Assessing the Needs of California's Low-Income Population

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ABSTRACT

This paper presents the results of a comprehensive study of the energy-related needs of California's low-income population. This study was commissioned to direct future policy regarding the various low-income energy programs offered in the state. These programs include the California Alternate Rate for Energy (CARE) Program, which provides a rate discount to qualified low-income customers, and the Low-Income Energy Efficiency (LIEE) Program, which installs weatherization and energy efficiency measures in qualified dwellings at no charge.

As part of this needs assessment, onsite surveys of over 1,500 of California's low-income households were completed to profile the underlying demographic, socio-economic, dwelling-type and geographic characteristics of the eligible population. Using information collected from energy audits and detailed customer interviews, issues such as energy burden and energy insecurity, household comfort, health and safety, and energy efficiency potential were explored. In addition, the study included a thorough assessment of the barriers to participate in the programs, including such factors as program awareness, reluctance to accept aid, and fear or distrust.

This paper has presented the results of this first-ever comprehensive study of the energy-related needs and perceptions among California's low-income population. These results can be used to direct future policy regarding the various low-income energy programs offered in the state. Differences across different demographic groups have been discussed as they indicate ways in which program outreach can be more effectively targeted.

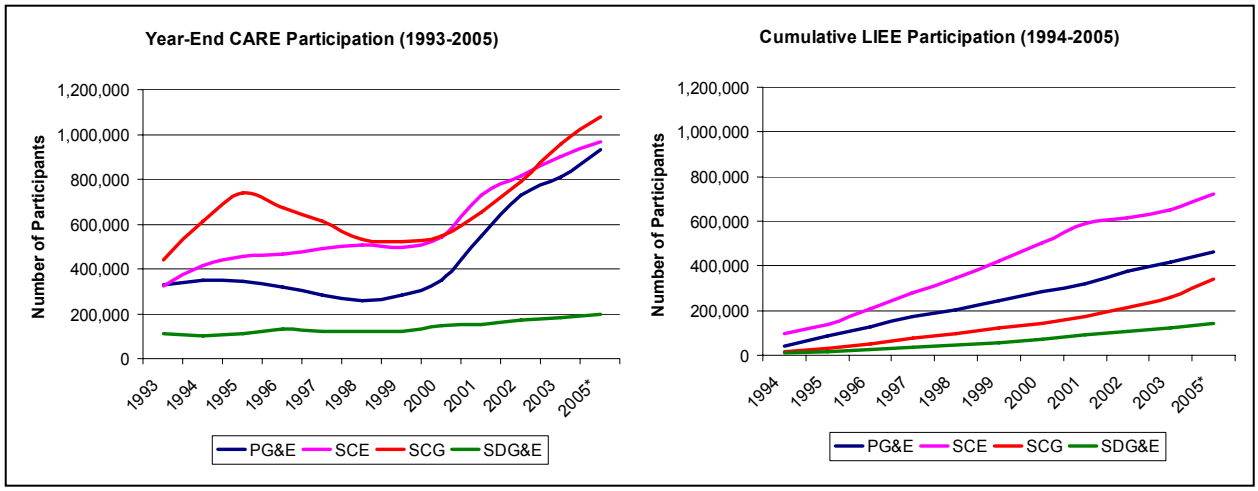
Introduction

Under the jurisdiction of the California Public Utilities Commission (Commission), the investor-owned utilities (IOUs) in the state of California offer low-income assistance programs to qualified low-income customers. The first of these programs is the California Alternate Rate for Energy (CARE) Program. CARE provides a 20% rate discount to qualified low-income customers who request to participate. The second program is the Low-Income Energy Efficiency (LIEE) Program. The LIEE Program provides that weatherization and energy efficiency measures be installed in qualified customer homes at no charge. In addition, the LIEE Program instructs participants on how they may reduce their energy bills by employing energy efficiency practices. Households with incomes at 200% of the federal poverty level are eligible to participate in the CARE and LIEE programs. The Commission has approved nearly $750 million for the major IOUs to fund the CARE and LIEE programs in 2006.[1]

[1] California's major IOUs are Pacific Gas & Electric, Southern California Edison, Southern California Gas, and San Diego Gas & Electric. Small and multi-jurisdictional utilities (SMJUs) also provide the CARE and LIEE programs to eligible customers in their service territories. Funding information taken from the Draft Decision of ALJ Weissman, 12/15/2005, "Opinion Approving 2006-2007 Low-income Programs and Funding for the Larger Energy Utilities and Approving New Low-income Energy Efficiency Program Measures for 2006," http://www.cpuc.ca.gov/published/comment_decision/51207.htm.

