



EM&V GROUP A – FINAL IMPACT EVALUATION

Local Third-Party Programs Evaluation, Program Year 2022

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Abbreviations and Acronyms

ACS – American Community Survey

CIS – customer information systems

EE – Energy efficiency

ESJ Plan – CPUC’s Environmental and Social Justice Action Plan

HVAC – Heating Ventilation and Air Conditioning

IDI – In-depth interview

MF – Multifamily

PA – Program Administrator

PG&E – Pacific Gas & Electric

PIP – program implementation plan

PY – Program Year

PY2021 – Program Year 2021

PY2022 – Program Year 2022

QA – Quality assurance

SCE – Southern California Edison

SCG – Southern California Gas

SDGE – San Diego Gas Electric

Glossary of key terms, abbreviations, and acronyms

California Database for Energy Efficiency Resources (DEER) – Refers to the Database for Energy Efficient Resources. This database contains information on energy-efficient technologies and measures. DEER estimates the energy savings potential for these technologies in residential and non-residential applications. DEER is used by California Energy Efficiency (EE) Program Administrators (PAs), private sector implementers, and the EE industry across the country to develop and design energy efficiency programs.¹ Available at eTRM: <https://www.caetrm.com/>.

California Energy Data and Reporting System (CEDARS) – Refers to the database that securely manages California Energy Efficiency Program data reported to the California Public Utilities Commission (CPUC) by Investor-Owned Utilities (IOUs), Regional Energy Networks (RENs), and certain Community Choice Aggregators.²

California Public Utility Commission (CPUC)³ – A state agency created by constitutional amendment in 1911 to regulate the rates and services of privately owned utilities and transportation companies. The CPUC is an administrative agency that

¹ CPUC. "Resolution E-5152." [deeresources.com](http://www.deeresources.com/files/DEER2023/Resolution%20E-5152%20DEER2023%20Complete.pdf), August 5, 2021. <http://www.deeresources.com/files/DEER2023/Resolution%20E-5152%20DEER2023%20Complete.pdf>

² California Energy Data and Reporting System (CEDARS). "Welcome to CEDARS." cedars.sound-data.com. <https://cedars.sound-data.com/>

³ CPUC. "California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals." April 2006. [\(PDF\) California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals \(researchgate.net\)](#)



exercises legislative and judicial powers; its decisions and orders may be appealed only to the California Supreme Court. The primary duties of the CPUC are to regulate privately owned utilities and secure adequate service to the public at rates that are just and reasonable to customers and shareholders of the utilities, including rates for electricity transmission lines and natural gas pipelines. The CPUC also provides electricity and natural gas forecasting, analysis, and planning of energy supply and resources. Its headquarters are in San Francisco.

Community choice aggregator (CCA) – Local government entities that procure power for residents opting to receive this service in their areas (e.g., MCE)

Contractor – A commercial entity that that installs the measures offered by EE programs.

Demand response (DR) – Demand response is a way for customers to manage their electricity demand by shifting or reducing usage during periods of peak demand.

Demand side management (DSM) – DSM encompasses a range of plans and technologies strategically used to manage and alter energy consumption levels and patterns among customers.

Depth of retrofit (DOR) – metric that measures average savings per site as a percent of site energy consumption. It gauges the degree of energy efficiency delivered by program activity.

Downstream program – An energy efficiency program with a delivery mechanism that provides incentives and technologies directly to participating customers.

Direct install program – An energy efficiency program where a contractor installs energy-saving technologies or upgrades in participating customer homes for no or low cost.

Disadvantaged community (DAC) – Refers to the areas throughout California that most suffer from a combination of economic, health, and environmental burdens.⁴

End user – A program participant who benefits directly from the EE program.

Energy Efficiency (EE) – Activities or programs that encourage customers to invest in more efficient equipment or controls that reduce energy use while maintaining a comparable level of service.

Energy efficiency measures (EEMs) – A technology or equipment whose installation and operation at a customer's premise reduces energy use.

eTRM - The eTRM is a repository of California's deemed measures, including supporting values and documentation.
<https://www.caetrm.com/>

Free-ridership – Program participants who would have installed the program measure or equipment in the absence of the program.

Gross realization rate (GRR) – the ratio of evaluated savings to claimed savings, without any adjustments for program influence.

Gross savings – Gross savings count the energy savings from installed energy efficiency measures (EEMs) irrespective of whether those savings are from free-riders, i.e., those customers who would have installed the measure(s) even without the financial incentives offered under the program.

⁴ CPUC. "Disadvantaged Communities." cpuc.gov, 2021. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/disadvantaged-communities>



Hard-to-reach (HTR) customer – The criteria for residential HTR customers is either the combination of a geographic prerequisite plus at least one of the following non-geographic criteria: primary language, income, or housing type, or meeting all three non-geographic criteria. HTR commercial customers also include factors such as business size and lease status.⁵

Heating, Ventilation, and Air Conditioning (HVAC) system – The equipment, distribution network, and terminals that provide either collectively or individually the processes of heating, ventilating, or air conditioning to a building.⁶

Implementer – A program implementer is a third-party entity contracted by a program administrator (PA) to design, implement, and deliver third-party programs.

Innovative – Within the context of third-party energy efficiency programs, an “innovative” program must ultimately increase the uptake of cost-effective energy efficiency by advancing a technology, marketing strategy, or delivery approach in a manner different from previous efforts.⁷

Integrated demand-side management (IDSM) – A strategy used to design and deliver a portfolio of demand-side management (DSM) programs to customers. DSM encompasses a range of plans and technologies strategically used to manage and alter energy consumption levels and patterns among customers.

Investor-owned utilities (IOUs) – A private company that provides a utility, such as water, natural gas, or electricity, to a specific service area. California investor-owned utilities are regulated by the CPUC.⁸

Key performance indicator (KPI) - a quantifiable measure of performance used to track progress toward goals and objectives.

Local third-party program (Local 3PP) – A program that operates within a limited territory and is proposed, designed, implemented, and delivered by a non-utility entity under contract to a utility program administrator (PA).

Measure – A technology or equipment whose installation and operation at a customer’s premise reduces energy use.

MMBtu – The sum of kWh and therm savings converted to a common unit of measure.

Net-to-gross ratio (NTGR) – A ratio or percentage of net program savings divided by gross or total impacts. Net-to-gross ratios are used to estimate and describe the free-ridership that may be occurring within energy efficiency programs.

Net savings – Refers to the savings realized when free-ridership is accounted for. Net savings are calculated by multiplying the gross savings by the net-to-gross ratio.

Overhead cost - Total Overhead, Other, and Outreach (administrative) costs reported by the programs in CEDARS.

Program Administrator (PA) – An entity tasked with the functions of portfolio management of energy efficiency programs and program choice.

Regional energy network (REN) – Local government entities that administer EE programs for residents, businesses, and institutions in their jurisdictions (e.g., BayREN, SoCalREN).

5 Specific details can be found here: [Statewide Deemed Workpaper Rulebook](#)

6 CPUC. “California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals.” April 2006. [\(PDF\) California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals \(researchgate.net\)](#)

7 CPUC. “Energy Efficiency Programs Implementation Plan Template Guidance.” cpuc.gov, May 2020. <https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/i/6442466376-implementation-plan-template-may2020.pdf>

8 CPUC. “California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals.” April 2006. [\(PDF\) California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals \(researchgate.net\)](#)



Split incentives - Occur when the party paying for the EE improvements is not the one receiving the benefits. With the landlord-tenant split incentive, the landlords pay for the capital improvements that yield energy savings, but the tenants are the ones who receive the benefits of the reduced utility costs. Therefore, property owners are not incentivized to make these capital improvements.

Stratified sampling – Stratified sampling is a type of sampling approach in which the total population is divided into smaller subgroups, or strata, to complete the sampling process. The strata are formed based on some common characteristics in the population data. After dividing the population into strata, samples are chosen randomly from each stratum in a way that is proportional to the stratum's size within the total population.

Tier 2 measures - Advanced energy efficiency technologies that can deliver higher energy consumption reduction than basic (tier 1) measures.

Total resource cost (TRC) – Measures the cost effectiveness of a program. A TRC value greater than or equal to one indicates cost effectiveness.



1 EXECUTIVE SUMMARY

This report provides DNV's impact and process evaluation of local third-party programs (local 3PPs) for program year (PY) 2022 on behalf of the California Public Utilities Commission (CPUC). A program is classified as "third-party" if it is proposed, designed, implemented, and delivered by an entity other than the utility under a contract with a utility program administrator (PA).⁹ The decision to develop a third-party program design and implementation structure was to foster innovation and cost-effective program delivery. Local 3PPs serve customers of a single utility by offering incentive levels and technologies specific to that utility.¹⁰ This is the second year DNV has completed an evaluation of local 3PPs.

The PY2022 local 3PP evaluation is crucial to monitoring how these programs perform and develop or why they fail to flourish. We examined claimed savings, savings attributed to the programs, program innovations, overall program performance, customer participation, and the equity impacts of the programs using data from PAs, program implementers (implementers), and a variety of public sources. We also engaged with non-participating customers (i.e., non-participants) to determine barriers related to program participation, as well as to gauge public interest in the programs.

1.1 Background

Local 3PPs have become a notable feature of the energy efficiency (EE) landscape in California, in part due to a decision by the CPUC regarding program administration. This 2016 CPUC decision, D. 16-08-019, mandates that investor-owned utilities (IOUs)¹¹ allocate at least 60% of their energy efficiency portfolio budgets to programs conceived and executed by third-party implementers, by the end of calendar year 2022.¹² The decision aimed to enhance the adoption of cost-effective energy efficiency through novel technologies, marketing strategies, or delivery approaches. This change is also the main driver for DNV's shift from analyzing the effectiveness of specific measures¹³ to examining the overall effectiveness of this pool of programs.

To determine the appropriate programs to evaluate, we started by reviewing all third-party programs with energy savings claims in PY2022 in the California Energy Data and Reporting System (CEDARS).¹⁴ From a pool of 121 programs, we eliminated statewide programs, programs that reported low expenditures and savings claims, programs that targeted custom projects,¹⁵ and programs that had closed or were unsolicited. As a result, we identified eight programs for evaluation in PY2022, seven of which we evaluated in PY2021.

The eight local 3PPs included in the PY2022 evaluation are:

San Diego Gas & Electric's (SDGE's) Residential Zero Net Energy Transformation Program (RZNET - SDGE4002) is a downstream¹⁶ program that targets multifamily and manufactured housing communities in SDGE's service territory. It offers measures such as Heating, Ventilation, and Air Conditioning (HVAC), water heating, and lighting.

⁹ A program administrator is an entity tasked with the functions of portfolio management of energy efficiency programs and program choice.

¹⁰ In contrast, statewide programs serve customers of multiple utilities and reflect design elements applicable to these utilities.

¹¹ A private company that provides a utility, such as water, natural gas, or electricity, to a specific service area. California investor-owned utilities are regulated by the CPUC.

¹² CPUC. "Decision Providing Guidance for Initial Energy Efficiency Rolling Portfolio Business Plan Filings." cpuc.gov, August 16, 2016.

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M166/K232/166232537.PDF>

¹³ A product whose installation and operation at a customer's premises reduces the customer's on-site energy use, compared to what would have happened otherwise.

¹⁴ CEDARS: California Energy Data and Reporting System. "Welcome to CEDARS." cedars.sound-data.com <https://cedars.sound-data.com/>

¹⁵ Custom projects are EE technologies and services that require unique calculations and do not use predefined values. These contrast with projects that use deemed savings values, which are researched, predictable, and vetted savings for EE interventions with well-established properties. Only projects with deemed savings, which fall under CPUC Group A, are within the scope of the current evaluation.

¹⁶ Downstream is a delivery mechanism that provides incentives and technologies directly to customers.



Pacific Gas and Electric Company's (PG&E's) Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009) targets federal and local government facilities and K-12 schools across PG&E's service territory. It offers downstream, direct install,¹⁷ and custom measures for a broad range of public customers.

PG&E's Multifamily Energy Savings Program (MESP - PGE_Res_003) is a multifamily¹⁸ retrofit program offering cash incentives and direct installation services to residential properties of five or more units in PG&E's service territory. It provides aerators, smart thermostats, clothes washers, and heat pump water heaters.

Southern California Gas' (SCG's) Community Language Efficiency Outreach (CLEO - SCG3861) is a residential direct install language outreach program that targets Chinese, Vietnamese, Korean, Hispanic, Indian, and African American communities in SCG's service territory. It offers in-language information and materials to promote energy efficiency. It provides measures such as aerators, smart thermostats, pipe insulation, and water heaters.

SCG's Small and Medium Commercial EE Program (SMCP - SCG3882) is a downstream program that offers a variety of commercial measures including insulation, tankless water heaters, ovens, and more. It targets hard-to-reach (HTR)¹⁹ and Disadvantaged Community (DAC)²⁰ customers in SCG's service territory.

SCG's Residential Advanced Clean Energy (Res ACE - SCG3883) is a downstream program that serves single-family homes and offers smart thermostats, water heaters, aerators, etc. It targets HTR and DAC customers in SCG's service territory.

SCG's Comprehensive Manufactured Home Program (CMHP - SCG3884) is a downstream program that targets manufactured housing customers in SCG's service territory. It offers smart thermostats, water heaters, furnaces, aerators, etc.

Southern California Edison's (SCE's) Multifamily Energy Efficiency Program (MFEEP - SCE_3P_2020RCI_004) is a multifamily program that provides a mix of measures and education opportunities to SCE customers to support deeper energy savings. It seeks to increase EE adoption in the HTR and DAC customer segments.

1.2 Research objectives

Our research objectives in this evaluation were to:

- Estimate the electric and gas savings associated with PY2022 local 3PPs.
- Estimate the proportion of program installations that would have occurred without the programs.
- Examine innovation and program performance.
- Understand participant characteristics and experiences.
- Determine program reach of underserved customer segments (i.e., HTR/DAC) and equity outcomes.
- Understand program participation barriers and gauge public interest in EE programs.

¹⁷ Direct install measures are energy-saving technologies or upgrades installed by programs for no or low cost in participating customer homes.

¹⁸ In the energy efficiency industry, multifamily programs are those designed to help property owners and managers of multifamily buildings reduce energy consumption and the cost of energy bills.

¹⁹ Hard to reach (HTR): The criteria for residential HTR customers is the combination of a geographic prerequisite plus at least one of the following criteria: primary language, income, or housing type. Commercial HTR customers are defined by a combination of a geographic requirement plus at least one of the following criteria: primary language, business size, or leased or rented facility. Specific details can be found here: [Statewide Deemed Workpaper Rulebook](#)

²⁰ Disadvantaged communities (DAC) refer to areas throughout California that most suffer from a combination of economic, health, and environmental burdens. See <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/disadvantaged-communities>



1.3 Study approach

Energy Savings. To evaluate program savings, we examined if the programs appropriately applied measure package values,²¹ including unit energy savings, used to estimate savings reported in the tracking data and verified that claimed measures were installed and operational. We revised the tracking data based on the values in the measure packages in cases where we identified inconsistencies. To verify installation of the program measures, we collected information using phone and web surveys among residential and non-residential participants and property managers.

Program Influence. Table 1-1 presents the population and sample sizes of our survey efforts. We conducted web surveys with residential participants and phone surveys with non-residential participants and property managers. We used the data collected to calculate the net-to-gross ratios (NTGRs),²² which quantify the savings attributable to the program (net savings), and to characterize participation. The sample sizes satisfy the 90/10 minimum confidence level and precision requirements.²³

Table 1-1. Survey efforts and sample size summary

Surveys	Mode	Measure population	Measures targeted	Measures completed	Attempted surveys	Completed surveys	Response rates
Residential participant	Web	44,136	532	674	4,188	377	9%
Non-residential participant	Phone	182	48	64	54	52	96%
Residential property manager	Phone	527	110	118	115	105	91%
Residential non-participant	Web	5,920,121*	1,568*	N/A	29,763	2,262	8%

*Customer population, as these were customers identified as having not participated in a program

Program performance and participant characterization. We continued to track the performance of the seven local 3PPs evaluated in PY2021 to monitor their progress year-over-year. To assess performance and characterize participants, we examined program implementation plans (PIPs) and interviewed the PAs and implementers. In addition, we reviewed the tracking data, CEDARS cost and savings filings, and key performance indicators (KPIs). We supplemented the assessment with data collected from customer surveys (referenced above), utility customer information systems (CIS), and the American Community Survey (ACS).

In particular, we assessed the programs':

- Marketing and delivery strategies
- Year-over-year performance (PY2021 to PY2022 comparison)
- Depth of retrofit (DOR)²⁴
- Innovative²⁵ program features
- Demographics and firmographic profiles

21 Measure packages contain estimates on energy savings (deemed savings values) of different technologies used in residential and non-residential settings. Energy efficiency programs use deemed savings values to make savings claims. Database for Energy Efficient Resources (DEER) available at eTRM: <https://www.caetrm.com/> provides deemed savings and other measure package information.

22 Net savings are the savings attributable to an energy efficiency program. Net-to-Gross ratios (NTGRs) are used to estimate and describe the "free-ridership" that may be occurring within energy efficiency programs. NTGR is the degree to which participating customers would have installed the technology or equipment without the program benefits. Gross savings are multiplied by the NTGR to arrive at net savings.

23 90/10 is a common evaluation criterion requiring that the research achieves 90% confidence that an estimated metric, such as NTGR, falls within 10% of the true value to provide a statistically valid outcome.

24 The DOR metric measures average savings per site as percent of site energy consumption. It gauges the degree of energy efficiency delivered by program activity.

25 Within the context of third-party energy efficiency programs, an "innovative" program must ultimately increase the uptake of cost-effective energy efficiency by advancing a technology, marketing strategy, or delivery approach in a manner different from previous efforts. More information can be found in the CPUC "Energy Efficiency Programs Implementation Plan Template Guidance," cpuc.gov, May 2020, <https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/i/6442466376-implementation-plan-template-may2020.pdf>



Equity. We evaluated each local 3PP's progress related to equity by applying frameworks established for the energy industry.²⁶ Based on these frameworks, we examined the following three dimensions of equity:

- Procedural equity: The extent to which programs targeted, engaged, and incorporated community input.
- Distribution equity: The extent to which programs served vulnerable communities to ensure the equitable distribution of program benefits.
- Structural or recognition equity metrics: The extent to which programs created benefits that reflect a recognition of historical, cultural, and institutional dynamics that have resulted in clean energy inequities among DACs and HTR communities.

To assess program progress as related to equity, DNV examined the PIPs, conducted PA and implementer interviews, and assessed the KPIs related to equity topics including DACs and HTR customers. DNV also examined equity outcomes through participation analysis by different customer groups.

1.4 Key findings

1.4.1 Gross and net impacts

In general, the programs applied measure package values appropriately to calculate claimed savings. In the few cases where there were discrepancies between the measure package values and tracking data, DNV updated utility-reported values to reflect the correct measure package values. These updates resulted in minor modifications of claimed gross savings.²⁷

Table 1-2 provides the total gross claimed and achieved (evaluated) electric and gas savings.²⁸ Local 3PPs achieved 8,615,609 kWh of gross electric savings, which is 98% of the total claimed gross savings (gross realization rate (GRR)).²⁹ They also achieved 2,589,346 therms of gross gas savings, which is a GRR value of 92%. Evaluated NTGRs, which represent the extent to which programs influenced participation based on program participant survey responses, indicate program attribution to be relatively high or on par with claimed values.

Table 1-2. Total Local 3PP energy savings, PY2022

Fuel	Total Gross Claimed Savings	Total Gross Evaluated Savings	Gross Realization Rate	Claimed NTGR	Evaluated NTGR	Total Net Evaluated Savings
Electric (kWh)	8,820,662	8,615,609	98%	95%	94%	8,085,579
Gas (therm)	2,824,118	2,589,346	92%	61%	85%	2,196,017

1.4.2 Program performance

The assessment of program design, marketing and outreach, and delivery activities form the cornerstone of our program performance evaluation. We focused on program delivery and innovations in the following sections.

1.4.2.1 Program delivery

One of the ways we continued to track and measure program delivery progress is by examining local 3PPs' ability to deliver savings cost-effectively. To do this, we compared their PY2021 and PY2022 spending and energy delivery metrics, including

²⁶ School for Environment and Sustainability-University of Michigan. "Energy Equity Project Report." energyequityproject.com, 2022. https://energyequityproject.com/wp-content/uploads/2022/08/220174_EEP_Report_8302022.pdf. ACEEE. "Leading with Equity: Centering Equity across ACEEE's Scorecards." aceee.org, <https://www.aceee.org/energy-equity-initiative>

²⁷ Gross savings are a measure of change in energy use due to energy efficiency programs, regardless of why customers participated.

²⁸ Negative kWh and therm savings reflect electric or gas use increases associated with some or all measures installed by the programs.

²⁹ Gross realization rate is the ratio of evaluated savings to claimed savings, without any adjustments for program influence.



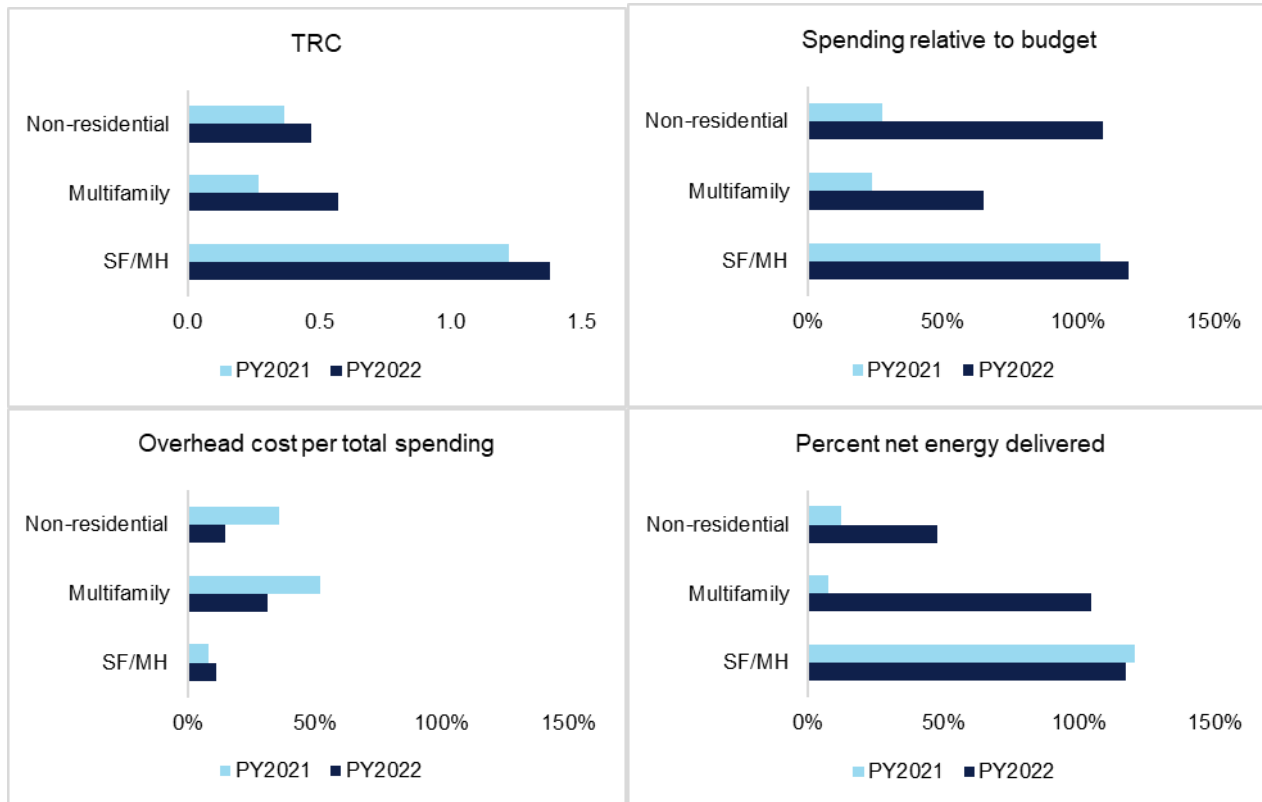
TRC (total resource cost), contracted budget versus claimed spending, the share of overhead spending, and the amount of planned versus claimed net energy (percent net energy delivered), as shown in Figure 1-1.

