

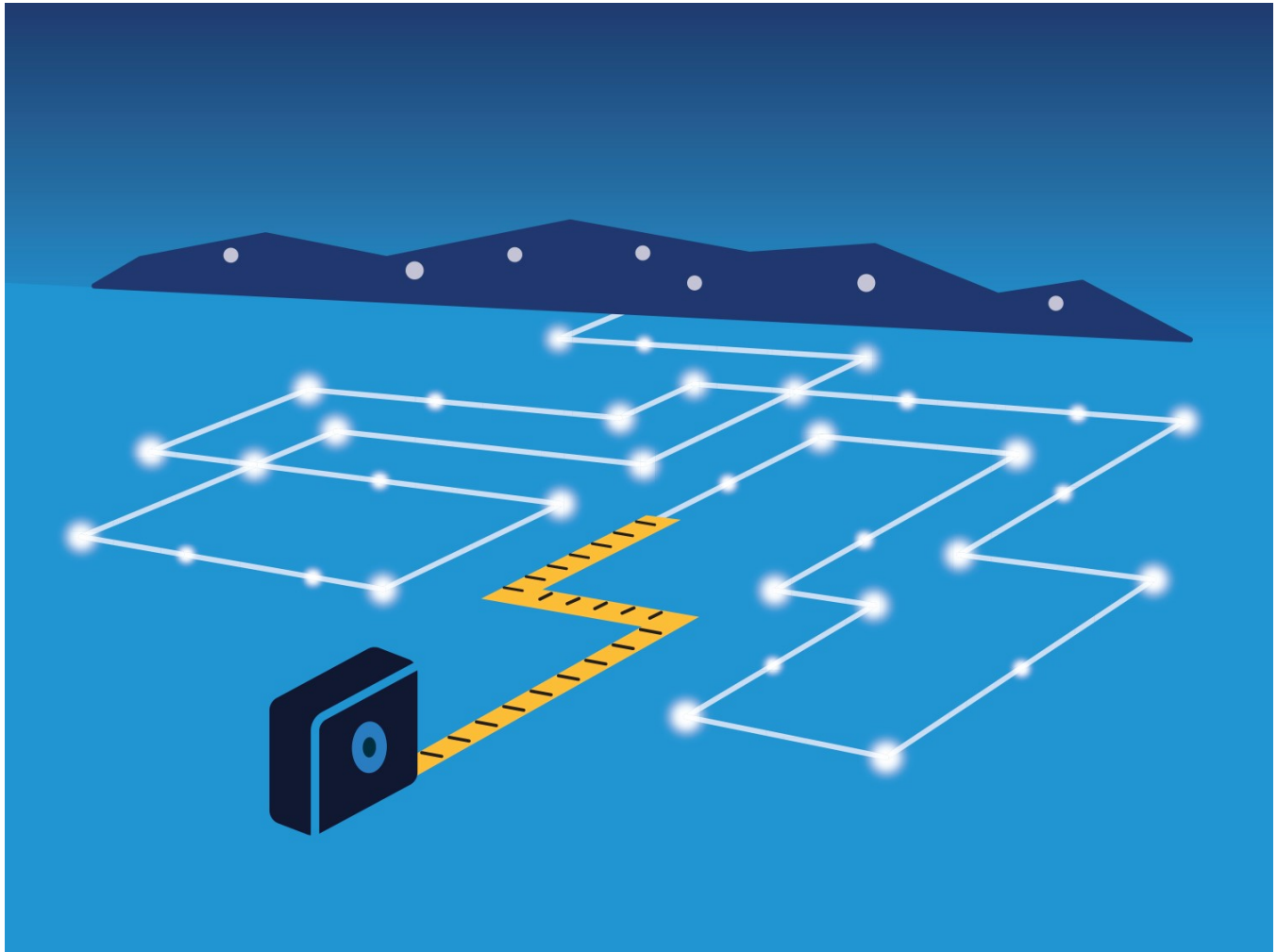


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San Joaquin Valley Disadvantaged Communities - Data Gathering Project

Research Plan

December 2, 2019





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1. Study Overview

1.1 Procedural Background

In 2014, Assembly Bill (AB) 2672 amended the California Public Utilities Code to include Section 783.5, which seeks to increase affordable access to energy for disadvantaged communities (DACs) in the San Joaquin Valley (SJV) and to improve the health, safety and air quality of these communities. Section 783.5 directed the California Public Utilities Commission (CPUC) to identify DACs in the San Joaquin Valley meeting specific income, geographic, and population requirements and to open a proceeding to evaluate the economic feasibility of extending natural gas pipelines, increasing subsidies, and other options intended to improve access to affordable energy for the identified communities. The statute is particularly focused on low-income households that lack natural gas service and must rely on electricity, propane or wood burning to fulfill their space heating, water heating, and cooking needs. Section 783.5 defines a San Joaquin Valley DAC as meeting the following criteria:

- 1) At least 25 percent of the residential households with electrical service are enrolled in the California Alternate Rates for Energy (CARE) program pursuant to Section 739.1;
- 2) Has a population greater than 100 persons within its geographic boundaries as identified by the most recent survey;
- 3) Has geographic boundaries no further than seven miles from the nearest natural gas pipeline operated by a natural gas corporation; and
- 4) “San Joaquin Valley” means the counties of Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare.

In 2015, the CPUC opened Rulemaking (R.) 15-03-010 pursuant to Section 783.6. In Phase I, the CPUC adopted Decision (D.) 17-05-014, which approved a methodology for identification of disadvantaged communities eligible under Section 783.5 and approved a list of 170 San Joaquin Valley disadvantaged communities that meet the statutory criteria. Nine communities were subsequently added to the list of DACs in 2018 bringing the current number of DACs to 179.

