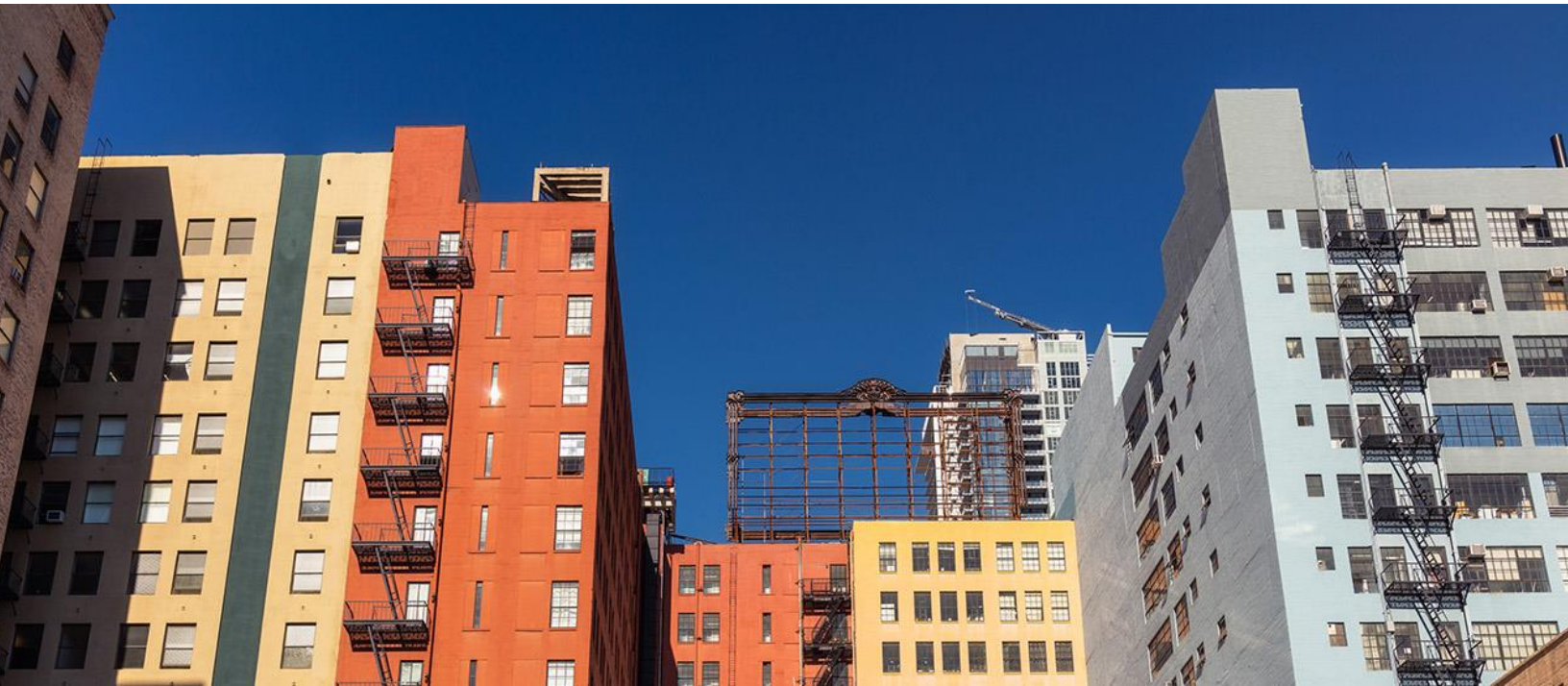




# **2022 Low Income Needs Assessment**



## **Research Plan**

**DRAFT**

**March 2, 2021**



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# 1 Study Approach and Work Plan

## 1.1 Background and Study Approach

This document presents the research plan for the 2022 Low Income Needs Assessment (LINA) that is being conducted on behalf of the joint California investor-owned utilities (IOUs) and the Energy Division of the California Public Utilities Commission (CPUC). The IOUs provide no-cost services and reduced rates to low-income customers to alleviate their energy burden while improving health, comfort, and safety. These services are delivered through the Energy Savings Assistance (ESA) and California Alternative Rates for Energy (CARE) programs.

The 2022 LINA is the fifth in a series of such studies required by CPUC Decision 14-08-030 to be conducted every three years. The 2022 LINA will examine potential remaining gaps in California's income-qualified programs, with a focus on renters and the rental market. As discussed in the 2022 LINA RFP, prior research has identified several reasons the existing programs have provided limited benefits to California's low-income rental market, including the well-known split incentive barrier between building owners and tenants. Most efforts to rectify this barrier, however, have focused on strategies to gain owner approval or provide property upgrades, which will only benefit low-income rental customers indirectly. The fact that the large low-income rental market has historically been underserved by the ESA program also supports the need to focus on understanding energy-related struggles more directly tied to low-income tenants. The 2022 LINA research has been designed to increase our understanding of renters' needs, which may be misaligned with the current measures and services offered via the ESA program.

Based on this background, the primary 2022 LINA objectives are to examine the rental housing market, assess ESA unmet needs/program gaps, and identify opportunities among low-income tenants living in different types of rental housing. This includes multifamily and single-family properties as well as deed-restricted and non-deed restricted buildings.