Underperforming programs have improved. Non-residential local 3PPs performed better than their goals and the prior program year. Implementers delivering these programs in PY2022 spent and achieved energy savings closer to planned levels than in PY2021 and reduced their percent spending on overhead activities. In PY2021, implementers delivering these programs underspent their budget and under-delivered energy savings relative to planned levels. They also spent a relatively large proportion (over 15%) of their total budget on overhead activities resulting in a TRC (cost-effectiveness) value of less than one.³⁰

These numbers indicate that the local 3PPs that struggled to become established during the ramp-up period (i.e., PY2021) are finding traction in the marketplace. Implementers of these programs reported their success is tied to more effective outreach methods, such as strategic partnerships with local government bodies, enabling them to run more effective programs.

Well-performing programs are stable. The residential local 3PPs serving either single or manufactured homes performed as planned, both in their spending and energy savings delivery, and were cost-effective in both program years. The one exception among this set - SCG's Community Language Efficiency Outreach (CLEO - SCG3861) - had experienced a ten-fold increase in its operations as it became a full-fledged third-party implemented program, resulting in a mixed performance in both program years.

Figure 1-1 Comparison of PY2021 and PY2022 Local 3PP cost and savings performance by customer segment



³⁰ TRC measures the cost effectiveness of a program. A TRC value greater than or equal to one indicates cost effectiveness.



Multifamily programs face steep challenges. Although some performance indicators for PG&E's Multifamily Energy Savings Program (MESP - PGE_Res_003) have improved significantly – such as TRC and the percent of net energy delivered—in PY2022 compared to PY2021, this program closed in the middle of 2023.³¹ SCE's Multifamily Energy Efficiency Program (MFEET - SCE_3P_2020RCI_004), which started operating in PY2022, also ceased operations in 2022. The program implementers reported a myriad of issues resulting in their inability to succeed, including limited or reduced measures available to implement (in particular, lighting), difficulty in recruiting customers, including limitations imposed by the pandemic, competition from other PA programs with similar offerings, limited direct install budgets, and split incentives³².

Specific examples of challenges include:

- Split incentives: Interviewed participating property managers indicated that they put lower emphasis on tenant unit installations than on common area ones due to the benefits accruing to tenants and not to the property owners.
- Competition: Implementers indicated they faced competition from MCE in the North Bay, BayREN in nine Bay Area counties, and SoCalREN in southern California.³³
- Limited direct install budget: Implementers noted that smaller-sized contracts limited the implementer budget and staffing for direct install offers, which impacted program success.

Addressing the challenges local 3PPs face to serve this customer segment will be critical to ensure renters receive benefits from state EE resources and multifamily buildings contribute to the state's climate goals by becoming more energy efficient.

1.4.2.2 Program innovation

One rationale for third-party program design and implementation was to spur innovation through competitive EE service provision. Local 3PPs have reported deploying innovative strategies to engage prospective customers, improve program offerings and delivery, and track progress based on the framework for innovation and definitions provided in the CPUC EE Program Implementation Plan Template Guidance.³⁴

Our evaluation did not assess the merit of the innovations local 3PPs have deployed but sought to determine their effectiveness. As part of this effort, we first identified and categorized these innovations based on reviews of PIPs and implementer interviews. We then used information from implementer interviews and KPIs to assess their effectiveness.

Marketing and Outreach Innovation. DNV identified four broad marketing and outreach innovations that started in PY2021 and continued in PY2022. These include:

- Data-driven methods: Analytical approaches that emphasize targeted marketing
- Digital-and-phone-based approaches: Delivery of targeted messages (for example, through multilingual program collateral outreach in communities where English is not the primary language)
- Partnerships: Partnerships with local government, trade allies, and other entities

³¹ PG&E's Multifamily Energy Savings Program's (MESP - PGE_Res_003) therm savings improved year-over-year and it also exceeded its PY2022 therm savings goals. However, its kW and kWh savings decreased year-over-year and it also fell far short of its kW or kWh savings goals for PY2022.

³² Split incentives occur when the party paying for the EE improvements is not the one receiving the benefits. With the landlord-tenant split incentive, the landlords pay for the capital improvements that yield energy savings, but the tenants are the ones who receive the benefits of the reduced utility costs. Therefore, property owners are not incentivized to make these capital improvements.

³³ MCE is a community choice aggregator (CCA), and BayREN and SoCalREN are regional energy networks that provide EE interventions in their respective areas. CCAs are local government entities that procure power for residents opting to receive this service in their areas. RENs are local government entities that administer EE programs for residents, businesses, and institutions in their jurisdictions.

³⁴ CPUC, "Energy Efficiency Programs Implementation Plan Template Guidance," cpuc.gov, May 2020, <https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/i/6442466376-implementation-plan-template-may2020.pdf>



- Direct outreach: Home walkthroughs and audits, and community events designed to engage customers directly and enhance program participation

Some of the identified innovations mirrored traditional marketing methods like phone-based and direct outreach ones commonly employed by utilities. Other approaches such as data-driven strategies and strategic partnerships, though not entirely novel, tested new avenues to enhance program engagement.

Among these, direct outreach (audits and in-language community events) and strategic partnership (collaboration with local governments) innovations were the most effective thus far based on implementer interviews in different program sectors. However, only four of the eight programs reported KPIs related to marketing and outreach innovations, with only one program providing KPI results. Similar to PY2021 evaluation findings, there was still insufficient data, resulting in difficulty tracking and assessing quantitative outreach performance. As a result, it is challenging to infer the success of the outreach innovations identified as being effective thus far.

Delivery Innovation. Local 3PP delivery innovations also focused on four broad areas in both program years, including:

- Improved data collection and program management tools and processes
- Customer education and engagement initiatives
- Introduction of measures and EE solutions
- Facilitation of financing options

These innovations aimed to improve program management and pursue deeper energy savings³⁵ and ongoing energy efficiency improvements. DNV evaluated the effectiveness of the identified delivery innovations based on their ability to succeed in these areas. Delivery innovation KPIs that the programs most commonly reported focused on the ability of programs to complete a higher proportion of total EE projects with deeper energy savings and to enroll customers in demand response (DR)³⁶ and integrated demand-side management (IDSM)³⁷ programs. In PY2022, as local 3PPs continued to ramp up their activities, innovations and the available KPIs related to program delivery reflected the progress in these areas.

While the KPIs are few, the available evidence indicates that delivery innovations have had a mixed impact. Some programs reported success in attaining their goals of increasing the numbers of EE projects that deliver deeper energy savings and increasing DR/IDSM program enrollments while other programs did not meet their goals. As noted in the PY2021 evaluation report, innovations to achieve broad and sustained deeper savings will take time. Given the heightened focus on ensuring deeper savings, tracking this progress will be critical as local 3PPs mature.

1.4.2.3 Customer participation

The PY2022 evaluation continued to track the characteristics of the customers the local 3PPs served to understand their market reach and compare them to the previous year's outcomes. Figure 1-2, which demonstrates this comparison, indicates that the performance of local 3PPs remained consistent year-over-year with improved reach of DAC customers in PY2022.

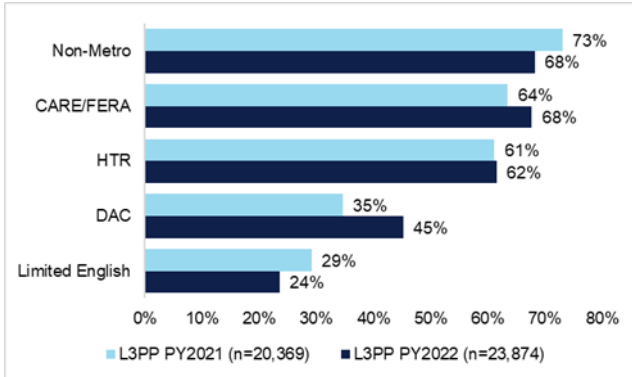
35 Deeper energy savings aim to install measures or undertake comprehensive EE projects that reduce a higher percentage of energy consumption, for example, through efficient water heaters, than small water heating saving measures like aerators.

36 Demand response is a way for customers to manage their electricity demand by shifting or reducing usage during periods of peak demand.

37 Integrated demand-side management (IDSM) is a strategy used to design and deliver a portfolio of demand-side management (DSM) programs to customers. DSM encompasses a range of plans and technologies strategically used to effectively manage and alter energy consumption levels and patterns among customers.



Figure 1-2. Local 3PP customer characteristics, PY2021 and PY2022



Multifamily participation. The two multifamily programs that were active in both PY2021 and PY2022 – SDGE’s Residential Zero Net Energy Transformation Program (RZNET - SDGE4002) and PG&E’s Multifamily Energy Savings Program (MESP - PGE_Res_003) – improved their reach of low-income renters in multifamily buildings in PY2022, serving one-third to two-thirds of such customers compared to less than a quarter in PY2021.³⁸

Residential participants. PY2022 local 3PP residential participants were mostly homeowners with a median income of \$39,440, which is less than 50% of the California median income. Most were non-Hispanic and White, although around one-third of HTR residential customers were Hispanic. Participants primarily own the single-family houses or manufactured homes they live in. More residential HTR than non-HTR participants experienced energy insecurity, with higher proportions needing to choose between buying necessities or keeping their homes at unsafe temperatures in the last 12 months. These levels of energy insecurity, particularly among these demographics, are similar to those noted in the PY2021 local 3PP evaluation.

Non-residential participants. In PY2022, local 3PPs commercial sector participants were primarily dry-cleaning businesses, though some were hotels, with one to nine employees, that mainly spoke English in the workplace. The public program served a combination of schools, community centers, and federal and local government facilities. More than half of the public organizations had 25 or more employees who primarily speak English. As with the residential customers, the firmographic profile of non-residential customers in PY2022 was similar to those served in PY2021.

1.4.2.4 Equity evaluation

Local 3PP implementers designed their programs before roadmaps for equity (including the Michigan and ACEEE frameworks and the CPUC’s Environmental and Social Justice Action Plan (ESJ Plan)) were in place. Procedural equity requires involving HTR and DAC members in program planning and decision-making. While two of the eight evaluated programs reported collecting community input, none of them documented these efforts or collected metrics related to them. The local 3PPs achieved equitable distribution of benefits across demographic groups, mostly meeting distributional equity. In PY2022, local 3PPs served higher proportions of customers in lower income categories, customers in areas with limited English proficiency, and HTR and DAC customers compared to the statewide average of households in these categories. Additionally, HTR customers received a higher proportion of program energy savings compared to the proportion of their energy consumption (61% compared to 57%). Except for one program, all local 3PPs are resource acquisition and prioritize cost-effective energy savings over equity goals. However, seven of eight evaluated programs indicated they have HTR/DAC

³⁸ Our analysis in PY2021 indicated gaps in the programs’ reach of populations living in multifamily rental buildings, with the programs serving no more than 20% of such populations.



KPIs. The pattern of findings suggests that the programs are achieving distributional equity, could somewhat improve on structural/recognition equity, and need improvement on procedural equity.

1.5 Key findings and recommendations

Table 1-3 summarizes DNV’s key findings, implications, and recommendations for this evaluation.

Table 1-3. Key findings and recommendations

Key findings	Implications and recommendations
<p>1. Program attribution is high or on par with claimed values, indicating the programs are reaching the intended population segments. Program delivery performance also improved or remained stable. Programs that had difficulties meeting energy savings and spending goals and were cost-ineffective in PY2021 performed better in PY2022. Programs that performed well in all three areas continued to do so in PY2022.</p>	<p>Other programs should consider emulating the strategies these programs have taken to achieve success, including offering measures that better align with customer preferences, such as electrification and deeper gas usage-saving measures, and employing more effective outreach strategies, such as direct multi-language outreach and community engagement (e.g., events).</p>
<p>2. Multifamily programs run by implementers of local 3PPs face systemic challenges that have resulted in the closure of two of these programs. Challenges included the inability to make inroads in the multifamily sector, possible competition from other PAs, inadequate funds for direct install activities, and limited measure options that programs can offer participants.</p>	<p>PAs could consider offering multifamily programs as equity rather than resource acquisition programs. Such an approach would allow them to provide higher incentives to property owners that reduce split incentive barriers and offer more measures attractive to multifamily participants. They could also consider requiring core measures for tenant units to improve renter equity.</p>
<p>3. There is inadequate data (KPIs) to track the impact of local 3PP innovations.</p>	<p>Given the heightened focus on innovation, PAs should develop and require standardized metrics to record and track the success of local 3PP innovations in all areas, including outreach and program delivery. For example, programs should track their outreach efforts: when, where, what, how, and who they reached.</p>
<p>4. The program implementers did not track efforts to obtain input from HTR/DAC communities, making it impossible to evaluate their efforts at procedural equity.</p>	<p>Track efforts to obtain input from HTR/DAC communities and track HTR/DAC community input. It is essential to track when outreach includes two-way communication that allows communities to provide feedback.</p>
<p>5. Outreach performance of local 3PPs to HTR customers and DACs remained consistent year-</p>	<p>Existing and developing local 3PPs should take note of the marketing and outreach innovations that have continued to</p>



Key findings	Implications and recommendations
<p>over-year with improved reach of DAC customers in PY2022.</p>	<p>work for this pool of programs year-over-year: direct outreach and strategic partnerships.</p>
<p>6. The evaluated programs do not meet all the equity standards embedded in the CPUC ESJ goals and other equity frameworks because the programs were designed and contracted before any equity plans were in place.</p>	<p>The next time PAs negotiate contracts with local 3PP implementers, they should include terms that cover a standardized equity framework.</p>



2 INTRODUCTION

2.1 Evaluation background

This report provides DNV's impact and process evaluation of local third-party programs (local 3PPs) for program year (PY) 2022 on behalf of the California Public Utilities Commission (CPUC). Third-party energy efficiency programs in California are a direct result of the CPUC Decision 16-08-019, which established the framework for these programs³⁹ and required the program administrators (PAs) to designate 60% of their energy efficiency budgets for programs designed and implemented by third parties by the end of 2022.⁴⁰ "Third-party" programs are proposed, designed, implemented, and delivered by an entity (other than the utility) under a contract with a utility program administrator (PA). The third-party program design and implementation structure is meant to encourage cost-effective program delivery and innovation in areas such as program delivery, design, and outreach. These programs serve customers of a single utility by offering incentive levels and technologies specific to that utility.⁴¹

2.2 Local third-party programs included in evaluation

For the PY2022 evaluation, DNV selected eight local 3PPs, including seven programs that were part of the PY2021 evaluation. Additionally, DNV included one Southern California Edison (SCE) multifamily program, SCE_3P_2020RCI_004 (MFEFP). The following section provides summaries of the programs included in PY2022's evaluation based on information provided in program implementation plans (PIPs) and supplemental information provided by the PAs. Local 3PPs targeted various market segments; out of the eight programs assessed in this evaluation, six focused on the residential market, one exclusively targeted public sector organizations, and one served the commercial sector.

2.2.1 Overview of local third-party programs

DNV evaluated local third-party programs for PY2021, making this the second evaluation of these programs. In the PY2021 evaluation seven programs were selected based on the availability of data and the status of their program activities.

DNV used a similar approach to select programs for the PY2022 evaluation as the one deployed in the PY2021 evaluation. To identify the appropriate local 3PPs to evaluate, we started by reviewing the PY2022 claims data in CEDARS.⁴² In May 2023, there were 121 third-party programs with PY2022 claims. We excluded 67 of the programs that were designated as state-wide (i.e., not local). From the remaining 54 third-party programs, we eliminated 38 due to low expenditures and savings claims. In addition, there were two programs (PGE_Ind_002 and SDGE4012) with non-deemed savings claims, which put them outside the scope of a Group A evaluation. We also eliminated one program that ended in PY2022, two programs that were not solicited, and three commercial programs that are part of Group A's PY2022 Commercial Third-Party Programs evaluation. This resulted in a final selection of eight programs to evaluate for PY2022.

2.2.2 Residential programs

This assessment included six residential programs. Among these programs, two exclusively served multifamily properties, three served single family properties, while one served both the single family and multifamily market segments. Below are summaries of the residential programs we evaluated.

1. **San Diego Gas & Electric's (SDGE's) Residential Zero Net Energy Transformation Program (RZNET - SDGE4002)** is a downstream program that targets multifamily and manufactured housing communities in SDGE's

39 CPUC. "Decision 16-08-019" cpuc.ca.gov, August 18, 2016. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M166/K232/166232537.PDF>

40 Ibid

41 In contrast, statewide programs serve customers of multiple utilities and reflect design elements applicable to these utilities.

42 CEDARS: California Energy Data and Reporting System. "Welcome to CEDARS." cedars.sound-data.com <https://cedars.sound-data.com/>.



service territory. It offers measures such as Heating, Ventilation, and Air Conditioning (HVAC), water heating, and lighting.

2. **Pacific Gas & Electric's (PG&E's) Multifamily Energy Savings Program (MESP - PGE_Res_003)** is a multifamily retrofit program offering cash incentives and direct installation services to residential properties of five or more units in PG&E's service territory. It provides aerators, smart thermostats, clothes washers, and heat pump water heaters.
3. **Southern California Gas Company's (SCG's) Residential Advanced Clean Energy (Res ACE - SCG3883)** is a downstream program that serves single-family homes and offers smart thermostats, water heaters, aerators, etc. It targets hard-to-reach (HTR)⁴³ and Disadvantaged Community (DAC)⁴⁴ customers in SCG's service territory.
4. **SCG's Comprehensive Manufactured Home Program (CMHP - SCG3884)** is a downstream program that targets manufactured housing customers in SCG's service territory. It offers smart thermostats, water heaters, furnaces, aerators, etc.
5. **Southern California Edison's (SCE's) Multifamily Energy Efficiency Program (MFEEP - SCE_3P_2020RCI_004)** is a multifamily program that provides a mix of measures and education opportunities to SCE customers to support deeper energy savings. It seeks to increase EE adoption in the HTR and DAC customer segments.
6. **SCG's Community Language Efficiency Outreach (CLEO - SCG3861)** is a residential direct install language outreach program that targets Chinese, Vietnamese, Korean, Hispanic, Indian, and African American communities in SCG's service territory. It offers in-language information and materials to promote energy efficiency. It provides measures such as aerators, smart thermostats, pipe insulation, and water heaters.

2.2.3 Public program

We evaluated one public sector program that operated in PY2022. This program also operated in PY2021 and continued to target similar customers in PY2022.

7. **PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009)**: targets federal and local government facilities and K-12 schools across PG&E's service territory. It offers downstream, direct install, and custom measures for a broad range of public customers.

2.2.4 Commercial program

Finally, we performed an assessment of one commercial sector program in PY2022, which also operated and provided service to similar customers in PY2021.

8. **SCG's Small and Medium Commercial EE Program (SMCP - SCG3882)**: is a downstream program that offers a variety of commercial measures including insulation, tankless water heaters, ovens, and more. It targets HTR and DAC customers in SCG's service territory.

43 Hard-to-reach (HTR): The criteria for residential HTR customers is the combination of a geographic prerequisite plus at least one of the following criteria: primary language, income, or housing type. Commercial HTR customers are defined by a combination of a geographic requirement plus at least one of the following criteria: primary language, business size, or leased or rented facility. Specific details can be found here: [Statewide Deemed Workpaper Rulebook](#)

44 Disadvantaged communities (DACs) refer to areas throughout California that most suffer from a combination of economic, health, and environmental burdens. See <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/disadvantaged-communities>



2.3 Reported gross and net savings

Table 2-1 presents the PY2022 claimed electricity and gas savings for seven of the selected local 3PPs. SCE's Multifamily Energy Efficiency Program's (MFEEP - SCE_3P_2020RCI_004) gross⁴⁵ or net savings⁴⁶ are not included in the table below since the program was discontinued in 2022.

The negative savings values in the table reflect electric or gas penalties associated with measures that save consumption of one fuel but have small associated increases of the other fuel. For example, the SCG Small and Medium Commercial EE Program (SMCP - SCG3882) installed tankless gas water heaters that saved gas consumption but used a minimal amount of electricity draw that the program reported as electric dissavings.

Table 2-1. Local 3PPs' kW, kWh, and therm claims

Program name	No. of claims	First year kW		First year kWh		First year therm	
		Gross	Net	Gross	Net	Gross	Net
Res ACE - SCG3883	37,036	2,193	2,083	2,419,881	2,299,037	367,438	334,167
CMHP - SCG3884	6,102	508	483	1,019,052	968,176	84,833	74,393
RZNET - SDGE4002	2,649	378	338	1,062,613	817,094	1,538,060	828,006
MESP - PGE_Res_003	127	0	0	7,195	7,195	584,804	321,642
CLEO - SCG3861	9,819	0	0	36,856	35,080	61,801	52,702
GK12 - PGE_Pub_009	146	41	31	4,284,041	4,215,534	-1,173	-777
SMCP - SCG3882	1018	-1	-1	-8,975	-5,412	188,356	120,151
Total	56,897	3,119	2,934	8,820,662	8,336,704	2,824,118	1,730,285

2.4 Evaluation objectives

Previously, DNV evaluated the local third-party programs for PY2021, making it the first year of evaluation for these programs. The report offered insights into how the programs performed against their defined goals and relative to peer programs that they replaced. The PY2021 evaluation also looked at the various strategies local 3PPs used for outreach and delivery, including innovative strategies, establishing a foundation for understanding how local 3PPs functioned. The PY2022 evaluation focuses on building on the lessons learned from the previous year, examining how these programs are meeting their goals, and comparing their performance to PY2021. With two years of data available for seven of the local 3PPs, we can undertake a year-over-year comparison. Furthermore, the PY2022 evaluation offers an opportunity to assess an additional program that had not previously been evaluated.

The primary objectives of this evaluation were to:

- Estimate the electric and gas savings associated with PY2022 local 3PPs.
- Estimate the proportion of program installations that would have occurred without the programs (e.g., net savings).
- Examine innovation and program performance.
- Understand participant characteristics and experiences.
- Determine program reach of underserved customer segments (i.e., HTR/DAC) and equity outcomes.
- Understand program participation barriers and gauge public interest in EE programs.

⁴⁵ Gross savings count the energy savings from installed energy efficiency measures (EEMs) irrespective of whether those savings are from free-riders, i.e., those customers who would have installed the measure(s) even without the financial incentives offered under the program.

⁴⁶ Net savings refer to the savings realized when free-ridership is accounted for. Net savings are calculated by multiplying the gross savings by the net-to-gross ratio.



3 METHODOLOGY

In this section, we provide a broad overview of the data sources and methods deployed to evaluate the selected local 3PPs.

3.1 Data sources

DNV used various datasets from both primary and secondary sources. Table 3-1 below summarizes these datasets and their respective applications within the report. The report relied heavily on data to calculate the net-to-gross ratios (NTGRs),⁴⁷ establish participant characteristics, and evaluate program performance.