In California, approximately 25-30% of all households are eligible to participate in the CARE and LIEE Programs.[2] Over time, the major IOUs have been successful in enrolling large numbers of households in the CARE program – by mid-2005, approximately 65% of all eligible households in the state were enrolled in the CARE program. On average, nearly 150,000 eligible households participate in the LIEE program each year in California. Figure 1 provides a historic summary of household participation in CARE and LIEE since the mid-1990s.[3]

Figure 1. Historic Summary of CARE and LIEE Participation



*Data on 2004 unavailable for CARE and included in 2005 for LIEE.
Source: Counts of CARE and LIEE participation were obtained from the IOUs in May 2004 and November 2005.

This paper presents the results of the first ever comprehensive study to characterize and assess the energy needs of California's low-income population. This study was undertaken to assist the Commission and the IOUs in designing effective targeting and outreach strategies for the CARE and LIEE programs. In the following sections, we present the results of the characterization analysis and needs assessment. We also provide a summary of the results related to barriers to participation.

Methodology

The results presented in this paper are derived from over 1,500 onsite surveys completed in 2003 with low-income households throughout the state of California. The onsite data collection effort was carried out using two-person teams, consisting of an experienced interviewer (or outreach specialist) and a trained energy auditor. Each was responsible for one of two primary stages or types of data collection. The first stage involved an in-depth interview

[2] This is an estimate based on 2003 data. An updated estimate based on 2005 data will be presented at the conference.

[3] For more information about the CARE and LIEE programs, visit the website of the Low Income Oversight Board (www.liob.org), which was established by the legislature for the purpose of advising the Commission on the energy low-income assistance programs of utilities under the jurisdiction of the Commission and serving as liaison for the Commission to low-income ratepayers and their representatives. On this website, the LIOB has posted prior evaluations of the LIEE program, annual reports from the utilities documenting CARE and LIEE participation, and other relevant Commission decisions and utility filings related to the CARE and LIEE programs.

with the head of the household and/or a member of the household who was responsible for the management of household finances such as energy bills. These interviews were conducted in a variety of languages, including English, Spanish, Chinese, Vietnamese, Korean and Tagalog. This first stage involved the collection of household characterization and needs assessment data. The second stage consisted of the energy audit and involved the collection of more detailed information about the home and the components of energy use, as well as the condition of the housing stock and the need/feasibility for energy efficiency measure installations.

Characterization

Households who are eligible for low-income energy assistance programs in California are demographically and geographically different than residents of the state as a whole. These households also exhibit different characteristics with respect to energy use, energy burden and dwelling features. The following is a summary of the key characteristics of California's low-income population:

Demographics

Race and ethnicity. There is no majority racial and ethnic group among households who are eligible for California's low-income energy assistance programs. The most predominant racial/ethnic category among the eligible population is White (43%), followed by Hispanic (35%). Eligible households that characterize themselves as Black or Asian each constitute 9%, and 4% of eligible households are classified as "other."

Language and linguistic isolation. Households eligible for low-income energy assistance programs in California are more likely to speak a language other than English, with the predominant second language being Spanish. About 20% of the eligible households are "linguistically isolated[4]," the majority of which only speak Spanish.

Literacy. The results of the English-language literacy assessment conducted as part of this study suggest an overall literacy rate of 85%. This is slightly higher than the estimate determined for the overall population of adults in California through the National Adult Literacy Survey (NASL).

Household size and composition. Single-person and large (more than five person) households are more prevalent among the households eligible for California's low-income energy assistance programs than residential population as a whole. Overall, household size is the same, or three persons on average. Eligible households are also more likely to consist of single-parent households with children and less likely to consist of families without children.

Household elderly/disability status. Of the population eligible for low-income energy assistance programs in California, about one third are elderly households and one in every four households contains a household member with a physical or mental disability.

[4] The U.S. Census defines linguistic isolation as "a household in which no person 14 years old and over speaks only English and no person 14 years old and over who speaks a language other than English speaks English 'Very Well'".