The 2022 LINA will include the following major activities:

1. **Construct a market characterization of California's low-income population (owners and renters) based on secondary data sources;**
2. **Conduct a large-scale (n=1,200) survey of the California low-income renter population to create different renter profile types;**
3. **Conduct in-depth interviews with a sample of each renter profile type (n=60 max);**
4. **Conduct in-depth interviews with a sample of building owners (n=30 max) covering a mix of ownership types and sizes; and**

**5. Synthesize information and develop program and policy recommendations that address the unique characteristics of different types of low-income renter households.**

Table 1 shows how these research activities will address the primary study objectives identified for the 2022 LINA.

**Table 1: Research Objectives and Data Sources**

Research Objective	Utility Customer Data	Census Data	Other Secondary Data	Phone Surveys	Interviews
Identify size of low income rental and owner customer markets	X	X	X		
Identify rental customer needs (or lack of needs) addressed/not addressed				X	X
Outline specific needs of different low income rental sub-populations				X	X
Outline policy and market barriers and potential solutions	X	X		X	X
Recommendations for ESA program, policy, marketing, etc. to address unmet needs	X			X	X

Each of the research activities are described in more detail below.

## 1.2 Background Research

The first stage of the project will be a review of the existing studies that might be used for the 2022 LINA. While these studies have focused generally on different issues and segments of the low-income market, the issues relating specifically to renters have historically received less attention.

The specific studies that will be included in the background research review include the following:

- 2019 LINA.** The prior LINA study had a major focus on CARE and alternative fuels, but there are some data on renters from the ESA health, comfort, and safety impact analysis that we plan to leverage. For example, surveys with ESA participants (n=396) and non-participants (n=907) (income-eligible/on CARE) could provide useful comparison data on renters that have and have not been reached by ESA. The study's interviews with ESA supervisors also provided evidence that landlords are unwilling to sign waivers for their tenants to receive cooling measures, and revealed some incidences of furnace replacement limitations.

- **2016 LINA.** The 2016 LINA, completed by Evergreen, employed a quantitative survey to understand energy burdens more comprehensively than had been done previously and focused qualitative research on selected hard-to-reach populations. The 2016 study will provide a historical benchmark for comparisons of energy burdens (standard and modified) for single-family renters and multifamily tenants. As needed, the survey data set would be available for additional time series analysis. Results from tenant interviews and high user focus groups conducted for the 2016 LINA will serve as a starting point for the development of in-depth interview discussion guides for the 2022 LINA.
- **2013 LINA.** The 2013 LINA, completed by Evergreen, employed a comprehensive quantitative survey with a deeper focus on eligible non-participants and a conjoint analysis to understand program parameters that serve as potential drivers and barriers to participation. We will draw on insights gained on barriers to participation and actual in-home energy-related opportunities from non-participating renters. Further, a set of non-participant profiles created for this study will serve as a starting point for designing and creating profile write-ups during reporting for the 2022 LINA.
- **ESA Program Multifamily Segment Study (and other relevant studies).** The Multifamily Segment Study provides a detailed characterization of the low-income multifamily market in California and includes profiles of different market segments. We will build from the multifamily segmentation data for the renter profiles we are proposing for the 2022 LINA. This study and the MFEER market characterization study will also inform our approach to an updated renter characterization, and provide the opportunity for time series comparisons. Evergreen will also leverage the Low-Income Energy Efficiency Segmentation and High Users studies (e.g., the Struggling Modest Renters profile and high user segment home characteristic data) to develop updated low-income renter household profiles.
- **ESA and CARE Annual Reports, ESA Impact Evaluations.** We will review these materials to begin our characterization of the general low-income market, including the types of measures installed, ESA penetration rates, and remaining households yet to be treated. As discussed below, we are planning to take most of the information directly from the utility tracking data for these programs.

While these reports can provide important historical context for the low-income population in California, conducting an in-depth examination of low-income renters has not been emphasized in these studies. Consequently, we will rely primarily on secondary data sources to develop the low-income market characterization, as discussed in detail below.

### 1.3 Secondary Data Analyses

Evergreen will utilize data from multiple existing sources to develop a statewide characterization of the low-income population that includes both renters and owners. This process will utilize many of the same data sources we used in the 2013 and 2016 LINAs, which will help facilitate comparisons over time. As we build this market characterization, we will expand on the submarket

of low-income renters using both existing data sources and primary data collected from the planned phone surveys.

In addition to the utility customer data for ESA and CARE, the secondary data sources we will use are summarized below.

- **Athens Research Estimates of ESA and CARE Eligibility.** Athens Research provides estimates of the number of IOU customers that are eligible for CARE and ESA, and these estimates are developed from the American Community Survey, the Current Population Survey, and labor market information data from the Employment Development Department. Evergreen will use these data to estimate the eligible low-income population for CARE and ESA.
- **The California Residential Appliance Saturation Survey (RASS).** The California Energy Commission and the IOUs sponsor a large-volume residential mail survey that provides self-reported demographic, home, and equipment information from a representative sample of residents in the California IOU service territories, including low-income residents. The data are available online and may be queried by IOU service territory, by Title 24 climate zone, and by various demographic categories including income level and renter/owner status. We will use the latest 2019 RASS to help identify appliance holdings for low-income renter households as part of the low-income population characterization. Evergreen used RASS data for the 2013 LINA, and we are familiar with the pros and cons of this data source compared to alternative sources (e.g., the Census). One benefit of the RASS data is that they are cleanly delineated by IOU service territory, making it easier to analyze data by IOU. The Census (Public Use Microdata Sample, or PUMS) offers a larger sample and has some similar data fields, though the RASS has some additional variables that we will review for possible inclusion.
- **Department of Energy's Low-Income Energy Affordability Data (LEAD) Tool.** This tool provides a cross-tabulation of U.S. Census housing data from the 2018, five-year American Community Survey. The LEAD Tool provides household data at the state, county, city, and census tract levels, as well as household income in either area median income (AMI) or Federal Poverty Level bins. We can use the LEAD Tool to determine the total number of housing units and low-income households within each service territory separated by owner versus renter, housing type (number of units), vintage, and primary heating fuel. The LEAD Tool also provides average annual household income and monthly expenditures on electricity, gas, and other fuels, which could be used to calculate average energy burden. These data have been pre-aggregated, which will streamline the analysis but also limits our flexibility (e.g., we cannot identify household demographics).
- **US Census and American Community Survey Data (ACS).** In the 2013 LINA, Evergreen utilized three data sources available from the US Census Bureau: the 2010 US Census, the 2011 ACS, and the 2004 and 2011 ACS PUMS. We compiled demographic and housing