Table 3-1. Summary of data sources and purpose in evaluation

Data	Description	Purpose in analysis
Program tracking data	Tracking data that PAs filed with the CPUC in CEDARS. Provides program names, measures, number of claims, savings per measure and claim, incentives, etc.	Identify program participants, installed measures, and calculate claimed (ex-ante) savings
Utility billing data	Offers customer energy consumption data (kWh and therms) and bill rates	Assess program performance, analyze customer participation trends, and evaluate energy usage patterns
PA Customer Information System (CIS) Data	Contains details on customer characteristics such as housing type, zip code, and climate zone	Analyze participant demographics, geographic distribution, and housing preferences for targeted program outreach
U.S. Census Data	Provides block group level data on language, geographic region, and rental status from the American Community Survey (ACS)	Analyze demographic information, geographic factors, and rental status influencing program participation
U.S. Office of Management and Budget (OMB) Data	Defines Core-based statistical areas (CBSAs) for metro and non-metro areas	Classify areas into metro and non-metro categories, allowing regional analysis of program reach and effectiveness
Data Axle	Database source containing company details such as size, revenue, location, NAICS code, etc.	Analyze corporate data to understand the impact of company size and revenue on program participation
California Environmental Protection Agency (CalEPA) Data	Provides CalEnviroScreen data measuring economic, health, and	Analyze environmental and economic factors affecting program participation,

⁴⁷ Net savings are the savings attributable to an energy efficiency program. Net-to-Gross ratios (NTGRs) are used to estimate and describe the “free-ridership” that may be occurring within energy efficiency programs. NTGR is the degree to which participating customers would have installed the technology or equipment without the program benefits. Gross savings are multiplied by the NTGR to arrive at net savings.

Data	Description	Purpose in analysis
	environmental burdens at the census tract level	focusing on areas with higher burdens for targeted interventions
Program information	Includes supplemental participant information (account number, contact name, email, and phone number) and details on replaced and installed measures	Verify gross savings, assess program performance, analyze participant engagement, and understand the effectiveness of installed measures in energy conservation
Telephone/web surveys	Web surveys with residential participants and non-participants, and phone surveys with non-residential and property manager participants and contractors	Inform NTGRs and net savings, verify installations, assess program performance, and gather insights into participant experiences and feedback
In-depth interviews	Interviews PA program staff and implementers to gather information on program design, performance, and outreach efforts. Interviews SCE customers to gain insight into the multifamily program	Verify installations, assess program performance, analyze participation, and gain qualitative insights into program effectiveness and stakeholder perspectives

3.2 Primary research

3.2.1 Data collection

DNV relied on primary data to conduct a comprehensive assessment for PY2022. Our approach to primary data collection focused on inputs from program actors including program administrators, implementers, contractors, and residential and non-residential customers. DNV utilized web surveys, phone surveys, and virtual in-depth interviews as primary data collection methods. Table 3-2 below provides a snapshot of the various methods employed for data collection. The table further outlines the frame source, mode, stratification approach, and sample size employed in the data collection for the local 3PP evaluation.

Table 3-2. Summary of primary data collection efforts – evaluation of PY2022 local 3PPs

Target group	Data collected	Frame source	Mode	Stratification approach	Targeted sample size
PAs and implementers	Program design and outreach, program innovation, program spending and incentives, customer participation trends, and KPIs	All utility program information	In-depth interviews	N/A	Census ⁴⁸
Contractors	Program effectiveness, experience, and market characteristics	Implementer information	Phone survey	N/A	Census

⁴⁸ We conducted interviews with four IOUs and the implementers that designed and ran the local 3PPs offered to the IOU customers.

Target group	Data collected	Frame source	Mode	Stratification approach	Targeted sample size
Public sector participant	Program influence – NTG, participant characteristics, program awareness, experience, and barriers, and participation in other programs	Program tracking data	Phone survey	Program measures installed	n=54
Commercial participant	Program influence – NTG, participant characteristics, program awareness, experience, and barriers, and participation in other programs	Program tracking data	Phone survey		
Property manager participant	Program influence – program awareness, experience, and barriers, and participation in other programs	Program tracking data	Phone survey	N/A	n=115
			In-depth interviews		n=3
Residential participant	Program influence – NTG, demographic data, occupancy, program awareness and experience, and participation in other programs	Program tracking data	Web survey	Program, HTR/DAC, climate zone	n=4,188
Residential customers not enrolled in programs (non-participants)	Program awareness/knowledge and interest, energy practices and projects, PA satisfaction, and demographics		Web survey	Building type, utility, and consumption magnitude	n=29,763

3.2.2 Sample design

For primary data collection, our sample design was based either on a census approach or a stratified random sample. Under the census approach (used to collect information from contractors), we attempted to collect data for each unit in the population. Under the stratified sampling approach (used for non-residential end users, residential end users, residential non-participants, and property managers), sample units are selected for the study from groups of interest (e.g., program and measure group). These were then grouped into strata based on savings, measured in btu. We determined sample sizes necessary for each program to achieve a targeted relative precision ($\pm 10\%$) at a desired level of confidence (90%). Once the sample sizes were calculated, sample points were randomly chosen from the population based on the stratification plan. In addition, backup sample points were selected in case any primary sample points needed to be replaced due to unit nonresponse. Replacement happened with sites that could not be contacted, refused participation, or that could not be evaluated for some other reason. Appendix E (section 6.5) provides the details.

The tracking data summarized in Table 3-3. provides the number of claims and participants by survey participant type and program used in the PY2022 evaluation. The number of participants in the table provides population sizes that are the sources of all the survey sample frames.



Table 3-3. Local 3PPs survey type, number of participants, and savings

Survey type	Program	No. of claims	No. of participants	First year gross kW savings	First year gross therm savings	First year gross kWh savings
Residential end-user survey	Res ACE - SCG3883	37,036	16,093	2,193	367,438	2,419,881
	CMHP - SCG3884	6,102	2,742	509	84,833	1,019,052
	CLEO - SCG3861	9,819	3,340	-1	61,801	36,856
Residential property manager survey	RZNET - SDGE4002 (Mobile Home Participants)	2,030	947	372	30,048	662,238
	RZNET - SDGE4002 (Multifamily Participants)	619	398	6	1,508,012	400,375
	MESP - PGE_Res_003	127	127	0	584,804	7,195
Non-residential end-user survey	GK12 - PGE_Pub_009	146	124	41	-1,173	4,284,041
	SMCP - SCG3882	1,018	103	-1	188,356	-8,975
TOTAL		56,897	23,874	3,119	2,824,118	8,820,662

3.2.3 Survey approach

DNV used web and telephone surveys to collect data vital to estimate free-ridership. Survey data also enabled us to obtain valuable insights into participant experience, satisfaction, interests, and characteristics, including participant demographics and firmographics (Table 3-4). The survey instruments used for data collection are provided in Appendix I or section 6.9.

Table 3-4. PY2022 Local 3PP survey topics among market actors

Survey topics	Residential end user	Residential non-participant	Non-residential end user	Property manager	Contractor
Free-ridership					
Equipment verification	•		•	•	
Measure specific free-ridership questions	•		•	•	
Program outreach and participation					
How participants first heard about the program	•	•	•	•	•
Preferred means of learning about programs	•	•	•	•	•
Drivers of program participation	•		•	•	
Effectiveness of rebates and incentives			•		•
Equipment availability/size					•
Program experience/satisfaction/interest					
Awareness/interest in programs		•			
Information provided	•		•	•	
Perceived program benefits	•		•		
Program satisfaction	•		•	•	•
Barriers	•	•	•	•	



Survey topics	Residential end user	Residential non-participant	Non-residential end user	Property manager	Contractor
Clean tech adoption					
Use of and interest in clean energy products	•	•	•		
Participation and interest in demand response programs	•		•		
Demographics/firmographics					
Home/facility ownership status	•	•	•		
Facility/company size			•	•	
Facility age				•	
Housing affordability				•	
Building/facility type			•	•	
Number of employees			•		
Primary language in home/at facility	•	•	•		
Participant characteristics: Race, ethnicity, income, education	•	•			
Energy security	•	•			

3.2.3.1 Survey mode and disposition

Residential end user surveys: We carried out an online survey for residential end users who participated one of the following programs: SCG’s Residential Advanced Clean Energy (SCG3883), Comprehensive Manufactured Home (SCG3884), Community Language Efficiency Outreach (SCG3861), and SDGE’s Residential Zero Net Energy Transformation (SDGE4002). These programs were aimed at single and manufactured/mobile home residential customers.

We conducted the web-based survey over a period of roughly 4 weeks from December 2023 to January 2024. The survey sample was drawn from a list of program participants who had provided email addresses. The survey questions and invitation email were written in both English and Spanish. To incentivize survey participation, we offered a chance to win one of six \$150 gift cards and sent four reminders to prompt participants to complete the survey. The results of the residential end user survey are summarized in Table 3-5.

In conducting this survey, DNV adhered to established best practices, which included:

- Giving respondents a link to the CPUC valid survey website to verify the authenticity of the survey
- Displaying the CPUC and IOU logos on the survey for co-branding
- Sending the survey invitation from an email address within the IOU domain to avoid being caught in spam filters
- Including a letter from the CPUC study manager emphasizing the importance of this research and participant responses to energy efficiency programs

Table 3-5. Sample disposition for residential end user web surveys

Residential end users	Total	RZNET - SDGE4002 (Mobile home)	CLEO - SCG3861	Res ACE - SCG3883	CMHP - SCG3884
Invitation emails sent	4,188	433	669	2,808	278
Partially completed surveys	178	33	36	93	16
Completed surveys	377	51	72	214	40
Response rate	9.0%	11.8%	10.8%	7.6%	14.4%



Residential non-participant survey: We also conducted a web survey with SCE and SDGE customers who were identified as having not enrolled in IOU energy efficiency programs, including the evaluated local 3PPs. This effort was used to understand customers' awareness of the programs, gauge interest in programs and energy saving practices, and assess their satisfaction with their IOU.

We conducted the survey over a period of roughly 6 weeks from November 2023 to January 2024. The survey sample included a cross section of residential customers residing in single family, multifamily, and mobile home housing types. The survey questions and invitation email were written in both English and Spanish. To incentivize participation, we offered a chance to win one of six \$100 gift cards and sent four email reminders to prompt program non-participants to complete the survey. The results of the residential non-participant survey are summarized in Table 3-6.

Table 3-6. Sample disposition for non-participant residential web surveys

Residential non-participants	Total	SCG customers	SDGE customers
Invitation emails sent	29,763	19,859	9,904
Partially completed surveys	763	505	258
Completed surveys	2,262	1,466	796
Response rate	7.6%	7.4%	8.0%

Non-residential end user surveys: DNV conducted phone surveys among a sample of non-residential end users who participated in SCG's Small and Medium Commercial EE Program (SMCP - SCG3882) and PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009). These programs offered no cost or discounted measures to commercial and public facilities, including K-12 schools.

Over two weeks in December 2023, DNV made up to six calls per site. The information collected was used to calculate rates of free-ridership, assess participant experience, and determine firmographic profiles. The sample frame for this survey was derived from a list of PY2022 local 3PP non-residential end users to represent various measure groups and savings levels provided by the programs. As an incentive to complete the survey, we offered participants the opportunity to win one of six \$150 gift cards. The sample disposition for the non-residential end user group is presented in Table 3-7.

Table 3-7. Sample disposition for non-residential end user phone surveys

Non-residential end users	Total	GK12 - PGE_Pub_009	SMCP - SCG3882
Attempted calls	54	26	28
Partially completed surveys	2	2	0
Completed surveys	52	24	28
Response rate	96%	92%	100%

Property manager surveys: We conducted phone surveys with property managers for two of the three local 3PP multifamily programs, SDGE's Residential Zero Net Energy Transformation (SDGE4002), and PG&E's Multifamily Energy Savings Program (PGE_Res_003). In these programs, property managers were the main decision-makers for installations.

We used the surveys to gather data from this program actor over approximately five weeks, from December 2023 to January 2024. During this period, DNV made up to six calls per site. The goal of this survey effort was to collect information to calculate free-ridership and to determine the demographic/firmographic profiles of the participants. The sample frame for this survey was derived from a list of PY2022 local 3PP multifamily properties chosen to represent various measure groups and savings levels provided by the programs. As an incentive to complete the survey, we offered participants the opportunity to win one of three \$150 gift cards. Table 3-8 presents the sample disposition for the property manager surveys.



Table 3-8. Sample disposition for property manager phone surveys

Property managers	Total	RZNET - SDGE4002 (Multifamily)	MESP - PGE_Res_003
Attempted calls	115	57	58
Partially completed surveys	10	4	6
Completed surveys	105	53	52
Response rate	91%	93%	90%

Installation contractor survey: Installation contractors play an important role in program delivery and can offer valuable perspectives on the effectiveness of the programs and possible opportunities for change or improvement. We conducted a phone survey of local 3PP contractors to gather insights into program delivery and identify any challenges they may be encountering.

This installation contractor phone survey was in the field between November 20 to December 11, 2023. We exclusively surveyed external contractors, programs using internal contractors were not included. The survey covered topics including their experience, market characteristics, and satisfaction with various aspects of the program. Each contractor was incentivized with a \$30 gift card for their participation in the survey. Table 3-9 provides a summary of interviews completed across the local 3PPs utilizing external contractors.

Table 3-9. Sample disposition for installation contractor phone surveys

Contractors	Total sample	GK12 - PGE_Pub_009	MESP - PGE_Res_003	CLEO - SCG3861	SMCP - SCG3882	MFEEP - SCE_3P_2020 RCI_004
Contractors called	19	5	2	4	5	3
Completed phone surveys	11	3	1	3	3	1
Response rate	58%	60%	50%	75%	60%	33%

3.2.4 Interviews with property managers

To understand the challenges to SCE’s Multifamily Energy Efficiency Program (MFEEP - SCE_3P_2020RCI_004), we conducted in-depth interviews in December 2023 with multifamily property managers who participated in the program. We completed interviews with two of the three contacts in the sample frame. During these calls, we collected information related to program experience and sought to understand how the program complemented or overlapped with other IOU or community choice aggregator (CCA) programs. As an incentive to complete the interview, we offered a \$50 gift card. Table 3-10. presents the sample disposition for the property manager in-depth interviews. The PY2022 interview guide is provided in Appendix I (section 6.9).

Table 3-10. Sample disposition for property manager IDIs

Property managers	MFEEP - SCE_3P_2020RCI_004
Attempted calls	3
Completed interviews	2
Response rate	67%

3.2.5 Interviews with PAs and implementers

DNV conducted in-depth interviews with PAs and implementers. These interviews allowed us to gain insights into the ongoing activities and progress of the local 3PPs in PY2022 relative to PY2021. The interview topics mirrored those of the PY2021 interviews, covering areas such as program goals, outcomes, data tracking, customer targeting, and any modifications made to the programs’ designs, including outreach strategies and innovative elements related to program delivery. The PY2022 interview guides are provided in Appendix I (section 6.9).



Over a 4-week period in September and October 2023, we interviewed 27 PAs and implementers. Table 3-11 provides the interview log, which includes the program names and call dates for each of the interviews.

Table 3-11. Local 3PP PA and third-party implementer interview log

Local 3PP PY2022 program	Program Administrator call date	Implementer call date
GK12 - PGE_Pub_009	19-Sept-23	18-Sept-23
MFEFP - SCE_3P_2020RCI_004	22-Sept-23	26-Sept-23
RZNET - SDGE4002	25-Sept-23	2-Oct-23
MESP - PGE_Res_003	26-Sept-23	18-Sept-23
CLEO - SCG3861	2-Oct-23	26-Sept-23
Res ACE - SCG3883	2-Oct-23	3-Oct-23
CMHP - SCG3884	2-Oct-23	3-Oct-23
SMCP - SCG3882	13-Oct-23	5-Oct-23

3.3 Savings evaluation approach

3.3.1 Gross impact evaluation

Our assessment of the programs' claimed savings was conducted by validating the measure package and verifying its installation. To validate the measure package, we used tracking data to gather details about the installed measures, including unit energy savings (UES), effective useful life (EUL), and net-to-gross ratios (NTGRs). Additionally, we used the 'Source Description' field in the tracking data to identify the origins of the California eTRM measure packages. This field provided comprehensive insights into the type of measure offerings, tiers, or equipment types associated with the claimed savings.

To ensure accurate application of the measure package information, we compared the parameters from the tracking data with the corresponding eTRM values. Using characteristics such as building type and climate zone from the tracking data, we pinpointed specific combinations within each measure package that aligned with these features. Our goal was to verify the precision of the measure parameters used in calculating savings. In cases where discrepancies arose between the two datasets, we aligned the information from the tracking data with that in the eTRM measure packages.

3.3.2 Net impact evaluation

Gross measure savings estimates are calculated based on customers' program participation, without considering their reasons for participation. Conversely, net savings estimates are derived from the savings that can be directly attributed to the program incentives, activities, and information. We studied the impact of each program on the measures implemented, aiming to determine what proportion of these implementations would have taken place even without the program. Free-riders are labeled as such because they reap the benefits of the programs for actions they would have likely undertaken in the absence of the programs. The savings accrued by these 'free-riders' are subtracted or 'netted out' in the net savings estimates.

We estimated net-to-gross ratios, or NTGRs, and then applied these ratios to gross savings estimates to calculate net savings. A NTGR of 1.0 signifies that the program gets credit for all the claimed savings which implies that the program completely influenced the efficiency, quantity, and timing of the energy efficient measures. In most cases, the influences of the programs are not so complete and the NTGRs are less than 1.0. A NTGR of 0.75, for example, indicates that 75% of the claimed savings for the project or measure should be credited to the program with the remaining 25% assumed to be free-ridership.



We conducted surveys with participants who were decision-makers for program installations, including residential and non-residential end users who participated and property managers who made decisions for direct install programs aimed at multifamily. Based on the survey responses, we calculated the degree of free-ridership and the proportion of program installations attributable to each program.

To quantify free-ridership, we focused on three factors: timing, quantity, and efficiency. These aspects combined allow for estimates of net energy (kWh, kW, and therm) savings attributable to each measure, as these savings are dependent on the number of measures installed (quantity), the efficiency of the measures (efficiency), and when the measures are installed (timing).

The timing question seeks to determine the time frame within which each measure would have been installed without the program. The program receives full credit for any measure that would not have been installed at all, and it receives partial credit for hastening the installation compared to when respondents claim they would have installed the measure without the program.

The efficiency question is relevant to the efficient measures installed by the programs for which a standard efficiency version is available in the market. The program receives full credit for the measure if the respondents indicate they would have installed nothing or a standard efficiency measure instead of the efficient program measure.

The quantity question asks about the number of units that would have been installed without the program. This question is relevant to measures where programs allow more than one installation per participating site. The program receives credit if the respondents indicate they would have installed fewer measures without the program.

Appendix F (section 6.6) provides details on how we scored participant survey responses to derive free-ridership values. We calculated measure-level NTGRs based on these, which were used to calculate measure- and program-level net savings.

3.4 Program performance and participation analysis

The PY2022 program performance and participation analysis methods mirrored those we used to evaluate the local 3PPs in PY2021. To understand how local 3PPs functioned, we reviewed program profiles to identify the customers implementers targeted, the services they delivered, and their delivery strategies. We also examined three functional areas of the programs, including their design, marketing and outreach, and delivery. Additionally, we identified and reviewed program innovations.

We used several sources to evaluate these dimensions of performance and participation, including the KPIs the PAs provided. We used the KPIs wherever possible and provided an assessment of their usefulness. While we benchmarked performance and participation relative to peer programs in the PY2021 evaluation, in this analysis, we compared PY2022 to PY2021 performance metrics to provide year-over-year assessments. We also compared select delivery performance metrics relative to goals or statewide values. Table 3-12 summarizes the program performance and participation dimensions we investigated. It also provides the performance metrics, methods, and data sources we used to support this effort.

Table 3-12. Local 3PP performance and participation dimension assessment methods

Program & participation dimension	Performance metrics	Methods and data sources
Program profiles	Target sector, services, outreach strategies, and program delivery	Reviewed PIPs, gathered insights from implementers and PA interviews, analyzed KPIs and survey responses
Program innovation	Marketing and outreach, program delivery, and implementation innovations	

Program & participation dimension	Performance metrics	Methods and data sources
Program design	Program goals, barriers, and strategies	
Program outreach and marketing	Outreach and marketing approaches	
Program delivery – Tracking performance	Audit outcomes, cross-program marketing, and participant contact information	
Program delivery – Costs and savings	Planned to actual program spending, overhead per total spending, cost per MMBtu saved, and cost effectiveness (TRC)	Analyzed CEDARS filings, PIPs and KPI scorecards
Program delivery – Depth of retrofit	Savings relative to consumption and distribution of measures	Analyzed tracking and billing data
Program delivery – Participant experience	Program influences, benefits, and satisfaction	
Participant characterization	Participant demographics/firmographics, HTR/DAC status, clean technology adoption and interest, and demand response program participation	Analyzed surveys, CIS information, and ACS data
Assessment of KPIs	Tracked performance, KPI definitions, and KPI benchmarks	Analyzed KPI values provided by PAs

3.5 Program equity evaluation

CPUC Decision 21-05-031 restructured the approach to California’s EE portfolio and programs, so they are better aligned with the state’s decarbonization goals.⁴⁹ The decision focused on three primary areas that enable this, including:

1. Equity
2. GHG reduction
3. Market transformation

Equity prioritizes vulnerable communities by ensuring their access to EE through low-medium income (LMI), multifamily, and HTR-targeted programs. Because equity programs focus on non-energy goals, including poverty reduction, improvement of public health, and housing, the evaluation of equity programs needs to focus on how well they meet equity metrics instead of cost-effectiveness requirements. It should be noted that the local 3PP designs preceded the CPUC decision and the application of an overarching equity framework such as the one used in the current evaluation. This means that strict, equity-related requirements may not apply to these programs. However, given current CPUC priorities around equity, the results of this equity evaluation should inform future local 3PPs delivering EE services.

For this evaluation, we assessed how equitable PY2022 local 3PPs were by applying equity frameworks developed for the energy industry.⁵⁰ We considered three dimensions of equity identified by these frameworks for the assessment. These include:

1. Procedural equity – the extent to which programs targeted, engaged, and incorporated community input. DNV considered the following metrics to assess procedural equity:
 - a. Percent of outreach to DAC/HTR compared to the percent of each utility’s service territory that is DAC/HTR

49 CPUC. “Assessment of Energy Efficiency Potential and Goals and Modification of Portfolio Approval and Oversight Process.” cpuc.gov, May 20, 2021.

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M385/K864/385864616.PDF> (ca.gov)

50 School for Environment and Sustainability-University of Michigan. “Energy Equity Project Report.” energyequityproject.com, 2022. https://energyequityproject.com/wp-content/uploads/2022/08/220174_EEP_Report_8302022.pdf. ACEEE; “Leading with Equity: Centering Equity across ACEEE’s Scorecards.” aceee.org, <https://www.aceee.org/energy-equity-initiative>



- b. Percentage of outreach that gathers feedback from DAC/HTR communities
 - c. Percent of outreach materials that were translated
 - d. Percent of community recommendations that were meaningfully incorporated into final designs
2. Distributional equity – the extent to which program benefits are distributed to vulnerable communities. DNV assessed distributional equity using the following analyses:
 - a. Assess whether HTR/DAC customers participate at a similar rate as they appear in the population by comparing the percentage of participants and the non-participants that are HTR or live in DACs.
 - b. Assess whether HTR participants achieve similar depth of savings as non-HTR participants by comparing the percentage of energy savings from HTR participants to the percentage of energy consumption from HTR participants.
 - c. Compare NTGRs for HTR/DAC and non-HTR/DAC participants.
3. Structural or Recognition Equity Metrics – the extent to which programs recognize the historical, cultural, and institutional dynamics that have resulted in clean energy inequities among DACs and HTR communities. DNV evaluated Structural/Recognition equity by considering:
 - a. Does the program have equity-related KPIs?
 - b. How is the program doing on those equity-related KPIs?

