1) temperate and non-temperate, and (2) top quintile and lower quintiles (combined and individually) are indicated by blue and red shading (90% confidence level).

APPENDIX C: In-Home Interview Summaries

Long Beach (Temperate)

1. Amy C. (Divided Household)

Amy is 49 and heads a household with one child and five boarders, one of whom is a disabled vet who is usually at home. She herself rents the house, which was built about 1966 and appears well-maintained, and the boarders rent from her. The cooktop and oven are electric and a second fridge in the garage is used for storage. The home contains five TVs (four tube style), and the home has a pool which Amy heats in the summer and other “long periods of warm weather.” She and the boarders use the clothes washer and dryer “a lot.”

Amy’s record shows her highest Q4 usage was 1,132 kW (She has resided there about one year; only one quarter of data was available.). Household income is \$33,000 to \$40,000/year.

Attitudes: Amy cooks for all as part of their rental arrangement. She cites this as an example of saving energy. The household shares use of the kitchen table and its overhead lighting as well as the downstairs (tube) TV, cable access and a computer, which she leaves on for them. But otherwise, the boarders spend virtually all other time in their individual rooms, which contain their personal TVs, computers and effects. Amy indicates she’s highly concerned about the environment and the cost of energy is highly motivating in trying to conserve. She wants to save energy, but doesn’t know how.

Energy Usage: Amy doesn’t have a clear idea of energy inefficient practices in the bedrooms because they are private areas. But she notes that people stay home a lot and tend to pass the time in their rooms where they watch TV. Three of the bedrooms have ceiling fans, but minimal overhead/table lighting. Only about 10% of the lights are CFLs.

Overall Assessment: A “House Divided.” In this household the boarders live independent of each other. It seems the pool pump is a contributing cause of the high utility bill, but because usage spikes in Q4, it apparently isn’t a primary driver during that period.

Amy doesn’t have disposable income to spend on energy efficiencies. Although she is a renter, she operates like a property manager and would probably be able to influence her landlord if both could benefit from energy efficient practices. She would probably be receptive to an energy audit by an expert and more information about energy efficiencies that save money.

2. Janine T. (Concerned, But Uniformed, User)

Janine is 39, does not work and suffers from chronic seizures. She rents a three-bedroom apartment that was built about 1959 and shares it with five others: two related adults and three children, one of which is her daughter's baby. The house has a single gas wall heater, appears to lack sufficient insulation in the outer walls and roof, and seems drafty. Household income is less than \$15,000/year.

Janine's record shows her highest quarter of usage was Q1 at 618 kW, compared to a 576 quarterly average.

To augment the heat provided by the living room wall heater, each bedroom has a portable heater and the household has up to five portable fans for use when the apartment gets hot/stuffy. Janine says she doesn't cook much. Family members make heavy use of the microwave.

Energy Usage: The main energy draw appears to come from use of five TVs, including one mid-size tube type and two large plasma TVs. Two TVs have game consoles. During the survey visit two different TVs were on in bedrooms with no one watching. A mini fridge in one bedroom contributes to this. There are few lights. The lighting in the kitchen and two baths are pairs of 24" fluorescent tubes. There are about a dozen incandescents in the remaining rooms.

Janine has not heard of EMA or participated in energy efficiency programs. She feels bound by the decisions her landlords makes. She has little consciousness of environmental concerns. To her energy use is a cost issue.

Overall Assessment: "Concerned, But Uniformed, User." Although Janine thinks that her high electric usage is chiefly related to the apartment's poor insulation and draftiness, and that she's conserving by turning of the occasional light, the household's heavy use of TVs and games probably contributes most. This is compounded by TVs left on and unattended. While energy use is a cost issue, she hasn't thought through the direct causes of high usage (probably TVs) and may not be able to change the habits and lifestyles of household member in the ways they waste energy.

3. Thomas S. (Hostage to Domicile)

Thomas is 58, is completing college coursework and rents a one-bedroom one bath duplex with his wife and dog. The unit was built about 1960. The unit has a single gas wall heater, but appears to have sufficient insulation to help retain heat or cooling. Household income is \$15,000 to \$28,000/year.

Thomas's record shows his highest quarter of usage was Q1 at 1039 kW, compared to a 748 quarterly average.

Attitudes: Thomas is concerned about wasting energy and is knowledgeable about global warming, the growing use of solar and wind power and the benefits of conservation. He says he tries to minimize energy use in his home, but it's mostly to save money. He reads the energy labels on appliances and consumer electronics before buying them. He believes that he and his wife can control the amount of energy they use and potential waste. He heard of EMA through a neighbor, but not enough to ever take action. Plus, as a renter, he feels he needs to follow the lead of the landlord.

Energy Usage: The kitchen appears to be the major source of energy usage. It contains an older fridge, a freezer that Thomas says isn't used much, and it doubles as an office/work area, with a laptop and printer. The bedroom contains an old A/C wall unit that Thomas says he uses "as needed" on hot summer days. He has no portable fans or heaters. He claims the TV is seldom used, which appeared to be true, and prefers to play CD player instead. The unit's lighting is minimal. In total it has about 9 incandescent bulbs, two CFLs and a paired fluorescent tube overhead light. Thomas and/or his wife are at home 95% of the time. When not sleeping they spend most of their time in the kitchen because it's the warmest room and because it's where they cook, read wash/dry clothes and work on the computer.

Overall Assessment: "Hostage to Domicile." The apartment would probably benefit from weatherization. But the heavier electricity usage in Q1 is, no doubt, related to colder weather and heavier use during that time of the kitchen lighting, appliances and computer. The need to let out the dog several times per day (opening the kitchen door and letting interior heat escape from the one warm room) probably results in the need to replenish heat in the kitchen and, perhaps, to use those appliances and electronics more.

4. Robert R. (Divided Household)

Robert is 30 and has been sharing a single family house rental with two non-related adults for the past 7 years. The home is two stories, with high ceilings and spacious rooms, and appears to have been built in the 1920s. The Gas Company shut down its central heat several years ago because it deemed the gas furnace (??) to be unsafe. (Access to the heating appliance was blocked.)

Electricity use was highest in Q1 at 898 kW and averaged 748 kW per quarter. Household income (for all household members) is less than \$15,000/year.

Energy Uses: The home's double ovens and cooktop are all electric. The main refrigerator is about 12 years old. The dishwasher and electric oven are each used about six times daily. Robert says the house stays cool in the summer, but is difficult to heat in the winter. The housemates make heavy use of three portable space heaters (the central heating isn't operational), portable fans and three working TVs that are medium size tube style with cable boxes. Robert's bedroom TV was on for the entire duration of the home visit. Someone is in the house 100% of the time.

Attitudes: Robert says he reduces some energy use by turning off lights when not needed and by washing dishes by hand instead of using the dishwasher. But he describes the house as a guzzler that uses energy because both it and its appliances are old. He also has a cavalier attitude about energy use. “I need certain things...My life isn’t going to change because of my energy bills...The things [electronics] you need all use energy.” He views the apathy of others as the cause of energy-related issues facing the nation (“Buildings in LA and New York leave lights on in skyscrapers at night...People are apathetic and are swayed by those saying there’s no global warming.”). Robert has little concern about improving the environment; he wants to reduce his energy bill and be comfortable in his home.

Robert has not participated in an energy efficiency program, but says he’s heard of EMA. However, he doesn’t know enough about EMA to take action. (“It’s a hassle getting permission from the landlord [to do anything].”)

Overall Assessment: A “Divided Household.” Members use the house, its appliances and electronics independently. They cook, wash clothes and entertain themselves separately. Energy use appears to have two major contributing factors: Kitchen appliances that include an old refrigerator and an all-electric cooktop and oven; and consumer electronics that include portable space heaters, several old, tube style TVs with cable boxes and two computers. The house would probably benefit from weatherization and switch to an Energy Star fridge.

5. Mary B. (Concerned, But Uniformed, User)

Mary is 36. For about one year she, her husband and eight year old daughter have rented a three-bedroom, two-bath townhouse that was built about 1972. The unit has been very well maintained. It appears to have good insulation and did not seem to have any drafty windows or doors. Both Mary and her husband are employed, but Mary is a real estate agent and works out of her home. She has not participated in an appliance recycle or rebate program, she’s not on a medical baseline and no one in the house is a senior or disabled. Household income exceeds \$200,000.

Mary’s record shows her highest quarter of usage was Q3 at 914 kW, compared to a 850 quarterly average.

The townhouse is all-electric. In the kitchen, the double oven and gas cooktop, along with an extra large 11 year-old fridge and 15 year-old dishwasher, are all-electric and generally used daily. The home has significant musical playing and recording equipment (multiple guitars, speakers and keyboards, amps, an equalizer, tape deck and CD player, etc.). Her husband uses them as his hobby as an in-home recording studio. The unit also has five TVs and cable boxes, three computers and video game consoles. Central heating heats coils that run through the ceilings. Space heaters are sometimes used in lieu of central heat, which Mary concluded is very expensive. The unit has no A/C. Nearly all of her lighting is a CFL or fluorescent tube.

Attitudes: Mary's biggest energy use concern is how to save money. Intellectually she's concerned about the environment, but she hesitated when asked to name a big energy-related issue facing the country ("I don't know...shortages. I think you should conserve... There shouldn't be waste.").

Mary says her electric bills "are killing us in payments...and it seems like we can't control it" ([A friend's bill] "is about \$50 and ours is over \$400."). She mentioned that she turns off lights when not in use, but her young daughter leaves things on. She has reduced use of central heat to reduce her bill and admits they have "too many electronic devices." But she hasn't considered the impact of those electronic devices on her bill.

Overall Assessment: "Concerned, But Uninformed, User." While the household expresses interest in using less electricity, it appears to lack sufficient information and guidance to conserve. Although the all-electric appliances in the kitchen and the all-electric heating are probably significant in their own right, the extensive array and heavy discretionary use of consumer electronics probably contributes a majority to the electric bill—and the household head seemed oblivious about that. The home might benefit marginally from an Energy Star fridge, but not from additional weatherization. The household head would value an energy audit by an expert that provided information about new appliance/product technologies.

6. Johanna C. (Concerned, But Uninformed, User)

Johanna is 35, married and is a stay-at-home mom with a three year old child. She has rented her 1920s three-bedroom, two-bath, two-story single family house for five years. She has not participated in an appliance recycle or rebate program, and unsure if she's heard of EMA. She's not on a medical baseline, although she has rheumatoid arthritis and lupus. No one in the house is a senior or disabled. The house appears to have some insulation, but has a flat roof above two bedrooms that probably lacks it. Household income is between \$15,000 and \$28,000/yr.

Johanna's record shows her highest quarter of usage was Q3 at 588 kW, compared to a 543 quarterly average.

The house has three flatscreen LED/LCD TVs (one that's about 40") with cable boxes, and two computers. Four ceiling fans are used in the summer to reduce heat; there are no A/C units. The house has older windows (double hung) and doors that are drafty. The gravity floor furnace heats "unevenly." Both fridges are about two years old, but don't appear to be Energy Star models. The vast majority of lighting (20+ bulbs) is incandescent. An outside motion detector is often activated by pets and has a high wattage flood lamp. The house includes a studio attached to the garage that contains significant musical equipment (several guitars and amps; a keyboard and two large speakers). The studio has an A/C wall unit and the garage contains a second fridge in continuous operation.

Attitudes: Johanna says they try to conserve “being eco-friendly, rather than [because of] the high bill...I open the blinds to use natural light...and close them in the summer to reduce the heat...We try to use only what we need at the moment. We unplug the phone chargers, microwave and lights when not in use.” She’s concerned that there won’t be enough energy in the future.

Energy Use: Of the available TVs, one is on about 6 hours per day. Lights are left on during the day because the house is naturally dark and the weather often overcast. Consumer electronics that were not in use, including the microwave and other such items, were unplugged. The clothes washer and dryer are used to wash full loads 2 or 3 times per week. The music studio is used about once a week by Johanna’s husband, and then for about 1 – 2 hours each time.