characteristics data from the standard pre-tabulated data available for the 2011 ACS and 2010 US Census via the American Fact Finder portal. We used these data to supplement the Athens, RASS, and our study phone survey sample demographic data for the ESA and CARE modeling. The standard pre-tabulated data for the 2011 ACS and 2010 Census did not provide the granularity required for the low-income population characterization task. For this task, we made use of the 2004 and 2011 ACS PUMS database. The PUMS database is a set of untabulated responses to the ACS about individual people or households from a subset of the total ACS respondents. The structure of the database allowed us to characterize the low-income population by IOU service territory,<sup>1</sup> urban or rural county, primary language, and housing type. For the current LINA, we will conduct the same compilation using the most recent data from these three sources. In addition to providing detail on the low-income population, using the same process and data sources from the earlier LINA will allow for a comparison of the ESA and CARE populations over time.

- **CoStar Data.** Should the current LINA need aggregated information on multifamily properties, Evergreen has obtained CoStar data that have supported multifamily research. The data are a good complement to IOU CIS and billing tenant unit data, since CoStar data are at the building level and include information on number of units. CoStar data are useful for developing a sample frame for multifamily customers if stratification by building size is desirable. While CoStar does not directly provide tenant income, there is a designation for affordable rental housing units such as subsidized housing.
- **IOUs' Customer Information System (CIS) Data.** In earlier LINAs, Evergreen obtained billing data from each IOU that included CARE status, energy usage and cost, and payment and arrearage history. These data were used for the energy burden analysis and to characterize the energy usage for the low-income population characterization. For the current LINA, we will explore the need for pulling these same data for the entire low-income population again, or for just a limited sample that targets renter households.
- **PG&E Home Energy Use Survey (HEUS) Data.** Evergreen conducted the HEUS survey in 2015 for the PG&E Codes and Standards program, and this study contains detailed energy-using equipment data on 500 renter households across PG&E's service territory, gathered by engineers from a representative sample of residential households (the complete sample is 1,000 households, split between homeowners and renters). These data are more detailed than what are available from the RASS, and they are based on the more accurate on-site survey data, which will help improve our characterization of the low-income population.

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<sup>1</sup> ACS PUMS geographically identifies households by assigning them to one of 233 Public Use Microdata Areas (PUMAs) in the state of California. We assign ACS PUMS households to an IOU service territory at the Public Use Microdata Area level using information provided in the Athens Research eligibility estimate data.



- **HEUS Follow-up Web Survey.** Evergreen is about to launch a follow-up web survey to all HEUS study participants to learn about changes in the homes that were surveyed (covering the current occupants, whether they were there when the survey was completed or not). We are offering an incentive and expect to get a 50 percent response rate, providing time series data on changes in household energy equipment over time, combined with a refresh of billing data, to track changes in energy usage. The survey will cover changes in household behavior due to COVID-19 and any other events that may have occurred.
- **California Multifamily Field Study.** Evergreen conducted an on-site survey for the PG&E Codes and Standards program, collecting detailed energy-using equipment data on a representative sample of 90 multifamily properties across California in early 2020. Twenty-eight properties in the sample were either rent restricted or rent subsidized, or were affordable housing properties. In addition to collecting information about the property shell and common areas, the study also included tenant units (up to three per sampled building.) These data provide a supplement to RASS, Census, and HEUS data, and reflect a more current snapshot of tenant unit and multifamily property energy holdings.
- **Princeton Eviction Database.** The Princeton Eviction Lab maintains a detailed database on evictions across the U.S., and we will explore whether this information can be added to the low-income population characterization. The Eviction Database provides the number of evictions and eviction filing rates by Census Tract and Block Group for each year between 2000 and 2016. Evictions are not simply a result of poverty, but can also be a cause; eviction leads to job loss and damaged credit, which create additional financial burden on the household. We will utilize these data to identify correlations between evictions and energy burden, CARE/ESA participation, and other low-income household characteristics. Eviction rates in California declined steadily between 2008 and 2016, but are expected to increase rapidly in 2020 due to the COVID-19 business closures. This analysis will help prepare the program staff for near-term changes in the low-income population.

The ultimate goal of compiling and analyzing these data is to first create a general picture of the low-income population in California, and then develop additional detail on the renter submarket. The end result of secondary data analysis will be the following:

1. Characterization of the entire low-income population in California based on the most recent data available;
2. Geographic distribution of low-income renter population (IOU service territory, rural vs. urban, climate zone, disadvantaged community, etc.);
3. Penetration rates for CARE, FERA, and ESA for both owners and renters; and
4. Estimates of energy burden for both low-income owners and renters.