Employment. Non-employment and part-time employment are considerably more prevalent among the population eligible for California's low-income energy assistance programs as compared to California's residential population as a whole.

Education. Education attainment among households eligible for California's low-income energy assistance programs is vastly different from the residential population as a whole. Many of those eligible have not completed high school, and fewer have completed college courses. This compares to California's residential population as a whole where nearly two-thirds have completed college-level courses.

Participation in non-energy related public assistance programs. Most of the households eligible for California's low-income energy assistance programs have also participated in a number of public assistance programs, such as Medi-Cal, Head Start, Meals-on-Wheels, etc. Only 43% are not participating in any of these types of programs.

Home ownership. The portions of eligible households that own and rent their homes are nearly exactly the inverse of the residential population as a whole. That is, 35% own and 65% rent among the eligible population. In the total population, 63% own and 37% rent.

Utility bill payment. The majority of eligible households pay their electric and natural gas utility bills directly to their utility company. Only 3% have their electricity utility costs included in their rent payment and 13% have their natural gas utility costs included in their rent payment. This is comparable to the general population.

Housing tenure. Households eligible for low-income energy assistance programs in California have lived in their current residences for a much shorter amount of time than households in the population overall. Nearly three quarters of eligible households have lived in their current residence for less than five years, as compared to less than half of households overall.

Housing density. Households eligible for California's low-income energy assistance program are more likely than the residential population as a whole to reside in either the most densely or the most sparsely populated areas of the state.

Dwelling Characteristics

Dwelling type. Households eligible for California's low-income energy assistance programs are less likely than households overall to reside in single-family dwellings and more likely to live in multi-family housing (especially larger, multi-family complexes).

Dwelling vintage. There are no significant difference in the vintage of dwellings occupied by eligible households and those occupied by the general population. The majority of the housing stock in the state was built before 1980, and only around 5% was built since 1995.

Space heating fuel. Most homes in California are heated by natural gas, followed by electricity as the next most common fuel source for heating. There is little difference between the primary space heating fuel for the state's population as a whole and the eligible population.

Air conditioning. The same percentage of eligible households as total households (56%) have some form of air conditioning present in their homes.

Water heating fuel. Natural gas is the prevalent water heating fuel among eligible households and the population as a whole. Fewer eligible households are directly responsible for the cost of water heating (included in rent) as compared to the population as a whole.

Dwelling size. Homes occupied by eligible households are smaller than those occupied by the residential population as a whole. About half of homes eligible for California's low income programs are between 500 and 1,000 square feet, whereas among California's population as a whole 50% of all homes are between 1,000 and 1,999 square feet.

Needs Assessment

This section presents a summary of the results of the needs assessment. First, we present a discussion of the energy-related burdens and concerns of California's low-income population, including an analysis of energy burden and energy insecurity. Second, we summarize the need for energy efficiency measures in eligible dwellings, as well as the energy savings potential determined for these measures. We also discuss related household needs concerning health, safety and comfort.

Energy-Related Burden and Concerns

Our assessment of energy-related burdens and concerns focused on two key areas:

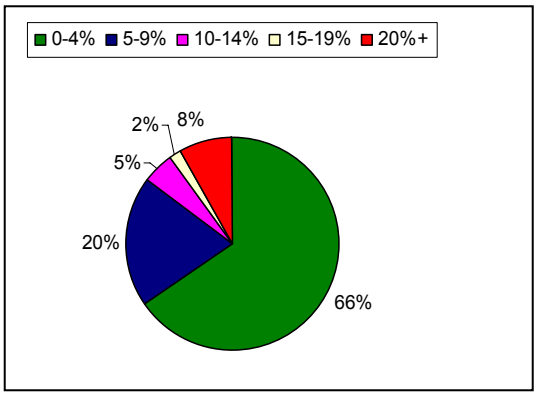
1. The high cost of energy faced by low-income households relative to their total income (or, energy burden), and
2. The difficulties faced by low-income households in meeting their energy needs and paying their energy bills (or, energy insecurity).

The following sections discuss each of the issues of energy burden and energy insecurity. Information related to energy costs and energy consumption was captured from utility billing records and analyzed along with the considerable insight on energy burden and energy insecurity gathered from the onsite surveys.