Overall Assessment: “Concerned, But Uninformed, User.” The household seem intent on saving energy, but also appears to lack sufficient information and guidance to do it. In addition, the household appears to lack discretionary income to improve energy efficiency. It would probably benefit from more information about EMA, free weatherization and CFLs, and other energy efficiency programs. The household head would value an energy audit by an expert that provided information about new appliance/ product technologies and incentive programs. But she notes that the biggest challenge will be following through.

Garden Grove (temperate)

1. Tammy B. (Concerned, But Uninformed, User—With Medical Needs)

Tammy is 51 and has owned her three-bedroom, three-bath, two-story townhouse for 30 years. It was built about 1956. She works part-time a few days per week as a mystery shopper and lives by herself. In contrast to her record, she has participated in an appliance recycle and rebate programs. She is on a level-pay plan and the medical baseline due to a chronic condition (requiring bi-monthly IV treatments in her home.) She is not a senior citizen. Household income is \$15,000 to \$28,000/year.

Tammy's record shows her highest quarter of usage was Q3 at 856 kW, compared to a 618 quarterly average.

Efficiency of home structure: The door and windows appear well-sealed, but lack of double-paned windows and having two stories results in the upstairs getting hot during summer months. During winter months, warming the home does not seem to be an issue.

Lighting, Appliances and Electronics: The home has 22+ incandescents (principally in the bedroom and baths), a few fluorescent tube fixtures and a few CFLs. A second, relatively new fridge in the garage and a stand-alone freezer are heavily stocked. There are basic kitchen appliances, with a gas oven/stove, but the main fridge is 14 years old. The home has three TVs, two with cable boxes. The primary and secondary TVs are LED/LCD.

Conservation Orientation and Attitudes/Program Participation:

Conservation “keeps costs down.” She reports she usually turns off lights when not in use, and “always” turns off the TV when not in use. However she uses TVs to help her sleep, so in fact they're never all off when she's at home. She has participated in appliance rebate and recycling programs and in EMA.

Energy Attitudes: “I want it to be available. I get panicked if it goes out...I pay attention to [my] energy use. [Energy bills don't affect what I do:] I'm used to doing what I'm do...I'm only one person, so I'm not allotted what other people [in similar houses] get.”

Reported Energy Use Practices: “I use the dishwasher...clothes washer and clothes dryer once a week...I use natural light instead of electric...I have two fridges and a freezer [that I use for storage because shopping with a walker or in a wheel chair is difficult.]” I don't over-use my A/C. I stay downstairs or upstairs, depending on the weather... [Consistent heating and cooling] helps easy my pain...I look for Energy Star appliances when I buy.”

Tammy has a TV on the entire time she's at home for background noise and while she sleeps as “company.” She's record programs for later playback if not at home and uses a laptop for a few hours per day.

Overall Assessment: “Concerned, But Uninformed, User.” Heavy use of TVs, combined with extra fridge and freezer (perhaps justified by medical conditions), draw power continuously. The customer’s need to stay cool requires heavy use of A/C, especially in Q3. The use of her TVs as companion (one is always on when she’s home), probably draw significant power throughout the year.

2. Faith O. (Concerned, But Uninformed, User)

Faith is 43. She and her husband are adding to their four-bedroom, three-bath, one-story single family house that they’ve owned for 16 years. The house was built about 1956. They have two children under 18 and live with her invalid mother. They haven’t participated in an appliance recycle or rebate program. One person who is over 65 is cared for as an invalid. Household income is \$28,000 - \$33,000/year.

Faith’s record shows her highest quarter of usage was Q1 at 804 kW, compared to a 765 quarterly average.

Efficiency of home structure: The home is midway through remodeling (additions of a master bedroom and bath, and an enlarged family room). The house was cold and drafty. The additions will probably be well sealed areas, but the older parts of the house are drafty, per Faith. The windows are the aluminum sliding type; no double-paned windows were seen. Insulation was being added to the new outer walls and roof. During winter months, warming the older part of the home is somewhat difficult, per Faith.

Lighting, Appliances and Electronics: The home has no A/C. The old part of the home has a few CFLs, but most lamps and overhead lighting fixtures have incandescents, especially in the older bedrooms. The new area has many recessed and overhead lighting fixtures, but nearly all have CFLs. The kitchen appliances are basic, including a gas oven/stove and an extra-large fridge. They have five TVs in total: the living room contains a large LED/LCD TV; three bedrooms have medium size tube TVs with cable boxes; two have game consoles. The new master has a large LEC/LCD TV with a cable box. Everyone shares one desktop; a laptop is occasionally used too. They have a second fridge in the garage.

Conservation Orientation and Attitudes/Program Participation: Faith has not participated in energy rebate or recycling programs or heard of EMA. She was unsure/confused about the relationship between household member behaviors and energy conservation. She had not given the specifics much thought. She hears that people should conserve, but hasn’t thought about why. She was unable to express an opinion about how a community might benefit if it conserves. After thinking about it she concluded that she could save some money if she conserved more.

Energy Attitudes: “I try to conserve energy. I use the washer and dryer once or twice per week and BBQ to save electricity.” Faith also said they conserve by not having A/C.

To her, wasted energy are the lights left on, not the extensive TV use. She concluded that leaving things plugged in causes some waste.

Reported Energy Use Practices: Although Faith's two kids have allergies requiring nebulizers, she opens the windows during the summer. They have one portable heater for winter use and portable fans for the summer that they use instead of A/C. Faith's mother is usually at home watching 12+ hours of TV/day and the kids watch or play console games several hours/day in their rooms—all on older tube TVs. Sometimes the kids fall asleep with the TV on.

Overall Assessment: "Concerned, But Uninformed, User." Heavy use of bedroom TVs, sometimes simultaneously in multiple rooms, combined with an extra fridge and freezer, draw power continuously. A desktop is never turned off. It appears members spend more time in the house during cold months (Q1), resulting in relatively more TV use and winter lighting and heating.

3. Kristina K. (Hostage to Domicile)

Kristina is 29. She and her husband have rented their three-bedroom, two-bath, one-story single family house for three years. She does not work because she has two children under age three. She has not participated in an appliance recycle or rebate program, she's not on a medical baseline and no one in the house is a senior or disabled. Her house was built about 1964. Household income is \$60,000 - \$75,000/year.

Kristina's record shows her highest quarter of usage was Q3 at 817 kW, compared to a 735 quarterly average.

Efficiency of home structure: The house doesn't retain heating or cooling well. During the winter, heating seems within her control. In the summer it doesn't. ("I know the A/C [is used a lot.]" A bathroom skylight reduces the need for electric lighting there.

Lighting, Appliances and Electronics: Lighting is about 50-50 incandescent-CFL. The kitchen appliances are basic, including a gas oven/stove and a large fridge that about 10-15 years old. The microwave is used daily; the oven about four times/week. They have three TVs, including one that's rear projection with surround sound that's on 8 hours a day to entertain her children; the secondary TV is tube-style. A desktop w/ printer is on about 8 hours/day and a portable fan and heater are used as needed. They use a compress to inflate a bounce house during summer. The A/C doesn't appear to work as well as it did when they first moved in.

Conservation Orientation and Attitudes/Program Participation: Kristina is willing to sacrifice personally in order to conserve—so long as it doesn't negatively impact her two small children. She always looks for Energy Star appliances. "I unplug appliances when they're not in use, turn off lights ...and do laundry at night." "Our central heating

and cooling is the bulk of our usage.” “I want less stress on the earth...and renewable energy.” “People would save money.”

Energy Attitudes: “I’d like to save energy...to save money and because I love the earth.” Kristina believes the biggest challenge for the community is educating people about the energy they use.

Reported Energy Use Practices: The household uses the A/C heavily in the summer, partly because the husband “likes it cool,” and partly because the house is not ideally insulated. They use the TVs heavily to help entertain/occupy/educate their two young children—the kids are the focus of their energy use—and to relax in their own bedroom in the evening. The desktop computer is used heavily to organize/crop family photos.

Overall Assessment: “Hostage to Domicile.” Apparently, poor insulation in the home and personal intolerance for summer heat causes heavy use of the A/C during warm months. A major contributing factor to energy use is heavy use of rear projection and large tube TVs and a desk top computer—all of which draw significant power throughout the year. Better attic/window insulation and weatherstripping would probably help. A more efficient refrigerator would probably contribute to energy use. For further significant reductions, major changes in behaviors or in the use of the TVs or in a change to Energy Star model TVs would be required.

4. Ted G. (Divided Household)

Ted is a 29 year-old ex-Marine who is now a teacher. For about one year he has rented the five-bedroom, three-bath, two-story single family house with a den/office, family room attic and pool. He lives with his spouse, four children and father. He has not participated in an appliance recycle or rebate program, he’s not on a medical baseline and no one in the house is a senior or disabled. Her house was built about 1956. Household income is \$100,000 - \$200,000/year.

Ted’s record shows that 791 kW were used in Q4 and 588 were used in Q3. (No other information was available.)

Home and Its Energy Uses: The house is extremely well insulated, retaining heating or cooling well, except in the paneled attic, which reflects the outside temperature. But the house is dark. The sun doesn’t come in. It has 15 ceiling fans. The windows are dual glazed.

The home has many lamps and lighting fixtures, with about 75% using CFLs. The kitchen has an extra large fridge about six years old and that’s not Energy Star. An electric heating tray, skillet and misc. small appliances were out. The stove and microwave are used daily. The home has six TVs, mostly tubes, and all of which are watched a few hours/day; most have TIVO/cable boxes. All bedrooms have several light fixtures, but usually with CFLs. There was a second, older fridge in the garage and

a mini-fridge near the pool. The pool had a pump and lighting. The clothes washer and dryer are used at least twice/day.

Conservation Orientation and Attitudes/Program Participation: “I want to save money and save the environment.” ...”I look for Energy Star appliances.” “I look at my bills, the change from the previous time, for something that sticks out.” “I’m not sure what I can do as a renter.” “I often think about how much energy I use.”

Energy Attitudes: “I try to conserve. The biggest energy-related issue facing the nation is “dependence on fossil fuels.” “I don’t want my kids fighting a war for natural resources.” Ted says reducing energy use is important to save money and the environment. He’d like more information sent to his landlord to help reduce energy use [by the pool pump and appliances].

Reported Energy Use Practices: “When we moved in the pool pump was running 24 hours a day and the large outside light came on every night...I changed that after my bill.” “The kids know to turn out the lights, but they’re kids.” “I try to minimize the A/C.”

Overall Assessment: “Divided Household.” With eight people and three generations living here somewhat independent of the others, this is an extremely large and diverse household in a spacious house—a “Divided Household.” Extensive consumer electronics are at the disposal of members, along with many ceiling fans and lighting fixtures (albeit with CFLs), a second fridge, a mini cooler and a pool with outdoor lighting. The pool and pump are heavily used in warm months. Several of the TVs are tube style. More coordinated use of electronics would probably help reduce costs significantly, though that doesn’t seem realistic. An energy efficient pool pump could probably help. Unless the household collectively decided to conserve (e.g., eliminate the second fridge; turn off the mini fridge or remove it, close off the hot/cold attic, etc.), it would seem difficult to significantly reduce energy use.

Anaheim/Orange (temperate)

1. Cindy M. (Hostage to Domicile)

Cindy is 59, employed as a dispatcher, and has rented her three-bedroom, two-bath, two-story condo for five years. About 15 months ago she agreed to have her daughter, son-in-law and their two young children move in with her because they were unemployed. She has not participated in an appliance recycle or rebate program, she's not on a medical baseline and no one in the house is a senior or disabled. The townhouse was built about 1973. Someone is home virtually 100% of the time. Household income is \$40,000 to \$46,000/year.