DNV examined PIPs, conducted program actor interviews, analyzed program tracking data and survey responses, and analyzed KPIs provided by implementers to gauge the local 3PPs' success in the three equity areas outlined above.



4 FINDINGS

4.1 Impact evaluation

4.1.1 Gross savings validation

Table 4-1 summarizes the results of the gross savings analysis for seven programs across three PAs. As evident in the table, there were few meaningful discrepancies between savings claimed in the tracking data and savings detailed in corresponding California eTRM documentation.⁵¹ In cases where there were discrepancies, we adjusted the values reported in the tracking data to reflect the accurate eTRM values. These changes resulted in modifications of claimed gross savings, summarized in the reporting savings and GRR values.

Some claims had discrepancies that did not affect gross savings, such as using the HTR NTG ID or mismatches between sector and building type. Another type of discrepancy was a mismatch between claimed zip code and climate zone. While it was a common discrepancy, it did not result in substantial differences between the reported and evaluated gross savings. Summaries of tracking data correlation with eTRM values by program are provided in Appendix D (section 0).

Table 4-1. Summary of local 3PP tracking data correlation with eTRM values and GRR impact by PA

PA	Program	Count of claims	Claims with discrepancy	kW GRR	kWh GRR	Therm GRR
SDGE	Residential Zero Net Energy Transformation Program	2,649	1%	100%	100%	100%
	SDGE Total	2,649	1%	100%	100%	100%
PG&E	Government and K-12 Comprehensive Program	146	14%	98%	100%	100%
	Multifamily Energy Savings Program	127	3%	-	100%	100%
	PG&E Total	273	9%	98%	100%	100%
SCG	Community Language Efficiency Outreach Program	9,819	<1%	100%	100%	100%
	Small and Medium Commercial EE Program	1,018	9%	322%	342%	182%
	Residential Advanced Clean Energy Program	37,036	18%	100%	100%	100%
	Comprehensive Manufactured Home Program	6,102	0%	100%	100%	100%
	SCG Total	53,975	13%	100%	99%	122%

The most common errors continued to include mismatches between building type and sector, incorrect climate zones selected, and errors in the building vintage column. The climate zone errors had a marginal impact on evaluated savings since many measure packages do not permute on climate zone, meaning the savings are the same across California's sixteen climate zones.

Also notable are the high gross realization rates for SCG's Small and Medium Commercial EE Program (SMCP - SCG3882). The primary reason this program received a higher realization rate is due to a discrepancy with the unit count for the tankless water heater measure. The savings values for this measure are normalized by input capacity in kBTU/hr. However, the savings were reported as if the normalizing unit was each, which led to a severe underestimation of gas savings. Specifically, 86 of the 116 claims records for this equipment have an installed quantity of '1' as if the normalizing unit is 'each' meaning per individual piece of equipment. The gross analysis verified the 200 kBTU/hour offering was claimed and

⁵¹ Most discrepancies are due to building type and climate zone mismatches. These had minimal impact on GRR.



the evaluated gross savings corrected this improper reporting of installed quantity based on the normalizing unit. According to the PA, the issue derived from an internal system issue that was not identified before the PY2022 claims were submitted.

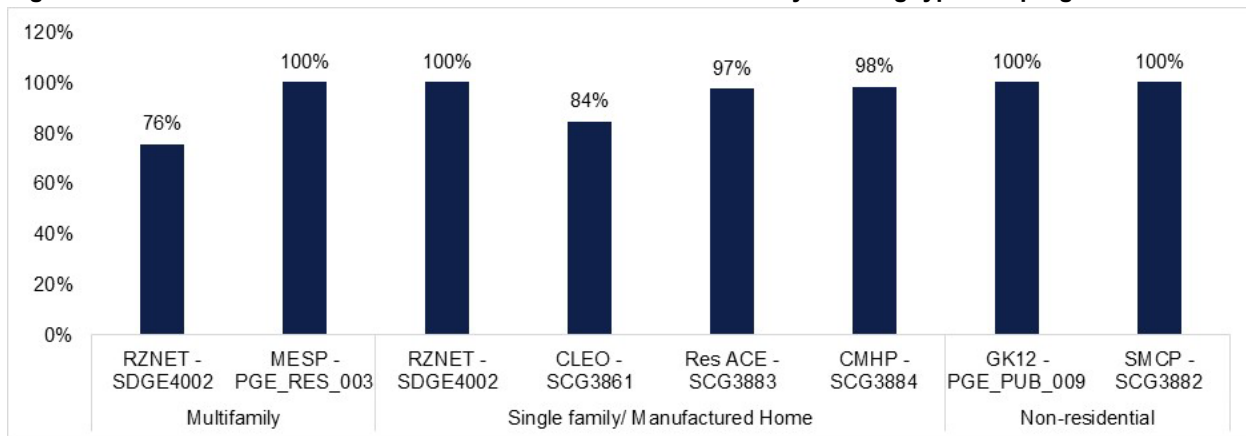
Finally, there was one error in the SCG Community Language Efficiency Outreach Program (CLEO - SCG3861) tracking data that is noteworthy for the smart thermostat measure offering. One claim record reported savings values and source description details for the PY2021 version of the smart thermostat measure package when application date, paid date, customer agreement date, and project completion date were all dated in 2022. These parameters should result in CEDARS capturing the PY2022 version of the measure package, which did have slightly different DEER savings values than in PY2021. The validation rules for the CEDARS database should catch instances where the prior year DEER values are being used. This claim was corrected to the PY2022 DEER values in the evaluated gross savings results.

4.1.2 Installation verification

DNV used web and phone surveys to collect information from residential and non-residential participants and property managers to verify measure installations in these sectors. We asked survey respondents to confirm if they received the measures documented in the tracking data. We also asked them if the measures were still in place and operational. Based on this information, we calculated the percentage of tracking data reported measures that were still installed and providing savings (in-service rates). We applied these in-service rates to evaluated gross savings.

As shown in Figure 4-1, except for the multifamily portion of SDGE’s Residential Zero Net Energy Transformation Program (RZNET - SDGE4002) and SCG’s Community Language Efficiency Outreach Program (CLEO - SCG3861), survey responses indicated that most of the claimed measures were installed and were providing energy savings. The primary reasons for the lower in-service rates for SDGE’s multifamily and SCG’s CLEO program were removals of water aerator measures due to incompatibility or customer dislike, or customers reporting not receiving insulation or HVAC measures.

Figure 4-1. PY2022 local 3PP in-service rates for claimed measures by dwelling type and program



4.1.3 Free-ridership and program attribution

Table 4-2 provides the NTGR for EE measures targeted at residential participants. Results show that the NTGR were generally high, ranging from 84% for faucet aerator to 100% for HVAC fan motor controllers.

The table presents ratios for all residential participants then provides ratios for those who qualified as hard-to-reach (HTR) and those who did not (non-HTR). There is not a pattern of higher NTGR for HTR participants compared to non-HTR participants. While program theory indicates that HTR customers need more assistance from energy efficiency programs than non-HTR customers, the current findings do not fully align with that theory. This may be because the programs generally reached customers that would not have participated without the programs.



Table 4-2. NTGR for measures targeted at residential customers

Measure	Population	Respondents	NTGR	Free-ridership
Faucet aerator	All	107	84%	16%
	HTR	107	84%	16%
HVAC Duct test and seal	All	119	91%	9%
	HTR	91	89%	11%
	Non-HTR	28	95%	5%
HVAC Fan motor controller	All	11	100%	0%
	HTR	9	100%	0%
	Non-HTR	2	100%	0%
HVAC Fan motor replacement	All	12	93%	7%
	HTR	7	100%	0%
	Non-HTR	5	80%	20%
Insulation	All	115	86%	14%
	HTR	104	86%	14%
	Non-HTR	11	97%	3%
Showerhead	All	140	87%	15%
	HTR	140	87%	15%
Smart Thermostat	All	122	91%	9%
	HTR	108	95%	5%
	Non-HTR	14	83%	17%
Tankless water heater	All	48	94%	6%
	HTR	48	94%	6%

Table 4-3 shows the NTGR for energy efficiency measures targeted at customers in multifamily buildings with a further breakdown of the ratios between HTR and non-HTR participants. The overall NTGR value for the program is driven by the NTGR value for insulation, which accounts for the bulk of the multifamily program savings. Although the NTGR for showerheads is relatively low at 61% and much lower than the 95% NTGR for this measure in PY2021, this ratio is based on a relatively small sample size. It also has wide confidence bounds, indicating that the available information is insufficient to conclude there has been a change in the program’s influence on this measure.

In general, sample sizes for most multifamily measures were small, and therefore, their NTGR should be interpreted and applied cautiously. However, while the sample sizes were small for particular measures, there was minimal variance in the overall 85% NTGR estimate for multifamily, which has a relative precision of 12% at a 90% confidence level. Additionally, 80% of respondents indicated that they were unlikely to install the EE technologies without program support, strengthening our overall program NTGR estimate.

Table 4-3. NTGR for measures targeted at customers in multifamily buildings

Measure	Population	Respondents	NTGR	Free-ridership
Faucet aerator	All	1	100%	0%
	Non-HTR	1	100%	0%
Indoor LED lighting	All	6	98%	2%
	HTR	2	99%	1%
	Non-HTR	4	98%	2%

Insulation	All	51	87%	13%
	HTR	8	82%	18%
	Non-HTR	43	88%	12%
Showerhead	All	4	61%	39%
	Non-HTR	4	61%	39%
Water heating controls	All	55	78%	22%
	Non-HTR	55	78%	22%

DNV also estimated NTGR for energy efficiency measures targeted at non-residential customers such as steam traps, modulating gas valves for furnaces, tankless water heaters, and water heating controls. Table 4-4 shows that the NTGR for all the non-residential measures were high except for water heating controls and modulating gas valves. The samples sizes for all the measures were very small (2-16 respondents). Therefore, their NTGR should be interpreted and applied cautiously.

Table 4-4. NTG ratios for measures targeted at non-residential customers

Measure	Population	Respondents	NTGR	Free-ridership
Boiler steam traps	Commercial	19	70%	30%
Insulation	Commercial	1	100%	0%
Modulating gas valve	Commercial	16	62%	38%
Tankless water heater	Commercial	5	100%	0%
Water heating controls	Commercial	5	0%	100%
Food service	Public	10	95%	5%
Heat pump water heater	Public	3	97%	3%
Indoor LED lighting	Public	1	100%	0%
Outdoor LED lighting	Public	3	98%	2%
Refrigeration	Public	1	95%	5%

4.1.4 Total savings

In general, the programs applied DEER measure package values appropriately to calculate claimed savings. In the few cases where there were discrepancies between the measure package values and tracking data, DNV updated utility reported values to reflect the correct measure package values. These updates resulted in minor modifications of claimed gross savings.⁵²

Table 4-5 provides the total gross claimed and achieved (evaluated) electric savings.⁵³ Local 3PPs achieved approximately 8.6 GWh of gross electric savings, which is 98% of total claimed gross savings (gross realization rate (GRR)).⁵⁴ Evaluated

⁵² Gross savings are a measure of change in energy use due to energy efficiency programs, regardless of why customers participated.

⁵³ Negative kWh and therm savings reflect electric or gas use increases associated with some or all measures installed by the programs.

⁵⁴ Gross realization rate is the ratio of evaluated savings to claimed savings, without any adjustments for program influence.



NTGRs, which represent the extent to which programs influenced participation based on program participant survey responses, indicate program attribution to be relatively high or on par with claimed values.⁵⁵

The 342% GRR in the SCG Small and Medium Commercial Program is due to a normalizing unit error in tracking data, particularly involving tankless water heater measures. Most claims inaccurately entered the equipment with an install quantity of one instead of a capacity amount in kBTU/hour, leading to an underreporting of gas savings and increased electric usage.

Table 4-5. Local 3PP gross and net electric (kWh) savings by program, PY2022

Program	Customer segment	Total gross claimed savings (kWh)	Total gross evaluated savings (kWh)	Gross realization rate	Claimed NTGR	Evaluated NTGR	Total net claimed savings (kWh)
RZNET - SDGE4002	Multifamily	400,375	302,542	76%	55%	98%	296,491
	Mobile home	662,238	662,238	100%	90%	97%	642,371
GK12 - PGE_Pub_009	Public	4,284,041	4,284,041	100%	98%	97%	4,155,519
MESP - PGE_Res_003	Multifamily	7,195	7,195	100%	100%	0%	0
CLEO - SCG3861	Single family	36,856	31,082	84%	95%	81%	25,177
SMCP - SCG3882	Commercial	-8,975	-30,693	342%	60%	100%	-30,693
Res ACE - SCG3883	Single family	2,419,881	2,356,500	97%	95%	91%	2,144,415
CMHP - SCG3884	Mobile Home	1,019,052	1,002,704	98%	95%	85%	852,298
All	All	8,820,662	8,615,609	98%	95%	94%	8,085,579

Table 4-6 provides the total claimed and evaluated demand (kW) savings. Local 3PPs achieved approximately 3.0 MW savings or 98% of gross claimed gross demand savings. We adjusted total gross demand savings to reflect the portion of savings due to program influence. Our evaluation indicated that the local 3PPs that delivered measures with claimed demand savings achieved net demand savings of approximately 2.7 MW.

Table 4-6. Local 3PP gross and net demand (kW) savings by program, PY2022

Program	Customer segment	Total gross claimed savings (kW)	Total gross evaluated savings (kW)	Gross realization rate	Claimed NTGR	Evaluated NTGR	Total net evaluated savings (kW)
RZNET - SDGE4002	Multifamily	6	5	76%	55%	97%	4
	Mobile Home	372	372	100%	90%	96%	357
GK12 - PGE_Pub_009	Public	41	40	98%	76%	99%	40
MESP - PGE_Res_003	Multifamily	0	0	0%	0%	0%	0
CLEO - SCG3861	Single family	0	0	84%	85%	0%	0
SMCP - SCG3882	Commercial	-1	-3	322%	60%	0%	0
Res ACE - SCG3883	Single family	2,193	2,135	97%	95%	88%	1,879
CMHP - SCG3884	Mobile Home	508	500	98%	95%	83%	415
All	All	3,119	3,049	98%	94%	88%	2,695

Table 4-7 provides PY2022 local 3PPs total claimed gas (therm) savings and total gross savings achieved (i.e., evaluated savings). In total, the programs achieved 2,589,346 therms of gross gas savings, which is 92% of gross claimed savings (GRR). The local 3PPs as a group, as well as most individual programs, had higher attribution than claimed.

SCG's Small and Medium Commercial EE Program (SMCP - SCG3882) had a high GRR value of 182% after correcting for the tankless water heater measures normalizing unit error in tracking data referenced in the electric savings section.

⁵⁵ The one exception is PG&E's Multifamily Energy Efficiency Program, which has an evaluated NTGR of 0% because the sole electric participant reported not being influenced by the program.



Table 4-7. Local 3PP gross and net gas (therm) savings by program, PY2022

Program	Customer segment	Total gross claimed savings (therm)	Total gross evaluated savings (therm)	Gross realization rate	Claimed NTGR	Evaluated NTGR	Total net evaluated savings (therm)
RZNET - SDGE4002	Multifamily	1,508,012	1,139,525	76%	53%	87%	991,387
	Mobile Home	30,048	30,048	100%	81%	96%	28,846
GK12 - PGE_Pub_009	Public	-1,173	-1,244	106%	66%	95%	-1,182
MESP - PGE_Res_003	Multifamily	584,804	584,804	100%	55%	78%	456,147
CLEO - SCG3861	Single family	61,801	52,120	84%	85%	80%	41,696
SMCP - SCG3882	Commercial	188,356	342,808	182%	64%	85%	291,387
Res ACE - SCG3883	Single family	367,438	357,814	97%	91%	89%	318,455
CMHP - SCG3884	Mobile Home	84,833	83,472	98%	88%	83%	69,282
All	All	2,824,118	2,589,346	92%	61%	85%	2,196,017

4.2 Program profiles

We provided an overview of the PY2022 Local 3PPs we evaluated in section 2.2.1. In this section we provide additional details on the programs. Table 4-8 summarizes critical elements of each PY2022 local 3PP. It also indicates changes relevant to how each program operated and delivered its offerings.

Table 4-8. Local 3PPs profiles and PY2022 notable changes

Services provided	Targeted customers	Outreach strategies	Program delivery	PY2022 notable change
Residential Zero Net Energy Transformation Program (SDGE4002)				
Audits Direct install HVAC, water heating measures, and lighting Enrollment in demand response (DR) and ESA programs	Multifamily and manufactured housing owners and HTR/DAC customers	Canvassing, flyers, and door hangers Conference and mobile home clubhouse presentations Trade magazine advertisements	Direct install visit with DR enrollment invitation and ASHRAE Level 1 audits to put homes on ZNE path	Digital QA tool that geo-tags installations images Data translation tool to convert data to the IOU's platform
Government and K-12 Program (PGE_PUB_009)				
Direct install measures, Incentives and financing, Audits and technical assistance	Public-sector (federal and local government facilities and K-12 schools) within DAC and HTR communities	Work with local government programs, community choice aggregators, regional energy networks, and community-based organizations	Provide tailored EE and demand reduction services	Focus on local government partnerships Fuel substitution and DR offerings
Multifamily Energy Savings Program (PGE_RES_003)				
Direct install – smart thermostats, aerators and showerheads, and heat pump water heaters Customized outreach, technical services, and education Flex incentives and financing options	Focused on Central Valley multifamily property managers, owners, and/or operators in PG&E's service territory, and HTR/DAC customers and underserved regions	Mass market outreach via trade professionals, community events Partners with organizations like the California Apartment Association to connect with decision-makers	Direct install and customized offerings	Restarted in-person events after COVID-19 Partnered with a hot water loop vendor to improve delivery Program closed mid-2023
SCG Community Language Efficiency Outreach Program (SCG3861)				

Services provided	Targeted customers	Outreach strategies	Program delivery	PY2022 notable change
<p>Direct install – bathroom and kitchen aerators, handheld tub spouts, smart thermostats, and hot water heater pipe sleeves</p> <p>Added in 2021 - tankless water heaters, furnaces, and fireplaces</p>	Vietnamese, Indian, Chinese, Korean, Hispanic, and African American customers HTR/DAC, low- and medium-income customers	<p>In-language seminars, community booths, and toll-free hotline</p> <p>Outreach via schools and community events, and door hangers and social media</p>	<p>Direct install of EE measures</p> <p>Information on EE and other programs</p> <p>Education via seminars, events, brochures, and website</p>	Increased social media ads with a focus on door hangers
Small and Medium Commercial EE Program (SCG3882)				
<p>Direct install – aerators, boiler steam traps, modulating gas valves, pipe and tank insulation, tankless water heaters, and water heating controls</p> <p>On-bill financing</p>	Small and medium commercial customers in San Bernardino and Riverside counties with annual therm usage up to 50,000 therms, and HTR/DAC customers	<p>Email campaigns</p> <p>Trade ally referrals</p> <p>Outreach to previous EE program participants</p>	Deliver mix of EE kits, direct install, and rebate measures	<p>Made certain measures (such as steam traps and tankless water heaters) free of charge</p> <p>Increased customer rebates</p> <p>Targeted email campaigns</p> <p>Partnership with trade allies</p>
SCG Residential Advanced Clean Energy Program (SCG3883)				
<p>Direct install – Duct test and seal, smart thermostat, kitchen and bathroom aerators, showerheads, and pipe wrap</p> <p>Advanced clean technologies – water heater, gas fireplace insert, furnace, and tankless water heaters</p>	Single family customers HTR/DAC customers	<p>Intelligent canvassing using mapping tools</p> <p>Flyers/door hangers</p> <p>Inbound calls and web inquiries</p> <p>Social media</p>	<p>Qualify sites, plan project, and enroll customers</p> <p>After DI, offer a no-cost walkthrough audit for deeper savings</p>	<p>Revised focus on tier 2⁵⁶ measures</p> <p>Developed a tool for geo-tagging installation images</p> <p>Emphasized energy education</p> <p>Targeted email campaigns through an internal marketing department</p>
SCG Comprehensive Manufactured Home Program (SCG3884)				
<p>Direct install – HVAC and water heating technologies</p> <p>Walkthrough audits ESA eligibility screening and measures (if eligible)</p>	HTR and DAC mobile home customers in Ventura, Los Angeles, Orange, Riverside, San Bernardino, and Imperial counties	<p>In-person meetings, phone calls, emails, and webinars</p> <p>Distribution of flyers and door hangers</p>	<p>Enroll customers in-person or virtually</p> <p>Direct install measures</p> <p>Invite customers for walkthrough audit and additional EE offers</p>	Combined their gas offerings with water and electric offerings, promoted tier 2 measures, focused on energy education, and targeted emails through the internal marketing department
SCE's Multifamily Energy Efficiency Program (MFEEP - SCE_3P_2020RCI_004)				
<p>Simple in-unit DIY measures</p> <p>Flexible incentives and financing options</p> <p>DR-enabled energy management technologies</p>	Multifamily residential sector across SCE's service territory	<p>General program flyers</p> <p>Direct mailers</p> <p>Phone campaigns</p> <p>Email campaigns</p> <p>Social media campaigns</p>	<p>DIY and direct install measures</p> <p>Offers deemed, custom and NMEC platforms</p>	Introduced water heaters in common areas

⁵⁶ Tier 2 measures are advanced energy efficiency technologies that can deliver higher energy consumption reduction than basic (tier 1) measures.



Services provided	Targeted customers	Outreach strategies	Program delivery	PY2022 notable change
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Customized flyers
 Data driven targeted marketing

4.3 Participant characterization

To gain insight into program participants, we used surveys to collect information about participating residential and non-residential end users, property managers, and residential non-participants. We used the information to build participant and non-participant profiles. Table 4-9 lists the characteristics covered in each survey.