Energy burden. Energy burden was defined as the portion of total household income that goes toward paying utility bills. Energy burden was calculated as the ratio of energy expenditures to total household income.[5] As shown in Figure 2, about two thirds (66%) of California's low-income population spend less than 5% of their total household income on energy. Approximately 8% spend 20% or more of their total household income on energy.

[5] The average household in the onsite survey sample spends approximately $738 per year on energy and reports approximately $21,500 per year in total household income. Energy burden for the typical low-income household in California is therefore calculated at 3%.

Figure 2. Energy Burden (Percent of Household Income Spent on Energy)



We examined the extent to which energy burden varies across different segments of the low-income population and found that:

- Asian and African-American households experience slightly lower energy burden when compared with White and Hispanic households.
- Home owners experience slightly higher energy burden as compared with renters.
- Energy burden is significantly higher for mobile home residents.
- Households located in more sparsely populated areas experience higher energy burden as compared to households in more densely populated areas.
- Households with above-baseline energy consumption and households with significant variability in seasonal energy consumption exhibit high overall energy burden.

Energy burden does not vary based on other important demographic characteristics, such as the languages spoken in the home, the elderly or disability status of household members, the number of household members, or the composition of the household (e.g., single-parent, two parents, no kids). In addition, energy burden does not vary based on other dwelling characteristics, such as building vintage and whether or not the home was recently treated through the LIEE Program.

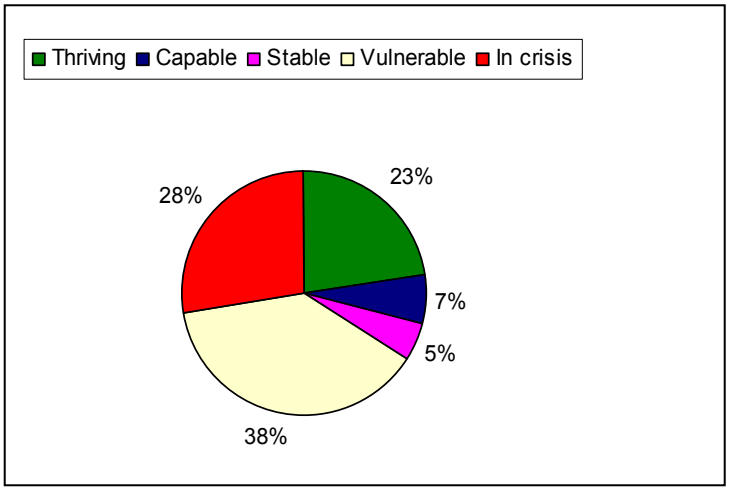
Energy insecurity. Energy insecurity was determined based on responses to questions about how difficult or easy it has been for low-income households to meet their energy needs. Households were asked questions such as how often they worry about being able to pay their energy bill, how often they keep their homes less comfortable than they would like because of the cost of energy, how often they skip energy payments, and how often they have had energy services disconnected.

Based on responses to the questions, households were placed in one of five energy insecurity groups, ranging from "thriving" (secure) to "in crisis" (insecure).[6] Households deemed "in crisis" would have reported one or more of these items occurring "almost every month," or they would have reported having had their electricity shut off because they were unable to pay

[6] These five groups represent the "energy insecurity scale," which is a modified version of the scale developed by Roger Colton and modified by APPRISE Inc. for the National Energy Assistance Directors Association LIHEAP Study.

the electric bill. Households deemed "thriving" would have reported that none of these items occurred over a 12-month period. Overall, the results indicate that the majority (66%) of eligible low-income households are classified as either "in crisis" (28%) or "vulnerable" (38%), the two most insecure categories on the scale (Figure 3).

Figure 3. Energy Insecurity



Energy insecurity was found to be highest among:

- African-American households
- Households who do not speak English
- Families with children, especially two-parent families
- Large families, especially those with 5 or more children
- Disabled households
- Homes located in sparsely populated areas
- Households not living in large multi-family apartment buildings (5+ units).

Energy-Related Needs

This section summarizes energy-related needs identified through the study. These needs are expressed in two ways. First, we document the need for specific energy efficiency measures that were identified in the detailed energy audits. In this discussion, we also present information on the energy savings potential from these measures to highlight the need for a given measure relative to its contribution toward the total energy savings potential for all eligible dwellings.