Cindy's record shows her highest quarter of usage was Q3 at 1,322 kW, compared to a 744 quarterly average. Household income is \$40,000 to \$46,000/year.

Home and Its Energy Uses: The house seems to lack sufficient insulation, especially exterior walls. The second story gets much warmer than the first, where the thermostat is located. Portable fans are used upstairs when it gets hot. Cindy sometimes leaves portable fans on all day to cool down the unit. In winter, she uses two quartz heaters all day for heating instead of the central heat to save money.

The unit has three TVs. The large LCD TV in the living room is on about 14 hours/day, often as a baby sitter for the children. Two bedrooms have medium size tube TVs-- but they're seldom used—and portable fans. The main fridge is nine years old and not an Energy Star. Meals are organized; the household eats dinner together and makes minimal use of the kitchen appliances and lighting.

Energy Attitudes: Cindy views energy use as “for survival. No choice about it. We need warmth.” Much energy use is outside her control (“I can't do anything about [my daughter's family's] energy use when I'm [working]. I like to be comfortable when I am here.”). She describes her energy use challenge as “over-occupancy.”

Energy Practices: The large LCD TV in the living room is on about 14 hours/day, often as a baby sitter for the children. Two bedrooms use portable fans and quartz heaters (The two medium size tube TVs in them are seldom used.). The main fridge is nine years old and not an Energy Star. Meals are organized; the household eats dinner together and makes minimal use of the kitchen appliances and lighting. The children sometimes leave the sliding doors open, losing heat and cooling.

Overall Assessment: “Hostage to Domicile.” Cindy's core challenge seems to be with heating and cooling her home. The unit suffers from (apparently) poor insulation and the need to heat/cool different levels at different times of the day. In the past 15 months this was complicated by the addition of four family members to the household and their “Divided Household” behaviors. But given the spike in Q3 electricity use, weather appears to be the bigger challenge. Cindy would probably benefit incentive programs that subsidize the cost of upgrading insulation and from information about energy efficiencies that SCE could provide.

2. Julia R. (Hostage to Domicile)

Julia is an empty nester mother, age 40, and has rented her 1970s three-bedroom, one-bath, one-story single family house for 14 years. After her daughter moved out a few years ago she has rent a room to a roommate. She has not participated in an appliance recycle or rebate program, she's not on a medical baseline and no one in the house is a senior or disabled. She has not heard of the EMA Program. The house was built about 1957.

Julia's record shows the two highest quarter of usage were Q1 and Q3 at 678 kW each, compared to a 625 quarterly average. Household income is \$15,000 to \$28,000/yr.

Home and Its Energy Uses: The back of the house seems drafty and less well insulated than the rest of the house. The home has central heat and A/C, but one bedroom gets much colder and warmer than the rest of the house. Both housemates use electric blankets at night.

The clothes dryer appears to be all-electric and is at least 15 years old. The fridge is large and about 20 years old. Its fan was running continuously through the on-site visit. The unit has four working tube TVs, the principal one is 30+ inches, sits in the living room.

Energy Attitudes: Julia views energy use as a cost issue and directly related to the weather. "I'm very conscious of the A/C because of the cost." But sacrifice for conservation has a limit: "It depends on how much sacrifice. Being slightly uncomfortable is OK, but not so that I freeze." She admits she needs to be "more diligent" about conserving and believes her actions have some effect on global warming.

Energy Practices: Someone is present in the home about 40% of the time. The living room TV is on about 8 hours/day and has a Wii attachment. Both housemates use the Wii and sometimes the living room TV is left on for background noise (Note: it was left on for the entire on-site visit.). Apparently TV is watched in the bedroom only occasionally.

Overall Assessment: "Hostage to Domicile." This is based on the spike in usage during Q1 and Q3 when the weather is hotter and colder and the house (apparently) doesn't retain a comfortable temperature. The housemates compensate by using fans and electric blankets more, further increasing energy usage. The residents would probably benefit from information about insulation and weatherization programs that can be passed on to a landlord.

3. Martin A. (Declining Health/Wealth)

Martin is 64 and retired from law enforcement. He lives with his wife in their three-bedroom, two-bath, one-story single family house for 39 years. The house is one of about 40 in the neighborhood that was built by bolting modular components together. They haven't participated in an appliance recycle program, but despite records, they say they received appliance rebates. They are on a medical baseline (Martin has sleep apnea and uses a device at night; he also has diabetes. Martin's wife is over 65. No one is disabled. The house was built about 1966 and the garage houses a Rolls Royce and a Bentley, both in pristine condition.

Martin's record shows his highest quarter of usage was Q3 at 1,138 kW, compared to a 794 quarterly average. He's on a level-pay program. Household income is \$40,000 to \$46,000/yr. They have not heard of the EMA program.

The Home and Its Energy Uses: The house is extremely well insulated and Martin regulated the opening and closing of windows and doors, using the weather to maximize a comfortable interior temperature. About 75% of the lighting uses incandescent bulbs.

The main fridge is 10 years old, extra large and has an outside ice dispenser. It and a second fridge in the garage are Energy Star models. The family room has a mini fridge and the garage contains a freezer. A rice cooker and toaster oven sit on his kitchen counters. Throughout the house many light fixtures and ceiling fans have remote controls, drawing power even when not fully on. Many of the consumer electronics are old, top of the line models: a 65" rear projection TV in the family room, with cable and VCR components; a laser disc player; cassette deck, stereo amplifier and receiver; CD player; turntable, etc. Two LCD/LED bedroom TVs have TIVO and cable box connections; one has a laser disc player. A bedroom air purifier is on 24/7. A tall flagpole in the front yard is lighted every night with a flood lamp.

Energy Attitudes: "My challenge is how to afford it. I'm charged 12 cents/kW for the first tier. I listen [to conservation ideas] and then use my own ingenuity." Martin can't tolerate hot temperatures, especially when trying to sleep. In general he monitors his meter to determine the electricity usage of various appliances. He tried to install CFLs in his light fixtures, but they wouldn't work with his dimmer controls.

Energy Practices: Someone is present in the home about 90% of the time. Martin says that generally the lights are turned off when no one is in the room. The family room TV is on about 12 hours/day. Martin's wife does all of the cooking and uses the oven and rice cooker daily.

Overall Assessment: "Declining Health/Wealth." Treatment for Martin's sleep apnea apparently requires consistent home temperature and, therefore, significant A/C use during not weather—plus he's on fixed income. The use of multiple remote control devices for dimming and ceiling fan control seems to waste some energy. The main fridge is an Energy Star model, but it's 10+ years old and may not be efficient. Use of

old consumer electronics (laser disc player, turntable, stereo receiver and amplifier adds to energy consumption.

4. Kelly S. (Divided Household)

Kelly is an employed single mom age 35, who has owned her four-bedroom, two-bath, one-story single family house for just under two years. She lives with her three children under 18. She has not participated in an appliance recycle or rebate program, she's not on a medical baseline and no one in the house is a senior or disabled. Her house was built about 1967. In the last year her 16 year-old son is spending more time by himself at home.

Kelly's record shows her highest quarter of usage was Q3 at 795 kW, compared to a 699 quarterly average. Household income is \$40,000 to \$46,000/yr.

The Home and Its Energy Uses: The house has drafty windows and doors which (apparently) hurt the comfort level of the home. One bedroom is particularly hot/cold, depending on the weather. She uses portable heaters that seem to be very effective. The home has central heat, but not central A/C.

The kitchen has a large year-old Energy Star fridge and an 8 year-old dishwasher. The cooktop and oven are all-electric, but Kelly says she cooks quick meals when home and often eats out because her kids are in sports. The clothes dryer is also all-electric. A desktop computer is in an adjacent kitchen area near a wall A/C unit.

The house has medium to large TVs, three of which have tubes and TIVO/DVR components and two of which have Wii components. One bedroom has a laptop.

Energy Attitudes: Kelly view energy use as important because she doesn't want high bills. She says she is always reminding her children to turn off lights. She herself unplugs the can opener and other appliances when they aren't used. She's proud of her electric bill, which she says averages about \$32/month. "I'm happy with the kilowatts I'm using. I want my children to be comfortable. I'm OK with a spike, but not with TVs and lights being left on."

Energy Practices: Someone is present in the home about 60% of the time. The clothes dryer is heavily used and is all-electric—as are the cooktop and oven. But apparently the latter are not used much. The TVs in the kitchen area and living room are watched about 5 hours/day in total; the bedroom TVs are on a couple of hours per day at most.

Overall Assessment: "Divided Household." The kids appear to act independently and use electronics on their own. The energy spike in Q3 is probably somewhat related to higher A/C use, but appears to stem mostly from three kids being home from school and using more electronics in the home. The home would probably benefit from additional information about energy saving practices and more knowledge about the energy consumption that's tied to consumer electronics in the home.

Oxnard/Ventura (temperate)

1. Rachelle G. (Divided Household)

Rachelle is an employed single mom age 30, who has rented her three-bedroom, two-bath, one-story single family house for three years. She has four children under 18; one sleeps on the living room couch. She has not participated in an appliance recycle or rebate program, she's not on a medical baseline and no one in the house is a senior or disabled. Her house was built in the 1960s. Household income is less than \$15,000. Rachelle's record shows her highest quarter of usage was Q3 at 795 kW, compared to a 699 quarterly average.

Efficiency of home structure: The house seems to have uneven insulation. The back bedroom gets "over-heated" in the summer and cold in the winter. Some natural light reaches the kitchen and two bedrooms, reducing the need for electric lighting. The customer reported no significant drafts from windows or doors.

Conservation Orientation and Attitudes/Program Participation: "I tell my kids, 'the more you use, the less you're going to have,' but it's like talking to the wall." We turn off the Christmas lights or use something less [if the bill is high]. We'll use one TV instead of several...cook outside. We use fans to warm and cool and wear heavier clothing. Rachelle had no awareness of EMA. She would need to check with her landlord to make any changes/improvements.

Energy Attitudes: "Energy is good. It's life." "Sometime my usage is above the bar. Usually it's \$40...If it's \$60 or \$80, I'm doing something wrong...Lowering my utility bill means I can buy more clothes." "I'm sure someone could use extra energy if everyone saved a little."

Lighting, Appliances and Electronics: Lighting is basic. The kitchen has two incandescents; the living room no lighting. Ceiling fans with lights provide the bedroom lighting, which total of 12 incandescents. The kitchen appliances are basic, including a gas oven/stove, a large fridge that's about 10 years old, a dishwasher, crock pot and blender. The microwave with toaster is used daily, the stove daily and the oven several times per week. (The outdoor BBQ is used heavily for cooking dinner.) They have four TVs, a large 60" in the living room, and medium and large tube TVs in each bedroom. There's a stereo and central A/C, but no computer. Has not heard of EMA.

Reported Energy Use Practices: [Note: The house was kept chilly, in the low 60s, for the duration of the HUNA visit.] "The kids like heat in the morning to help them get up for school." We use the fireplace and sometimes I boil something so the steam warms things up. We don't use space heaters. "When kids are home from school, on vacation, doing things [we use more]."

Overall Assessment: “Divided House.” The presence of Rachelle’s four children when school is out during the summer appears to be the primary cause of the energy spike in Q3. The house is minimally heated in the winter, when Rachelle is the only one home. A/C may be used more in the summer when her children are at home with her. In addition, it’s likely that TV use increases in summer when the kids are out of school and the house is warmer/more comfortable. Use of incandescent bulbs in the bathroom and curling irons/flat irons that two teenage daughters use a lot contribute to electricity use year-round. Rachelle is already coordinating some TV use; more coordination would increase energy savings. Also, switching to CFLs would save some energy. The customer would like more information about specific improvements and changes she can make to reduce her bill, and she’d like her landlord to receive it too.

2. Madelyn J. (Hostage to Domicile)

Madelyn is a mother and grandmother, age 47, who has rented her three-bedroom, two-bath, one-level apartment for 15 years. She “sets the rules” for the five-person household, which includes two young adult daughters, two male children and one grandson by one of the (apparently) unmarried daughters. She has participated in an appliance recycle program. No one in the household is disabled or has medical needs. The apartment was built about 1970.