Table 4-9. Demographic/firmographic variables in participant surveys

Residential end user and non-participants	Non-residential end user
Home ownership	Facility purpose
Race	Building ownership
Language	Number of employees
Income	Square feet
Education level	Language
Energy insecurity	

4.3.1 Local 3PP participant profiles

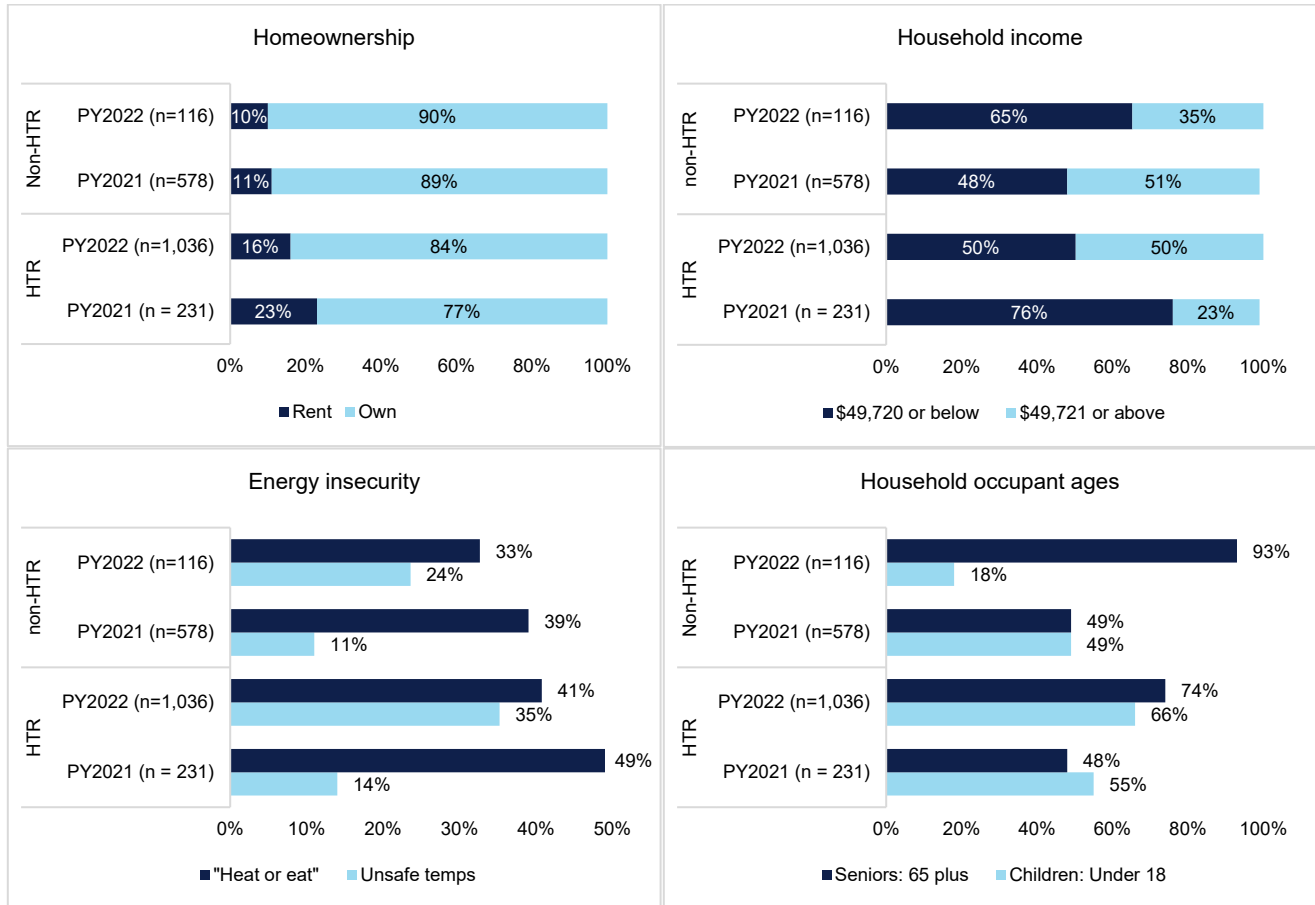
Residential end user profiles: PY2022 Local 3PP residential participants who were decision-makers for program participation lived in either single family or mobile homes. We collected information from this participant group via web surveys.

The panels in Figure 4-2 below illustrate various features of the residential end user participants in the local 3PP residing in HTR and non-HTR communities in PY2022 relative to PY2021. We observed the following trends among the residential end users:

- **Residential participants with program participation decision-making abilities were predominantly homeowners:** In both program years, residential participants in local 3PP programs were predominantly homeowners, with homeownership rates above 80%.
- **The programs served a lower proportion of low-income HTR customers in PY2022:** Based on those who reported their incomes, residential programs served lower proportions of low-income customers in PY2022 than in PY2021. The proportion of HTR participants with a household income of \$49,720 or less was lower in PY2022 compared to PY2021, while the proportion of non-HTR participants with a household of \$49,720 or less was higher in PY2022 than in PY2021. However, given the residential programs' overall improved reach of disadvantaged customers (see Figure 4-3), it would be prudent to monitor this atypical trend in future program years to see if it persists.
- **Energy insecurity persists among residential participants with HTR customers facing greater energy insecurity than non-HTR customers:** We examined energy insecurity across two dimensions, "heat or eat" and unsafe temperatures among HTR/non-HTR residential participants in PY2022 and PY2021. The analysis indicates that HTR customers experienced both "heat or eat" and unsafe temperature burdens more than non-HTR customers. Compared to PY2021, in PY2022, more participants opted to forgo adequate heating and cooling in favor of getting basic necessities (fewer participants reported facing a "heat or eat" dilemma).
- **More households with older residents participated in PY2022 residential programs:** DNV used the participant survey results to construct an age profile of the participants in local 3PPs residential programs. According to our analysis, in PY2022, more participating homes included seniors (those 65 years old or above) compared to PY2021.



Figure 4-2. Profile of local 3PP residential end user participants characteristics, PY2021 and PY2022



Multifamily program participant profiles: As part of our research, we gathered data on multifamily participants by surveying property managers who are the decision makers when it comes to participating in programs. The survey collected information on building vintage, type, and affordability, summarized in Table 4-10.

- Multifamily programs served more low-income households in PY2022.** The programs shifted to serving more income-qualified units in PY2022 compared to PY2021. Assuming that one-third of the mixed and senior rental units catered to income-qualified or low-income households,⁵⁷ DNV's calculations suggest that the programs served multifamily buildings with 30-64% low-income households in PY2022 compared to 15-19% of such households in PY2021. Given that IOU billing data typically indicate that 30-35% of households are on CARE, a low-income proxy, this increase indicates that the programs served low-income households at least in proportion to their presence in the population.

Table 4-10. Local 3PP multifamily participant building characteristics by program, PY2021 and PY2022

Building characteristics	RZNET - SDGE4002		MESP - PGE_Res_003	
	PY2021 (n=56)	PY2022 (n=64)	PY2021 (n=38)	PY2022 (n=57)
Market rate units	62%	37%	42%	4%

⁵⁷ According to the National Low Income Housing Coalition (NLIHC), in 2020, approximately 33% of California's rental homes were affordable and available to households whose income was 50% of the area median income (i.e., low-income households). <https://nlihc.org/housing-needs-by-state/california>

Housing affordability	Mixed units	15%	40%	58%	49%
	Senior units	20%	4%	0%	0%
	Income qualified units	3%	16%	0%	47%
	Calculated market rate units	85%	66%	81%	36%
	Calculated low-income units	15%	30%	19%	64%
Building vintage	Before 1940	5%	4%	39%	13%
	1940 - 1989	62%	92%	51%	42%
	After 1990	33%	3%	10%	45%
Building type	Apartment or condo (5 or more units)	80%	100%	97%	100%
	Apartment or condo (2-4 units)	13%	0%	3%	0%
	Townhouse/duplex/row house	7%	0%	0%	0%

Non-residential program participant profiles: We collected survey and independent third-party information on non-residential end-users, composed of commercial and public sector participants, to understand the characteristics of participants in this customer segment. Table 4-11 provides the profile of the participants we compiled based on the information we gathered. A significant portion of participants in the commercial sector consisted of small hotels and dry cleaners. These enterprises typically operated in small, leased premises spanning less than 5,000 square feet. Almost all employed fewer than 25 people whose primary language was English. By contrast, the public sector program catered to multi-use public buildings and K-12 schools. Participants in this sector typically operated in large buildings they owned, spanning over 10,000 square feet. Most of these establishments employed more than 25 people, who were predominantly English speakers.

Table 4-11. PY2022 local 3PP non-residential end-user participants by program

Program	Source	Most common characteristics of non-residential end user participants
GK12 - PGE_Pub_009	Purchased third-party data and evaluation survey	· K-12 schools or multi-use public buildings
		· 100% own building
		· 56% have 25+ employees
		· 67% of buildings have >10,000 square feet
		· 95% have fluent English speakers
		· 96% Small hotels or dry cleaners/laundry
SMCP - SCG3882		· 87% lease building
		· 94% have < 25 employees
		· 81% of buildings have <5,000 square feet
		· 89% have fluent English speakers

4.3.2 Residential non-participant profiles

Residential local 3PP participants and residential non-participants have distinct demographic profiles. We compared residential participants with non-participants based on survey data collected from each group. Since the participants in the multifamily segment are property managers and not tenants, we used responses from single and manufactured home dwellers for the comparison, provided in Table 4-12. A higher proportion of participants were manufactured home residents and lower-income compared to the general population. Both HTR and non-HTR customers were predominantly from lower-income brackets compared to non-participants. While most participants and non-participants owned their homes, homeownership among HTR participants was slightly lower compared to non-HTR participants and non-participants. HTR

participants also included more customers whose primary language was non-English and faced greater energy insecurity, unlike those from the general residential population.

Table 4-12. Local 3PP participant and non-participant characteristics

Characteristics	Local 3PP Residential participants		Non-participants		
	HTR (n=1,018)	Non-HTR (n=113)	SCG (n=1,497)	SDGE (n=854)	All (n=2,351)
Homeownership					
Own	85%	93%	85%	87%	86%
Rent	15%	7%	15%	13%	14%
Housing type					
Single-family	84%	44%	97%	97%	97%
Mobile home or manufactured home	15%	53%	1%	1%	1%
Other	1%	3%	2%	3%	2%
2022 income					
Over \$200,000	3%	4%	10%	17%	12%
\$101,121 up to \$200,000	10%	2%	25%	27%	26%
\$70,281 up to \$101,120	11%	18%	16%	17%	16%
\$49,721 up to \$70,280	25%	10%	14%	14%	14%
Below \$49,720	50%	65%	35%	25%	32%
Language					
English	80%	94%	85%	89%	86%
Spanish	15%	2%	8%	6%	7%
Chinese (including Mandarin and Cantonese)	3%	0%	2%	1%	1%
Energy insecurity					
Unsafe temps	35%	24%	29%	34%	30%
Unable to pay bill	32%	28%	26%	21%	24%
"Heat or eat"	41%	33%	31%	27%	29%

Most non-participants reported a lack of awareness of EE programs. Our survey of residential customers who had not participated in the local 3PPs showed that two-thirds of respondents were unaware of utility energy efficiency (EE) programs in general, while three-quarters of respondents were unaware of the specific residential local 3PPs we evaluated (see Table 4-13). Those who were aware of the programs reported they had learned of them from a bill insert (14%), direct mail (10%), the utility website (9%), or an advertisement (8%). However, if respondents wanted to find information on energy efficiency or how to lower their bills, they would use an online search (55%), utility website (36%), rely on word-of-mouth (26%), or a government resource (20%). This indicates that while customers prefer to find EE information using a digital resource, most learn about programs through the mail.

Table 4-13. Non-participant awareness of EE programs

EE program awareness	General awareness of EE programs	Specific program awareness		
	All (n=2,933)	Res ACE - SCG3883 (n=1,890)	CMHP - SCG3884 (n=1,890)	RZNET - SDGE4002 (n=1,043)
Aware	32%	26%	20%	19%
Unaware	68%	74%	80%	81%

The majority of non-participants are interested in EE upgrades but face financial barriers. Fifty-six percent of survey respondents indicated interest in implementing an EE home improvement project in the next two years. However, half said that inflation has caused them to postpone or cancel a planned EE project in recent years. We asked customers what factors have prevented them from making EE upgrades, described in Table 4-14. Respondents noted that project costs or

lack of financing is the biggest barrier to improvements (64%). Respondents who indicated “other reason” often noted that they were unable to complete upgrades due to being a renter, so they were unable to make implementation decisions.

Table 4-14. Non-participant barriers to EE home improvements

Barriers to EE improvements	SCG (n=1,890)	SDGE (n=1,043)	All (n=2,933)
Cost or lack of financing	67%	61%	64%
Upgrade not needed	12%	22%	16%
Other reason	9%	7%	8%
Identifying energy efficiency opportunities	4%	3%	3%
Uncertainty on return on investment	4%	2%	3%
Finding a qualified contractor	1%	3%	2%
Don't know	3%	2%	3%
Availability of energy efficient equipment	0%	1%	1%

Non-participants are most interested in measures outside recent program offerings. Non-participants reported a wide variety of EE upgrades they intended to implement in the next two years, as shown in Table 4-15. The top upgrades were exterior improvements (31%), followed by kitchen appliances (28%), and hot water heaters (24%). Residential measures implemented by Local 3PPs in PY2022 included hot water heaters (24%), smart thermostats (17%), LED lighting (16%), showerheads and aerators (15%), and HVAC duct test and seal (13%). So, although non-participants have the potential to be an untapped market for the Local 3PPs, the measures they can offer could limit this engagement.

Table 4-15. Non-participant EE projects planned in next two years

Planned EE upgrades	SCG (n=1,890)	SDGE (n=1,043)	All (n=2,933)
Windows, doors, siding, roof, or other exterior improvements	31%	30%	31%
Kitchen appliances	30%	25%	28%
Hot water heater*	21%	27%	24%
Home automation	24%	23%	23%
Solar panels	23%	24%	23%
Weatherizing or caulking	23%	19%	22%
Insulation to the attic, wall, or floor	22%	21%	22%
Air conditioning	24%	18%	21%
Laundry appliances	21%	18%	19%
Home battery or generator	14%	24%	18%
Smart thermostat*	17%	17%	17%
Heating system	18%	16%	17%
LED lighting* or occupancy sensors	15%	16%	16%
EV charger	14%	17%	15%
Low-flow showerheads or faucet aerators*	14%	16%	15%
Room fans or air filtration	11%	16%	13%
Test air heating/cooling system for leaks and repair*	12%	14%	13%

Multiple responses permitted
 *Denotes a measure offered by local 3PPs

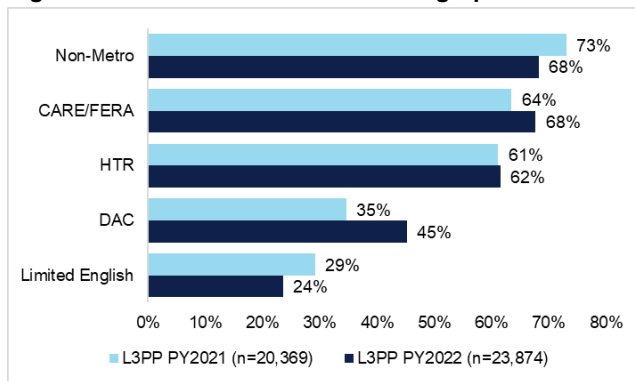
4.3.3 Profiles relative to previous program year

We also analyzed participant characteristics to understand if there are differences between PY2021 and PY2022 participant profiles. We obtained data from ACS and utility CIS to perform this analysis. The CIS provides data on individual participant characteristics, whereas the ACS provides data on participant locations at the census block group level. The information we collected for the analysis based on these data includes:

- Percent of participants on the CARE or FERA rate
- Percent of participants that are HTR
- Percent of participants living outside of CBSA metro areas
- Percent of participants living in an area classified as DAC
- Percent of participants with limited English proficiency

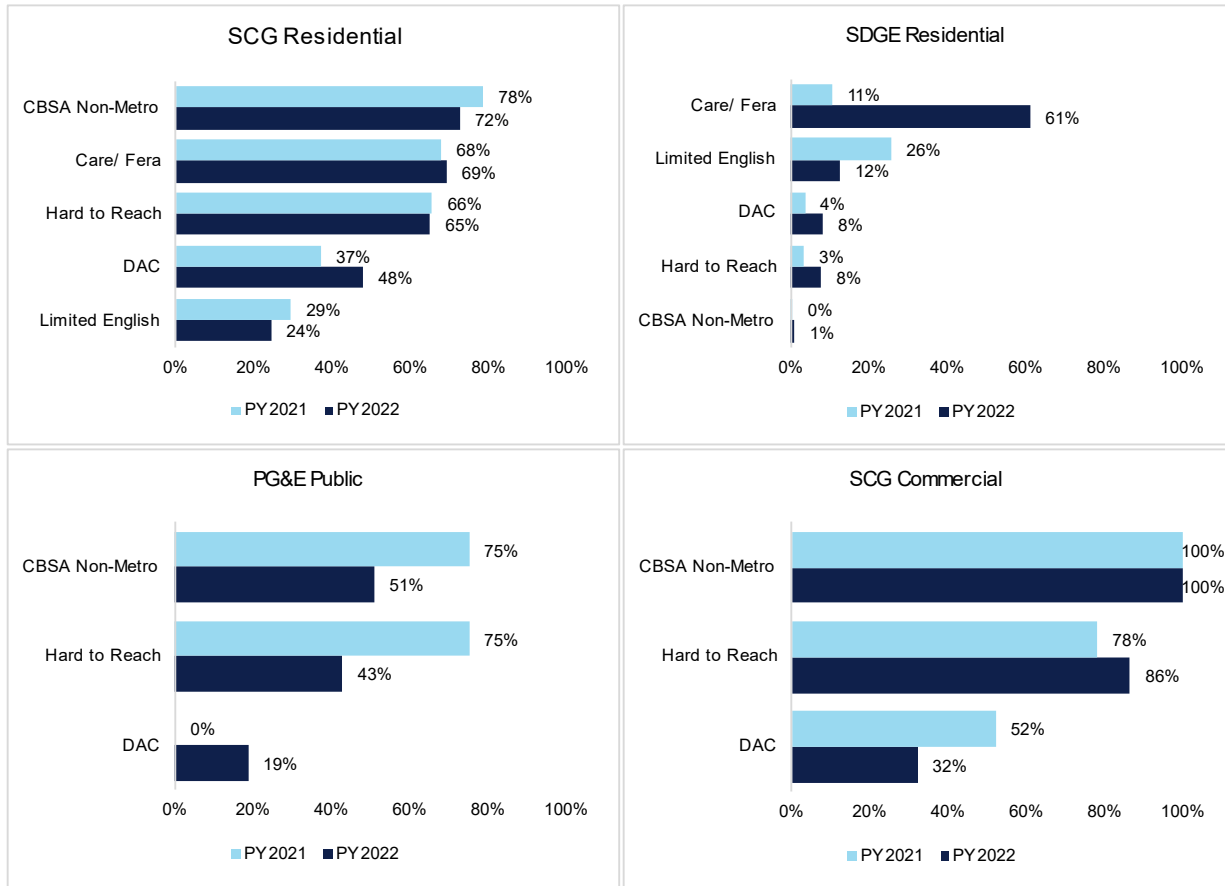
Figure 4-3, which provides a comparison of the PY2021 and PY2022 outcomes, indicates that the performance of local 3PPs remained consistent year-over-year with improved reach of DAC customers in PY2022.

Figure 4-3. Local 3PP customer demographic for PY2021 and PY2022



We also compared PY2021 and PY2022 participant profiles by sector. Figure 4-4 compares SCG’s and SDGE’s residential, PG&E’s public, and SCG’s commercial participant characteristics. Overall, local 3PP reach of HTR and other equity segment customers was better in PY2022 than in PY2021. However, the residential programs served somewhat lower proportions of customers with limited English proficiency and, in SCG’s case, in non-metro areas in PY2022 compared to PY2021. The public and commercial programs also served a lower proportion of DAC customers in PY2022 relative to PY2021. These could be areas of additional focus in future program years. However, given the significant improvement in local 3PP reach of customers in many critical underserved segments, current program efforts indicate a reasonable focus on equitable energy efficiency service delivery.

Figure 4-4. Local 3PP participant HTR and related segments in PY2021 and PY2022



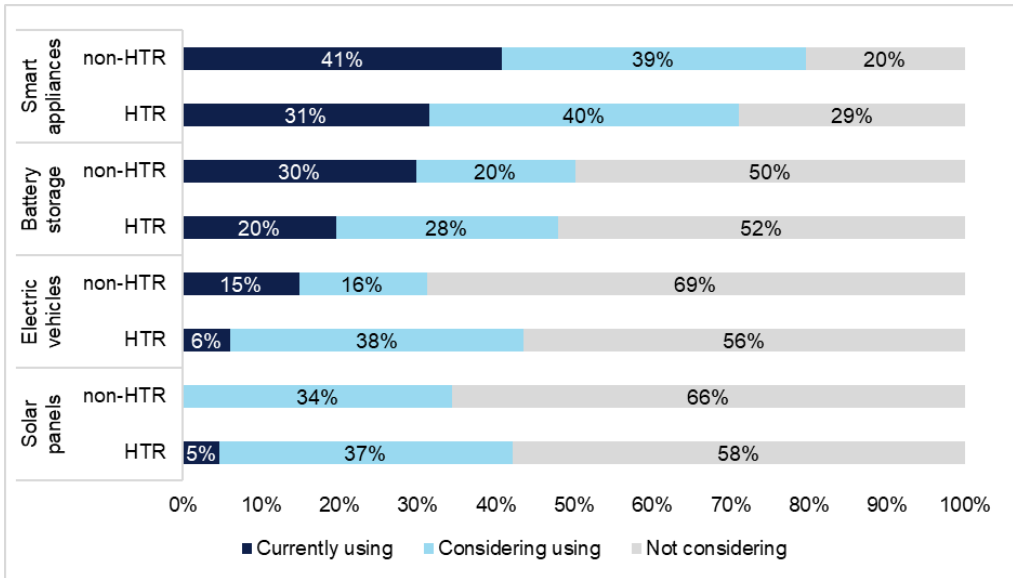
4.3.4 Participant interests

We surveyed Local 3PP residential and non-residential end users about their interest in additional energy efficiency enhancements by asking about their current and anticipated adoption of clean technologies. Specifically, we asked these groups to identify the technologies they currently use or plan to adopt within the next two years.

Figure 4-5 reveals that smart appliances and battery storage were the most favored technologies among both the HTR and non-HTR populations. While EVs and solar panels were not as commonly adopted, at least 16% of participants expressed interest in adopting them in the future.

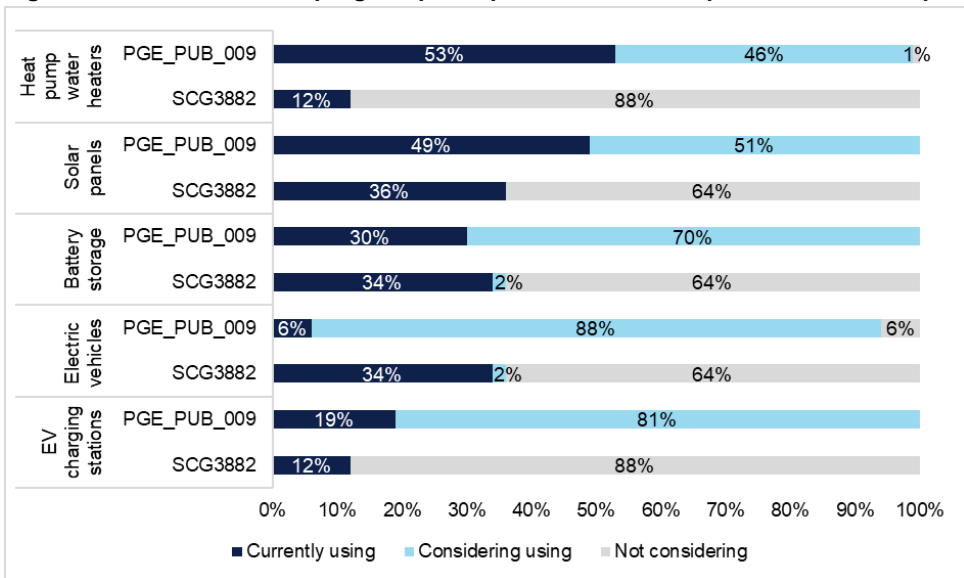
There was a notable difference between HTR participants and non-HTR participants when it came to adoption of the technologies. Current and future adoption of smart appliances and battery storage was about 10% lower for HTR versus non-HTR participants, which could be related to disparities between the two groups. Compared to the PY2021 results, we can see a higher level of adoption for all the technologies except for solar panels. However, about 10% more participants in PY2022 reported considering solar panels than in PY2021.

Figure 4-5. Residential HTR and non-HTR participants’ current and planned future adoption of other clean technologies



We also assessed non-residential participants' openness to adopting clean technologies, as summarized in Figure 4-6. As we saw in PY2021, public program participants demonstrate a stronger openness to all suggested technologies than commercial participants. These differences likely stem from the distinct firmographic dissimilarities between the two programs' participants. While PG&E's public sector program primarily enrolls large institutional buildings, the commercial program works with small and medium businesses who are less likely to own their space.