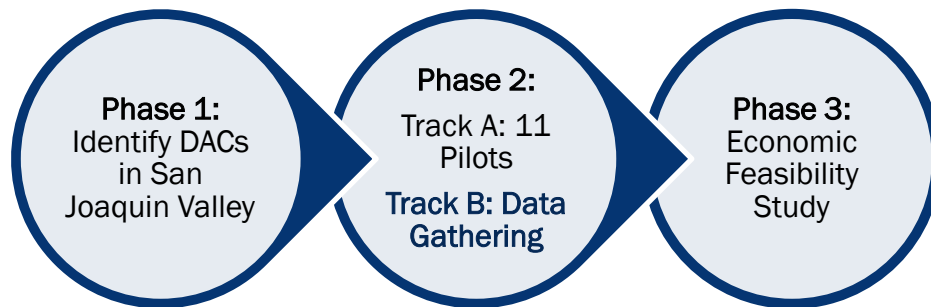
On December 6, 2017, an Assigned Commissioner issued a Scoping Memorandum and Ruling (Phase II Scoping Memo) which indicated that Phase II of the proceeding would proceed on two tracks. Track A identified twelve SJV DAC communities and addresses the implementation of pilot projects in eleven communities and further assessment of a pilot project in the twelfth. Track B addresses data gathering needs in the 179 identified SJV DACs. Subsequently, Phase III of this proceeding will review the data collected pursuant to the approved pilots and Data Gathering Plans to conduct the economic feasibility study required by AB 2672.

On January 31, 2018, the IOUs and GRID Alternatives submitted proposals for pilot studies for twelve communities under the Track A proceeding. Following a comment and review period, updated pilot proposals were submitted to the CPUC on September 10, 2018. D. 18-12-015, dated December 19, 2018, the CPUC approved Track A San Joaquin Valley Disadvantage Communities Pilot Projects.

The Phase II Scoping Memo indicated that Track B of this proceeding would finalize a plan to gather information needed to establish baseline conditions in the identified communities to support an analysis of the economic feasibility of affordable energy options for those communities to be conducted in Phase III. D. 18-08-019, dated August 23, 2018, approved the IOUs’ consolidated proposed Data Gathering Plans and directed PG&E to issue a request for proposals (RFP) for a single contractor to conduct a baseline study. PG&E

was also directed to establish a Data Plan Working Group (“Working Group”), co-chaired by the California Public Advocates Office and Self-Help Enterprises (SHE), which shall operate in an advisory capacity and provide input on the Data Gathering process and deliverables. In addition to adding nine communities to the DAC list, the Decision approved a process for updating the list every three years

Figure 1. SJV DAC Project Phases



1.2 Study Goals & Objectives

The Data Gathering Plan includes data collection, analyses, reporting, and a project database task, which will be used to inform a subsequent economic feasibility study for expanding various pilots (and/or elements of the pilots). In addition, the pilots will be evaluated to assess the extent to which various interventions assist in reducing energy costs and mitigating the use of fuels such as propane, wood, and diesel generators by residential customers residing in SJV DACs. The future economic feasibility assessment is expected to translate the costs and benefits of expanding the pilots, including GHG emissions and energy rates for all customers.

In service of these goals, Opinion Dynamics will:

- 1) Identify, collect data on, and report “baseline energy conditions” of the 179 DAC communities within the San Joaquin Valley. Baseline energy conditions include quantitative data and analyses of (a) fuels currently used by households living in DACs; (b) reasons for use of these fuels; (c) energy costs including breakdown for each fuel, and (d) other relevant data that informs these conditions such as size of household, condition of household structure, etc. Qualitative data will also be collected to support this objective.
- 2) Develop data collection instruments for primary data collection within the 168 non-pilot and 11 pilot DACs. Coordinate with the pilot implementation team and train the CENs on data to be collected through the 11 pilot communities.
- 3) Provide a database that includes data collected as part of the Data Gathering Plan, IOU data, third-party data gathered as part of the Plan, and analyses of the data.

Study Research Questions

The Data Gathering Plan seeks to answer the following research questions:

1. What are the existing types and conditions of the homes and equipment/appliances in the 179 DACs in the San Joaquin Valley?
2. How do residents currently fuel their heating, water heating, clothes drying, and cooking needs? Is the reason for their current fuel access to other energy sources and if so, what are the constraints? Is their current fuel a preference, and if so, why the preference?
3. What is the energy usage and energy burden of households that rely on alternate fuel sources, such as wood, propane, diesel generators, or other fuels for their heating, water heating, clothes drying, and cooking needs?
4. How does usage and burden differ from comparable households in these communities that do not rely on these alternate fuels?
5. What are key issues or drivers of the burden or hardship customers with alternative fuels (i.e., do not have natural gas or use only electricity) experience?
6. What are residents' attitudes and desires associated with their current fuel uses and potentially different ones (e.g., electricity or natural gas) to supplant use of propane, wood, diesel generators, or other fuels?
7. What factors (e.g., physical home; location; ownership status, attitudes, cultural/lifestyle beliefs) hinder individual households OR communities from replacing propane and wood with electricity or natural gas?
8. What are the total energy costs including the bills for alternate fuel used by customers?
9. How do these costs compare to those who have access to natural gas and electricity?
10. What, if any, benefits, hardships and/or demographic differences exist between customers who use these alternative fuels and those who do not (e.g., health/comfort/safety benefits and sacrifices, usage levels, usage patterns, income, demographic profiles of households, etc.)?
11. Within the SJV DAC's what are key differences or similarities between communities "served by natural gas" and those "minimally or not served by natural gas"?
12. What energy programs or tariffs are already available to the disadvantaged communities that are expected to increase the affordability of energy? To what extent do customers take advantage of these?

Data Elements to be Collected

To answer the research questions outlined in the previous section, Opinion Dynamics will collect the Data Elements in Table 1.

Table 1. Data Elements

Data Elements in Data Gathering Framework	
Engagement/Access to Affordable Energy	<ul style="list-style-type: none"> Awareness or participation in low income programs Community capacity and interest (ex. experience with community outreach related to energy solutions, effective outreach methods). Community preference for an energy solution Customer preferences for energy solution ESA remediated date ESA program measures installed ESA program measures not installed Estimates of customers eligible but not participating in existing low-income programs, and interest in enrolling in low-income programs
Household Demographics & Home Conditions	<ul style="list-style-type: none"> Number of occupants Number of occupants aged 65 or older Number of children Number of working adults Additional appliances (medical, TVs, etc.) Address Age of tenants Asbestos present or likely? Assessment of home's insulation (fully, partially insulated) Attic insulation presence Basement / crawlspace presence, type, condition, insulation Build Date (Year?) / Age of Home (Range) Ceiling fans Clothes washing/drying Condition of windows, doors, exterior (housing envelope) Construction type (Manufactured, Modular, Mobile, Stick-built / on-site) Cooking Cooling / Cooling Type Disabled residents electric code issues Electric wiring condition Electric wiring type Electrical panel size / condition Employment status Existing Electric Appliances Existing Natural Gas Appliances Existing Oil Appliances Existing Propane Appliances Existing Wood Appliances/EU Home Heating Home internal characteristics Housing code issues that may be triggered by fuel switching? Housing Type (Single detached, single attached, multifamily, mobile) Internet usage / engagement (Facebook, Twitter, etc.) Internet/Wi-Fi Currently available?