Madelyn’s record shows her highest quarter of usage was Q1 at 738 kW, compared to a 648 quarterly average. Household income is less than \$15,000/yr. Madelyn has participated in the appliance rebate and refrigerator recycling programs, but she has not heard of EMA.

The Home and Its Energy Uses: The apartment is all electric. It does not have any A/C. The oven and cooktop are all-electric and about 15 years old. The kitchen also has a microwave, crock pot, George Foreman Grill and electric skillet. The apartment has several electric wall heaters (not in use) and one portable heater. Lighting is minimal and used minimally. The living room has a TV that’s on two hours/day and only has a cable box attached. It also has a desktop computer. Each bedroom has a medium size tube TV and a cable box component.

Energy Attitudes: Madelyn says she “gets on the kids all the time... I unplug things when they’re not in use. The phone always uses energy because it’s plugged in. I have rules: 5-minute showers. One hour on the computer. 15-minutes on the TV when it’s bed time.”...“I consider a bill over \$70 to be high. When I look to buy something, I look for the Energy Star.”

Energy Practices: Someone is present in the home about 70% of the time. Madelyn has taped over the electric wall heaters because she considers them dangerous and costly. The household share one electric heater. About 90% of the bulbs in lamps and fixtures are CFLs. She and her daughters do all the cooking. The living room TV is used about 4-5 hours/day. The computer is used about 1 – 2 hours/day. The bedroom TVs are on 2 – 3 hours/day.

Overall Assessment: “Hostage to Domicile.” Madelyn’s all-electric apartment probably dictates a significant portion of her energy consumption. In addition, her all-electric cooktop and oven are probably extra-inefficient because they’re so old. She would benefit from programs that permit her (and her landlord) to upgrade appliances.

3. Claire A. (Divided Household)

Claire is 39 and has lived rent free for ten years in a 1947 three-bedroom, two-bath, one-story single family house owned by her husband’s parents. She thinks of herself as an owner. Claire’s husband was out of work until recently. She recently starting work taking inventory for companies during a graveyard shift. They have one child over 18 and three under 18. They have not participated in an appliance recycle or rebate program, they aren’t on a medical baseline and no one in the house is a senior or disabled. Her house was built about 1957.

Claire’s record shows her highest quarter of usage was Q1 at 726 kW, compared to a 542 quarterly average. Household income is less than \$15,000/yr. She has not participated in a rebate or recycling program, and has not heard of EMA.

The Home and Its Energy Uses: The house is extremely dilapidated. The husband started some remodeling six months ago, but stopped midway. Cabinet doors have been pulled off all kitchen cabinets and left in the backyard; plaster around a sliding door is unfinished. The roof is flat, which implies there’s little/no insulation above the ceiling.

There are wall-unit A/Cs. The kitchen has a large, basic fridge that’s 5 years old and a microwave. There are five TVs in total. The living room has a 68” plasma TV with surround sound, a cable box, DRD and PlayStation. Each bedroom contains a tube TV with cable and boxes. One has a TIVO component. The clothes washer and dryer are used about 8 times/week. There are a few working lights, most with CFLs.

Energy Attitudes: Claire says she tries to keep the TV on less, but she accepts that her children and husband watch TV and play video games separately in their rooms.

Energy Practices: Someone is present in the home about 100% of the time. Everyone seems to fend for themselves, so the microwave is heavily used for cooking every meal. The plasma TV is used about six hours/day and is left on when no one is in the room. The bedroom TVs are on about 2 – 3 hours each/day.

Overall Assessment: “Divided Household.” This is a dysfunctional family living in incredible squalor. Based on the disarray of every room, the free-wheeling graffiti that the teenage boy has painted on every inch of the sheetrock in his bedroom, and other similar observations, it’s unlikely that the parents make any significant requests of their children or that the children would act on them. Presumably there are other households

like it. This particular house would probably benefit from better insulation and weatherization.

4. Natalie S. (Concerned, But Uninformed, User)

Natalie is 63 and has lived with her husband, who's 65+, for 13 years in a 1994 four-bedroom, three-bath, two-story 2,200 square foot single family house. The living room has a vaulted ceiling. There's a Jacuzzi in the backyard. In the recent past they rented a spare room to an adult male. They have participated in an appliance rebate program, but no refrigerator recycling program. They are on a medical baseline due to Natalie's back and mobility disability.

Natalie's record shows her highest quarter of usage was Q1 at 686 kWh, compared to a 602 quarterly average. Household income is \$60,000 to \$70,000. They haven't heard of EMA.

The Home and Its Energy Uses: The house is very well maintained and appears to retain heat/cooling well. The living room has vaulted ceilings. There is central heat, but no A/C. The windows are single pane.

There is a significant amount of lighting throughout the house, especially in the bedrooms and three baths. Natalie says they're turned off when not used, but each switch tends to control many bulbs. About 75% of the lighting is from incandescent bulbs.

All kitchen appliances are three years old, including an extra large fridge with "all bells and whistles," an electric oven and gas stove, microwave, trash compactor and dishwasher.

There are four TVs: one in the living room has a medium size tube TV. Three of the bedrooms have house phone chargers and tube TVs that are up to 10 years old, along with cable boxes. The house had a desktop and laptop computer. The garage has a second fridge and small compressor. The backyard has a Jacuzzi.

Energy Attitudes: "I try to conserve and buy energy efficient equipment to save money...We all need to do our best to save energy and resources. It's the right thing to do."

Energy Practices: Someone is present in the home about 50% of the time. A housemate shares the kitchen and family area with Natalie and her husband. The electric oven is used about five times per week; the dishwasher two. The microwave is used daily by all. The family room TV is watched 2- 3 hours/day and the bedroom TVs average 1 – 2 hours/day. The desktop in one bedroom is always left on for convenience.

The compressor is used every two months to file the tires of two motorcycles. The backyard Jacuzzi is used during warm weather 2 – 3 times/week.

Overall Assessment: “Concerned, But Uninformed, User.” This household supports conservation efforts and intends to make additional purchases to improve the home’s heating and cooling efficiency. Because of their number lights and fixtures, they would have immediate conservation gains if they switched out their incandescent bulbs with CFLs. The Jacuzzi may benefit from a more efficient pump.

5. Becky R. (Merry User)

Becky is a homemaker, age 58, who lives with her husband, daughter and her husband and their two young children in a 1952 three-bedroom, two-bath, one-story single family house she’s owned for 30 years. Her daughter moved back in a couple of years ago because of her difficult financial situation. She has not participated in an appliance recycle program. She has participated in a rebate program with The Gas Company. She’s not on a medical baseline and no one in the house is a senior or disabled. Becky’s husband works in construction and has just begun adding a large dining room to the house. Household income is \$33,000 to \$40,000.

Becky’s record shows her highest quarter of usage was Q1 at 771 kW, compared to a 694 quarterly average. Household income is \$33,000 to \$40,000.

The Home and Its Energy Uses: The house has central heat, but no A/C. Some windows and doors are drafty and appear to lack adequate weatherstripping (“You can feel the cold air coming through the cracks.”). The home doesn’t appear to retain heat for long.

Energy Attitudes: Becky and her husband are concerned about energy costs, but not about conserving. She says, “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.”

Energy Practices: Becky and her husband have stark differences about comfortable home temperatures—Becky feels cold more easily and often turns up the central heat. During the on-site visit, while outside temperatures were in the low 60s, the husband left the door to the garage open several times. Each time this dissipated the heat in the kitchen area. Becky said this was why she was always cold and needed to turn up the heat.

Becky also revealed that when she’s gone, she leaves the TV on for her puppies. About 75% of the 20+ bulbs in lamps and fixtures are incandescent.

The kitchen has a six year-old, extra-large fridge with “all the bells and whistles.” It’s not an Energy Star model. It also has a gas oven and stove, dishwasher, compactor, a large microwave and commercial size toaster. Becky uses the stove/oven daily. The grandkids in the home each check the fridge several times a day.

The home has six TVs, which appear to be a major cause of high energy use. The living room contains a large rear projection-type that's 15 years old and has a PlayStation console attached. It also has a wall-mounted small LED/LCD TV that's on about four hours/day (It remained on for much of the on-site visit.). Two of the bedroom TVs have medium size tubes and average 4 -5 hours of use/day. The other two are LED/LCD types that average 9 – 10 hours use/day. The bedrooms also have a mix of game consoles, cable and TIVO boxes, stereos. The baths contain curling and flat irons. One room has a blueprint printer with a 30" roller, which is used periodically. The homes clothes washer and dryer is used daily.

Overall Assessment: "Merry Users." Becky and her husband don't like the amounts of their energy bills, but they tolerate them because they like comfortable temperatures and their current lifestyle of usage. (She agrees that "Having the benefits I get from using energy is more important than saving energy."). Weatherstripping would definitely reduce some heating needs. More education about the downside of not conserving might convince the household to modify some of its energy waste.

6. Lillian F. (Concerned, But Uninformed, User)

Lillian is 35 and lives with her husband and three children in the 2002 three-bedroom, two-bath, one-story single family house she's owned for 6 years. She has not participated in an appliance recycle or rebate program. She's not on a medical baseline and no one in the house is a senior or disabled.

Lillian's record shows her highest quarter of usage was Q1 at 627 kW, compared to a 591 quarterly average. Household income is \$33,000 to \$40,000.

The Home and Its Energy Uses: The house has central heat and A/C. The kitchen contains a 5 year-old large, top-of-the-line fridge that's an Energy Star model as well as a gas oven/stove, a dishwasher, microwave, compactor and toaster oven. The kitchen has several CFLs, but eight recessed bulbs are incandescent.

The house also has four TVs, two with cable attachments and two with game consoles. The TV in the nook/family area is 60" tube-style that's several years old, but is an Energy Star model. It's connected to surround sound, a blue ray device, a PlayStation3 console, cable box, VCR records and DVD player. The master bath has a Jacuzzi. The garage has a second full size fridge.

Energy Attitudes: Lillian views energy as "something we need." During a recent blackout "I couldn't do anything!" "December is the most expensive time of the year, so I decided not to put up Christmas lights." Her sister lives two blocks away and has a \$45 bill vs. Lillian's \$90 one. But she hasn't planned to change her behavior. Yet, she was surprised that Q1 was her highest quarter and considered that important information. She's unclear why conservation might be a good goal for the community.

Energy Practices: Someone is present in the home about 80% of the time. The extensive kitchen lighting is on daily from dusk to about 8:30 p.m. The electronics in the nook/family area appears to be a major source of energy consumption. Everyone seems to use some of the electronics in it, so everything is left plugged in and often left on.

The living room has a 5-year old desktop and router. A daughter uses it about 3 hours/day for homework, but it's never turned off.

The bedrooms have about 20 incandescent lights, including multi-bulb fixtures over the bathroom sinks. Each bedroom has a tube TV, two of which are Energy Star models. Lillian initially said these TVs average about 1 – 2 hours of use per day, but later commented that they're often left on when no one is watching, including after the kids fall asleep. The bedrooms have other incidental electronics.

Lillian has a 10 year-old 2nd fridge in the garage, along with a clothes washer and dryer, which she uses for 6 loads/week.

Overall Assessment: "Concerned, But Uninformed, User." Lillian considers energy costs as important and considered information about her high Q1 energy use to be very important. She cites "the cost of new appliances or repairs," rather than changes in behaviors, as the major obstacle to conserving more. But she agrees that she has too many things that use electricity. She doesn't appear to have sufficient guidance about what to do to conserve. More education might persuade her to change habits in the household.

7. Christopher L. (Concerned, But Uninformed, User)

Christopher is 54 and has rented his 1989 two-bedroom, two-bath, single family house for eight years with his wife and two children. He has not participated in an appliance recycle or rebate program, he's not on a medical baseline, and no one in the house is a senior or disabled. Christopher's wife and two children spend the summer in Japan, reducing the household size for several months.