Once this characterization is established, it will be used to create a statistically representative sample for the phone survey and help guide the structure of the in-depth interviews. At the back

end, expanding the results from the surveys to this low-income renter characterization will help us understand the size and/or relative impact of various policy and program recommendations made at the end of this study.

Evergreen used many of these data sources previously in the 2013 and 2016 LINA studies, as well as for other low-income program evaluations.

### *Energy Burden*

The definition of energy burden is generally defined as the ratio of energy costs to total household income. There are also modified energy burden metrics that encompass additional costs and/or income streams, such as non-cash forms of assistance and transportation expenses. The methods and data sources vary widely in the application of this definition.

Table 2 provides an overview of the data source options for the energy burden calculation. Any difference in data sources across studies is likely to lead to some variation in the energy burden metrics, but as long as the report identifies the methods, data sources, and assumptions, it is usually feasible to compare energy burden across reports and sources.

**Table 2: Data Sources for Energy Burden Calculation Inputs**

Metric	Source	Sample Size	Concerns
Household Income	A Self-report	Small sample – usually from a phone survey	Potential non-response bias, which is often more of an issue for low-income / hard-to-reach households
	B Verified income documents	Small sample – from low-income program verification	Potential bias; usually only available from low-income program participants
	C EIA/RECS estimates for Western U.S.	Large samples	Anonymized; limited to large geographic areas beyond IOU service territory (i.e., not specific households)
	D ACS PUMS estimates for small geographic areas	Large samples	Anonymized; limited to small areas within IOU service territory
Household Energy Costs	C EIA/RECS estimates for Western U.S.	Large samples	Anonymized; limited to large geographic areas beyond IOU service territory; includes costs for all fuels
	D ACS PUMs estimates for small geographic areas	Self-report, large samples	Uncertain data validity; anonymized; limited to small geographic areas

Metric	Source	Sample Size	Concerns
	E Utility data	Actual consumption and cost data at the household level	Uncertain link between records of households served by multiple utilities (e.g., dependent on manual address matching)

For this study, we propose to use sources D and E generally, while also using source A through customer surveys for a smaller sample of households. The methods for our calculations will be the same for the eligible population and participants in the IOU programs, but the source will differ between the calculations, because we do not have a single source that captures both groups. For the eligible population, we have the ACS PUMS (source D) with self-reported expenditures on electricity and natural gas, as well as self-reported household income by source. For the IOU participants, we will have actual electric and natural gas utility bills (source E, though it will be limited to electric only or gas only in many households that are served by multiple utilities), and the best available estimate of household income (i.e., source E, which includes IOU-verified income from program enrollment, self-reported income during program enrollment, estimated household income from a third party, or imputed income from program eligibility thresholds).

If the IOU participant data include indicators for applicants who receive public assistance (such as food stamps, Medicaid, or housing vouchers), we will also calculate a modified energy burden metric that considers both household income and an estimated value of all public assistance benefits. When adjusting for the value of such non-cash benefits, prior research that Evergreen conducted for the California IOUs has shown that the burden for households at the lowest levels is significantly reduced.<sup>2</sup>

Note that the phone survey discussed next will provide an opportunity to create a potentially more accurate calculation of energy burden for a sample of customers – one that relies on self-reported income and actual energy cost data from the IOUs. This will be available for only the phone survey respondents using a statistically representative sample, however. The approach described above allows for energy burden estimates to be calculated for the entire low-income market characterization using more aggregated data.

## 1.4 Quantitative Data Collection

One of the benefits of the low-income market characterization is that it provides a sample frame for additional data collection, with enough detail for appropriate weighting to the population and for designing a sample that can yield statistically representative results. The phone survey and in-

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<sup>2</sup> Fraser, Jenny, Tami Rasmussen, Ingo Bensch, and Carol Edwards. 2017. "More Tools in the Toolbox – An Examination of Metrics for Low-Income Customer Energy Burden." International Energy Program Evaluation Conference. [https://www.iepec.org/wp-content/uploads/2018/02/2017paper\\_fraser\\_rasmussen\\_bensch\\_edwards-1.pdf](https://www.iepec.org/wp-content/uploads/2018/02/2017paper_fraser_rasmussen_bensch_edwards-1.pdf).

depth interview tasks discussed below are designed to collect additional information on low-income renter households to understand the myriad pressures they face. Ultimately, this information will be used to create several different renter type profiles that can then be extrapolated back to the population.

### *Phone Survey Sample*

The phone survey will be the main source of primary data collected in our proposed approach; it will be used to provide additional detail from the analysis of existing secondary data sources. The phone survey will be conducted on low-income renter households and will be approximately 15-20 minutes in length. We believe that a phone survey is the optimal mode to reach these households, as online surveys may be a barrier for some that are not as comfortable performing tasks online (e.g., elderly, disabled). In addition, mail surveys limit the number of questions we can ask and make it difficult to screen based on renter status or other demographic criteria.

We will conduct 1,200 phone surveys with sample quotas established by climate zone and housing type; we will use the CARE flag in the utility data to identify low-income households. All survey completes will be for low-income renter households.

The following tables show how the survey sample will be divided across several different markets and population subgroups. In all cases, the survey quotas are designed to get a mix of building types between single-family homes and multifamily complexes of different sizes. An additional stratification will be added as a way to make the survey process more efficient in locating renters. To do this, we will use a sampling approach that is a modified version of what was used in the 2016 LINA to screen for CARE-qualified customers. For the renter survey, we will sort the zip codes by level of renter penetration (based on our low-income market characterization), create strata, and then assign more points to those zip codes with a higher incidence of renters. This can be done in addition to the IOU and income-level segmentations shown in Table 3 and provides a cost-effective way to locate renter households efficiently to recruit for the survey.