Data Elements in Data Gathering Framework	
	Landlord Contact info, if rented Name of propane vendor Number of bathrooms Number of bedrooms "Number of levels in the home (Number of stories, basement, attic)" On all electric rate On CARE rate On FERA rate On Medical Baseline rate Ownership status Plumbing system condition Pools, pool pump Preference/willingness for keeping or converting an existing appliance - e.g., propane to Natural gas (which appliance?), propane to electric, etc. Propane line underground? Propane pipe condition Propane tank leased or owned? Qualified for Medical Baseline rate Roof characteristics Size of HH (sq. foot) Thermostat type Visual mold / any issue with mold Water Heating Water Well Whole house fans Wi-Fi interested in future enrollment?
Barriers	Structural Barriers (Condition of the home) Non-structural barriers such as language, trust, etc.
Energy Burden	Current Energy Costs- Electric Current Energy Costs- Natural Gas Current Energy Costs- Propane / Wood / Oil / Other Customers' current usage levels for each household energy source (propane, wood, electricity and other fuel, to support estimating the share of local pollution generated by household sources) Equipment and installation costs (to refine utility estimates) Household income Real and perceived challenges with paying energy bills Resources/Income from other areas (Public assistance, Disability, Veterans benefits, Pensions, Child support, etc)
Non-Energy Impacts - Health/Comfort/ Safety	# of days missed at school or work Criteria air pollutants reduced Duration of lack of access to wood or propane Duration of outages (electric, natural gas, wood, or propane) GHGs reduced Health, comfort and quality of life benefits Number of times per year resident lacks access to wood or propane

Data Elements in Data Gathering Framework	
	Number of Outages per year (electric, natural gas, wood, or propane) Pests such as rodents or insects Public health, both inside the residence and in the community Safety to the community and homes
Energy Usage Impacts (per household)	Customer energy needs and perceived energy or air quality challenges (such as difficulty affording energy costs and in-home temperature comfort and air quality) Perceived burden of energy costs Perceived reliability of energy source (propane or wood reliability, issues)
Awareness and Satisfaction	Awareness of community-based organizations (CBOs) Awareness of the San Joaquin Valley Proceeding (R.15-03-010) Awareness or participation in low income programs Effective energy saving practices Overall customer satisfaction

Appendix A of this Research Plan maps each Data Element to Data Gathering Research Questions. In addition, we show the data collection instrument or analyses that will cover each Data Element.

1.3 Study Data Sources

Opinion Dynamics will collect data from multiple sources in order to fully capture the Data Elements required for this study, including primary research and utility or third-party data sources. Opinion Dynamics will conduct primary research through quantitative surveys, in-home audits, and qualitative in-person interviews as well as compile utility and third-party data sources including usage data, census data, alternate fuel cost assessments, and CalEnviroScreen data.

Primary data collection will provide insights into demographic and household characteristics, home condition, alternate fuel usage, barriers to fuel substitution, key drivers of energy burden and hardship, energy-related attitudes and behaviors, and qualitative household data (e.g., health, safety, personal preferences, cultural or faith-based influences and preferences, and other unstated relevant data etc.).

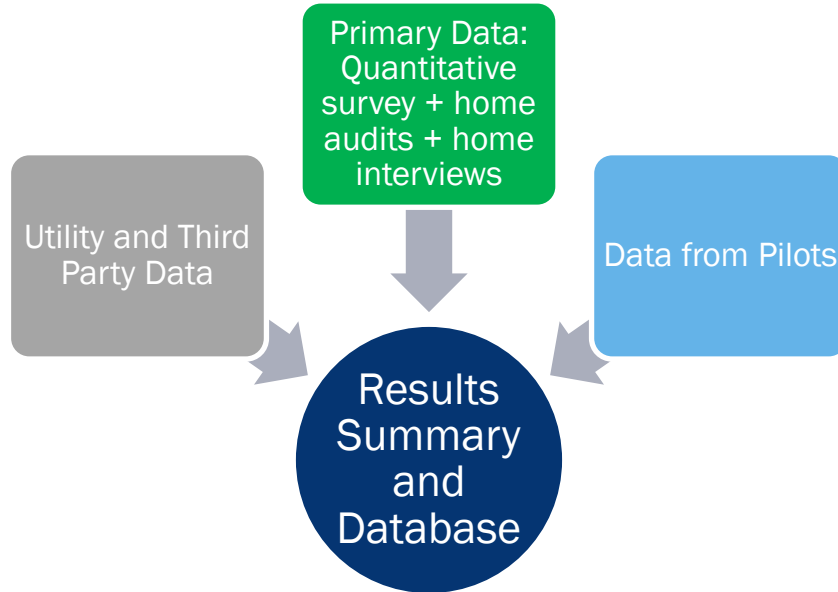
Pilot implementation teams and CENs will collect primary baseline data for the 11 pilot communities, whenever possible. Opinion Dynamics will provide the pilot implementation teams with the same data collection instruments and tools so that the data elements collected in pilot communities will be the same as those collected in the non-pilot communities.

Utility data will provide contact information needed for sampling, current electric and natural gas usage (previous 12 months of usage and billing data), CARE, ESA and other program participation, outage data, and additional household characteristics. Additional third-party data sources will be used for sampling and to provide information on alternative fuel costs, additional housing characteristics, as well as additional community-level information.