Christopher's record shows his highest quarter of usage was Q1 at 731 kW, compared to a 595 quarterly average. Household income is \$40,000 to \$46,000/yr.

The Home and Its Energy Uses: The house has raised ceilings, central heat, but no A/C, and appears to have effective weatherstripping. The household uses one space heater to augment the central heat.

Dimmers are installed throughout the house because the owner is very sensitive to bright light. About 60% of the lights in fixtures and lamps are incandescent. Recessed flood lamps are used to light the kitchen. The kitchen has a 20 year-old extra-large fridge with an outside ice and water dispenser. In addition to a gas stove/oven, the

house has a dishwasher, large microwave, toast oven, rice cooker, house phone and other incidental consumer appliances.

The home has three TVs and one desktop computer. The living room TV is about 50", is a rear-projection type; a second one in the family area is a medium size tube type. Both are on about 1 hour/day. These rooms also contain the desktop computer, a VCR, cable boxes, CD player, and old stereo equipment that includes a receiver/amplifier and turntable.

The two bedrooms and bath have a few CFLs and about 20 incandescents. They have an old medium size tube TV with a DVD player, more old stereo components and a space heater.

The garage has a 2nd fridge that's about 15 years old and a compressor that's rarely used.

Energy Attitudes: Christopher is conversant with many issues related to energy conservation and use of fossil fuels. He considers his electricity bills to be high, but admits he doesn't pay much attention to them. He believes he has inadequate heating for his home and that it takes too long to heat it. He has a fear of gas asphyxiation and leaves a living room window cracked open at night. He personally prefers to turn up the heat, rather than wear a sweater. He valued *hearing* information about the home's high Q1 use and planned to act on it. He thought reading the same information in the bill would have had little impact on him.

Energy Practices: Someone is present in the home about 70% of the time. The oven is used occasionally, but heavy use is made of the microwave, stove and rice cooker. The living room and family area TVs are on about 2 hours per day in total. The stereo is used periodically. The bedroom TV is about one hour per night. The 2nd fridge in the garage is heavily used (to store items bought on sale) as is the clothes washer and dryer ("We do a lot of laundry.")

Overall Assessment: "Concerned, But Uninformed, User." More information about how to conserve and explanations about the track record of safety from asphyxiation would probably reduce electricity consumption. The spike of energy used in Q1 is probably connected to the need to heat the home more at that time, and the absence of three family members in Q3, when usage is lowest. Christopher has tried to switch out his many incandescent bulbs, but the CFLs he's bought don't work with dimmers, which he has installed everywhere possible because he's sensitive to bright light. His practice of opening a window at night (to avoid gas asphyxiation) probably leads to heater use that's otherwise unnecessary. TV use appears minimal, but the older stereo equipment probably draws heavily when used.

Lancaster (non-temperate)

1. Jessica B. (Merry User)

Jessica 36. For about one year she has lived with her husband and 4 kids in a rented, 1987 four-bedroom, two-bath single family house. She doesn't work, but her husband is a plumber and works out of their home. She has participated in an appliance recycle and a rebate program, though records indicated she had not. She hasn't heard of EMA and the household is on a medical baseline, though she says one child has fibromyalgia and can't regulate her body temperature well. No one is a senior citizen or disabled. Household income is between \$33,000 and \$44,000/yr.

Jessica's record shows her highest quarter of usage was Q3 at 1980 kW, compared to a 1,446 quarterly average.

The house has vaulted ceilings and appears to have good insulation. It also has five TVs, one large plasma TV with surround sound, a game console, a DVR and cable box in the living room, and four bedroom TVs (each with cable boxes; two that are tube style; one with a game console). Collectively TVs are on about 28 hours/day. The home has central heating and A/C. Three electric blankets are used in the winter. The home also has three computers, a large 2nd fridge with freezer in the garage and a compressor that's used about once a month. Four ceiling fans are used in the summer to reduce heat; there are no A/C units. About 90% of 30+ lamp and overhead bulbs are incandescent.

Attitudes: Jessica says "energy is important. You can't live without it." She associates it most with heating and cooling. If a bill was "too low, I'd expect a mistake. If it was high, we'd cut back on the A/C and central heat." The option of an energy saving appliance would have no effect on buying it...She wouldn't consider efficiency over price—only as a tie breaker. She considers her bill to be about average compared to other houses like hers.

Energy Use: On a typical day 28 hours of TV use occurs among five TVs, with the large sized plasma TV accounting for about 8 hours. The children watch their own TV in their bedrooms. Jessica indicates she never turns off or powers down home computers when not in use. The A/C is needed for comfort in the summer, but she sometimes uses ceiling fans instead. She's willing to accept information, but unsure if it will affect household behaviors/energy use ("It depends on what they showed me. Am I doing one thing wrong, or ten?")

Overall Assessment: "Merry User." Household members appear to be oblivious to their energy use. The household co-head has a vague sense of the energy used, mostly from impressions of the monthly bill, but she believes the bill is high because SCE charges too much. Little of the lighting in the home is from CFL bulbs. The co-head does not appear to guide or limit her children in their TV viewing or gaming. No one seems to care particularly about the household's energy consumption. Providing the

household with additional energy efficiency information probably wouldn't hurt, although it's difficult to imagine anyone acting upon it.

2. Melanie A. (Concerned, But Uninformed, User)

Melanie is 41 and has rented her 1970s three-bedroom, two-bath single family house for about 2-1/2 years with two adults and one child under 18. She says she has diabetes and high blood pressure, but she's not on a medical baseline. No one in the house is a senior or disabled. Household income is less than \$15,000/yr. and she's on a level-pay plan. She has heard of EMA, but knows nothing about it. Someone is in the house 100% of the time.

Melanie's record shows her highest quarter of usage was Q2 at 1,030 kW, compared to a 946 quarterly average.

Melanie says it's "very hard" to keep it at a comfortable level, especially in the summer. The house was extremely warm during the visit, though Melanie said she keeps the thermostat at 76. The house appears to have some drafty windows and doors. The living room contains a large LED/LCD TV with DVR, surround sound and a PlayStation console. About 95% of the bulbs in lamps or fixtures are incandescents. She uses a swamp cooler for cooling.

Melanie says she requested a new energy efficient fridge and a swamp cooler, but never heard back from SCE. The current fridge is about 15 years old. She uses a deep fryer, but has not others

Attitudes: She says, "You need it to live. Why can't it be free?" Saving energy is important because of the cost. "I'm on fixed income." She looks at her utility bill, but the graph is too complicated. She's not surprised that she uses more energy in Q2, because it includes her "birthday month," which she celebrates by having more social gatherings at her house. She presumes she uses less energy than those around her. She considers herself extremely unknowledgeable about things she can do around the house to save energy.

Energy Use: The plasma TV in the living room is on about 12 hours a day; collectively there's about 23 hours of TV use/day. Two bedrooms have small tube TVs, but one has an Xbox attached and a computer. The bedrooms also have 3 portable fans. The family uses the living room PlayStation console a lot of that time. Household members cook breakfast and lunch for themselves and generally share a dinner. She's trying to conserve by turning off the lights and TV when not in use. Nearly all of her lighting uses incandescent bulbs.

Overall Assessment: "Concerned, But Uninformed, User." The house has an old fridge, at least one person who is very sensitive to cold and a narrow range of consumer electronics (TVs and game consoles) that are heavily used. The household doesn't know how to reduce energy consumption ("They don't teach you that."). She would

probably benefit from an expert audit of her home's energy usage and from the full array of energy efficiency programs and services that SCE offers, particularly those offering free CFLs.

3. Kimberly C. (Concerned, But Uninformed, User)

Kimberly is 42 and for the past 3 years she has rented her 1990s single family house with her husband, two kids and elderly mother. The house has vaulted ceilings. She has not participated in an appliance rebate program. Despite records to the contrary, she says she has participated in the refrigerator/freezer recycling program. She has also heard of, and says she has participated in, EMA at her current residence. Kimberly's mother appears to need assistance with activities of daily living, but the household is not on a medical baseline. Household income is \$15,000 to \$28,000/yr.

Kimberly's record shows her highest quarter of usage was Q3 at 1546 kWh, compared to a 932 quarterly average.

The home has central heat and A/C. It also has a desktop, four medium size TVs (three with tubes), one with a cable box and DVR. No other consumer electronics using significant electricity were seen. The lighting in two baths includes fixtures of 60- or 75-watt incandescent bulbs over the sinks. Nearly all of the 40+ bulbs in lamps and fixtures are incandescent.

Attitudes: Kimberly says she pays a lot of attention to her bill and is trying to reduce it by not using the TVs and lights during the day. She compares the current month usage on her bill to the month last year and believes her bills are high compared to others.

Energy Use: It appears the dishwasher is seldom used, the kitchen lights are left off when not needed and the Energy Star fridge is about one year old. The living room has a nearby desktop computer and printer, but no TV. The four bedrooms each have a TV, three of which are medium size, older tube-style. One of the tubes is on about 12 hours a day to keep the elderly mother entertained and help her sleep; another has an Xbox and PlayStation attached.

Overall Assessment: "Concerned, But Uninformed, User." The household's concern about the energy bill appears to be serious, but the customer lacks sufficient information and guidance to do much about it. It appears that the cause of the Q3 spike in energy consumption is due to significantly greater use of the A/C and/or to much greater use of the TVs and related components during the summer (when her kids are home). Use of numerous incandescent bulbs probably contributes a fraction to the bill. The household would probably benefit from an expert audit of the home's energy use and from the full array of energy efficiency programs and services, especially those involving free CFLs.

4. Mark H. (Hostage to Domicile)

Mark is 45. He's a former police officer who is studying to become a Journeyman electrician. For the past 15 years he has owned his 1990s single family house with wife and three children, one of whom is under 18. He hasn't participated in an appliance rebate program, but has participated in the refrigerator/freezer recycling program. He has also participated in EMA. No one in the household is on a medical baseline. Household income is less than \$15,000/year.

Mark's record shows his highest quarter of usage was Q3 at 1,364 kW, compared to a 1,201 quarterly average.

The home structure seems well maintained, and apparently has good insulation and no major drafts from windows or doors. The owner notes that home has "36 windows and vaulted ceilings." The home has central heat and A/C. Nearly all the bulbs in lamps and fixtures are CFLs. It also has three TVs, three desktop computers and one laptop, two DVRs and two video game consoles. Someone is in the house 90% of the time.

Attitudes: Mark is wary of communications about energy use. "It's a scam. [Energy] is a God-given right." He pays much attention to the amount of his bill. He considers wearing heavier clothing in cold weather, but adds, "It's 2010. We shouldn't be living in the Ice Age." He does look for the Energy Star emblem when buying new appliances. He considers new information about energy efficiency to be a waste of his time ("You can't conserve more than I do.")

Energy Use: The large LED TV with surround sound and DVD attachments in the living room is used about seven hours/day. Two bedroom TVs, one with a PlayStation and Xbox consoles, average about 2 – 3 hours of use per day. The house has a pool and spa. A contractor began to install a pump provided by SCE, but stopped because the home had a solar energy source that didn't comply with the pump. The backyard and garage also have six lighting fixtures with paired fluorescent tubes, outdoor speakers and a large size freezer.

Overall Assessment: "Hostage to Domicile." The owner's initiative in installing so many CFLs demonstrates intent to conserve. However, the presence of the pool and spa hinder significant conservation efforts. In addition, the TVs and gaming consoles present in the home probably result in heavy electricity usage that's independent of the pool pump. The household seems unable/unwilling to rein that in. Despite the owner's wariness about energy efficiency information, and his presumption that he knows a lot already, he's somewhat interested in it. He would most benefit from a pool pump that can work with a solar power generation system.