Table 3 shows how the survey will be allocated across four general climate zones and building types. The climate zone types are designed to capture a mix of weather conditions (north coast, south coast, central, and mountain/east), and they will also help ensure that each IOU gets adequate coverage in the sample. Setting the sample quotas by climate zone should also ensure a representative mix of urban and rural households. We have also created several size strata for multifamily properties so that a mix of building and ownership types are adequately represented. The survey will prioritize obtaining responses from as many large multifamily residents as possible (i.e., buildings with 40 or more units), but given the smaller number of these sites we have combined them with medium-sized multifamily buildings to set the survey quotas.

**Table 3: Phone Survey Sample by Housing Type and Climate Zone<sup>3</sup> Group<sup>4</sup>**

Building Category	CZ Group 1	CZ Group 2	CZ Group 3	CZ Group 4	Total Survey Completes
Single-family	75	75	100	50	300
Multifamily - Small (2 to 10 units)	75	75	100	50	300
Multifamily - Medium (11 to 39 units)	150	150	200	100	600
Multifamily - Large (40+ units)					
<b>Total</b>	300	300	400	200	1,200

We have also identified several key demographic sub-populations, and minimum survey quotas have been established to ensure that statistically representative survey results will be obtained (Table 4). Note that the totals for these groups are less than the full 1,200 survey sample; consequently, some groups will receive more than the targeted minimum shown here.

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<sup>3</sup> A map of the climate zones can be found here: [https://ww2.energy.ca.gov/2018publications/CEC-400-2018-018/appendices/Appendix\\_C\\_EnergyStandardsClimateZones.pdf](https://ww2.energy.ca.gov/2018publications/CEC-400-2018-018/appendices/Appendix_C_EnergyStandardsClimateZones.pdf)

<sup>4</sup> CZ Group 1 = climate zones 1, 2, 3; CZ Group 2 = climate zones 5, 6, 7; CZ Group 3 = climate zones 4, 8, 9, 10, 11, 12, 13; CZ Group 4 = climate zones 14, 15, 16.

**Table 4: Phone Survey Sample Demographic Subgroup Quotas**

Building Category	Large Family	Elderly	Disabled	English 2 <sup>nd</sup> Language	Single Parent	Subsidized	Market Rate
Single family	70	70	70	70	70	70	70
Multifamily - Small (2 to 10 units)	70	70	70	70	70	140	140
Multifamily - Medium (11 to 39 units)							
Multifamily - Large (40+ units)							
<b>Total</b>	140	140	140	140	140	210	210

Please note that these sample quotas are preliminary and may be refined after the review of the secondary data and IOU customer data. Any adjustments to the sample quotas will be done to make the final sampling plan more proportional to the actual distribution of customers in the population.

### *Phone Survey Instrument Development*

To develop the phone survey instrument, we will first conduct a set of approximately 20 exploratory interviews to investigate the range of issues facing low-income renter households. We intend to include questions and exploratory discussions that provide insights about:

- Observations about energy use and bills;
- Attitudes/interests associated with energy efficiency;
- Housing and other logistical barriers related to energy efficiency (small bills; move more often; less control over building);
- The primary challenges low-income households face overall (not just energy-related); and
- Nature of relationship with landlord, including who pays the utility bills.

Once the phone survey instrument has been created, it will be used to collect detailed information from the low-income households. The types of quantitative information that will be collected include:

- Demographics (number in household, language, ethnicity, age of household members, tenure at current home, type of lease, age of bill payer);
- Building characteristics (building type, vintage, heating and cooling types);
- Financial information (income, monthly rent, employment status);

- Changes in household make-up, income, and housing arrangements in the past three years (to identify trends and patterns);
- Level of concern regarding about energy bills and costs;
- Level of concern regarding energy-related health, comfort and safety;
- Relationship with landlord (e.g., who pays the utility bills);
- Level of interest in ESA program and efficiency measures (i.e., why program is “not for me” (mobility, measures offered, perceived inconvenience to apply, etc.);
- ESA program awareness;
- ESA existing measures installed and remaining program opportunities; and
- General approach to cost-control efforts (not just in energy) and awareness and use of utility services beyond low-income programs (budget billing, payment arrangements, exploring cost-saving tips, etc.) to get a sense of interest and uptake on support already available to them.

We believe that the sample of 1,200 will provide a large enough group to develop statistically representative results for each of the renter profile types (see Table 4 for minimum survey quotas for key demographic groups). Additional detail – information that will be used to refine the program recommendations to better fit renter households – will be collected in the qualitative data collection task, described below.

## 1.5 Qualitative Data Collection

### 1.5.1 Qualitative Renter Type Profiles

To build on the quantitative data we collect through the phone survey, we will conduct additional in-depth, semi-structured interviews with high priority subpopulations of renters. These interviews will provide rich information and holistic insights about the 6 to 8 selected renter profile types.

We are planning a total of 60 interviews for this task, which amounts to about 7 to 10 interviews per renter profile (depending on the final number of renter profiles created). We will pay a \$20 incentive per interview to facilitate recruitment and reduce potential non-response bias. Once we have determined the renter profile types, we will conduct an additional 10 interviews with community based or housing organizations that know these populations well.