Opinion Dynamics will bring together all data sources to produce a summary of results that provide answers to study research questions. Upon customer approval, individual responses will be provided back to each IOU with data linked back to their customer records. In addition, Opinion Dynamics will produce a database, which

will include all primary and third-party data, for future analyses and the economic feasibility phase of this research (Figure 2).

Figure 2. Data Gathering Overview



2. Data Collection

2.1 Sampling

Opinion Dynamics will prepare a detailed data collection sampling plan based on the approved research plan. Opinion Dynamics will propose a sample design to support the key objectives of this effort and include a discussion of minimum data needed at the household and community level to meet these goals.

The plan will identify required sample sizes and proposed sub-stratum samples for participants and eligible customers to satisfy 90/10 confidence/precision for key strata, except where it makes sense to satisfy 90/10 confidence/precision at the overall DAC level. Opinion Dynamics will ensure that the sample allows for valid statistical analyses of key subgroups where possible based on project objectives, the number of households in the target population, and project budget.

Opinion Dynamics will present a draft of the data collection sampling plan to the Working Group, answer questions from Working Group members and make appropriate revisions to the plan based on input from the Working Group.

The timeline for finalizing the Sampling Plan is November 2019.

2.2 Primary Data Collection

Primary data collection activities will include a quantitative survey, in-home audits, and qualitative in-person interviews. Opinion Dynamics will develop the research instruments for each data collection task. Data

collected through quantitative surveys, in-home audits, and qualitative interviews will be analyzed and stored in the project database.

2.2.1 Primary Data Collection Instruments

Opinion Dynamics will develop the instruments necessary for all primary data collection activities. Opinion Dynamics will work with PG&E and the Working Group to develop and align the data collection instruments with each approved project data element.

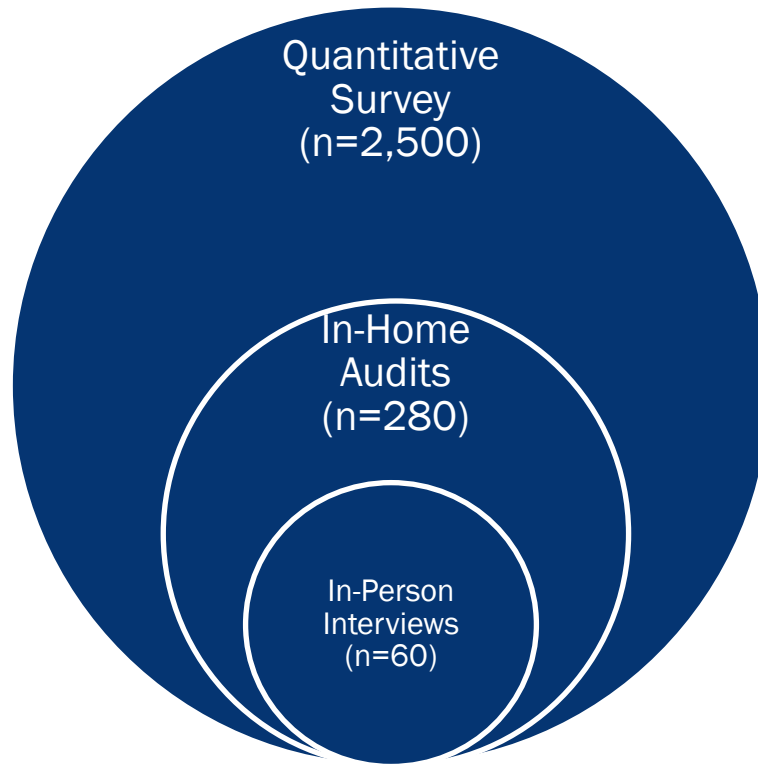
Opinion Dynamics will translate all English data collection instruments into Spanish. Opinion Dynamics with support from SHE will make use of telephone and in-person interviewers and audit field staff who are fluent in both English and Spanish so customers can provide information in their preferred language.

2.2.2 Primary Data Collection Tasks

The primary data collection activities will utilize a nested sampling design (see Figure 4). We will initially complete quantitative surveys with 2,500 customers. We will complete in-home audits with 280 of the 2,500 customers who completed the survey. We will complete in-home interviews with 60 of the 280 customers who participate in the audit portion of the study. A nested sample approach has several advantages:

- The information collected from the initial quantitative survey can be used to construct oversamples of homes for subsequent in-home audits and in-depth interviews. For example, the survey will contain questions about heating fuel sources. Opinion Dynamics will use this information to identify homes that use alternative fuels, and oversample homes with alternative fuels for the in-home audits.
- A nested sample approach also allows the Opinion Dynamics team to collect data using multiple sources. Customers have difficulty providing accurate information on certain topics, such as details about household equipment and appliances or the condition of their home's building shell. We will verify these items in the in-home audit and then adjust the survey results, which have a larger sample size. These adjustments are calculated through adjustment ratios that we can apply back to the overall population. We are using the strengths of one method to make up for the weakness of another. We will have the strength of the detailed audit to make up for the weaknesses of the accuracy of the quantitative survey. The in-home audits will also help us to gather answers to technical questions that customers cannot accurately answer in the quantitative survey (e.g. building shell, condition of home, insulation, etc.).
- The in-person interviews will be a bit more in-depth and will help us to add additional detail to more qualitative data elements such as preferences, attitudes, and barriers or perceived barriers to fuel substitution and other alternatives.