San Bernardino (non-temperate)

1. Maria M. (Hostage to Domicile)

Maria is 53 and has rented her 1953 two-bedroom, one-bath apartment for less than one year to house three generations: herself, her three children, and her daughter's young child. One person sleeps in the living room. Maria has not participated in an appliance recycle or rebate program, she's not on a medical baseline, and no one in the house is a senior or disabled. She has heard of EMA, but doesn't know enough to take action.

Maria's record shows only two quarters of usage: Q3 at 1,108 kW and Q4 at 921 kW. Her household income is less than \$15,000/yr.

The Home and Its Energy Uses: The apartment was chilly during the visit and appears to lack sufficient weatherstripping around the doors and windows. It's on second of two stories and insulation above the ceiling may not be adequate. The unit has a heat pump.

There is minimal lighting and all bulbs are incandescent. The oven and stove are all-electric. They also use a small microwave and an electric roaster for cooking. The refrigerator is an Energy Star and there's no dishwasher.

The living room has a large LED (Energy Star) TV that's connected to a PlayStation. A stereo and DVD are plugged in along with one space heater.

The two bedrooms have large older tube TVs that are collectively on about 4 hours/day. One bedroom uses a second portable heater.

Energy Attitudes: Maria says, "I'm trapped. There's not much I can do. There's energy being wasted. Even when you try, it's not enough." She tries to use as much natural light as possible to light her apartment. She understands that appliances often use some energy when plugged in, so she unplugs many when they're not in use. Her motivation to conserve is so she can stretch a limited budget. She pays a lot of attention to her energy bills and will skip buying a coffee to help offset the cost.

Energy Practices: Someone is present in the home 100% of the time. In summer Maria tries to keep the apartment cool with a portable fan because her son suffers from asthma. She uses space heaters in the winter. She cooks on the electric stove every day.

The apartment has three TVs. The one in the living room is on about 5 hours/day. The living room space heater is used whenever it gets cold. The two bedroom TVs average about 4 hours of use/day. Each bedroom also has a CD player. The bathroom has a curling iron.

Overall Assessment: “Hostage to Domicile.” Her challenge is to maintain normal heating and cooling. The all-electric kitchen, the drafty apartment and the weak central heat are beyond her control to change. She does not appear able to afford newer, more efficient appliances. As a renter, she appears uncomfortable about asking her landlord for something. She has tried without success to reduce her electric bill. The EMA program seems tailored to her condition and needs.

2. Carl C. (Hostage to Domicile)

Carl is 44 and has rented his 1962 four-bedroom, two-bath, single family house for 13 years with his wife and two children. As a roofer, his work and income have significantly declined, and he’s facing a layoff. He has not participated in an appliance recycle or rebate program, he’s not on a medical baseline, and no one in the house is a senior or disabled.

Carl’s record shows his highest quarter of usage was Q3 at 1,877 kW, compared to a 952 quarterly average. Household income is \$46,000 to \$53,000/yr.

The Home and Its Energy Uses: The house has low ceilings that, according to Carl, help when heating it, but results in uncomfortable temperatures when the weather is hot. He considers the insulation to be bad. The house has central heat and A/C provided by a unit that’s about 15 – 30 years old.

House lighting is basic. The percent of incandescent bulbs is about 25% and Carl says he’s successful in keeping off lights when not needed.

The main fridge is large and basic and about 8 years old. The oven and stove use gas. A medium size microwave is about two years old. A coffeemaker is unplugged when not in use. The dishwasher has remained inoperable for some time.

The home has four TVs, four laptops and one desktop computer in total. The living room and family room contain a large tube TV, watched for about an hour per day, and a 32” LCD Energy Star TV, used about 4 hours/day. Both are attached to game consoles; one has a DISH component attached. A snake tank has a light always on to keep the python warm. The four bedrooms have two large TVs, one is a tube. The other has an LCD screen, surround sound a DRV and a VCR as attachments. Each bedroom has a portable fan and a laptop, one with a printer.

The garage has a compressor, a large 2nd fridge that’s about 12 years old and a stand-alone freezer that’s five years old.

Energy Attitudes: Carl views energy costs in terms of the number of hours he needs to work to pay it. He’s skeptical about the importance/relevance of greenhouse gases. His landlord has never raised the rent, so he’s determined not to ask for anything, such as newer, energy-efficient appliances. He considers them personally unaffordable at this time.

Energy Practices: Someone is present in the home about 60% of the time. During hot spells the A/C is left on all day when no one is home to have it comfortable when people arrive home. Still, the family will avoid certain rooms when the weather is hot. The family uses portable fans in all bedrooms and the living room during those periods. The family room LCD TV averages about 4 hours of day. One bedroom TV is on a about 4 hours/day. Everyone uses the microwave for cooking; the oven and stove are used periodically.

Overall Assessment: “Hostage to Domicile.” Carl says he doesn’t have the funds to switch/replace appliances and the landlord would charge back for any new appliances he requests. Arguably his consumption could be cut with reductions in the household’s use of electronics, but his Q3 spike seems to be directly related to hot weather, which his house is ill-equipped to handle.

3. Frank K. (Hostage to Domicile)

Frank is 39 and owns a 1971 three-bedroom, two-bath, single family house. He’s lived there for 9 years. He currently lives with his wife, who he’s divorcing, and two renters. Despite records to the contrary, the owners says he had participated in an appliance recycle and rebate programs, but he has not heard of EMA. He’s not on a medical baseline, and no one in the house is a senior or disabled.

Frank’s record shows his highest quarter of usage was Q3 at 1,435 kW, compared to a 1,381 quarterly average. Household income is \$75,000 to \$100,000/yr.

The Home and Its Energy Uses: Frank says the insulation is inadequate, and that leaky windows and doors let the hot air in. He has installed exterior shades and planted shrubs along the western perimeter of the house to generate shade. He has central heat and A/C provided by a unit that’s about 10 – 15 years old.

The home has a basic assortment of floor and table lamps, mostly with incandescent bulbs, and several ceiling fans. Overall the home has four TVs, two desktops, two laptops and one cable box. It also has an older main fridge, an old stand-alone freezer and a 2nd fridge in the back yard. The kitchen has a gas oven/stove and a microwave.

Energy Attitudes: Frank turns off lights that are not in use. But his energy bills are high and it’s caused anger to grow between himself and his wife. During the on-site visit they got into several heated arguments about energy inefficiencies and who was the worse at conserving. Frank says he “hates heat.” He says his bill is directly related to the extent of hot weather.

Energy Practices: Someone is present in the home about Frank runs the A/C 24/7 when the weather is hot because the house instantly heat up beyond a comfortable level. The microwave and electric coffee pot are heavily used. Each household member cooks and eats by him/herself.

The tube TV in the living room is old and on about 4 hours/day. It's got a cable, VCR and DVR attachments. Of the two tube TVs in the bedrooms, one is on 16 hours/day; the other is on 2 hours/day.

Overall Assessment: "Hostage to Domicile." The home would benefit from better weatherization and insulation. The A/C might benefit from a tune-up. Although the owner made his own case for this household being dysfunctional (a "Divided Household"), the spike in Q3 appears directly tied to outside weather and the apparent lack of insulation, weather stripping and other such measures. From an energy efficiency point of view, household discord doesn't seem to be the primary problem. Each person operates independently—and sometime contrarily—to the efforts of the others and could adopt energy efficient behaviors. But it's difficult to imagine the household cooperating in the near future. At the same time the owner is adamant about not investing more in the property (or in new appliances) because he anticipates a divorce.

4. Michael V. (Hostage to Domicile)

Michael is 53 and has owned his 1981 two-story, four-bedroom, three-bath single family house for 15 years. He shares it with his wife. He has not participated in an appliance rebate program, but says he had participated in the refrigerator recycling program. He's not on a medical baseline, and no one in the house is a senior. It seems Michael *could* be considered disabled because he suffered a debilitating heart attack several years ago and had to stop working. He has not heard of EMA.

Michael's record shows his highest quarter of usage was Q3 at 2,077 kW, compared to a 1,381 quarterly average. Household income is \$15,000 to \$28,000/yr.

The Home and Its Energy Uses: The home is extremely well maintained and fully decorated. The home, particularly the second story, is (apparently) not well insulated. Overall it has four bedrooms, three baths and spacious living and family rooms, with incandescent bulbs in chandeliers that are used to light several rooms. There are four TVs, three with cable/TIVO/Russian TV boxes, a large (older) main and (brand new) secondary refrigerator. The kitchen also has a dishwasher and various small consumer appliances. The home has a pool and spa with backyard lighting for it.

Energy Attitudes: Michael says that he has to maintain a cool house because heat makes his heart race, which then causes him to panic and then fear he's having another heart attack. He feels victimized by the house, electronics, pool and spa that he once could easily afford, but that now cost him so much to maintain. He calculated that with his life expectancy it was cheaper to pay \$1,000/year to maintain his pool than to pay to remove it and lose some property value. Michael's wife appears to use lighting and TVs somewhat obliviously.

Energy Practices: Someone is present in the home about 100% of the time. Lights tend to be left on downstairs and in the upstairs Master bedroom. The house A/C is heavily used, partly to maintain a comfortable temperature for Michael, but also because it's more difficult to cool the second story. Michael claimed they watch little TV. But his wife appeared to leave on the TV in the master bedroom for the duration of the on-site visit, along with many bedroom lights. Michael does not heat the pool or spa in the winter, but uses them heavily during the summer, when they entertain the extended family.

Overall Assessment: "Hostage to Domicile." Michael would benefit from expert evaluations of his insulation, weatherization and A/C system. Most likely the household would also benefit from a more efficient pool/spa pump and from energy efficiency information that might inspire them to minimize their energy waste. Michael appears to be victimized by a house that is not energy efficient and that has become difficult to afford after his heart attack. His situation comes close to a "Declining Health/Wealth" classification, except that he doesn't want to maintain the things he had accumulated. Instead he feels he has no sensible alternative. During the interview, he alluded to a desire to sell, but had concluded that the real estate market was down too much to make that feasible.

APPENDICES

Appendix D: Quantitative Telephone Survey Research Instrument

n=1,500 Residential Customers

INTRODUCTION

Hello, I'm _____ calling from HINER & PARTNERS, on behalf of [Southern California Edison / Pacific Gas & Electric] to conduct a survey about energy usage in your area. [SCE/PG&E] is requesting your help with this survey, which will be used for planning for programs and services that are offered by the utility. We are only interested in your opinions, and all your answers are completely confidential.

S1. Could I speak to the person in your household who is primarily responsible for making decisions about your electric service, for example the person who would call [SCE/PG&E] if you had a question or wanted to sign up for a program? (IF LANGUAGE BARRIER, ASK TO SPEAK TO SOMEONE WHO SPEAKS ENGLISH)

- | | |
|---|---------------|
| Yes, speaking..... | GO TO S1 |
| Someone else..... | REREAD INTRO |
| Not available..... | SCHD CALLBACK |
| Language Barrier: No English speaker..... | CONTINUE |

S2. DO NOT ASK: WHAT LANGUAGE?

- | | |
|--|--------------|
| Spanish..... | SPANISH PROC |
| Asian (SPECIFY IF POSSIBLE: _____)..... | 2 |
| European (SPECIFY IF POSSIBLE: _____)..... | 3 |
| Other (SPECIFY: _____)..... | 4 |
| Don't know / can't determine..... | 9 |

(ONCE THE CORRECT PERSON IS ON THE LINE, READ INTRO AGAIN)

Hello, I'm _____ calling from HINER & PARTNERS, on behalf of [Southern California Edison / Pacific Gas & Electric] to conduct a survey about energy usage in your area. [SCE/PG&E] is requesting your help with this survey, which will be used for planning for programs and services that are offered by the utility. We are only interested in your opinions, and all your answers are completely confidential.

IF NEEDED OR WHEN ASKED: The survey can take as long as 20 minutes. I can begin now and at any time we can break and continue later.