Figure 4-6. Non-residential program participants’ current and planned future adoption of other clean technologies



4.4 Program performance

This section presents our assessment of the program design, marketing and outreach efforts, and program delivery for the local 3PPs. Our evaluation involved comparing the performance of each program element against its intended goals and,



where feasible, against peer programs. The following subsections delve into program design, marketing and outreach strategies, and an analysis of various aspects of program delivery.

4.4.1 Program design

The California Evaluation Framework provides the blueprint that energy efficiency programs need to follow to ensure their success.⁵⁸ It requires that programs articulate a program theory, outlining specific goals and planned activities to achieve them. Additionally, the framework recommends that a comprehensive program theory identifies the barriers the program intends to address and the proposed strategies to overcome them.

DNV reviewed the program theories the local 3PPs provided in their PIPs. We focused on ensuring that the PIPs articulated program objectives, barriers the programs intended to overcome, and approaches to do so. Most of the programs were in place since PY2021 and their design elements remain unchanged. Table 4-16 presents a summary for the program design elements of all the programs we evaluated, including the new multifamily program added in the current evaluation.

Table 4-16. Summary of PY2022 local 3PP goals and barriers

Program	Goals and objectives	Barriers
RZNET - SDGE4002	Improve energy efficiency among multifamily properties and manufactured homes	<ul style="list-style-type: none"> • Tenant/landlord split incentives • Complexity of energy efficiency programs
GK12 - PGE_Pub_009	Improve the energy efficiency of public sector buildings, including local and federal government buildings and K-12 schools	<ul style="list-style-type: none"> • Limited funding for energy efficiency projects • Complex procurement processes • Lack of visibility into energy consumption • Limited staff available to engage in energy efficiency
MESP - PGE_Res_003	Improve energy savings among underserved multifamily properties and provide deeper retrofits to large and newer properties	<ul style="list-style-type: none"> • Tenant/landlord split incentives • Several layers of decision makers • Inadequate technical expertise • Low priority of energy efficiency • Funding barriers
CLEO - SCG3861	Provide energy efficiency services (including in-language training and direct installations) among communities whose primary language is not English	<ul style="list-style-type: none"> • Language barrier • Lack of customer awareness about energy efficiency benefits • Lack of funds required for energy efficiency
SMCP - SCG3882	Help small and medium businesses (such as dry cleaners, hotels and motels, retail spaces, and restaurants) be more competitive by increasing their energy efficiency	<ul style="list-style-type: none"> • Financial barriers faced by small and medium businesses that lack access to capital
Res ACE - SCG3883	Improve the energy efficiency of single-family homes and help drive deeper savings among this customer segment	<ul style="list-style-type: none"> • High cost of home retrofits
CMHP - SCG3884	Improve the energy efficiency of manufactured homes and help drive deeper savings among this customer segment	<ul style="list-style-type: none"> • High cost of home retrofits
MFEER-SCE-3P-2020RCI-004	Achieve significant energy savings in multifamily buildings through comprehensive EE solutions Increase EE adoption rates among DAC/HTR multifamily residential buildings	<ul style="list-style-type: none"> • Tenant/landlord split incentives • Inconvenience and search cost • Uncertainty in EE benefits • Investment capital and sufficient returns

Every program identifies clear goals, encompassing overarching objectives and specific sub-goals. Energy efficiency consistently stands out as the primary goal across all programs. The programs also identify barriers that hinder participation and the proposed solutions to overcome them. Commonly acknowledged barriers include financial constraints, limited

58 CALMAC. "The California Evaluation Framework." calmac.org, June 2004. https://www.calmac.org/publications/California_Evaluation_Framework_June_2004.pdf



expertise, and intricate decision-making arising from split incentives or organizational structures. These programs appear to have carefully considered and laid out critical design elements in their plans.

4.4.2 Program marketing and outreach

This section provides a discussion of the PY2022 local 3PPs marketing and outreach activities and an assessment of the relative success of these activities compared to PY2021.

4.4.2.1 Marketing and outreach activities

As part of the local 3PPs evaluation, we gathered information on the marketing and outreach activities conducted by the programs in PY2022. We examined the PIPs and collected insights from implementers to review the outreach and marketing methods employed by the programs. These methods aimed to establish program awareness, generate leads, and increase customer participation in PY2022.

The local 3PPs utilized various approaches to develop comprehensive marketing and outreach strategies. For programs in their second year of operation, the program implementers capitalized on market insights gained and market segment response to the previous year's outreach efforts. The programs strategically used a combination of direct, partnership-based, and data-driven approaches in their marketing efforts.

Programs employed a data-driven marketing approach, complemented by direct outreach activities such as flyers and door hangers, targeted or general email blasts, and social media campaigns. The programs also leveraged partnerships with other organizations to improve outreach. In DAC/HTR communities, the preferred outreach strategy was geofencing - a location-based marketing method. This approach involved establishing a virtual geographic boundary to direct marketing efforts precisely toward a specific customer segment.

Second year programs also pivoted strategies to improve outreach results in PY2022. PG&E's Multifamily Energy Savings Program (MESP - PGE_Res_003) resumed in-person events after a hiatus due to the COVID-19 pandemic, and SCG's Residential Advanced Clean Energy (Res ACE - SCG3883) and SCG's Comprehensive Manufactured Home Program (CMHP - SCG3884) established internal marketing departments to enhance social media engagement. SCG's Community Language Efficiency Outreach Program (CLEO - SCG3861), PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009), and SCG's Small and Medium Commercial EE Program (SMCP - SCG3882) focused on building partnerships and adopting a more targeted approach. Table 4-17 summarizes the marketing strategies implemented by each program in PY2022 and notable changes from PY2021. Appendix H (section 6.8) provides additional details on each program's marketing approach and the changes from PY2021 outreach efforts.

Table 4-17. Marketing and outreach strategies and changes in PY2022

Programs	Data driven	Digital and phone-based	Partnership-based	Direct outreach / face-to-face	Notable changes in PY2022
RZNET - SDGE4002	Data and maps for targeted outreach	Phone and email outreach	N/A	ASHRAE Level 1 audits Flyers and door hangers	Planned future TV advertisements
GK12 - PGE_Pub_009	N/A	N/A	Partnerships with local governments and community stakeholders	N/A	Focus on local government partnerships
MESP - PGE_Res_003	Demographic data for targeted outreach	Cold calls Email blasts Digital content	Partnerships with vendors, CCAs/RENs, and trade associations	In-person events	In-person events Partnered with a water heater vendor
CLEO - SCG3861	N/A	Social media ads	N/A	In-language community seminars and booths Community events Door-to-door canvassing	Increase in social media ads Flyers and door hangers

Programs	Data driven	Digital and phone-based	Partnership-based	Direct outreach / face-to-face	Notable changes in PY2022
SCMP - SCG3882	N/A	Targeted emails	Partnership with trade allies	Outreach to previous program participants	Targeted email campaigns Partnership with trade allies
Res ACE - SCG3883	Geofencing / mapping tool for outreach	Emails Social media campaigns	N/A	ASHRAE-level 1 audits Flyers and door hangers In-person or webinar meetings	Establishment of internal marketing department
CMHP - SCG3884	Geofencing for targeted outreach	Emails Social media campaigns	Leverage manufactured homes association membership for outreach	Flyers and door hangers Clubhouse presentations	Establishment of internal marketing department
MFEFP - SCE_3P_2020RCI_004	Proprietary software for outreach	N/A	Collaborations with various market actors including trade allies	N/A	Inactive as of 2023

Source: Program implementation plans and interviews with program implementers

4.4.2.2 Assessment of local 3PPs outreach and marketing

Table 4-18 presents the outreach methods which program implementers identified as impactful in PY2022 and PY2021. Additionally, it indicates whether programs utilized KPIs to monitor the success of their marketing and outreach efforts. As in PY2021, only two programs reported KPIs that track outreach success.

Table 4-18. Comparison of local 3PP outreach and marketing methods in PY2021 and PY2022

Program	Effective outreach and marketing strategies PY2021	Effective outreach and marketing strategies PY2022	KPI tracking outreach & marketing
RZNET - SDGE4002	Direct outreach through canvassing	Direct outreach through canvassing	✓
GK12 - PGE_Pub_009	Partnerships with community leaders and local government bodies	Partnerships with community leaders and local government bodies	
MESP - PGE_Res_003	Direct outreach through canvassing Implementation contractor referrals	Partnership with vendors	
CLEO - SCG3861	Implementation contractor referrals	Direct outreach and social media	
SMCP - SCG3882	Direct outreach through door hangers	Partnership with trade allies	✓
Res ACE - SCG3883	Direct outreach through canvassing	Direct outreach Email and social media campaigns	
CMHP - SCG3884	Direct outreach through canvassing	Direct outreach Email and social media campaigns	
MFEFP - SCE_3P_2020RCI_004	N/A	None were successful	

Source: Implementer interviews, PIPs, and IOU KPI metrics

Direct outreach is an overall winner: The evaluation for PY2022 echoes sentiments observed previously in PY2021 regarding marketing and outreach, which included various elements from in-person assessments/audits to virtual meetings. There is a consensus among program implementers that direct outreach, whose core objectives include establishing direct communication, building relationships, and promoting program offerings to a targeted audience, remains the most effective method. The personal touch of reaching out and educating a customer leads to a higher conversion rate, translating marketing efforts into actual participation. Given the success observed with this strategy, we recommend continuing these efforts.

Partners in success: Partnerships play a significant role in marketing and outreach efforts. In PY2022, PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009), which shifted their marketing approach from relying on big data analytics to engaging in partnerships with various stakeholders in PY2021, continued using this approach



to achieve increased program participation. Similar stories emerged from other programs that promoted their initiatives through trade allies, community partners, and local government agencies. We strongly recommend maintaining this approach, as it has proven to be a meaningful factor in successful marketing and outreach efforts.

Media campaigns continue to be an effective tactic: Programs have reported the utilization of phone/web/social media, as well as print/TV campaigns, as marketing methods. Program implementers have reported success in engaging with such campaigns, emphasizing their potency in generating awareness and converting interested/prospective customers into program participants. We recommend continuing these strategies in the coming years.

Multifamily remained a challenging market segment: Similar to PY2021, multifamily program implementers expressed difficulties executing their marketing and outreach strategies in PY2022. This challenge is partly due to ownership turnover as multifamily property management groups frequently buy and sell properties which posed a significant obstacle to implementer outreach efforts. This frequent change in ownership created challenges in identifying the appropriate individuals responsible for decision-making. In some cases, lack of customer data also posed a challenge in engaging in outreach activities.⁵⁹ In order to overcome these challenges, the PAs could consider offering multifamily programs as equity rather than resource acquisition programs. Such an approach would allow them to provide higher incentives to property owners that reduce split incentive barriers and offer more measures attractive to multifamily participants. They could also consider requiring core measures for tenant units to improve renter equity.

4.4.3 Program delivery

Since PY2021 was the first program year (of three contracted years) for the local 3PPs, we compared their first performance against values they filed in CEDARS and peer programs. In PY2022, all the programs, except SCE's multifamily program, have a year of history, and we compared their performance to their first-year outcomes. Moreover, given incomplete CEDARS filed values (mostly in PY2021), to benchmark their performance relative to expectation, we used contracted or KPI values for this purpose. Such a comparison indicates the change in performance relative to a stable base that reflects average expected performance across the three contract years.

4.4.3.1 Program cost and savings

In the following subsections, we compare PY2021 and PY2022 program costs and savings to follow the development of the local 3PPs.

Local 3PP cost and energy savings relative to goal

We assessed the performance of local 3PP costs and savings by comparing the programs' established goals with their reported results. Both the program goals and the claimed/delivered values were reported in CEDARS, but we also reviewed the KPI scorecards and the PIPs for the program's contracted values. We compared their PY2021 and PY2022 spending and energy delivery metrics, including TRC (total resource cost), contracted budget versus claimed spending, the share of overhead spending, and the amount of net energy delivered in MMBtu,⁶⁰ as shown in Table 4-19. The share of total expenditure on overhead activities provides insight into the effectiveness of such implementations. The percentages of budgets spent by programs and the energy savings claimed by programs relative to planned levels serve as indicators of the programs' capacity to implement energy-saving measures as per the plan. The table also includes the TRC values, which measure program's cost-effectiveness delivered, as shown in Table 4-19.

⁵⁹ The MFEET - SCE_3P_2020RCI_004 program implementer mentioned in the interview that lack of data was a barrier to deploying their planned outreach activities. This observation highlights the importance of customer information/data for successful outreach activities.

⁶⁰ MMBtu is the sum of kWh and therm savings converted to a common unit of measure.



Table 4-19. Comparison of PY2021 and PY2022 Local 3PP cost and savings performance relative to goals

Sector	Program	TRC		Spending/budget		Overhead cost per total spending		Percent net energy (MMBTU) delivered	
		PY2021	PY2022	PY2021	PY2022	PY2021	PY2022	PY2021	PY2022
Residential	CMHP – SCG3884	2.5	2.5	63%	71%	8%	13%	55%	63%
	Res ACE – SCG3883	1.5	1.4	118%	195%	7%	12%	92%	130%
	RZNET – SDGE4002	1.1	1.3	109%	91%	9%	9%	150%	123%
	CLEO – SCG3861	0.2	0.5	151%	113%	8%	12%	89%	146%
Multifamily	MESP – PGE_Res_003	0.3	0.7	24%	65%	52%	26%	7%	105%
	MFEFP – SCE_3P_2020RCI_004*	-	-	-	4%	-	61%	-	0.03%
Non-residential	SMCP – SCG3882	1.1	0.6**	17%	104%	29%	21%	28%	64%
	GK12 – PGE_Pub_009	0.2	0.4	33%	112%	38%	12%	4%	39%

*New program in PY2022

** Program implementer noted this value is incorrect and the evaluated TRC is above 1.

Underperforming programs have improved. In general, we can see that the non-residential local 3PPs that underperformed in PY2021 are improving. In PY2022, the programs underspent their budget and under-delivered energy savings relative to planned levels. They also spent a relatively large proportion (over 15%) of their total budget on overhead activities resulting in TRC (cost-effectiveness) performance less than one. In PY2022, the non-residential programs spent closer to their contracted budgets, delivered closer to planned energy savings, and their percent overhead spending decreased. This indicates that programs that had struggled to become established during the PY2021 ramp up period are finding traction in the marketplace. Despite this trend, we did observe a 70% decline in TRC for SCG’s Small and Medium Commercial EE Program (SMCP - SCG3882). During interviews, the implementer indicated that they believe this number to be incorrectly reported in CEDARS. This was error validated by the PA and the discrepancy is due to a reporting issue for measure count of the tankless hot water heater measure. This issue is described in more detail in the gross savings valuation section (section 4.1.1) and Appendix D (section 6.4.5).

Well-performing programs are stable. In PY2022, the residential local 3PPs serving either single or manufactured homes performed as planned, both in their spending and energy savings delivery, and were cost-effective in both evaluated program years. The exception among this group was SCG’s Community Language Efficiency Outreach Program (CLEO - SCG3861), which had experienced a ten-fold increase in its operations as it became a full-fledged third-party implemented program, resulting in a mixed performance in both program years. Also, SDGE’s Residential Zero Net Energy Transformation Program’s (RZNET - SDGE4002) spending and delivered savings relative to expectations were approximately lower by 20% and 30%, respectively, in PY2022. The implementer reported that although the program exceeded its therm goal due to the hot water heating measures it implemented, it did not meet its kWh or kW goals due to a lack of cost-effective deemed measures available.

Multifamily programs face steep challenges. However, the local 3PPs that serve the multifamily sector have struggled and two have even closed. Although some performance indicators for PG&E’s multifamily program have significantly improved year-over-year, including TRC and the percent of net energy delivered, this program closed in the middle of 2023.⁶¹ The SCE’s multifamily program, which started operating in PY2022, also ceased operations in 2022. The program implementers reported a myriad of issues resulting in their inability to succeed, including limited or reduced measures

⁶¹PG&E’s Multifamily Energy Savings Program’s (MESP - PGE_Res_003) therm savings improved year-over-year and it also exceeded its PY2022 therm savings goals. However, its kW and kWh savings decreased year-over-year and it also fell far short of its kW or kWh savings goals for PY2022.



available to implement (in particular, lighting), difficulty in recruiting customers, limitations imposed by the pandemic, possible competition from other PA programs with similar offerings, limited direct install budgets, and split incentives.

Specific examples of challenges include:

- **Split incentives:** Interviewed participating property managers indicated they do not value tenant unit saving to the same extent as common area ones due to the benefits accruing to residents and not to the property owners and managers.
- **Competition:** Implementers indicated they faced competition from MCE in the North Bay, BayREN in nine Bay Area counties, and SoCalREN in southern California.⁶²
- **Limited direct install budget:** Implementers noted that smaller-sized contracts limited the implementer budget and staffing for direct install offers, which impacted program success.
- **Impacts of the COVID-19 pandemic:** Multifamily program staff reported that the pandemic limited their ability to access individual living units and also reduced cash liquidity among landlords making them unable to afford upgrades.

Addressing the challenges local 3PPs face to serve this customer segment will be critical to ensure renters receive benefits from state EE resources and multifamily buildings contribute to the state's climate goals by becoming more energy efficient.

Local 3PP cost and savings performance year-over-year

In order to track the local 3PP's cost effectiveness, we examined their cost versus savings outcomes, as described in Table 4-20. The table covers a wide range of metrics used to assess the programs' performance, including TRC, costs versus savings, and value changes from PY2021 to PY2022.

Table 4-20. Local 3PP cost and savings performance year-over-year

Sector	Program	TRC		Cost of conserved energy (MMBTU)				Percent change (PY2021 to PY2022)	
		PY2021	PY2022	Total cost per net energy savings		Overhead cost per net energy savings		Net savings (MMBTU)	Total cost
				PY2021	PY2022	PY2021	PY2022		
Residential	CMHP - SCG3884	2.5	2.5	\$110	\$111	\$9	\$14	12%	13%
	Res ACE - SCG3883	1.5	1.4	\$114	\$134	\$8	\$16	34%	50%
	RZNET - SDGE4002	1.1	1.3	\$49	\$50	\$4	\$5	-20%	-17%
	CLEO - SCG3861	0.2	0.5	\$505	\$230	\$39	\$28	49%	-30%
Multifamily	MESP - PGE_Res_003	0.3	0.7	\$333	\$71	\$173	\$19	265%	110%
	MFEFP - SCE_3P_2020RCI_004	-	-	-	\$22,501	-	\$13,687	-	-
Non-residential	SMCP - SCG3882	1.1	0.6	\$61	\$121	\$18	\$26	111%	179%
	GK12 - PGE_Pub_009	0.2	0.4	\$706	\$202	\$268	\$23	244%	119%

The cost of conserved energy decline in PY2022 compared to PY2021. When we examined the overhead spending versus unit of energy saved, we saw a notable improvement in this metric in PY2022, in particular for PG&E's programs. While some of the other programs had increases in overhead spending per unit of energy saved, this increase could indicate an increase in outreach to secure participant or efforts to scale operations to expand program participation.

⁶² MCE is a community choice aggregator (CCA), and BayREN and SoCalREN are regional energy networks that provide EE interventions in their respective areas. CCAs are local government entities that procure power for residents opting to receive this service in their areas. RENs are local government entities that administer EE programs for residents, businesses, and institutions in their jurisdictions.

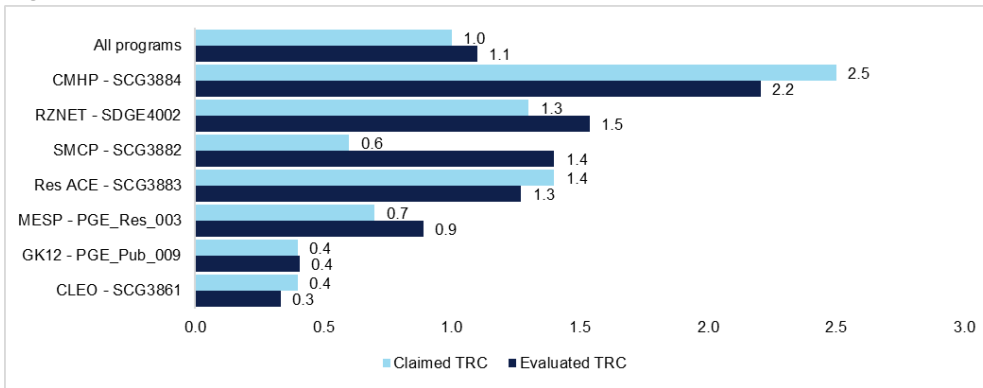


Additionally, we compared the total program spending per unit of energy savings delivered by the programs to determine how effectively they spent program funds. Overall, there was a trend toward more effective program spending, resulting in a lower cost for each unit of energy saved as programs moved from ramp-up to a steady state of operation. In particular, PG&E’s Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009), SCG’s Community Language Efficiency Outreach Program (CLEO - SCG3861), and PG&E’s Multifamily Energy Savings Program (MESP - PGE_Res_003) all showed notable improvement of at least 75% year-over-year in this area.⁶³

4.4.3.2 Cost effectiveness calculations

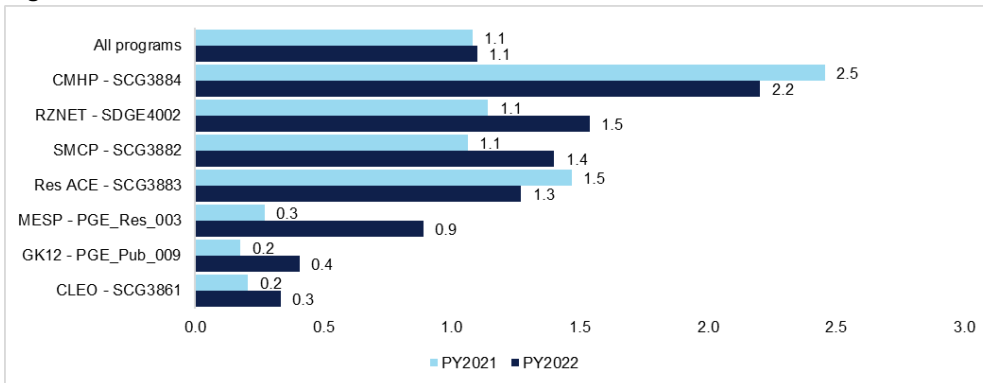
We calculated the PY2022 local 3PPs’ cost-effectiveness based on evaluated savings using the Cost Effectiveness Tool (CET) available on the CEDARS website. One metric calculated in the tool is the total resource cost ratio (TRC), which compares total benefits to the total resource cost. We provide a summary of the claimed and evaluated TRC in Figure 4-7. Overall, the PY2022 local 3PPs were more cost-effective than claimed. Individually, the programs were more or as cost-effective as claimed.

Figure 4-7. Claimed and evaluated PY2022 TRC



Additionally, we compared the evaluated PY2022 TRC ratios to PY2021 ratios. Figure 4-8 illustrates this comparison. In PY2022, the cost-effectiveness of local 3PPs showed improvement compared to PY2021, as most programs demonstrated a higher TRC ratio in PY2022 than in PY2021.

Figure 4-8. Evaluated PY2022 and PY2021 TRC



⁶³ The commercial program experienced a relative increase in total spending per unit of energy delivered, likely due to the savings calculation issue mentioned in the gross savings section.