While discussion topics for interviews will be developed based on the research plan and the survey results, we offer the following as possible question modules:

**Household overview** – Each interview will begin with an effort to get to know the household in some detail so we can separate out energy implications of the targeted characteristic featured by the profile from other household characteristics. We will do this with a semi-ethnographic exploration that is deeper than is customary with in-depth household interviews to understand



who the household members are, their relationships and dynamics, and the households' main drivers and challenges.

**Making ends meet and the role of energy costs** – To build on prior LINA explorations of customer financial situations and practices, we will explore the degree to which the household is able to meet basic needs, compromises and trade-offs made in the process, and how choices about energy use and energy bill payments fit into that broader context. One of the goals of this module will be to assess how much energy costs contribute (or not) to overall financial stresses, as well as to gain an understanding of whether there are solutions other than lower energy costs that would be helpful to households (such as energy cost forecasting tools or flexibility in payment terms not already offered).

**Housing conditions and considerations** – For many low-income renters, housing costs are their single-highest recurring expense. For context, we will explore why the household lives where it lives, how well the home meets the tenants' needs, and how housing costs fit into the household's overall budget. From there, we will explore the intersection of housing and energy by asking about heating and cooling in the home with an intent to understand the home's envelope, the heating and cooling equipment's performance and costs, comfort issues and trade-offs, thermostat settings, and household efforts to conserve. We will also explore the degree to which the landlord keeps the envelope and major systems maintained and upgraded.

**Energy-using appliances and fuels used** – Beyond heating and cooling, we will discuss energy-using equipment in the home, including landlord-owned appliances and ones that the household brought into the home. Our focus will be on understanding any particularly large contributors to energy consumption and bills, as well as household options to reduce costs that they may not already be applying. In past research like this, we discovered a high prevalence of multiple old refrigerators in homes of people who seek to reduce food costs by buying in bulk on a monthly basis. We will explore appliance usage enough to be able to reveal similar insights about in-home usage that will help low-income energy programs better serve renters either through landlord-based equipment replacements or directly through the equipment and practices the households control.

**Relationship with landlord** – A unique complication in this market is the relationship between the tenant and the landlord. In addition to the well-established split incentive problem, with low-income tenants there may be additional worries about possible eviction, missed or late rent payments, or other issues that may make renters wary of requesting efficiency improvements from their landlord. The interviews will allow us to assess the extent of this issue and (if needed) formulate ESA recommendations that are directed toward landlords and property managers.

**Interactions with utility** – Finally, we will ask about the household's relationship with its utility (or utilities), including awareness, use, and perceptions of the utility's customer-focused services and programs. We will include low-income programs such as CARE and ESA in this discussion, as well as

utility billing options, feedback and tools to help customers manage their consumption and bills, and conservation tips. The goal of these questions will be to point to opportunities to better meet low-income renter needs through ESA as well as through the utility's other interactions with customers, including information-based approaches.

**Impact of external large-scale events** – Questions will be asked to understand how major events in the last several years have impacted renters. This will include understanding how Covid-19 has directly affected households (e.g., illness, quarantining, job loss, working at home, schooling, behavior change), the impact of wildfires, and the effect of public safety power shutoffs.

Ultimately, these interview results will be used to provide a richer picture of the low-income renter households in a variety of different contexts. Since the interview sample will build on the data from both the phone survey and market characterization, there is an opportunity to extend these results to the larger low-income renter population.

### 1.5.2 Qualitative Building Owner Interviews

In addition to the tenants, a separate task will involve in-depth interviews with building owners. A sample of 30 interviews have been allocated for building owners and will cover both the smaller owner models ('mom and pop' owners of single-family or small multifamily properties) and the owners of medium and larger multifamily buildings that serve low income customers.

These interviews will collect information on the building owner's perspective of the low-income renter market and will cover such topics as:

- Characteristics of the property;
- Amount of direct interaction with renters, use of property management company;
- Utilities included in rent;
- Relative turnover of tenants;
- Interest and perceived value of energy efficiency property improvements;
- Interest in the ESA program;
- Tenant needs;
- Barriers to installing efficiency measures;
- Differences in perceptions of tenant needs across subsidized and market rate properties;
- Past participation in ESA, covering both common area measures (CAMs) and measures installed within tenant spaces;
- Perception on how renters benefit from CAMs installed through the ESA program; and
- Opportunities for additional support from the ESA program.

Additional topics will be added as identified through the background research, tenant surveys, and interviews.

## 1.6 Scope of Work by Task

We describe the study Scope of Work below. In Section 2.1 (Project Timeline and Deliverables), we summarize the project deliverables by task.

### *Task 1: Conduct Project Initiation Meeting*

A project initiation meeting was held on January 15, 2021 with the Evergreen team and representatives from the IOUs and the CPUC. The results of the meeting (issues, discussion, decisions reached) were documented in a memo that was distributed for IOU and CPUC Energy Division staff review to ensure the CPUC/IOU Study Team had a common understanding of the meeting discussion and outcomes.

### *Task 2: Develop Research Plan*

Following the project initiation meeting with the Study Team, a draft research plan was created (this document) that reflects the scope of the work. Further adjustments will be made as needed based on stakeholder input (see Task 3). As a parallel task, data request memos will be submitted to the IOUs during this same period.

### *Task 3: Conduct Public Workshop on Proposed Research Plan*

On March 5, 2021, public workshop will be held via webinar to solicit comments on the draft research plan and to inform possible revisions of the final research plan. We will prepare an agenda and meeting materials, and will document the meeting outcomes and stakeholder comments for IOU and Energy Division review.