SCREENING – 2 Minutes

S3. To begin, which of the following activities are you involved in for your household? (READ. MULTIPLE RESPONSE)

Making decisions about purchasing new appliances.....	1	CONTINUE
Reviewing and/or paying the monthly [SCE/PG&E] bill.....	2	CONTINUE
Calling [SCE/PG&E] if there's a problem, such as a power outage	3	CONTINUE
Budgeting for or figuring out ways to reduce your electricity costs	4	CONTINUE
None of the Above	7	OTHER
Don't Know/Not Sure.....	8	OTHER
Refused	9	OTHER

MUST SAY YES TO 2 OR MORE OF ITEMS 1-4 TO QUALIFY.

OTHER: Ask for someone else who would say yes to two or more of these questions. If yes, return to intro and continue. If not, thank and terminate.

For quality purposes, this call may be monitored or recorded.

First, I have some questions about your household and your home that can tell us something about the energy your household uses. These will help us know how to better serve you.

S4. How many people live in your home for at least 6 months out of the year?

(RECORD NUMBER) _____
 Refused..... 99

S5. (IF S4=2 OR MORE) How many are under 18?

(RECORD NUMBER) _____
 Refused..... 99

S6. (IF S4 MINUS S3=2 OR MORE) How many are 65 or older?

(RECORD NUMBER) _____
 Refused..... 99

MAIN QUESTIONNAIRE

I. HOME CHARACTERISTICS (5 minutes)

HC1. What type of home do you live in? Is it a ... (READ UNTIL RESPONDENT SELECTS ANSWER)

- Single Family Detached home..... 1
- Duplex..... 2
- Townhouse or Row House with shared walls..... 3
- Condominium with shared walls and another unit above or below 4
- Apartment..... 5
- Mobile Home..... 6
- Or some other type (SPECIFY) (DO NOT READ)..... 7
- Don't Know / Refused (DO NOT READ)..... 9

HC2a. Approximately how many square feet is your home? Your best guess is okay.

- (RECORD NUMBER) _____ (0-9998)
- Don't Know / Refused (DO NOT READ)..... 9999

HC2b. How many bedrooms do you have?

- (RECORD NUMBER) _____ (0-8)
- Don't Know / Refused (DO NOT READ)..... 9

HC3. Do you own or rent your home?

- Own 1
- Rent / lease..... 2
- Don't Know / Refused (DO NOT READ)..... 99

HC4. How many years have you lived at your current residence?

- Less than 1 year 0
- (RECORD NUMBER OF YEARS) _____
- Don't Know / Refused (DO NOT READ)..... 99

HC4a. [IF HC4=4 or less] And how many times have you moved in the past 5 years?

- None 0
- (RECORD NUMBER OF Times) _____
- Don't Know / Refused (DO NOT READ)..... 99

HC5. Do you know in what year it was built? Your best guess is okay. (IF GUESSING TRY FOR NEAREST DECADE LIKE "1960")

- (RECORD YEAR) _____
- Don't Know / Refused (DO NOT READ)..... 99

HC6. To the best of your knowledge, which of the following does your home have ...? (READ)

- Yes..... 1
- No 2
- Not Sure/Don't Know..... 8
- Refused..... 9

1. Ceiling fan
2. Double or triple paned windows
3. Intact weatherstripping at all windows and doors that seals air leaks ... If you have any windows or doors that leak air when they are closed, than answer "no"
4. A programmable thermostat for heating and cooling
5. Motorized attic vents or fans (that remove hot air from the attic)
6. Attic insulation that would meet current standards
7. Whole house fan (that pulls air from inside the home into the attic and then outside)

[FOR EACH "YES" IN HC6, ASK HC7 BEFORE MOVING ON TO NEXT ITEM]

HC7. Was it installed before you moved in or since you have been living there?

- Already installed when I moved in..... 1
- Installed since living there / I installed it..... 2
- Not Sure/Don't Know..... 8
- Refused..... 9

HC8. Approximately how many of your light bulbs are compact florescent or CFL bulbs?
(READ)

- None (0%) 1
- One-quarter (25%)..... 2
- Half (50%)..... 3
- Three-quarters (75%) 4
- All or nearly all (100%)..... 5
- Don't Know / Refused (DO NOT READ)..... 9

HC9. What type of air conditioning does your home have? (READ)(MULTIPLE OKAY)

- Central AC..... 1
- Heat Pump..... 2
- Evaporative or swamp cooler..... 3
- Window or wall mounted air conditioner(s)..... 4
- Portable air conditioner..... 5
- Fans 6
- None..... 7
- Don't Know / Refused (DO NOT READ)..... 9

HC10. [IF HC9=1,2,3,4] What is the approximate age of your air conditioner(s)? (IF MORE THAN ONE: The one you use most often.) Your best estimate is okay.

- Less than 5 years old..... 1
- 5 to less than 10 years..... 2

10 to less than 15 years.....	3
15 to less than 30 years.....	4
30 or more years.....	5
Don't Know / Refused (DO NOT READ).....	9

HC11. As far as you know, has anything else been done to your home to make it more energy efficient that I've not mentioned?

Yes.....	1
No	2
Don't know / Refused (DO NOT READ).....	9

HC12. [IF HIN11=1] What else has been done?

HOME INVENTORY AND EFFICIENCY – 1 MINUTE

My next questions are about things you have in your home that use energy.

HIN1. How many of each of the following does your household have? Only count those that are used or are plugged in at least on occasion.

____(RECORD NUMBER BETWEEN 1-20)	
Don't know/Refused.....	99

ELECTRONICS (ASK 1-5 AS FIRST GROUP– RANDOMIZE WITHIN THE GROUP)

1. TV's
2. Desktop computers
3. Laptop computers
4. Cable, satellite, DVR or TIVO boxes
5. Video game consoles like Xbox, PlayStation or Wii

APPLIANCES (ASK 6-14 AS SECOND GROUP – RANDOMIZE WITHIN THE GROUP)

6. Refrigerators
7. Stand alone freezers
8. Dishwasher
9. Clothes washer
10. Clothes dryer
11. Pool or spa
12. DELETED
13. Window AC units (ask ONLY if HC9 = 4)
14. Plug in electric heaters

HIN2. Do you have any other electrical equipment or appliances in your home or garage that you believe use a lot of power? (DO NOT READ LIST – PROVIDE EXAMPLES IF NEEDED.)

Fish tank.....	1
Power tools (table saw, power tools, welding, etc.).....	2

Air Compressor.....	3
Car charger (for electric car).....	4
Medical Equipment.....	5
Other (SPECIFY:_____)	6
Don't know/Refused.....	99

HIN3. How old is your main refrigerator (in years)? (IF DON'T KNOW, PROBE: Can you tell me how long you have had it?) Your best estimate is okay.

_____(RECORD NUMBER BETWEEN 1-50)	
Don't know/Refused.....	99

HIN4. Is your home all electric or do you have both electricity and gas?

All Electric.....	1
Electricity and Gas.....	2
Don't know/Refused.....	9

ATTITUDES & MOTIVATIONS (10 Minutes)

AT1. How would you describe [S4=1: your][S4=2 OR MORE: your household's] efforts to save energy in your home? Please use a scale of 1 to 5, where 1 means "You do very little to save energy" and 5 means "You always try to save energy in your home."

5 You always try to save energy.....	5
4	4
3	3
2	2
1 You do very little to save energy.....	1
Don't know / Refused (DO NOT READ).....	9

AT2. How successful do you think you have been in reducing energy use in your home? Please use a scale of 1 to 5, where 1 means "you have not been very successful" and 5 means "you have been very successful".

5 You have been very successful.....	5
4	4
3	3
2	2
1 You have not been very successful.....	1
Don't know / Refused (DO NOT READ).....	9

AT3. What obstacles do you face in trying to save energy in your home? (DO NOT READ. MULTIPLE OK) What other obstacles do you face? (CONTINUE PROBING UNTIL EXHAUSTED)

Cooperation of others in the home.....	1
Construction of home (cathedral ceilings, multiple floors, skylights, etc.)....	2
Condition of home (not enough insulation / single pane windows, etc.).....	3
Cost (or initial cost) of new appliances or repairs / Lack of money.....	4
Maintain comfort / Heating or Cooling / AC use.....	6

Age of home / home is old.....	7
Lack of time / too busy.....	8
Don't know what to do.....	9
Medical needs (of someone in the home).....	11
Work from home / need to be comfortable or run equipment for work.....	12
Pool / spa / need to run pool pump.....	14
Renter / not the owner / landlord problems.....	15
Too many things that use electricity (TV's, cell phones, etc.).....	16
Other (specify) _____.....	17
Don't know / not sure.....	99

[IF MORE THAN ONE ITEM SELECTED IN AT3, ASK AT4]

AT4. Which ONE of these things do you see as the BIGGEST obstacle to saving more energy? (IF NEEDED, REREAD AT3 RESPONSES. RECORD ONE)

Cooperation of others in the home.....	1
Construction of home (cathedral ceilings, multiple floors, skylights, etc.)....	2
Condition of home (not enough insulation / single pane windows, etc.).....	3
Cost (or initial cost) of new appliances or repairs / Lack of money.....	4
Maintain comfort / Heating or Cooling / AC use.....	6
Age of home / home is old.....	7
Lack of time / too busy.....	8
Don't know what to do.....	9
Medical needs (of someone in the home).....	11
Work from home / need to be comfortable or run equipment for work.....	12
Pool / spa / need to run pool pump.....	14
Renter / not the owner / landlord problems.....	15
Too many things that use electricity (TV's, cell phones, etc.).....	16
Other (specify) _____.....	17
Don't know / not sure.....	99

AT5. Now tell me which of the following is more important to you by allocating 10 points between these three options. For example you can allocate all 10 points to just one of them if it is the only one that is important to you, or you can divide the 10 points between the options. (READ ALL THREE OPTIONS, THEN RECORD POINTS. MUST TOTAL 10 PTS)

(RANDOMIZE)

- a. ___ Reducing energy use to save money on my bill
- b. ___ Reducing energy use to improve our environment
- c. ___ Using energy to be comfortable and productive in my home
- Don't know / Refused (DO NOT READ)..... 99

AT6. Next, I am going to read you some statements about your outlook on energy use in and around your home. For each statement, I'd like you to tell me if you "strongly agree," "somewhat agree," "neither agree nor disagree," "somewhat disagree," or "strongly disagree." How much do you agree with the statement:

Strongly Agree.....	5
Somewhat Agree.....	4
Neither Agree nor Disagree.....	3

Somewhat Disagree.....	2
Strongly Disagree.....	1
Don't know / Refused (DO NOT READ).....	9

[RANDOMIZE]

CONSERVATION / ENVIRONMENT ATTITUDES, KNOWLEDGE & BEHAVIORS

1. Having the benefits I get from using energy is more important than saving energy
2. I don't often think about how much energy I use in my home
3. DELETED
4. I believe new technologies can help me use energy more efficiently
5. The amount of energy I use today has an impact on future generations.
6. I'm very concerned about the environment
7. DELETED

PRICE & COST SENSITIVITY

8. Saving even a few dollars on my electric bill is worth sacrificing some comfort or convenience
9. DELETED
10. If I were to buy a new appliance like a refrigerator or air conditioner, I would probably buy a less expensive one even if it used more energy
11. I sometimes worry whether there is enough money to pay my energy bill
12. The cost of energy makes me want to conserve.
13. DELETED

EMPOWERMENT & PERSONAL CONTROL

14. DELETED
15. If I really wanted to, I could probably use less energy than I use now without sacrificing too much
16. Someone in my household is dependent on using energy in my home for health reasons
17. I do more than most people I know to reduce my impact on the environment
18. I am often the first among my family and friends to purchase new appliances or electronics equipment
19. I am very knowledgeable about things I can do around my home to save energy
20. I monitor my electricity bills very closely
21. I've already done everything I can to save energy in my home.
22. I regularly try to convince others to use less energy
23. My actions have little effect on global warming.
24. I usually buy used rather than new appliances

BEHAVIORS – 3 MINUTES

Next I want to ask some questions about things that you [IF S4=2 OR MORE: and members of your household] may or may not do in order to save energy. . Please try to be as honest as you can [IF S4=2 OR MORE: and answer for your entire household rather than just for yourself].