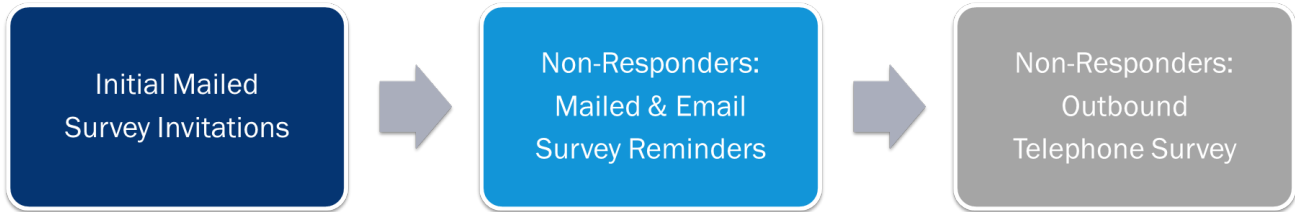
Figure 3. Nested Sampling Approach



Quantitative Survey

Opinion Dynamics will develop a quantitative survey instrument keeping in mind that the instrument will be disseminated over the web, telephone, and in-person administration. We will craft the instrument to be easy to understand and, for the online versions, easy to navigate. We will invite customers to participate in the quantitative survey, first through a mailed survey invitation inviting customers to complete the survey over the web or by calling in to take the survey over the telephone with an interviewer. For non-responders, we will follow-up with a second mailed invitation and e-mail reminder (when e-mail contact information is available). Finally, we will follow-up with non-responders via telephone, as needed, and attempt to complete telephone interviews (Figure 5). Using this approach, customers can complete the survey through their preferred mode either via the web or telephone. We will provide an incentive of \$25 Visa gift card for quantitative survey participants. Our goal is to complete the quantitative survey with 2,500 SJV customers. If we are struggling to reach our targets with the proposed outreach, we will be able to send out additional invitations to an additional subset of sample. We will also leverage the community outreach that SHE will be doing to support data collection in the small communities or low incidence households.

Figure 4. Survey Invitations & Reminders



In-Home Audits

Some data elements, such as the condition of appliances, building shell, and insulation, can only be gathered on-site by trained auditors. We will complete 280 in-home audits with a subsample of quantitative survey respondents. During the quantitative survey, respondents will be able to indicate if they would be interested in the follow-up in-home study or not. We will contact customers who express interest in the in-home study using their preferred contact method (telephone or email) and language. Customers will receive a \$100 Visa gift card incentive for participation in an in-home audit.

In-home audits will verify quantitative survey responses for adjustment to the total population. As a critical tool for our field data collection, we plan to use an electronic, tablet-based, and mobile ready application (app) to conduct the in-home audits.

In-Person Interviews

Finally, we will conduct qualitative in-person interviews with a subsample of 60 audit participants to provide a deeper understanding of alternate fuel usage, health and safety considerations, energy burden and perceived burden, as well as customer preferences. These qualitative in-person interviews will be conducted in conjunction with the in-home audits at a subsample of homes. Participating customers will receive an additional \$50 Visa gift card incentive for participation in the in-person interview.

2.2.3 Coordination with Pilots

For all primary data collection efforts, Opinion Dynamics will provide training to organizations that will utilize the data collection instruments developed as part of the data gathering plan. These organizations include SHE, as the Pilot Community Energy Navigator Program Manager (CPM), the pilot implementers and Community Based Organizations (CBOs) identified to capture data. Pilot implementation teams and CENs will collect primary baseline data for the 11 pilot communities (Allensworth, Alpaugh, Cantua Creek, Ducor, Fairmead, Lanare, Le Grand, La Vina, Seville, California City, and West Goshen), whenever possible. Opinion Dynamics will set up a data transfer system so that data is seamlessly transferred from the data collection tools to an internal database to facilitate analysis and record keeping. Upon receipt, Opinion Dynamics will integrate baseline data from pilot communities with the data collected for non-pilot communities.

2.2.4 Optional Phase II Data Collection

To the extent warranted and the schedule permits, this data gathering effort may require an additional data collection phase. Following the presentation of interim findings, the Working Group and Opinion Dynamics may decide that additional targeted data gathering is necessary. This optional subtask provides for this possibility following a revision of the Research Plan; this will allow Opinion Dynamics to monitor response rates and

adjust follow-up plans accordingly, whether that means targeting follow-ups to boost response rates in general or trying to boost response rates within specific underrepresented sub-segments. This optional data collection must be undertaken with the express approval of the Data Plan Working Group.

2.3 Utility and Third-Party Data

Opinion Dynamics will utilize utility and third-party data for sampling and analysis. Utility data will provide the contact information needed for sampling, as well additional data for analysis and reporting. Third-party data sources will provide information on alternative fuel costs, additional housing characteristics, as well as additional community-level information.

2.3.1 Utility Data

Utility data will include data from the utility billing systems, ESA enrollment, CARE program, and additional energy efficiency, customer/TOU rate, demand response program participant enrollment data. Additionally, the Utilities' internal customer information systems and customer relationship management databases contain a wide amount of customer and household demographic information that we will request, based on availability and project needs. We will request any third-party income, demographic or household summary data that IOUs have available to supplement self-reported demographic and household primary data.

Data Requests

Opinion Dynamics will break up data requests into two phases. The first request will be customer data needed for drawing the quantitative survey sample and will include all customers within the 167 non-pilot DACs. This data request will include data such as premise IDs, fuel type, monthly usage data from the previous year, name, address, unit numbers, city, zip, email and telephone numbers.

The second round of data requests will be for additional detail for those customers that completed the quantitative survey. The second data request will include information on CARE and ESA participation, participation in additional EE programs, electricity outages and duration, and third-party data from CoStar, Experian, and other segmentation services that IOUs have available.

2.3.2 Third-Party Data

Opinion Dynamics will make use of select third-party data to supplement the primary data gathered as part of the data gathering project. Most data will be at the community or census tract or block group levels and will be matched to each study participant in the final database.

Publicly available data could include:

- CalEnviroScreen Scores
- Census data and other government data relevant to DACs (e.g. demographics, mobility rates, economic data, etc.)
- Data from previous research including the Low Income Needs Assessment and Residential Appliance Saturation Study

Data from private third-party sources could also supplement the primary data collected. For example, data from third-party subscription services such as Experian, Claritas 360, Axiom, or CoStar could fill in missing data that respondents chose not to provide or were unable to (e.g. household income). These alternative

sources are typically less accurate than data from respondents or that collected through in-home audits but are better than having empty data fields. IOUs hold some of these subscriptions and could provide data on select customers to fill data gaps on an as needed basis.

2.4 Community Outreach and Communication

Opinion Dynamics, in coordination with SHE and the Working Group, will develop a Community Outreach and Engagement plan. The plan will describe how trust will be established within the identified communities, how community-based organizations and community residents will be included and engaged to gain access and participation. The plan will identify culturally sensitive ways to collect information and support the validity and reliability of data collection.

The timeline for the Community Outreach and Communication Plan is December 2019.