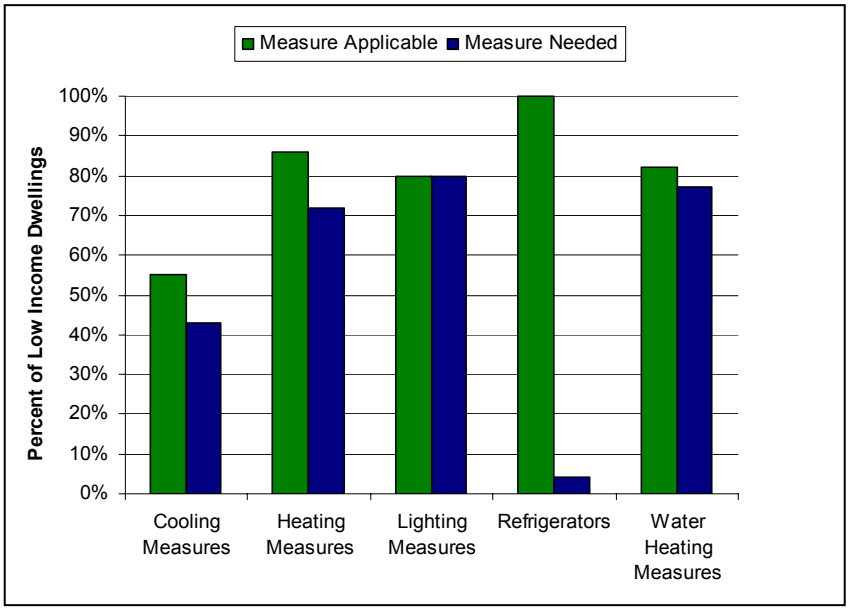
The second type of energy-related need addresses household concerns about health, safety and comfort. In addition to achieving measurable energy and bill savings impacts, the LIEE Program is designed to reduce hardship and enhance comfort for participating households. Hardship is defined as "adverse impacts on the comfort, health, and safety of low-income customers that can be mitigated by access to low-income energy efficiency programs and services." We discussed various health, safety and comfort issues with respondents in our sample and present the results in this section.

Need for energy efficiency measures. This study also identified the need for energy efficiency measures as determined through detailed onsite energy audits. Specifically, the following types of measures were included in this assessment:

- Energy efficient appliance measures (programmable thermostats and refrigerators)
- Cooling equipment measures (replacement and maintenance for central air conditioners, room air conditioners, and evaporative coolers, and whole-house fans)
- Natural gas furnace measures (replacement, repair, filter)
- Minor home repairs (window pane, door, and wall repair and replacement)
- Lighting measures (screw-in CFLs and porch light fixtures)
- Water heating measures (water heater replacement, pipe insulation, tank wrap, faucet aerators, and low-flow showerheads)
- Infiltration measures (caulking, weatherstripping, ceiling insulation, duct sealing, and room air conditioner/evaporative cooler covers).

The need for specific measures was based on whether or not the measure was technically feasible (e.g., does the home construction allow for ceiling insulation?) and needed (e.g., is the existing insulation inadequate?) according to the structural conditions and performance factors we observed onsite. Figure 4 presents a summary of the results for a variety of different measure categories.