EB1. For each statement, tell me if you do this “always,” “most of the time,” “some of the time,” “rarely,” or “never.” How often do you...

Table with 2 columns: Response options (Always, Most of the time, Some of the time, Rarely, Never, Not applicable / do not have this, Don't know / Refused) and corresponding scores (5, 4, 3, 2, 1, 8, 9).

[RANDOMIZE]

LIGHTS

- 1. Turn off lights in rooms when not in use
2. DELETED

ELECTRONICS / APPLIANCES

- 3. Turn off or power down your computer when it is not in use
4. Unplug cell phone, battery, or toothbrush chargers when not in use
5. Turn off your TV when it is not in use
6. Run appliances like your dishwasher or clothes washer ONLY with full loads

HEATING/COOLING

- 7. Use fans instead of an air conditioner on hot days
8. [IF HC9=1 AND 3, E.G. BOTH] Use an evaporative or “swamp” cooler instead of the air conditioner on most hot days
9. Set your thermostat at a temperature where you might feel somewhat uncomfortable
10. Put on a more clothing to keep warm instead of turning up the heat
11. Close heating or cooling ducts in rooms that are not used much
12. Turn down the temperature on the water heater

EB2. What temperature do you typically keep your home at on hot summer days? (IF NEEDED: Your best estimate is okay.)

Table with 2 columns: Response options (Record number 55-95, Don't Know / Refused) and corresponding scores (1, 9).

EB3. What temperature do you typically keep your home at on cold winter days? (IF NEEDED: Your best estimate is okay.)

Table with 2 columns: Response options (Record number 55-95, Don't Know / Refused) and corresponding scores (1, 9).

CONNECTION WITH UTILITY / PROGRAM AWARENESS & PARTICIPATION – 1.5 MINUTES

My next few questions are about your energy utility company.

CU1. Thinking about all the services that [Southern California Edison/Pacific Gas & Electric] currently provides, on a scale of 1 to 10 where “1” means not at all satisfied and “10” means completely satisfied, how satisfied are you with [SCE/PG&E] overall?

[RECORD SATISFACTION RATING]

1	2	3	4	5	6	7	8	9	10	<u>DK</u>	<u>REF</u>
										98	99

CU2. Your utility company offers customers different programs to assist them in saving energy. What do you think about these programs overall? (DO NOT READ. MULTIPLE RESPONSE.) Are there any negatives about them?

POSITIVES

Good / great / helpful / like them..... 1

NEUTRAL

Don't know much about it / no opinion..... 2

Don't care / don't pay attention to this..... 3

NEGATIVES

Need money to participate / don't have the money..... 4

Rent / need landlord's permission 5

Don't qualify / hard to qualify..... 6

Not enough information about them / Don't know what is offered 7

Don't trust the utility or their motives, etc..... 8

Too much work or effort (e.g., too much paperwork for rebates) 9

Rebates are too small / not worth it..... 10

Other (SPECIFY: ____). 11

Refused (DO NOT READ). 99

CU3. Have you ever participated in any utility programs that assisted you in saving energy (IF NEEDED: such as rebates or a home energy survey)?

Yes..... 1

No 2

Don't know / Refused (DO NOT READ)..... 9

CU4. [IF CU3=1] Which of the following programs have you participated in? (READ)(Yes, No, DK for each)(RANDOMIZE. H ALWAYS LAST)

- a. Rebates for energy efficient appliances or improvements or electronics
- b. DELETED
- c. Refrigerator or freezer recycling
- d. Home energy surveys or audits
- e. [SCE: Summer Discount Plan][PG&E: SmartAC], the air conditioning cycling program

- f. [SCE: Emma][PG&E: Energy Partners], where income-qualified customers can receive weather stripping, insulation, refrigerators, evaporative coolers, CFL light bulbs, and information about saving energy at no cost.

LIEE PARTICIPATION, PERCEPTIONS, AND BARRIERS – 3 MINUTES

LIEE1. [IF CU4f=NO/DK] Have you heard of this [Emma/Energy Partners] program that includes weatherstripping, insulation, refrigerators, and such?

- Yes – Heard of it..... 1
- No – Have not heard of it..... 2
- Don't know / Not sure..... 3
- Refused..... 9

LIEE2. [LIEE1=1] Which of the following best describes what you know about this program? (READ)(ONE ANSWER ONLY)

- You've heard of it but know nothing about it..... 1
- You've heard of it and know something about it but not enough to take action..... 2
- You've considered the program but made a decision not to sign up..... 3
- You attempted to sign up but were informed that you were not eligible or could not participate..... 4
- (DO NOT READ) Don't know / Refused..... 9

LIEE3. [IF CU4f=YES] Was that in your current home or a previous home?

- Current..... 1
- Previous..... 2
- Don't know / Refused..... 9

LIEE4. [IF CU4f=YES OR LIEE1=1] How did you learn about this program? (DO NOT READ) (PROBE:) Did you hear about it from any other sources? Which ones?

- Friend / neighbor / family member..... 1
- Saw / Heard an ad..... 2
- Representative came to my home / door-to-door..... 3
- Utility's website..... 4
- Called utility and they told me..... 5
- Landlord..... 6
- Other (SPECIFY:____)..... 7
- Don't know / Refused..... 9

LIEE5. [IF CU4f=YES] What were the main reasons that you signed up for or participated in this program? Please tell me whatever details you remember about how you learned about the program and about what the program offers that prompted you to sign up.

LIEE6. [CU4f=YES] Before you agreed to participate, did you have any concerns about it, or any reasons to hesitate to sign up? (DO NOT READ)

Did not believe or trust it was free.....	1
Might be a scam / fine print	2
Would take too much time.....	3
Too much paperwork.....	4
Had to provide income documentation.....	5
Did not trust contractor / representative to let them in home	6
Doubted the quality of work / appliances.....	7
Other (SPECIFY:____).....	8
Don't know / Refused.....	9

LIEE7. [IF CU4f=YES] After you signed up, did you encounter any difficulties, problems, or disappointments concerning the program?

Yes.....	1
No	2
Don't know / Refused.....	9

LIEE8. [IF LIEE7=1] Can you describe that problem or disappointment?

LIEE9. [IF LIEE2=2, 3] Which of the following are reasons that you've not signed up for the [Emma / Energy Partners] program? (YES, NO, DK/REF FOR EACH)(RANDOM. G ALWAYS LAST)

- You are not sure how to sign up
- You do not think you would qualify based on your income
- You do not think your home needs the improvements that the program offers
- Someone else needs the improvements more than you do
- You have doubts that the work would be of high quality
- You have doubts that the appliances would be of high quality
- Are there any other reasons I have not mentioned?

LIEE10.[IF LIEE9g=1] What is the reason you've not signed up?

LIEE11.[IF LIEE2=4] What was the reason you were given for not being able to participate? (DO NOT READ. MULTIPLE RESPONSE OKAY.) Any other reasons?

Income too high / Did not qualify based on income.....	1
Needed landlords permission / Landlord refused.....	2
Improvements already done / Previous tenant participated.....	3
Home did not need anything / Home or refrig or AC did not qualify.....	4
Program ran out of funds.....	5
Not in my area at that time.....	6
Other (Specify: _____).....	7
Don't know / Refused.....	9

SOURCES OF INFORMATION / MEDIA / COMMUNICATION – 1 MINUTES
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IS1. What is the best way for [SCE/PG&E] to get information to you about saving energy or about their programs? (DO NOT READ)(MULTIPLE RESPONSE) What other ways should they get information to you? (RECORD "BEST" AND "OTHER WAYS")

News: Television, Radio.....	1
Newspapers	2
Stores / Retailer (e.g., Home Depot).....	3
Government partnerships.....	4
[PG&E/SCE] employees / in-person.....	5
[PG&E/SCE] advertising: TV, radio, Internet.....	6
[PG&E/SCE] bill or inserts in the bill.....	7
[PG&E/SCE] separate mail.....	8
[PG&E/SCE] website.....	9
Word-of mouth: Friends, neighbors, etc.....	10
Internet / Websites / Google search.....	11
Contractors / electricians.....	12
Community or assistance organizations.....	13
Other (specify) _____.....	14
None / Don't want information.....	15
Don't Know/Refused.....	99

IS2. DELETED
 IS3. DELETED
 IS4. DELETED

DEMOGRAPHICS – 2 MINUTES

These last questions are for classification purposes. Your answers will be kept confidential.

D1. In what year were you born?

- 19 __ (ENTER LAST TWO DIGITS)
- Don't Know / Refused (DO NOT READ)..... 99

D2. Which of the following best describes your education? (READ LIST)

- High school or less..... 1
- Some college or post-high school training..... 2
- College graduate 3
- Completed graduate school..... 4
- Don't Know / Refused (DO NOT READ)..... 9

D3. Do you consider yourself (READ LIST)

- White..... 1
- African-American..... 2
- Hispanic or Latino 3
- Asian..... 4
- American-Indian..... 5
- Or a member of another race..... 6
- Don't Know / Refused (DO NOT READ)..... 9

D4. And what language do you speak most often in your home? (DO NOT READ)(IF RESPONDENT SAYS CHINESE, CLARIFY MANDARIN OR CANTONESE)(IF MORE THAN ONE SPOKEN MOST OFTEN EQUALLY, MARK BOTH)

- English..... 1
- Spanish..... 2
- Mandarin (Chinese) 3
- Cantonese (Chinese)..... 4
- Vietnamese 5
- Tagalog (Filipino)..... 6
- Korean..... 7
- Japanese..... 8
- Russian..... 9
- Other (SPECIFY:_____)..... 10
- Don't Know / Refused (DO NOT READ)..... 99

D5. Which of the following categories best describes your annual household income? (READ LIST)

- Less than \$15,000..... 1
- \$15,000 to just less than \$28,000..... 2
- \$28,000 to just less than \$33,000..... 3

\$33,000 to just less than \$40,000.....	4
\$40,000 to just less than \$46,000.....	5
\$46,000 to just less than \$53,000.....	6
\$53,000 to just less than \$60,000.....	7
\$60,000 to just less than \$75,000.....	8
\$75,000 to just less than 100,000.....	9
\$100,000 to just less than 200,000.....	10
\$200,000 or more.....	11
Don't know / Refused (DO NOT READ).....	99

D6. Do you or does anyone in your household have a permanent disability, related to mobility, hearing, vision, cognitive, psychological, or chronic disease?

Yes.....	1
No.....	2
Refused.....	9

D7. [IF D6=YES] In which category would you classify the disability? (READ ONLY IF NEEDED TO PROMPT)

Mobility.....	1
Hearing.....	2
Vision.....	3
Cognitive (learning or mental).....	4
Psychological.....	5
Chronic disease.....	6
(DO NOT READ) Other (Specify: _____).....	7
(DO NOT READ) Don't know / Refused.....	9

D8. OBSERVE AND RECORD GENDER

Male.....	1
Female.....	2
Don't know.....	9

CONFIRM NAME AND TELEPHONE.

On behalf of [SCE/PG&E], thank you very much.

IF RESPONDENT HAS QUESTIONS ABOUT SURVEY LEGITIMACY: The name of the SCE/PG&E manager for this survey project is Carol Edwards. She can be reached at (626) 633-7105.

IF RESPONDENT WANTS INFORMATION OR ASSISTANCE WITH A PROGRAM, PROVIDE THE APPROPRIATE PHONE NUMBER:

Help with bill payment	800-950-2356
Emma (EMA) program	800-736-4777
Other programs or assistance	800-655-4555