3. Analysis and Reporting

3.1.1 Analysis Methods

For each data element collected through primary data collection, Opinion Dynamics will provide summary statistics. The type of statistics will be appropriate for the data element collected but could include frequency distributions of responses, measures of central tendency (i.e. means, median, and mode), measures of variation (i.e. variance and standard deviation) and standard errors. We will provide these statistics for the overall sample as well as for key subgroups.

3.1.2 Reports and Presentations

This analysis and reporting task will include a draft report of initial findings, a public presentation of initial study findings, a revised draft report that includes complete study findings, a final report and presentation, and database development. Feedback on the Draft Report will be captured in a Comment Response document, allowing for formalized comments and responses. Major deliverables for this task include:

- A draft findings report including appendices and methods from the study;
- A workshop presenting initial findings and soliciting party and community feedback;
- A comprehensive Draft Report that incorporates feedback from the public presentation and summarizes all of the information obtained from the data gathering effort, including information necessary to establish baseline conditions, and key insights about these customer groups;
- A Final Report incorporating comments and feedback from the Data Gathering Working Group;
- A presentation of final study results; and
- A database containing collected information and a user guide to the database to the parties to R.15-03-010 and the Commission.

3.1.3 Project Database

At the conclusion of the project, Opinion Dynamics will provide a database containing collected information and a user guide to the database to the parties to R.15-03-010 and the Commission. In doing so, PG&E and Opinion Dynamics will ensure aggregation and anonymization, of all data and results in a manner that excludes

or masks all customer-specific data and any commercially-sensitive proprietary information and that complies with relevant state and federal laws and all Commission customer privacy decisions, including D.06-06-066 and Appendices; D.11-07-056 and Appendices; D.14-05-016; and D.16-08-024. The database will be readable using a commercially available data management software package. The database will be easily exported as a CSV with a data dictionary that can then be imported into future IOU systems.

Opinion Dynamics will provide each IOU with a separate datafile with customer identifiable data for its customers who have granted permission for data sharing.

4. Project Management

4.1.1 Staffing Plan

Making this project a success will require working and coordinating with multiple involved and interested parties. Opinion Dynamics will work together with the Data Gathering Working Group, including: PG&E, Southern California Edison, SoCalGas, Self Help Enterprises (SHE), Public Advocates Office and the CPUC Energy Division (ED). Other entities likely will include various Community Based Organizations (CBOs), TRC, and possibly others. Beyond that, we recognize that successful coordination on this scale requires an understanding of, and attention to, the context in which this project will be managed. Opinion Dynamics recognizes that to keep project management efficient it is critical that the team work directly with and through a primary point of contact (POC) in developing plans, schedules, instruments, and reports. The primary POC for this study and the study lead from PG&E is Lynn Spencer. The primary contact working daily to support the Data Gathering Project from Opinion Dynamics is Melanie Munroe. The Opinion Dynamics Team also includes support from the Executive in Charge, Tami Buhr, and a lead consultant on the project, Jordan Folks. The primary contacts for TRC include Marian Goebes and Rupam Singla.

Opinion Dynamics will not treat the project management duties in this task as just opportunities for a one-way communication or “reporting out” of status. Rather, we will use them as interactive channels for communication among the research team, the POC, and other parties on the status of activities, any issues or concerns, project needs, and next steps.

4.1.2 Roles and Responsibilities

Opinion Dynamics will manage Data Gathering Project Tasks day-to-day and will be responsible for the following:

- Facilitate project initiation meetings with the Data Gathering Plan Working Group (Completed);
- Weekly (at least initially) phone meetings with the PG&E project manager.
- Coordinate meetings with the Working Group or project SME’s as needed for the development and execution of specific tasks including but not limited to; Research plan, Sampling plan, Data Collection Instruments, etc.;
- Monthly status update meetings with the Working Group in which progress toward goals for the month and plans for the following month are discussed along with any issues that need to be addressed.
- Monthly summaries of work completed during the month provided along with monthly invoices.
- Tracking all deliverables against the schedule and updating the Working Group if any variances arise;

Opinion Dynamics will coordinate meetings with the Working Group at key junctures of the project as noted above. The goal of the meetings and subsequent input meetings will be to obtain input on the overall research plan, as well as input to ensure optimal, reliable and valid data collection and analyses to achieve the overall goals of this effort. The meetings will be preceded and/or followed by a brief period (e.g., 5 working days) where by Working Group members may provide written input on specific issues relevant to the forthcoming stage of the project. They will also be used to obtain feedback on interim results at key milestones and input on issues that may arise at any time over the course of the project. It is expected that Working Group meetings will occur at key junctures that accommodate the timing and budget needs of the project.

The team will not treat the project management duties in this task as just opportunities for a one-way communication or “reporting out” of status. Rather, we will use them as interactive channels for communication among the research team, the POC, and other parties on the status of activities, any issues or concerns, project needs, and next steps.

4.1.3 Timelines and Deliverables

The timeline of each deliverable is provided below in Table 2 and Figure 7.

Table 2. Timelines for Deliverables

Deliverables	Timeline
Project Initiation Meetings	September 2019 (Completed)
Specification of Methodology and Research Plan	September 2019 - October 2019
Data Collection Sampling & Implementation Plan	November 2019
Community Outreach and Engagement Plan	November 2019 - December 2019
Data Requests	September 2019 - February 2020
Develop Data Collection Instruments	December 2019 - February 2020
Community Outreach	February 2020 - April 2020
**Primary Data Collection	February 2020 - June 2020
Data Analysis	April 2020 - August 2020
Preliminary Results Draft Report	August 2020
Optional Phase II Data Collection	August 2020 - September 2020
Database Development	February 2020 - November 2020
Public Workshop – Presentation of Results	October 2020
Draft and Final Report	December 2020 - January 2021
Final Results Presentation	February 2021

Figure 5. Data Gathering Timeline Chart

SJV DAC Data Gathering Milestones	2019				2020												2021	
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Project Initiation Meetings	█																	
Specification of Methodology and Research Plan	█	█																
Data Collection Sampling & Implementation Plan			█	█														
Community Outreach and Engagement Plan			█	█														
Data Requests	█	█	█	█	█													
Develop Data Collection Instruments				█	█	█												
Community Outreach					█	█	█	█	█	█								
**Primary Data Collection					█	█	█	█	█	█	█	█						
Data Analysis							█	█	█	█	█	█	█					
Preliminary Results Draft Report												█	█					
Optional Phase II Data Collection												█	█	█				
Database Development					█	█	█	█	█	█	█	█	█	█	█	█		
Public Workshop – Presentation of Results														█	█			
Draft and Final Report															█	█	█	
Final Results Presentation																	█	█

4.1.4 Project Budget

Data Gathering budgets are provided by task and in total below in Table 3.