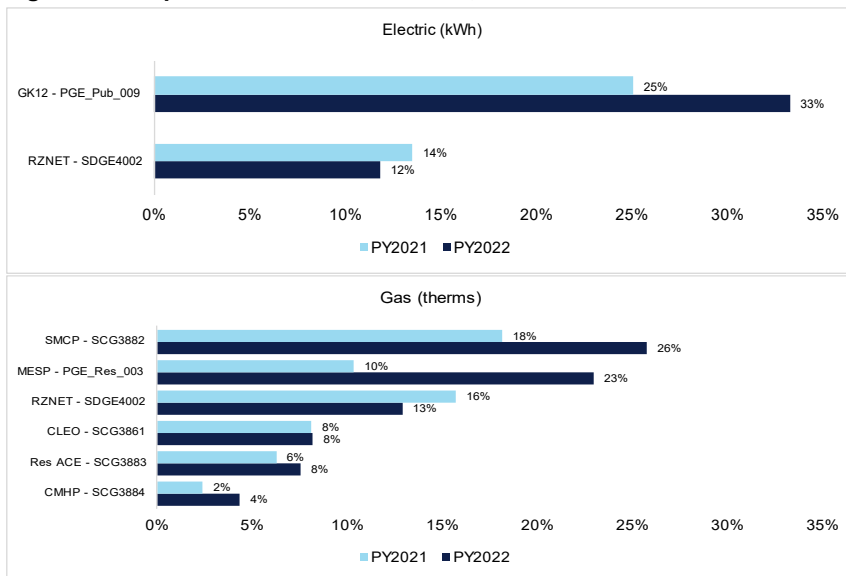
4.4.3.3 Depth of retrofit

Another dimension of delivery performance is the level of energy consumption reduction made possible among participating sites due to program intervention. We evaluated how local 3PPs performed in this area by examining the depth of retrofit, which we measured using average savings as a percent of each site's energy consumption.

In the prior evaluation, we compared each program's depth of retrofit to that of a peer program. In this evaluation, we compared the PY2022 depth of retrofit to PY2021 values by program and fuel to assess if PY2022 local 3PPs delivered measures and interventions with deeper savings.

Figure 4-9 compares the PY2021 and PY2022 depth of retrofit values of local 3PPs. The figure provides values that reflect activity for all local 3PPs except for PG&E's and SCE's electric multifamily operations, which offered electric savings measures to one site each. As the figure indicates, the average percent savings (energy savings relative to energy consumption) of local 3PPs in PY2022 is about the same or higher than in PY2021.

Figure 4-9. Depth of retrofit of local 3PPs, PY2021 and PY2022



Additionally, we reviewed the measures offered by programs to understand their potential impact on delivering deeper energy savings. The mix of measures the local 3PPs offered was primarily the same in the two program years.⁶⁴ However, the volume of measures installed associated with deeper savings was higher in PY2022. Figure 4-10 provides the percent of savings by measure for the two local 3PP non-residential programs. PG&E's public program savings were mainly from lighting installations in PY2021 and heat pump water heaters in PY2022. SCG's commercial program savings were mostly from modulating gas valves in PY2021 and steam traps in PY2022. The measures offered by PG&E's public program in particular explain the deeper savings the program delivered in PY2022 compared to PY2021.

⁶⁴ The exceptions included measure offerings by PG&E's public and SDGE's multifamily programs. The former offered two new measures (refrigeration and food service-related), and the latter no longer offered HVAC maintenance measures (including coil cleaning and refrigerant replacement) in PY2022.



Figure 4-10. Percent of savings from installed measures of non-residential local 3PPs, PY2021 and PY2022

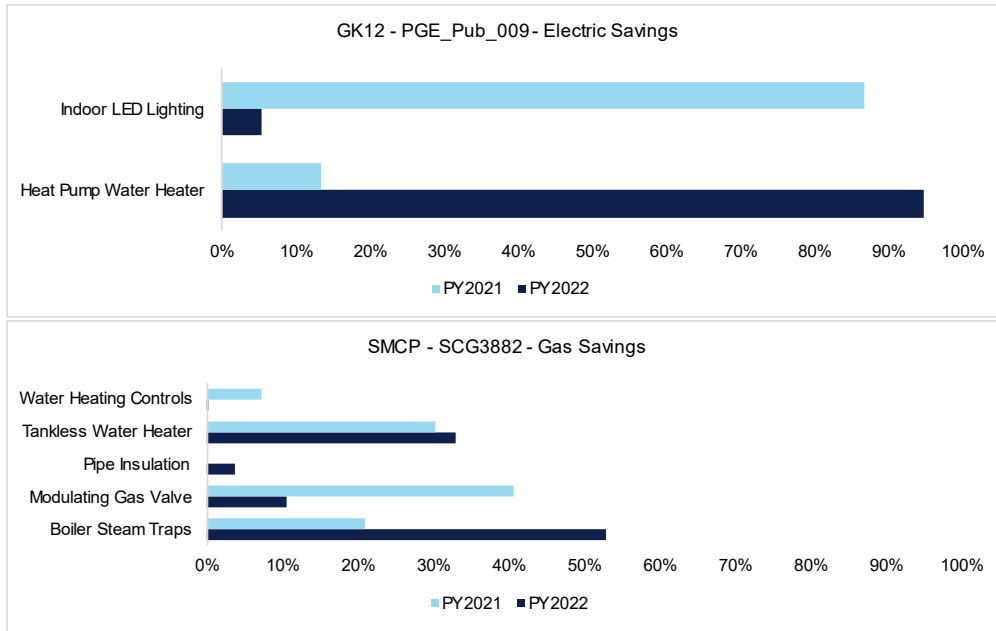
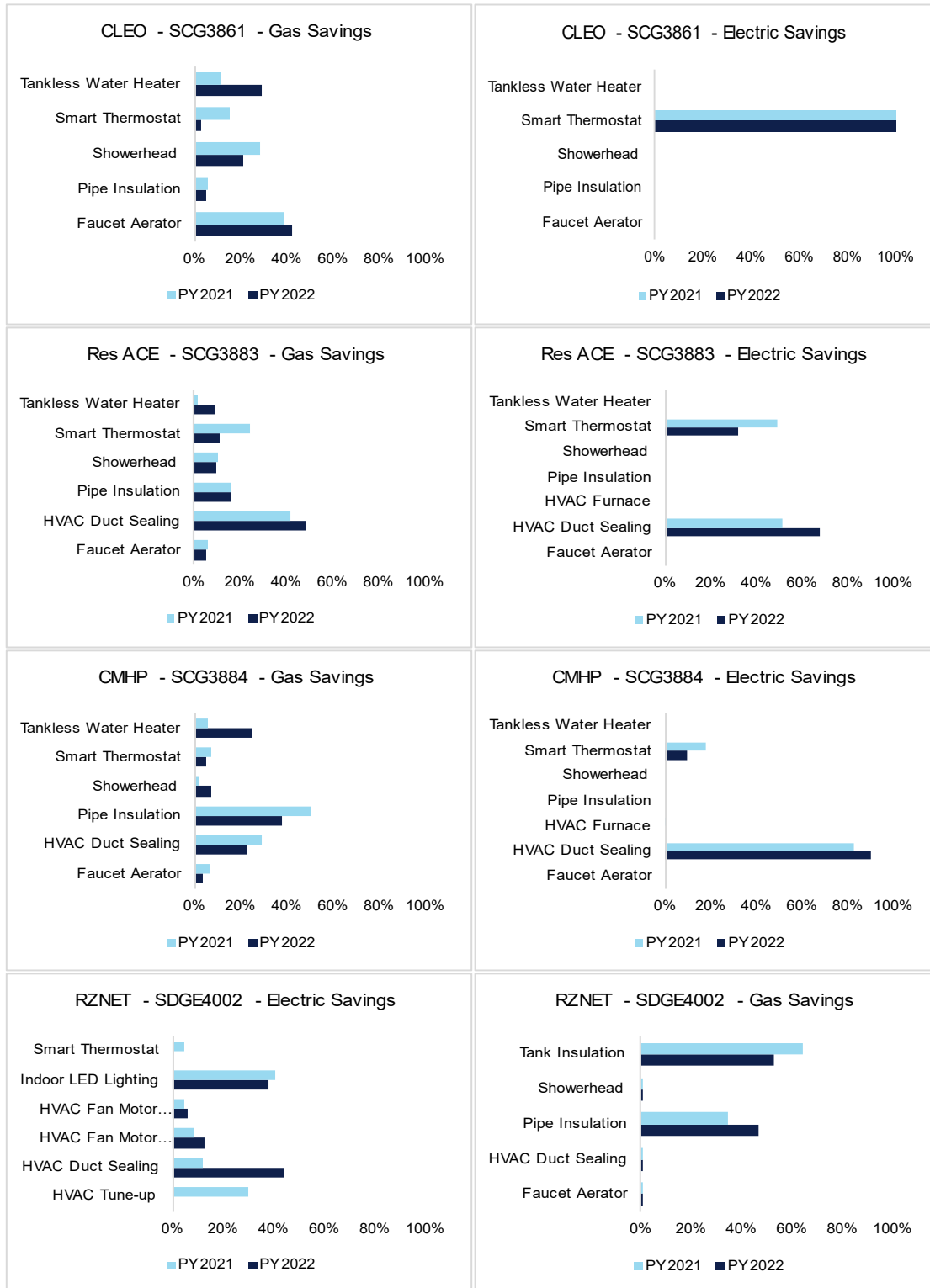


Figure 4-11 provides the percent savings from the measures offered by the residential programs. For three local 3PPs (CLEO - SCG3861, Res ACE - SCG3883, and CMHP - SCG3884), more energy savings were from tankless water heaters in PY2022 compared to PY2021. For another two local 3PPs (Res ACE - SCG3883 and RZNET - SDGE4002), more energy savings were from duct sealing in PY2022 compared to PY2021. In both cases, the programs shifted from interventions with lower energy savings potential (HVAC tune-ups or smart thermostats) to those with higher energy savings potential (duct sealing).



Figure 4-11. Percent of savings from installed measures of residential local 3PPs, PY2021 and PY2022





4.4.3.4 Tracking program information

The programs evaluated in PY2022 are all resource programs, defined by the CPUC as those yielding quantifiable energy savings tracked by program administrators.⁶⁵ These programs have regulatory reporting requirements, including on the types of measures they installed, and the energy savings associated with them. All implementers tracked and reported energy savings related data to the PAs, which are documented in CEDARS.

The implementers and PAs also track additional information that is critical for the success of the programs. DNV closely examined data collection methods to understand the nature of the information tracked and reported by implementers and the PAs. Insights from interviews with program implementers played a vital role in this effort. While some programs introduced additional features and tools to improve the data collection processes, the program implementers reported that there were no significant changes in the types of data tracked and collected relative to PY2021.

Table 4-21 summarizes the information tracked by the programs, which mirrors what we reported in PY2021. SDGE's RZNET (RZNET - SDGE4002) was the sole program that tracked audit outcomes. For programs with an audit component, monitoring the conversion of audits to participation provides a significant measure of program effectiveness. Additionally, most local 3PPs tracked limited cross-program promotions they may have undertaken. Given their multiple customer touchpoints, tracking outcomes in this area will also help gauge the delivery success of local 3PPs.

On the other hand, the local 3PPs tracked critical customer-related information. Most tracked and reported the HTR status of participants, which is necessary for understanding program performance related to equity. All the programs also collected customer contact information required for evaluating program performance.

Table 4-21. Information tracked by Local 3PPs in PY2022

Data types	Outcomes of audit efforts	Cross-program marketing	Customer experience	HTR/DAC status	Contact information
RZNET - SDGE4002	✓	✓	✓	✓	✓
GK12 - PGE_Pub_009		✓	✓		✓
MESP - PGE_Res_003			✓		✓
CLEO - SCG3861				✓	✓
SMCP - SCG3882				✓	✓
Res ACE - SCG3883			✓	✓	✓
CMHP - SCG3884			✓	✓	✓

4.4.3.5 Participant experience

Program delivery significantly shapes the participant experience, influencing both customer satisfaction and the perception of non-energy benefits. Furthermore, it plays a pivotal role in determining the information customers receive, thereby optimizing the advantages derived from ongoing and prospective program participation. This section delves into a comprehensive analysis of these facets of the customer experience, drawing insights from survey data. Additionally, we present key motivating factors for program participation, gleaned from the survey findings, to provide valuable input for enhancing future program delivery strategies.

Participating customer satisfaction

Residential participants. We surveyed participants on the level of satisfaction with various aspects of program elements and compare satisfaction rates among residential HTR and non-HTR participants. Table 4-22 shows the percentage of

⁶⁵ CPUC. "Energy Efficiency Policy Manual-Version 6." cpuc.ca.gov, April 2020. <https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/e/6442465683-ee-policy-manual-revised-march-20-2020-b.pdf>.



residential participants who were satisfied those who rated a 4 or 5 on the five-point scale with each aspect of the program and factoring out those who said they did not know or who refused to respond. Satisfaction with specific program elements ranged from the low 64% to the high 91%. Overall program experience remains high for both HTR and Non-HTR respondents in both years, with a slight decrease for HTR participants. Provided are a few key takeaways:

- **Application or paperwork:** Overall, there is a trending decrease in respondents citing satisfaction with the application and paperwork from PY2021 to PY2022.
- **Energy savings and cost reduction:** In PY2021, HTR participants reported higher energy savings and cost reduction benefits than non-HTR participants, while in PY2022, the perception of such benefits for the two groups was similar.
- **Experience with installation contractor:** Both HTR and Non-HTR respondents show a decrease in satisfaction with their experience with installation contractors from PY2021 to PY2022.
- **Information and education provided:** There is a small decrease in satisfaction with the information and education provided, with both HTR and Non-HTR respondents showing declines from PY2021 to PY2022.
- **Non-energy impacts:** Non-energy impacts continue to be one of the areas with lower rates of satisfaction, decreasing for both groups from PY2021 to PY2022.
- **Program equipment offerings:** Both HTR and Non-HTR respondents show a consistent or slightly decreased satisfaction level with program equipment offerings from PY2021 to PY2022.

In summary, the overall trend suggests a slight drop in satisfaction across various aspects, with some variations between HTR and Non-HTR respondents.

Table 4-22. Residential participant satisfaction with local 3PPs, PY2021 and PY2022

Program element	HTR		Non-HTR	
	PY2021 (n=231)	PY2022 (n=1,036)	PY2021 (n=578)	PY2022 (n=116)
Overall program experience	88%	85%	88%	91%
Application or paperwork	84%	68%	80%	67%
Energy savings and cost reduction	85%	81%	79%	82%
Experience with installation contractor	87%	81%	86%	84%
Information and education provided	85%	81%	78%	77%
Non-energy impacts	78%	72%	76%	64%
Program equipment offerings	81%	81%	82%	79%

Non-residential participants. Presented in Table 4-23 is the percentage of non-residential participants who were satisfied (those who rated a five-point scale) with each aspect of the program, factoring out those who said they did not know or who refused to respond.

- **Overall program experience:** Overall program experience remains consistently high for all program elements from PY2021 to PY2022. While the SCG Small and Medium Commercial EE Program (SMCP - SCG3882) maintains high satisfaction levels year-over-year, we saw a notable increase in satisfaction levels for the PG&E’s Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009) in PY2022.
- **Application or paperwork:** There is a significant increase in satisfaction with the application or paperwork process for the non-residential programs in PY2022 with an 8% improvement for the PG&E program and 6% increase for the SCG program. Still, three PG&E customer respondents attributed their dissatisfaction to complicated paperwork.

- **Energy savings and cost reduction:** PG&E’s program shows a substantial improvement in satisfaction with energy savings and cost reduction, increasing from 38% in PY2021 to 93% in PY2022. SCG’s program maintains high satisfaction levels, with a slight increase from 91% to 95%.
- **Information and education provided:** Both programs show an increase in satisfaction with the information and education provided. PG&E’s program increased from 38% to 95%, and SCG maintains high satisfaction levels, with an increase from 84% to 99%.
- **Non-Energy Impacts:** Both program elements exhibit high levels of satisfaction with non-energy impacts. PG&E’s program significantly increased from 74% to 95%, while SCG maintains high satisfaction levels, with a slight decrease from 96% to 93%.
- **Program Equipment Offerings:** PG&E’s program shows a significant improvement in satisfaction with program equipment offerings, increasing from 59% in PY2021 to 100% in PY2022. Satisfaction with the SCG program offerings remains high, with an increase from 90% to 99%.

In summary, both program elements continue to exhibit high overall satisfaction. There are notable improvements in several aspects, particularly in PG&E, where satisfaction increased across all elements of the program, as well as overall.

Table 4-23. Non-residential participant satisfaction with local 3PPs, PY2021 and PY2022

Program element	GK12 - PGE_PUB_009		SMCP - SCG3882	
	PY2021	PY2022	PY2021	PY2022
	(n=5)	(n=29)	(n=33)	(n=38)
Overall program experience	59%	98%	97%	97%
Application or paperwork	59%	67%	93%	99%
Energy savings and cost reduction	38%	93%	91%	95%
Information and education provided	38%	95%	84%	99%
Non-energy impacts	74%	95%	96%	93%
Program equipment offerings	59%	100%	90%	99%

Presented in Table 4-24 is the percentage of property manager participants who were satisfied (those who rated a 4 or 5 on a five-point scale) with each aspect of the program and factoring out those who said they did not know or who refused to respond. Overall Program Experience: Both program elements, PG&E’s Multifamily Energy Savings Program (MESP - PGE_Res_003) and SDGE’s Residential Zero Net Energy Transformation Program (RZNET - SDGE4002), maintain very high overall program experience satisfaction levels, with only minimal changes from PY2021 to PY2022.

- **Application or paperwork:** While the SDGE program experienced a slight increase in satisfaction with the paperwork related to the program, we saw a notable decrease in satisfaction in this area for the PG&E program from PY2021 to PY2022. Nine PG&E respondents stated that it was “a long process,” suggesting that this could be a possible change in the application process resulting in lower satisfaction in this area compared to PY2021.
- **Energy savings and cost reduction:** PG&E’s program experiences a decrease in satisfaction with energy savings and cost reduction, dropping from 100% in PY2021 to 87% in PY2022. SDGE’s maintains high satisfaction levels, with a slight increase from 98% to 100%.
- **Experience with installation contractor:** Both program elements exhibit consistently high satisfaction levels with the experience of the installation contractor, with no significant changes from PY2021 to PY2022.
- **Information and education provided:** Both programs show a minor decrease in satisfaction with the information and education provided, with PG&E dropping from 100% to 96% in PY2022.
- **Non-energy impacts:** Both programs showed increases in satisfaction with project-related non-energy impacts.



- Program equipment offerings:** PG&E experienced a decrease in satisfaction with program equipment offerings, dropping from 100% in PY2021 to 89% and SDGE maintains high satisfaction levels, with no significant changes from PY2021 to PY2022.

In summary, both program elements generally maintain high satisfaction levels in overall program experience, application or paperwork, experience with installation contractor, and information and education provided. There are some slight decreases in satisfaction in specific categories for both elements, particularly in energy savings and cost reduction for PG&E and program equipment offerings for both elements. Additionally, non-energy impacts data is not available for PY2022.

Table 4-24. Property manager participant satisfaction with local 3PPs, PY2021 and PY2022

Program element	MESP - PGE Res_003		RZNET - SDGE4002	
	PY2021 (n=38)	PY2022 (n=57)	PY2021 (n=56)	PY2022 (n=64)
Overall program experience	100%	96%	98%	100%
Application or paperwork	100%	65%	98%	100%
Energy savings and cost reduction	100%	87%	98%	100%
Experience with installation contractor	100%	100%	98%	100%
Information and education provided	100%	96%	97%	100%
Non-energy impacts	92%	98%	96%	99%
Program equipment offerings	100%	89%	98%	100%

Non-energy benefits

We examined non-energy benefits (NEBs) reported by residential and non-residential end users. NEBs are an important metric in the context of energy-efficiency programs as they provide a holistic impact assessment on the overall value and effectiveness of a program. And non-energy benefits often directly impact the well-being and satisfaction of the end-users. Understanding and quantifying non-energy benefits can help policymakers and program managers tailor and optimize energy efficiency initiatives. It allows for the identification of successful strategies and the refinement of programs to better align with the needs and preferences of participants.

Table 4-25 shows the self-reported NEB's and compares non-HTR to HTR for program years 2021 and 2022. The findings show overall, there are some downward trends in reported benefits, with increased comfort and indoor air quality improvements decreasing slightly. There is a slight increase in the reported decrease in operations and maintenance costs in the HTR category. Safety improvements vary, with a significant decrease in the HTR category and a notable increase in the non-HTR category.

Table 4-25. Self-reported non-energy benefits of local 3PP residential participants for PY2021 and PY2022

Reported non-energy benefits	HTR		Non-HTR	
	PY2021 (n=231)	PY2022 (n=1,036)	PY2021 (n=578)	PY2022 (n=116)
Indoor air quality improvements	19%	13%	18%	13%
Increased comfort	29%	21%	30%	27%
Decreased operations and maintenance costs	14%	16%	21%	13%
Improved safety	28%	16%	14%	21%

The surveys asked respondents what information installation contractors provided them, summarized in Table 4-26. Installation contractors sharing information about program benefits with their customers is important for several reasons including enhanced customer satisfaction, helping informed decision-making, building trust and credibility and long-term



relationships, along with meeting customer expectations, compliance with rules set by programs for education, and upselling or additional services. Overall, the survey findings suggest contractors mainly provided information related to using the installed equipment for all programs. Residential customers also received information on other ways to save energy with additional equipment and by enrolling in another program. The public program contractors also provided information on enrolling in additional EE programs (16%). However, there is room for improvement across all programs for contractors to encourage deeper savings among program participants with additional information beyond the installed equipment.

Table 4-26. Information provided to participants by the programs for PY2022

Information provided	Residential end users		Non-residential end users		Property managers	
	HTR (n=1,036)	non-HTR (n=116)	MESP - PGE_Res_0 03 (n=57)	RZNET - SDGE4002 (n=64)	GK12 - PGE_Pub_0 09 (n=29)	SMCP - SCG3882 (n=38)
Tips on how to save energy with the installed equipment	51%	40%	86%	72%	79%	59%
Tips on how to save energy unrelated to the installed equipment	20%	16%	9%	0%	5%	0%
Recommended participation in another utility energy conservation program	14%	10%	2%	2%	16%	0%
Provided additional energy savings opportunities during walk-through consultation	14%	16%	4%	0%	0%	3%
Provided information on financing options	3%	4%				
Installers did not provide any information	9%	9%	2%	14%	0%	1%

Multiple responses permitted

Cross-program participation

We performed an analysis of customer cross-program participation because it is one of the goals of several local 3PPs. To do this, we surveyed residential and non-residential participants on their awareness of DR programs and the influence of local 3PPs on subsequent participation in additional EE programs.

Table 4-27 shows a small year-over-year increase for HTR customers both in terms of their awareness of DR programs and the programs' influence on their participation in additional EE programs. On the other hand, non-HTR customers reported more awareness of DR programs, but did not indicate the local 3PP program they participated in as having any influence on joining a subsequent program. It is possible that this non-HTR group has a strong awareness of other EE programs in general, so participating in a program would not influence them to enroll in another one.

Table 4-27. Cross-program participation among residential local 3PP participants for PY2021 and PY2022

Cross-program participation	HTR		Non-HTR	
	PY2021 (n=231)	PY2022 (n=1,036)	PY2021 (n=578)	PY2022 (n=116)
Never heard of DR programs	45%	47%	41%	26%
Influenced participation in subsequent EE programs	4%	6%	8%	0%

We also surveyed non-residential participants on their awareness of DR programs and participation in additional programs, summarized in Table 4-28. Both the commercial and public program participants showed increased awareness of DR programs from PY2021 to PY2022. We learned from interviews with the public program staff that the program added DR



offerings in PY2022, which would explain the increase. While the commercial program continued to influence customers to enroll in additional EE programs, we saw a decrease in influence for the public program.