Figure 4. Energy Efficiency Measure Applicability and Need



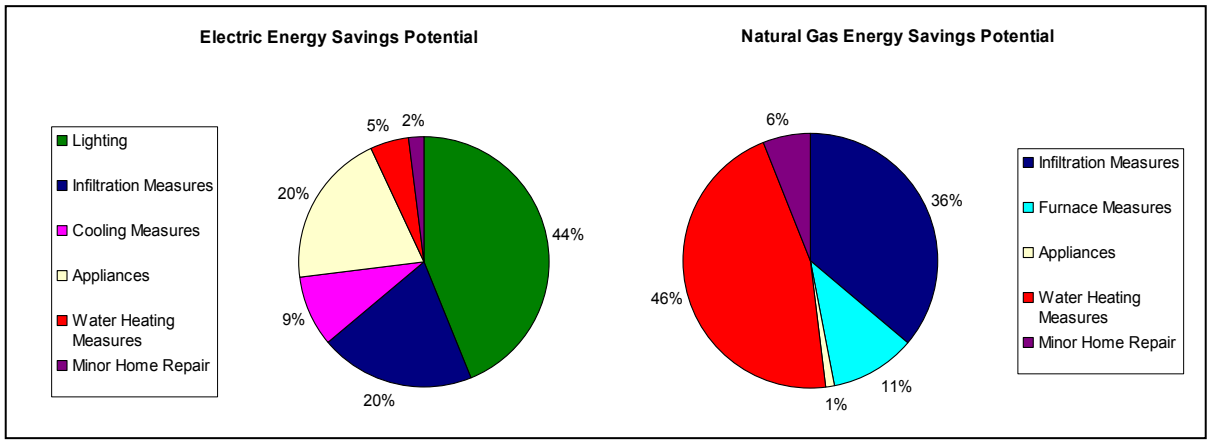
The following specific types of measures were associated with the greatest applicability and need among all low-income dwellings:

- Screw-in CFLs and porch light fixtures
- Water heating measures (aerators, showerheads, pipe wrap, tank insulation)
- Weatherstripping and caulking

- Ceiling insulation
- Programmable thermostats
- Whole house fans
- Natural gas furnace filter replacement.

In addition, we determined the energy savings potential for the needed measures using estimates developed for the LIEE Program. Figure 5 summarizes energy savings potential among all low-income dwellings by measure category. As shown, measures with the greatest energy savings potential for low-income households include: lighting, infiltration measures, water heating measures, appliances, and natural gas furnace measures.

Figure 5. Energy Savings Potential by Measure Category



Health, safety and comfort. In addition to measurable energy savings, energy efficiency measures can also provide certain intangible or indirect benefits (or at least the perception of these benefits) in terms of improved health, safety and comfort. The need for energy efficiency measures to address these non-energy benefits was explored through this study.

Overall, less than 20% of all low income households reported having a sickness or health issue related to a housing issue (e.g., home is too cold/hot, poor air quality, water impurities, heat sources, etc.). The specific types of health issues low income households most commonly attribute to these factors include colds and flus, asthma and other breathing problems, allergies, heat exhaustion and dehydration, and headaches.

The majority of low income households reported that, generally speaking, they felt their homes were "very secure." The most common reasons these households reported for feeling unsafe had to do with having been burglarized, living in unsafe neighborhoods, and/or living alone and feeling isolate. About 16% of all low income households attributed their feeling unsafe to doors and windows that are not secure or locked.

Unlike relatively moderate concerns regarding health and safety, low income households perceive many energy-related concerns related to comfort. Specifically, low income households were asked a number of questions related to comfort (Table 1). As shown, most of the low income households surveyed feel as if their homes are not very comfortable, that they do not have adequate control over the comfort levels in their homes, and that their homes are often too cold and drafty during the winter months.

Table 1. Perceptions Regarding Household Comfort

	Percent of Low-Income Households
Not very comfortable in winter	55%
Not always able to control comfort in winter	41%
Too cold in winter	70%
Too drafty in winter	50%
Too hot in winter	13%
Too stuffy in winter	39%
Not very comfortable in summer	68%
Not always able to control comfort in summer	61%

Barriers to Participation

A critical component to this study was the full exploration of issues and factors that pose barriers to participation in low-income energy assistance programs, such as CARE and LIEE. The following potential barriers were explicitly addressed in this study:

- Lack of awareness
- Participation process (application, multiple visits, income documentation)
- Fear (e.g. distrust among elderly, immigrant residency issues)
- Welfare stigma and reluctance to accept aid.

There are additional barriers to participation in the LIEE Program that have to do with the construction conditions and equipment/appliance performance factors of the home. These barriers were assessed as part of the analysis of applicability and need for energy efficiency measures, as discussed above.

Awareness

A number of questions were asked during the survey to determine awareness of the CARE and LIEE Programs. Responses to these questions were analyzed to determine the extent to which lack of awareness serves as a barrier to participation. The analysis determined that lack of awareness remains a considerable barrier to participation in CARE and LIEE. At the time of the survey, only 58% of low-income households in California were aware of CARE and only 27% were aware of LIEE.[7]

There were important differences in program awareness across different demographic groups. For example:

- Awareness of CARE and LIEE is highest among households who speak English.