Table 3. Project Budget by Task

Task	Budget (Not to Exceed)
Task 1A: General Project Management	\$86,494.00
Task 1B: Data Plan Working Group Input and Presentations	\$64,616.00
Task 1C: Community Outreach and Coordination	\$82,876.00
Task 2: Project Initiation Meetings	\$35,896.00
Task 3A: Specification of Methodology and Research Data Needs	\$62,188.00
Task 3B: Data Collection Sampling & Implementation Plan	\$46,956.00
Task 4A: Develop Data Collection Instruments	\$110,190.00
Task 4B: Data Requests	\$40,220.00
Task 4C: Primary Data Collection	\$777,648.00
Task 4D: Optional Phase II Data Collection	\$104,238.00
Task 4E: Data Analysis	\$149,916.00
Task 5A: Preliminary Results Draft Memo	\$54,696.00
Task 5B: Public Workshop – Presentation of Results	\$33,158.00
Task 5C: Draft and Final Report	\$138,190.00
Task 5D: Final Results Presentation	\$12,506.00
Task 5E: Database Development	\$101,596.00
Data Gathering Total Budget:	\$1,901,384.00

Appendix A. Data Elements Detailed Discussion

This Appendix includes the full list of detailed data elements, the definition of each element, and how those elements will be collected and mapped to data sources.

Research Questions	Data Elements Section	Data Elements	Data Collection Instrument
1. What are the existing conditions of the homes and equipment/appliances in the 170 DACs in the San Joaquin Valley?	HH Demographics & Home Conditions	# of occupants	Survey
		# of occupants aged 65 or older	Survey
		# of children	Survey
		# of working adults in HH	Survey
		Additional appliances (medical, TVs, etc)	Survey, Audits
		Address	Utility Data
		Age of tenants	Survey
		Asbestos present or likely?	Audit
		Assessment of home's insulation (fully, partially insulated)	Audit
		Attic insulation presence	Audit
		Basement / crawlspace presence, type, condition, insulation	Audit
		Build Date (Year?) / Age of Home (Range)	Survey, Audits
		Ceiling fans	Survey, Audits
		Clothes washing/drying	Survey, Audits
		Condition of windows, doors, exterior (housing envelope)	Audit
		Construction type (Manufactured, Modular, Mobile, Stick-built / on-site)	Survey, Audits
		Cooking	Survey, Audits
		Cooling / Cooling Type	Survey, Audits
		Disabled residents	Survey
		electric code issues	Audit
Electric wiring condition	Audit		
electric wiring condition	Audit		

Research Questions	Data Elements Section	Data Elements	Data Collection Instrument
		Electric wiring type	Audit
		Electric wiring type	Audit
		Electrical panel size / condition	Audit
		Electrical panel size/ condition	Audit
		Employment status	Survey
		Existing Electric Appliances	Survey, Audits
		Existing Natural Gas Appliances	Survey, Audits
		Existing Oil Appliances	Survey, Audits
		Existing Propane Appliances	Survey, Audits
		Existing Wood Appliances/EU	Survey, Audits
		Home internal characteristics	Survey, Audits
		Housing code issues that may be triggered by fuel switching?	Audit
		Housing Type (Single detached, single attached, multifamily, mobile)	Survey, Audits
		Internet usage / engagement (facebook, twitter, etc)	Survey
		Internet/WiFi Currently available?	Survey
		Landlord Contact info, if rented	Survey, Audits
		Number of bathrooms	Survey, Audits
		Number of bedrooms	Survey, Audits
		Number of levels in the home (Number of stories, basement, attic)	Survey, Audits
		On all electric rate	Utility Data
		On CARE rate	Utility Data
		On FERA rate	Utility Data
		On Medical Baseline rate	Utility Data
		Ownership status	Survey, Audits
		Plumbing system condition	Audit

Research Questions	Data Elements Section	Data Elements	Data Collection Instrument
		Pools, pool pump	Survey, Audits
		Qualified for Medical Baseline rate	Utility Data
		Roof characteristics	Survey, Audits
		Size of HH (sq foot)	Survey, Audits
		Thermostat type	Survey, Audits
		Visual mold / any issue with mold	Audit
		Water Heating	Survey, Audits
		Water Well	Audit
		Whole house fans	Survey, Audits
		Wi-Fi interested in future enrollment?	Survey
2. How do residents currently fuel their heating, water heating, cooking needs? Why? Is accessibility the issue and if so, what are the constraints? Is there an issue of preference, and if so, why the preference?	HH Demographics & Home Conditions	Home Heating	Survey, Audits
		Name of propane vendor	Survey, Audits
		Preference/willingness for keeping or converting an existing appliance - e.g., propane to Natural gas (which appliance?), propane to electric, etc.	Survey, In-home Interviews
		Propane line underground?	Audit
		Propane pipe condition	Audit
		Propane tank leased or owned?	Survey, Audits
3. What is the energy usage and energy burden of households that rely on alternate fuel sources, such as wood, propane, diesel generators, or other fuels for their heating, cooling, water heating, and cooking needs?	Energy Burden	Household income	Survey, Interviews
		Current Energy Costs- Propane / Wood / Oil / Other	Survey, Third Party Data Sources
		Customers' current usage levels for each household energy source (propane, wood, electricity and other fuel, to support estimating the share of local pollution generated by household sources)	Survey, Utility Data, Third Party Data Sources
		Equipment and installation costs (to refine utility estimates)	Survey, Third Party Data Sources
		Real and perceived challenges with paying energy bills	Survey, Interviews, Third Party Data Sources
		Resources/Income from other areas (Public assistance, Disability, Veterans benefits, Pensions, Child support, etc)	Survey, Interviews
	Energy Burden	Household income	Survey, Interviews