### *Task 4: Develop Final Research Plan*

After the public workshop, a final research plan will be created that addresses the comments received during the webinar. As part of the revision process, we will develop a comment tracker in Excel that records all of the comments received on the draft research plan. In the comment tracker, we will indicate how the comment was incorporated in the final plan, or else explain why a comment was not addressed.

### *Task 5: Data Collection and Analysis*

This task will cover all the data collection and analysis activities described previously, beginning with the background research based on existing reports that focus on the low-income sector in California.

The secondary data analysis will combine the data sources described earlier to develop a comprehensive snapshot of the low-income market that includes both renters and owners. The foundation of this database will be a combination of detailed Census data overlaid with

information from the IOUs on their low-income customers (i.e., ESA participation data, CARE data, Athens data on the low-income population). All survey samples will be drawn from this database and weights carefully constructed so that the survey results can be extrapolated to the low-income population and conclusions can be drawn with confidence.

The phone surveys will be fielded by CIC Research, will include a sample of 1,200 low-income renters, and will use the quotas discussed previously. Evergreen staff will conduct the interviews of the 60 renter households chosen for developing the renter profiles, and these interview subjects will be drawn from the sample of completed phone surveys. Each interview respondent will be paid a \$20 incentive to encourage participation. Evergreen will also conduct the 30 interviews planned for the building owners.

All phone survey instruments and interview guides will be submitted to the LINA team for review and comment, and then final survey instruments/guides will be created that incorporate comments on the guides. No surveys or interviews will be conducted without express consent from the IOUs. The final survey instruments and interview guides will also be included in the final LINA report as appendices.

The results of the data collection and analysis will provide a detailed picture of low-income renter households in California, one that captures all the important variations across these homes. The market characterization and the quantitative phone survey data will enable us to understand the different types of renter households, and how prevalent each is across the different regions in the state (IOU territory, climate zone, urban vs. rural). The qualitative data will provide additional information on the variety of needs across the different types of renter households. This allows for more tailored recommendations to each group, rather than a 'one size fits all' approach that will miss opportunities within the renter population.

The following are examples of how this approach can be used to address the program-related research questions:

- **What existing ESA program rules and policies limit benefits to rental customers?** The market characterization that includes the ESA participation data will show how many within the eligible renter population have participated recently in the ESA program. Once the non-participating renter segments are identified, the phone survey and interview results will help determine whether non-participation is due to ESA program rules or other reasons (e.g., lack of awareness, language barriers, distrust of the program/utility, low interest in efficiency relative to other household budget factors).
- **What specific savings, health, comfort, and safety benefits do rental customers receive via the ESA program and to what extent are these comparable to those benefits that eligible homeowners receive?** The market characterization will show the distribution of ESA participants (both renters and homeowners) and the distribution of eligible renter

households (both ESA participants and non-participants). These distributions will highlight differences in ESA measures installed, energy savings, and non-energy benefits such as comfort and safety. Additional nuance in these differences can be determined through a closer examination of the survey results from the various renter profiles.

- **Are there other measures that may be considered to serve the needs of the tenants living in different types of rental housing?** The phone survey, renter profiles, and interviews will explore how needs differ across both renter profile types and building types. Once the important needs (especially underserved needs) are identified, the structure of the phone survey sample that is nested in the market characterization will allow for extrapolation to the entire low-income renter population. This will highlight just how important these issues are (large unmet need versus smaller need). Identifying the tenant unmet needs and assessing if and how the ESA program can address these needs will also be covered in this task.
- **What, if any, new measures may be considered that do not require any landlord approvals or involvement?** The phone surveys and interviews will identify if there is a demand for new measures, and the evaluation team and Study Team can assess whether these would require landlord involvement. Extrapolating from the phone survey to the larger low-income renter population using the market characterization will provide an estimate of the potential demand for any new ESA measures identified through this process. Alternatively, the holistic approach we envision may reveal utility support other than typical “measures” that eases challenges faced by low-income renters and falls purely in the purview of the households, thereby bypassing the need for landlord involvement.

### *Task 6: Draft Results and Report*

The Evergreen team will analyze the data collected in Task 5 and document the methods and results in a draft report. Our analysis will comprise both qualitative and quantitative reviews of the information collected, as appropriate to the nature of the data, while being cognizant of the strengths and weaknesses of each data source. In most cases, we will draw from multiple sources of information to triangulate and provide a comprehensive understanding of the research topics we have covered. The focus of our reporting will be on explaining our work and results in a clear, easy-to-understand manner, while focusing on providing actionable insights, which will distinguish between recommendations, suggestions, and topics for more exploration. The draft and final reports will adhere to the specifications included in the "Guidelines for CPUC-ED & California IOU Evaluation Measurement & Verification Reports".

### *Task 7: Public Workshop on Draft Report*

Following the delivery of the draft report, we will prepare and conduct a public workshop to solicit comments to inform possible revisions for the final report. A meeting agenda and materials will be posted to the service list 10 days prior to the meeting. We will also document the outcomes of the meeting (issues, discussion, decisions reached) in a memorandum for the IOUs and the CPUC

Energy Division to review within three days of the meeting. During this meeting we will also discuss the timeline for finalizing the report and remaining study deliverables.

### *Task 8: Final Report and Data Sets*

Following the draft report public workshop and discussions with the IOUs and the CPUC Energy Division about meeting outcomes and revisions to the report, we will prepare a draft final report for IOU and Energy Division review. Once we have approval of the draft final, we will make any necessary changes and produce a final report. We will provide the requested number of copies and accompanying datasets, as indicated in the RFP.