[7] These percentages include households that were already enrolled in CARE (but didn't know it) or that lived in homes recently treated by LIEE (and didn't know it).

- Awareness of CARE is lower for non-White households, and Asian households in particular were among the most likely to be unaware CARE. No differences in LIEE awareness by race/ethnicity.
- Households living in densely populated areas (i.e., urban) were the least aware of CARE and LIEE.
- Awareness of LIEE is highest among mobile home and single family home residents, as compared to residents in multi-family dwelling.
- Awareness of LIEE is higher among home owners than renters.

Participation Process

Households who have participated in CARE and LIEE were asked whether or not they experienced any difficulties with the application process. Overall, participating households reported very little difficulty with either the CARE or LIEE application processes.

Overall, 80% reported that it was "not at all difficult" to complete the CARE application. Certain types of households, including households that do not speak English and disabled households, were more likely to report difficulty with the CARE application process. Similarly, few households reported difficulties with either the LIEE application or scheduling processes. Specifically, 67% reported that providing the income documents required for participation in LIEE was "not at all difficult" and 73% reported that it was "not at all difficult" to schedule an appointment to install the LIEE program measures. Since relatively few households recalled participating in LIEE at the time of the survey, differences by demographic segment were not found to be statistically significant.

In addition, household were asked to state their level of agreement with statements related to barriers to participation in public assistance programs (such as CARE and LIEE). Responses to these questions are shown in Table 2. As shown, perceptions (or misperceptions) regarding the participation process (i.e., delays, application process) are among the most common barriers to participation. For example, 23% of the respondents overall strongly agreed with the statement "It takes too long to get services from most programs," and 20% agreed with "It is difficult to apply for most programs." Another 13% perceived the application process (filling out forms) to be confusing and 6% held the perception that it would be difficult to provide documentation to verify income. This latter barrier may also reflect a certain amount of fear or distrust among households not willing to provide income information due to IRS, immigration or other governmental concerns.

The following summarizes differences in perceptions regarding participation process barriers across important demographic groups:

- *Race and ethnicity.* There is strong evidence of differences between racial and ethnic groups with regard to participation process barriers. For example, non-White households were more likely to strongly agree with the statements such as:
  - The forms they want me to fill out are confusing.
  - It is difficult to gather the papers to prove my income.
  - It is difficult to apply for most programs.

  It is possible that these differences uncover underlying cultural issues or distinctions between racial and ethnic groups. It is more likely, however, that these

differences point to barriers that have more to do with English language capabilities as discussed below.

Table 2. Barriers to Participation in Public Assistance Programs

Barrier Type	Barrier Statement	Percent Strongly Agreeing
Participation process	It takes too long to get services from most programs.	23%
	It is difficult to apply for most programs.	20%
	The forms they want me to fill out are confusing.	13%
	It is difficult to gather the papers to prove my income.	6%
Fear or distrust issues	I worry that my application information will be given to government agencies.	15%
	If I participate in these types of programs people will be able to tell me what to do and how to live my life.	8%
	It bothers me to have people from the government or utility in my home.	3%
Welfare stigma, reluctance to accept aid	I don't like to use programs because there are other people who need them more than me.	18%
	I would be embarrassed if my neighbor or friends knew I was participating in these types of programs.	4%
	Someone else in this household is against participating in these programs.	3%

- *Language.* There is significant evidence of a difference between households that are unable to speak English (and those that are capable but may also speak other languages) in terms of their perceptions regarding the application and participation processes. For example, non-English speaking households were more likely to agree that the forms are confusing and the application process is difficult. These differences highlight challenges perceived by non-English speaking households when considering in participating in public assistance programs such as CARE and LIEE.
- *Housing density***.** Households living in sparsely populated areas tend to more strongly agree that application forms are confusing and are less likely to have difficulty documenting their household income. This might imply a need to simplify the requirements for participation among rural households (especially as an attempt to mitigate the increased cost of reaching these customers).

Fear or Distrust

Fear (e.g. distrust among elderly, immigrant residency issues) was determined to be a barrier for a small segment of the population. This segment is reluctant to participate in these types of programs for fear of giving information to government/utility agencies or is hesitant to allow government/utility representatives in their home. As shown in Table 2 above, 15% strongly agreed with the statement, "I worry that my application information will be given to government agencies." Another 8% worried that participation in these types of programs would mean that "…people will be able to tell me what to do and how to live my life" and 3% expressed concern with having "…people from the government or utility in my home."