Research Questions	Data Elements Section	Data Elements	Data Collection Instrument
4. How does usage and burden differ from comparable households in these communities that do not rely on these alternate fuels?		Current Energy Costs- Propane / Wood / Oil / Other	Survey, Third Party Data Sources
		Current Energy Costs- Electric	Utility Data
		Current Energy Costs- Natural Gas	Utility Data
		Customers' current usage levels for each household energy source (propane, wood, electricity and other fuel, to support estimating the share of local pollution generated by household sources)	Survey, Utility Data, Third Party Data Sources
		Equipment and installation costs (to refine utility estimates)	Survey, Third Party Data Sources
		Real and perceived challenges with paying energy bills	Survey, Interviews, Third Party Data Sources
		Resources/Income from other areas (Public assistance, Disability, Veterans benefits, Pensions, Child support, etc.)	Survey, Interviews
	Energy Usage Impacts (per household)	Perceived burden of energy costs	Survey, Interviews
		Perceived reliability of energy source	Survey, Interviews, Utility Data
5. What are key issues or drivers of the burden or hardship customers with alternative fuels (i.e., do not have natural gas or use only electricity) experience?	Energy Burden	Household income	Survey, Interviews
		Current Energy Costs- Propane / Wood / Oil / Other	Survey, Third Party Data Sources
		Customers' current usage levels for each household energy source (propane, wood, electricity and other fuel, to support estimating the share of local pollution generated by household sources)	Survey, Utility Data, Third Party Data Sources
		Equipment and installation costs (to refine utility estimates)	Survey, Third Party Data Sources
		Real and perceived challenges with paying energy bills	Survey, Interviews, Third Party Data Sources
	Energy Usage Impacts (per household)	Perceived burden of energy costs	Survey, Interviews
		Perceived reliability of energy source	Survey, Interviews, Utility Data
6. What are residents' attitudes and desires associated with their current fuel uses and potentially different ones (e.g., electricity or natural gas) to supplant use of propane, wood, diesel generators, or other fuels?	Engagement/Access to Affordable Energy	Community capacity and interest (ex. experience with community outreach related to energy solutions, effective outreach methods).	Survey
		Community preference for an energy solution	Survey
		Customer preferences for energy solution	Survey
	Awareness and Satisfaction	Awareness of community-based organizations (CBOs)	Survey
		Awareness of the San Joaquin Valley Proceeding (R.15-03-010)	Survey
		Awareness or participation in low income programs	Survey

Research Questions	Data Elements Section	Data Elements	Data Collection Instrument
		Effective energy saving practices	Survey
		Overall customer satisfaction	Survey
7. What factors (e.g., physical home; location; ownership status, attitudes, cultural beliefs) hinder individual households OR communities from replacing propane and wood with electricity or natural gas?	Barriers	Structural Barriers (Condition of home)	Survey, Audits, Interviews
		Non-structural barriers such as language, trust, etc	Survey, Audits, Interviews
8. What are the energy costs as reflected in the bills for alternate fuel use customers?	Energy Burden	Current Energy Costs- Propane / Wood / Oil / Other	Survey, Third Party Data Sources
		Customers' current usage levels for each household energy source (propane, wood, electricity and other fuel, to support estimating the share of local pollution generated by household sources)	Survey, Utility Data, Third Party Data Sources
	Energy Usage Impacts (per household)	Customer energy needs and perceived energy or air quality challenges (such as difficulty affording energy costs and in-home temperature comfort and air quality)	Survey, Interviews, Utility, Third Party Data Sources
		Perceived burden of energy costs	Survey, Interviews, Third Party Data Sources
		Perceived reliability of energy source	Survey, Interviews, Third Party Data Sources
9. How do these costs compare to those who have access to natural gas and electricity?	Energy Burden	Current Energy Costs- Electric	Utility Data
		Current Energy Costs- Natural Gas	Utility Data
10. What, if any, benefits, hardships and/or demographic differences exist between customers who use these alt. fuels and those who do not (e.g., health/comfort/safety benefits and sacrifices,	Non-Energy Impacts - Health/Comfort/ Safety	# of days missed at school or work	Survey, Interviews
		Criteria air pollutants reduced	Survey, Audits, Third Party Data
		Duration of lack of access to wood or propane	Survey, Interviews
		Duration of outages	Survey, Interviews, Utility Data
		GHGs reduced	Survey, Audits, Third Party Data
		Health, comfort and quality of life benefits	Survey, Interviews
		Number of times per year resident lacks access to wood or propane	Survey, Interviews

Research Questions	Data Elements Section	Data Elements	Data Collection Instrument
usage levels, usage patterns, income, demographic profiles of households, etc.)?		Outages per year	Survey, Interviews, Utility Data
		Pests such as rodents or insects	Survey, Interviews
		Public health, both inside the residence and in the community	Survey, Interviews
		Safety to the community and homes	Survey, Interviews
11. Within the DAC's what are key differences between communities "served by natural gas" and those "minimally or not served by natural gas"	Barriers	Structural Barriers (Condition of home)	Survey, Audits, Interviews
		Non-structural barriers such as language, trust, etc	Survey, Audits, Interviews
	Engagement/Access to Affordable Energy	Community capacity and interest (ex. experience with community outreach related to energy solutions, effective outreach methods).	Survey
	Energy Burden	Customers' current usage levels for each household energy source (propane, wood, electricity and other fuel, to support estimating the share of local pollution generated by household sources)	Survey, Utility Data, Third Party Data Sources
		Equipment and installation costs (to refine utility estimates)	Survey, Third Party Data Sources
		Real and perceived challenges with paying energy bills	Survey, Interviews, Third Party Data Sources
12. What energy programs or tariffs are already available to the disadvantaged communities that are expected to increase the affordability of energy? To what extent do customers take advantage of these?	Awareness and Satisfaction	Awareness or participation in low income programs	Utility Data
	Engagement/Access to Affordable Energy	ESA program measures installed	Utility Data
		ESA program measures not installed	Utility Data
		ESA remediated date	Utility Data
		Estimates of customers eligible but not participating in existing low-income programs, and interest in enrolling in low-income programs	Survey, Utility Data

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