### *Task 9: Project Management and Reporting*

We will track all costs on a monthly basis and closely monitor evaluation progress so that the evaluation proceeds as scheduled. Evergreen project manager Martha Wudka will conduct regular conference calls to discuss project status, issues, and scheduling, in addition to preparing a monthly written status report that describes the last month's activities and planned accomplishments for the upcoming month. Additional senior team members will attend these meetings as needed. We will also prepare weekly data collection progress reports while primary research is in the field, along with interim memos describing the current state of analysis and findings when requested by the IOU and CPUC project leads.

## 2 Timeline / Deliverables / Staffing Plan

### 2.1 Project Timeline and Deliverables

The timeline for the major tasks and deliverables is shown in Table 5.

Having worked on previous LINAs, we understand the significant amount of coordination required with the IOUs, CPUC Energy Division, and other interested stakeholders. We will be submitting meeting agendas and presentations one day prior to any public meetings, and we will provide comment matrices in Excel that capture both the public comments and the Evergreen team's responses. All items submitted to the Study Team for review (research plan, survey instruments, draft reports, etc.) will have a clear review timeline identified (typically two weeks) in order to keep the project on schedule.

As part of the project management task, we have planned for weekly update calls with the Study Team, in addition to a separate internal Evergreen team call where we will discuss progress on current and upcoming tasks.

**Table 5: Project Timeline and Deliverables**

Proposed Task	Completion Date
<b>Project Initiation meeting</b>	<b>January 15, 2021</b>
Meeting agenda	January 11, 2021
PowerPoint presentation of the proposal	January 15, 2021
Meeting notes	January 18, 2021
<b>Develop Detailed Research Plan</b>	<b>February 19, 2021</b>
Research Plan / Objectives	January 28, 2021
Outline of data needs for data requests, management plan	February 5, 2021
Outline of work plan & schedule by project tasks	February 12, 2021
<b>Public Workshop – Research Plan</b>	<b>March 5, 2021</b>
Meeting Agenda	March 3, 2021
PowerPoint presentation of Research Plan	March 4, 2021
Meeting Minutes	March 8, 2021
Comment matrix w/ team responses	March 12, 2021
<b>Data Collection, Analysis and Draft Report</b>	<b>September 2022</b>



Proposed Task	Completion Date
Additional data requests as needed	TBD / Ongoing
Weekly progress reports during data collection	Weekly / Ongoing
Analysis plan linked to specific data collected	June 1, 2021
Analysis plan linked to sampling plan	July 1, 2021
Background research completed	June 1, 2021
Secondary data analysis / low-income market characterization	May 1, 2021
Draft survey and interview instruments	August 1, 2021
Final survey and interview instruments	September 1, 2021
Phone survey completed	March 14, 2022
In-depth interviews completed	June 1, 2022
Preliminary results / conclusions to Study Team	June 14, 2022
Internal review draft report to Study Team	July 21, 2022
Internal comments / additional analysis tasks finalized	August 7, 2022
Public draft report	September 14, 2022
<b>Public Workshop – Draft Report</b>	<b>October 2022</b>
PowerPoint presentation, agenda	October 11, 2022
Presentation on draft report	October 12, 2022
Workshop minutes	October 15, 2022
Comment matrix with team input	October 21, 2022
Revised schedule for finalizing report	October 21, 2022
<b>Final Report &amp; Data Sets</b>	<b>November 2022</b>
Final report that conforms to CPUC/IOU guidelines	November 16, 2022
Data documentation and appendices (electronic)	November 23, 2022
Project database and documentation	November 23, 2022
Data dictionary	November 23, 2022
<b>Project Management and Reporting</b>	<b>Ongoing</b>
Monthly written status updates	Monthly, submitted with invoice
Weekly calls with SCE Project Manager	Weekly / Ongoing

Proposed Task	Completion Date
Meetings with Study Team and Evergreen senior staff on significant milestones (research plan, data collection, initial findings)	TBD / As needed
Weekly internal team calls	Weekly / Ongoing

## 2.2 Staffing Plan

The Evergreen team consists of the following:

- **Evergreen Economics** is an economics consulting firm that specializes in energy efficiency program evaluation, with years of experience researching low-income programs in California. Our firm was founded in 2011 and has since grown to include 17 staff members. This project will be managed by our California staff in San Diego and Berkeley, all of whom worked on the prior LINA.
- **CIC Research** is a full-service survey research firm located in San Diego and founded in 1965. CIC Research has 30 Computer-Assisted Telephone Interview (CATI) stations and conducts thousands of phone, web, and mail surveys each year. CIC has partnered with Evergreen on multiple previous evaluations including the 2016 LINA. CIC Research is also a certified MBE in California.
- **Princeton University Eviction Lab.** The Eviction Lab conducts groundbreaking research on poverty issues surrounding renters, including eviction and the range of factors that lead to eviction. They will help shape the 2022 LINA research so that we can develop a more holistic picture of renters and the pressures they face, which in turn will enable us to develop more effective recommendations for the ESA program.

The project director will be Tami Rasmussen, who managed the prior LINA studies completed by Evergreen. Martha Wudka will be the Project Manager and will oversee the day-to-day project tasks to ensure that the research activities stay on track. Dr. Steve Grover, Ingo Bensch, and Sarah Monohon will be Technical Advisers for the project and will assist on specific research areas as needed. Dr. Carl Gershenson from the Princeton University Eviction Lab will also serve as a Technical Advisor and will help shape the research questions and the data collection activities, providing input based on his experience at the Eviction Lab.