We found some evidence of differences among non-English speaking households that relate to the fear of giving information to government agencies and the desire to be "left alone."

However, we found no evidence of differences between racial and ethnic groups with regard to these types of barriers.

"Welfare Stigma"

There is also a segment of the population who are not likely to participate in these types of programs because of the "welfare stigma" or a general reluctance to accept aid because others need it more. For example, 18% strongly agreed with the statement, "I don't like to use programs because there are other people who need them more than me." Only a few respondents (4%) strongly agreed with the statement, "I would be embarrassed if my neighbor or friends knew I was participating in these types of programs" and 3% strongly agreed that "Someone else in this household is against participating in these programs."

We found strong evidence of differences between racial and ethnic groups with respect to accepting aid and the idea of "welfare stigma." For example, White households were more likely to agree with the following statements: "I don't like to use programs because there are other people who need them more than me," and "I would be embarrassed if my neighbor or friends knew I was participating in these types of programs."

In addition, households living in sparsely populated areas are more likely to indicate reluctance to participate in these programs because of the belief that "there are other people who need them more than me." This is consistent with anecdotal evidence from the recruitment and field data collection effort. Schedulers and interviewers often commented that attempts to recruit for the survey in rural areas was sometimes met with a general disbelief that households like theirs could/would be eligible for these types of programs. This may also point to a general indication that rural households are less likely to perceive a need for the program, despite being eligible, and as such may not be a priority for targeted outreach efforts. It may be more effective to increase general awareness efforts in rural areas and then let those households who believe they have a need for the program seek it out.

Summary

In 2006, over $750 million will be spent on the CARE and LIEE programs in California. These programs have provided bill payment assistance to nearly two-thirds of the eligible population and delivered energy efficiency services to approximately 150,000 households each year. The needs assessment was commissioned to direct future policy regarding these programs and to aid in targeting outreach activities such that those with the greatest need for the programs' services will be reached.

The needs assessment suggests that, across all households eligible for the programs, energy burden is significant for a relatively small group – i.e., only about 8% spend 20% or more of their total household income on energy. In order to reach households with the greatest energy burden, the programs should target eligible home owners (as opposed to renters), households located in rural areas (as opposed to urban), and households with above-baseline energy consumption and significant variability in seasonal energy consumption.

While the average household does not experience significant energy burden, nearly two-thirds of households eligible for these programs are classified as "in crisis" or "vulnerable" with respect to their ability to pay their energy bills and avoid disconnection. The needs assessment found that some of the most energy insecure segments of the low income population include

households who do not speak English, families with children (especially two-parent families), large families (especially those with 5 or more children), and households with at least one member with a physical or mental disability. Targeting the programs toward these segments may be effective in reducing energy insecurity among the most vulnerable households.

In addition to energy insecurity, households eligible for the programs perceive significant energy-related needs related to comfort. Most feel as if their homes are not very comfortable, that they do not have adequate control over the comfort levels in their homes, and that their homes are often too cold and drafty during the winter months. Targeting households with the greatest need for infiltration measures, and heating and cooling equipment measures, would likely result in the greatest benefit related to comfort.

While the needs assessment found significant energy savings potential for infiltration measures and heating and cooling equipment measures, the measures that contributed the most savings include lighting and refrigeration measures (electric) and water heating measures (gas). As such, targeting households with the greatest need for these measures will likely result in the greatest overall energy savings benefit.

Finally, the needs assessment addressed the remaining barriers to increased participation in the CARE and LIEE programs. Lack of awareness is the most significant barrier to participation – i.e., almost half of customers eligible for CARE (but not currently participating) are unaware of the program, and more than 70% of households eligible for LIEE are unaware of the program. Efforts to increase awareness would be most effective if targeted at non-English speaking households, non-White households (especially Asian), households living in urban areas, and renters.

After awareness, the most significant barriers to participation were related to the application process (especially for non-English speaking, disabled and/or rural households), fear and distrust (especially among elderly and immigrant households), and a general reluctance to accept aid (especially among White households and households living in rural areas). Targeting strategies that take into account these differences and sensitivities are likely to be the most effective.