Table 4-28. Cross-program participation among non-residential local 3PP participants for PY2021 and PY2022

Cross-program participation	GK12 - PGE Pub 009		SMCP - SCG3882	
	PY2021 (n=5)	PY2022 (n=29)	PY2021 (n=33)	PY2022 (n=38)
Never heard of DR programs	41%	27%	70%	66%
Influenced participation in subsequent EE programs	21%	11%	9%	9%

Participation drivers

We collected information from residential, non-residential, and multifamily participants related to program enrollment drivers, as summarized in Table 4-29. As observed in the PY2021 evaluation, residential customers continue to participate in EE programs to save money on their bills or on measures. Reducing carbon emissions was also a cited reason at similar levels as the previous program year.

Multifamily participants were similarly driven to enroll in the program by cost and financial savings. They also noted participation in a previous program and reducing carbon emissions were reasons they participated in EE programs, though PG&E respondents cited these several times more than the SDGE participants.

Finally, non-residential commercial customers were driven to participate in programs due to possible savings, including measure rebates and energy bill savings. On the other hand, public program participants were mainly driven by recommendations from a contractor or the need to upgrade old equipment. The variations between these two customer types imply that effective marketing strategies should emphasize distinct outcomes tailored to each type of customer.

Table 4-29. Factors influencing local 3PP participation for PY2021 and PY2022

Factors influencing participation		
	Residential HTR (n=1,036)	Residential non-HTR (n=116)
Program was free/ no cost to me	63%	75%
Reduce energy bills	42%	47%
Rebates/incentives	19%	11%
Reducing carbon emissions	17%	10%
	MESP - PGE_Res_003 (n=57)	RZNET - SDGE4002 (n=64)
Rebates/incentives	75%	75%
Previous program participation	40%	8%
Reduce operation / maintenance costs / energy bills	39%	11%
Reducing carbon emissions	35%	6%
	SMCP - SCG3882 (n=38)	GK12 - PGE_PUB_009 (n=29)
Utility rebates / incentives	46%	0%
Reducing carbon emissions	23%	0%
Reducing facility energy bills	22%	0%
Contractor recommendation	0%	14%
Equipment failure or end of useful life	0%	9%
Equipment needed maintenance	8%	0%

Multiple responses permitted



Contractor experience

To understand the experience of program contractors, we completed phone surveys with 11 people who served the program in this role. We spoke with three respondents each from PG&E’s Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009), PG&E’s Multifamily Energy Savings Program (MESP - PGE_Res_003), and SCG’s Small and Medium Commercial EE Program (SMCP - SCG3882) and one each from PG&E’s Multifamily Energy Savings Program (MESP - PGE_Res_003) and SCE’s Multifamily Energy Efficiency Program (MFEEP - SCE_3P_2020RCI_004).

Source of information about program: As shown in Table 4-30, in PY2021, the implementer continues to be the primary way the contractors heard about the program (62%), followed by utility staff or marketing materials (19%). Distributors (11%) also lead contractors to the program and one person surveyed first heard about the program from a friend. The uptick in distributors referring contractors to the program could suggest that the programs are gaining traction in the marketplace.

Table 4-30. Source of information about program PY2021 versus PY2022

Sources	PY2021 (n=16)	PY2022 (n=11)
Implementer	73%	62%
IOU	23%	19%
Distributor	0%	11%
Other	2%	9%

Equipment: Contractors have a pulse on the market for equipment, so we asked them about changes they observed in the availability of the measures they install. In PY2021, two-thirds of respondents reported that the supply of energy efficient equipment has increased. This is a trend that continues in PY2022, as 86% of contractors observed the same trend of equipment being more available in the marketplace. Two-thirds of the respondents attributed this increase to changes in the supply chain and 20% believe it has to do with the influence of energy efficiency programs such as the local 3PPs.

We also asked contractors how often they install smaller or lower capacity equipment because a more efficient unit can generate the same output. The results in Table 4-31 indicate a similar frequency of downsizing equipment as the previously evaluated program year, with nearly half of contractors installing smaller equipment always or often.

Table 4-31. Frequency of installing smaller equipment PY2021 versus PY2022

Frequency of replacement with smaller equipment	PY2021 (n=16)	PY2022 (n=11)
Always	21%	19%
Often	23%	26%
Sometimes	14%	23%
Rarely	9%	32%
Never	21%	0%
Don’t know	12%	0%

Program satisfaction: We asked contractors to rate their level of satisfaction on a 5-point scale with various areas of the program as well as their overall experience, which is summarized in Table 4-32. While the overall satisfaction with the program nearly doubled since PY2021, the results related to the individual program characteristics didn’t vary more than 17% from year to year. Satisfaction among contractors decreased in areas including experience with program staff, paperwork, and the incentive amounts paid. However, we are seeing improvement related to program marketing and a small



increase related to the timeliness of rebate payment, though the latter still remains the lowest area of satisfaction for this group. We asked contractors who reported satisfaction scores below 3 to provide more details, four said that timeliness of incentive payments was an issue, two said that some customers don't believe the program is real, and two said that the program took a long time to pay the contractors for their work.

In addition, we asked the contractors an open-ended question about what aspects of the program they perceived as going well. Five contractors felt that the programs are doing a good job at helping customers with EE improvements and three thought the program helped the contractors find new customers.

Table 4-32. Contractor satisfaction PY2021 versus PY2022

Program characteristic	PY2021 (n=16)	PY2022 (n=11)
Staff	96%	85%
Paperwork	72%	60%
Marketing	65%	81%
Incentive amount	62%	45%
Rebate timeliness	38%	43%
Program overall	45%	84%

Equity: Out of the 11 respondents, five reported their firm to be a disadvantaged business enterprise (DBE),⁶⁶ while five were not DBE companies and one respondent was unsure of their firm's status. In addition, we asked contractors if they felt they had sufficient resources to serve customers in DACs. All 10 of the respondents who answered this question affirmed that they had enough support to serve DAC customers.

4.5 Assessment of key performance indicators (KPIs)

The primary objective of the KPIs is to track the performance of the programs against set goals to ensure implementers meet their contractual obligations. KPIs are also valuable to a broader stakeholder group, including regulators and evaluators, to understand program performance over time and across different program groups.

In PY2021, DNV examined KPIs monitored by the PAs for local third-party programs. We received the applicable KPIs for PY2022 from the PA for the current evaluation. Since contracts for the local 3PPs are solicited and awarded for a given period (typically three years), there were no material changes in the PY2022 KPIs.

KPIs for all the local 3PPs in both years were outlined in the PIPs and covered various aspects of the programs' performance. These included program performance, supply chain responsibility, service delivery, cost-effectiveness, and the program's engagement with the DAC/HTR segment. Monitoring frequencies vary, with some metrics tracked monthly and others reported annually.

The KPIs reported by SDGE programs included definitions, categories, company metrics, scoring, weights, and assigned net goals for each metric. SCG's KPIs featured a scorecard and a table indicating weights and definitions. Programs under PG&E, however, reported KPIs differently. Instead of scores or weights, they provided individual data, KPI definitions, and a scorecard, presenting a distinct format compared to the other two categories.

⁶⁶ A disadvantaged business enterprise (DBE) is a firm that must be at least 51% owned by socially and economically disadvantaged individuals. More information can be found at: [Definition of a Disadvantaged Business Enterprise | US Department of Transportation](#)



In PY2021, DNV noted an inconsistency in weights and scores, making program outcome comparisons on a uniform scale difficult. The PY2021 report also highlighted that local 3PP did not track all the performance categories uniformly. Even when programs tracked the same performance categories, different KPI definitions were used, further emphasizing the lack of consistency across programs. We observed the same issue in PY2022.

Since it was challenging to make program performance comparisons using the reported KPIs, we sought information from program administrators to see the overall performance of the local 3PP when gauged through KPIs. Table 4-33 provides a summary by program indicating if the program met its overall KPI goals in PY2022 compared to PY2021.

Table 4-33. Comparison of PY2021 and PY2022 overall KPI performance

Programs	PY2021	PY2022
RZNET - SDGE4002	Goals not met	Met goals
GK12 - PGE_Pub_009	Goals not met	Met goals
MESP - PGE_Res_003	N/A	Met goals
CLEO - SCG3861	Partially met the goals	Met goals
SMCP - SCG3882	Goals not met	Met goals
Res ACE - SCG3883	Partially met the goals	N/A
CMHP - SCG3884	Partially met the goals	N/A
MFEFP - SCE_3P_2020RCI_004	N/A	Goals not met

Source: Interviews with the program administrators

As the table indicates, the PY2022 local 3PPs performed better overall than in PY2021. This observation underscores the programs' improvements in ramping up their activities in PY2022 and their adaptability to the evolving market requirements. The sole exception was SCE's Multifamily Energy Efficiency Program (MFEFP - SCE_3P_2020RCI_004), which failed to meet its overall KPI threshold. SCE's Multifamily Energy Efficiency Program (MFEFP - SCE_3P_2020RCI_004) encountered challenges in acquiring participants and achieving its savings goals. Insufficient demand, persistent pandemic effects, competition from other programs, data limitations, and constraints in measures available for the multifamily sector and incentives plagued the program.

Another program facing challenges in the multifamily segment was PG&E's Multifamily Energy Savings Program (MESP - PGE_Res_003). In the program year 2021, PG&E's Multifamily Energy Savings Program (MESP - PGE_Res_003) couldn't achieve the KPI goals due to the pandemic's impact, whereas in PY2022, the program showed improvement but faced difficulties in gaining traction. The implementer reported partial achievement of the program's KPI goals.

4.6 Program innovations

The third-party programs were conceived to encourage innovation and realize potential cost savings. In the PY2021 report, DNV examined the various innovative strategies employed by the programs to improve program design, marketing and outreach, product offerings, and delivery in alignment with the definition provided by CPUC Plan Template Guidance.⁶⁷ According to the template, innovation in the context of third-party programs involves efforts that improve energy efficiency through technology, marketing strategies, or delivery approaches, such as developing efficient program management tools relative to previous methods used in deploying energy efficiency programs. The guide outlines several examples of innovative strategies, such as the introduction of new technologies to the market that enhance savings, establishing better

67 CPUC. "Energy Efficiency Programs Implementation Plan Template Guidance." Version 2.1, May 2020. <https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/i/6442466376-implementation-plan-template-may2020.pdf>



program management processes to improve efficiencies, deploying marketing and outreach strategies that increase customer participation in the program, and developing incentive structures that encourage participation.

In the PY2021 evaluation, we examined the PIPs in detail to glean insights into the innovative strategies the programs identified to meet program goals. In this study, we built on what we learned about innovative strategies by augmenting them with insights from the interviews with program implementers to identify any material changes from PY2021.

This section provides our findings on marketing outreach and delivery innovations. The objective is to evaluate whether there were any modifications to the innovative strategies in PY2022 relative to PY2021 and their overall effectiveness. In all cases, we did not evaluate the innovative merit of the programs but sought to categorize and assess their effectiveness.

4.6.1 Marketing and outreach innovations and assessment

In the PY2021 evaluation, we identified four broad categories that encapsulated the innovative aspects of the programs' marketing and outreach efforts. These included analytical and data-driven approaches (data-driven methods), the delivery of targeted messages through digital methods and phone calls (digital- and phone-based approaches), partnerships with local communities, trade allies, and other entities (partnerships), and lastly, walkthroughs and audits and in-language community events designed to engage customers directly and enhance program participation (direct outreach). For this evaluation, we interviewed the program implementers to see the status of these strategies and to review their overall impact on the programs.

The program implementers acknowledged that marketing activities initiated in PY2021 continued through PY2022. However, in this program year, they gained a deeper understanding of market dynamics and adapted their strategies to align with market needs. For example, programs used data-driven approaches to identify and reach out to DAC/HTR communities across most programs. Additionally, programs worked to enhance partnerships and heighten trust with stakeholders. Programs like PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009), PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009), and SCG's Small and Medium Commercial EE Program (SMCP - SCG3882) enhanced their outreach activities by continuing and deepening collaboration with various partners such as government associations and trade allies. Additionally, SCG's Comprehensive Manufactured Home Program (CMHP - SCG3884) established partnerships with other energy efficiency programs to enhance cross-marketing efforts. Table 4-34 summarizes the PY2022 marketing and outreach innovations in effect, KPIs used to track their success, and PY2022 outcomes compared to PY2021.

Table 4-34. Marketing and outreach innovations and their effectiveness in PY2021 and PY2022

Programs	Innovations in effect in PY2022	KPI	PY2021 Outcome	PY2022 Outcome
RZNET - SDGE4002	<ul style="list-style-type: none"> Outreach using data and maps for effective targeting ASHRAE-Level 1 audits to engage participants 	<ul style="list-style-type: none"> Percent sites treated compared to sites marketed Conversion to ASHRAE Level 1 audits 	<ul style="list-style-type: none"> Met the goal 	<ul style="list-style-type: none"> Met the goal
GK12 - PGE_Pub_009	<ul style="list-style-type: none"> Collaborations with local government partners and other community stakeholders to expand outreach 	<ul style="list-style-type: none"> None reported 	<ul style="list-style-type: none"> No data to assess outcome 	<ul style="list-style-type: none"> No data to assess outcome
MESP - PGE_Res_003	<ul style="list-style-type: none"> Outreach using data and maps for effective targeting Partner with stakeholders to support outreach efforts 	<ul style="list-style-type: none"> None reported 	<ul style="list-style-type: none"> No data to assess outcome 	<ul style="list-style-type: none"> No data to assess outcome

Programs	Innovations in effect in PY2022	KPI	PY2021 Outcome	PY2022 Outcome
CLEO - SCG3861	<ul style="list-style-type: none"> In-language community booths and seminars Community events Increase in social media ads 	<ul style="list-style-type: none"> Number of outreach events related to goals 	<ul style="list-style-type: none"> Surpassed goals 	<ul style="list-style-type: none"> Not reported⁶⁸
SCMP- SCG3882	<ul style="list-style-type: none"> Outreach using data and maps for effective targeting Engaged with trade allies Targeted email blasts 	<ul style="list-style-type: none"> Number of installs by marketing methods 	<ul style="list-style-type: none"> No data to assess outcome 	<ul style="list-style-type: none"> No data to assess outcome
Res ACE - SCG3883	<ul style="list-style-type: none"> Geofencing mapping tool for effective targeting ASHRAE-Level 1 audits to engage participants Email campaigns through internal marketing department 	<ul style="list-style-type: none"> Number of installs by marketing methods 	<ul style="list-style-type: none"> Not reported 	<ul style="list-style-type: none"> Not reported
CMHP - SCG3884	<ul style="list-style-type: none"> Geofencing mapping tool for effective targeting Email campaigns through internal marketing department 	<ul style="list-style-type: none"> Number of installs by marketing methods 	<ul style="list-style-type: none"> Not reported 	<ul style="list-style-type: none"> Not reported
MFEFP - SCE_3P_2020R CI_004	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A

Source: Implementer interviews, PIPs, and IOU KPI metrics

Some of the identified innovations mirrored traditional marketing methods like phone-based and direct outreach ones commonly employed by utilities. Other approaches such as data-driven strategies and strategic partnerships, though not entirely novel, tested new avenues to enhance program engagement.

Among these, direct outreach (audits and in-language community events) and strategic partnership (collaboration with local governments) innovations were the most effective thus far based on implementer interviews in different program sectors. However, only four of the eight programs reported KPIs related to marketing and outreach innovations, with only one program providing KPI results. Similar to PY2021 evaluation findings, there was still insufficient data, resulting in difficulty tracking and assessing quantitative outreach performance. As a result, it is challenging to infer the success of the outreach innovations identified as being effective thus far.

4.6.2 Delivery innovations and assessment

Local 3PPs continued their program delivery innovation efforts that began in PY2021. These innovations focused on four primary areas, including tools and processes for better data collection and program management, customer education initiatives to set participants on a path to pursue deeper and long-term energy efficiency, the introduction of new energy efficiency measures that align with market needs, and the facilitation of financing options for customers.

The program implementers mentioned various innovative tools and processes to improve program delivery in PY2022. SDGE’s Residential Zero Net Energy Transformation Program (RZNET - SDGE4002) implemented a digital quality assurance (QA) tool that geo-tags installed measures. The program’s implementer also introduced a tool to facilitate the translation and transfer of delivery-related data to the program administrator. The program implementer mentioned that this process improvement contributed to program delivery-related information transfer efficiency. SCG’s Residential Advanced Clean Energy (Res ACE - SCG3883) also introduced a geo-tagging tool, which enables the installer to take a picture of the installed measure and geo-tag it, streamlining the verification process.

⁶⁸ The program implementers tracked these KPI’s internally. We did not receive any data related to these metrics.

Programs also added new energy efficiency measures among their offerings to their customers. SCG's Residential Advanced Clean Energy (Res ACE - SCG3883) and SCG's Comprehensive Manufactured Home Program (CMHP - SCG3884) shifted their focus to tier 2 measures. Tier 2 measures require a co-pay but also offer deeper savings. In PY2022, the PG&E Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009) actively revamped its measure mix in response to customer feedback and market needs. It incorporated fuel substitution measures to better align with the climate action plans of stakeholders and introduced demand response (DR) offerings to customers in the public sector.

To assess the effectiveness of the programs, in the PY2021 evaluation, DNV reviewed the KPIs provided by the program administrators. We followed a similar approach in the current study. Table 4-35 summarizes the various innovations in program delivery in place in PY2022 and the KPIs used to monitor their effectiveness. The table provides a year-over-year comparison of outcomes to identify any changes.

Table 4-35. Delivery innovations and their effectiveness in PY2021 and PY2022

Programs	Innovations in effect in PY2022	KPI	PY2021 Outcome	PY2022 Outcome
RZNET - SDGE4002	<ul style="list-style-type: none"> DR enrollment during EE installations Customer engagement to encourage deeper savings. Digital tool to geotag installation images. Tool to translate project data to IOU platform format 	<ul style="list-style-type: none"> DR enrollment Conversion to additional energy efficiency 	<ul style="list-style-type: none"> EE conversion goal met DR goal partially met 	<ul style="list-style-type: none"> EE conversion goal met DR goal partially met⁶⁹
GK12 - PGE_Pub_009	<ul style="list-style-type: none"> Online platform to track program activities. Fuel substitution offerings Integrated EE, DR, and EMT offerings On-bill financing 	<ul style="list-style-type: none"> Number of bundled EE and DR installations Number of IDSM program enrollees 	<ul style="list-style-type: none"> Not reported⁷⁰ 	<ul style="list-style-type: none"> Not reported
MESP - PGE_Res_003	<ul style="list-style-type: none"> Effective program management using a simplified custom application. Flexible incentive structure 	<ul style="list-style-type: none"> None reported 	<ul style="list-style-type: none"> No data to assess outcome 	<ul style="list-style-type: none"> No data to assess outcome
CLEO - SCG3861	<ul style="list-style-type: none"> In-language installations Focus on tier 2 measures 	<ul style="list-style-type: none"> None reported 	<ul style="list-style-type: none"> Goal met 	<ul style="list-style-type: none"> Goal met
SCMP- SCG3882	<ul style="list-style-type: none"> Customer engagement through audit to encourage deeper savings Made certain measures (such as steam traps and tankless water heaters) free of charge. Increased customer rebates 	<ul style="list-style-type: none"> None reported 	<ul style="list-style-type: none"> No data to assess outcome 	<ul style="list-style-type: none"> No data to assess outcome
Res ACE - SCG3883	<ul style="list-style-type: none"> Developed tool for geotagging installation images. Revised focus on tier 2 measures. Facilitated additional financing. 	<ul style="list-style-type: none"> Conversion to deeper savings 	<ul style="list-style-type: none"> Did not meet goal 	<ul style="list-style-type: none"> Did not meet goal
CMHP - SCG3884	<ul style="list-style-type: none"> Developed tool for geotagging installation images. Refocused on customer education. Revised focus on tier 2 measures. 	<ul style="list-style-type: none"> Conversion to comprehensive EE projects 	<ul style="list-style-type: none"> Did not meet goal 	<ul style="list-style-type: none"> Did not meet goal
MFEFP - SCE_3P_2020R CI_004	<ul style="list-style-type: none"> Comprehensive multifamily solutions Flexible incentives financing options Program became inactive 	<ul style="list-style-type: none"> Program data/ engineering quality 	<ul style="list-style-type: none"> Not reported⁷¹ 	<ul style="list-style-type: none"> Goal met

69 The tool-based innovations did not have specific KPIs but resulted in higher quality assurance (QA) pass rates and faster invoice approvals.

70 The KPI was mentioned in the PIP, but was not reported in the data we received from the program administrators.

71 This program was not evaluated in PY2021.



Source: Implementer interviews, PIPs, and IOU KPI metrics

Delivery innovation KPIs that the programs most commonly reported focused on the ability of programs to complete a higher proportion of total EE projects with deeper energy savings and to enroll customers in DR and IDSM programs. In PY2022, as local 3PPs continued to ramp up their activities, innovations and the available KPIs related to program delivery reflected the growth in these activities.

While the KPIs are few, the available evidence indicates that delivery innovations have had a mixed impact. Some programs reported success in attaining their goals of increasing the numbers of EE projects that deliver deeper energy savings and increasing DR/IDSM program enrollments while other programs did not meet their goals. As noted in the PY2021 evaluation report, innovations to achieve broad and sustained deeper savings will take time. Given the heightened focus on ensuring deeper savings, tracking this progress will be critical as local 3PPs mature.

4.7 Program equity evaluation

DNV assessed how well the Local 3PPs addressed three components of equity: procedural equity, distributional equity, and structural/recognition equity. We discuss our findings in the following sections.

4.7.1 Procedural equity

Procedural equity requires involving HTRs and DAC members in program planning and giving them a voice in decision-making. Accessible outreach that gathers and utilizes input from the communities is a necessary component to achieve procedural equity. Two of the eight evaluated programs reported collecting community input:

- PGE_PUB_009 – solicits feedback from communities via local government entities such as city councils and community-based organizations regularly. The implementer holds office hours twice per month and takes one-on-one meetings to receive feedback. New for PY2022, the program started meeting weekly with local partnerships to discuss opportunities and challenges.
- SDGE4002 - performs follow-up surveys with customers and solicits feedback from contractors to improve how the program operates.

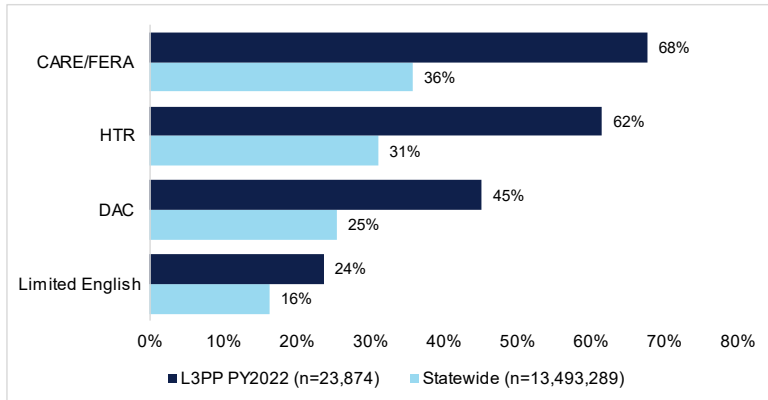
Program administrators did not document these activities or collect any metrics, making it impossible for an evaluator to verify if they occurred and were productive. The other programs reported soliciting public feedback during the program design phase and relied on evaluations, such as this one, for ongoing feedback. Several programs noted that lack of English proficiency was a barrier for some customers. However, only CLEO reported translating its outreach materials.

4.7.2 Distributional equity

Program participation by demographic group. To investigate the extent to which programs delivered equitable distribution of benefits, DNV examined program participation by demographic group. In particular, we compared the percentage of HTR and DAC participants served by local 3PPs to the percentages of these groups appearing in the general population. Figure 4-12 summarizes these comparisons. In PY2022, local 3PPs served higher proportions of customers in lower income categories (proxied by customers on CARE/FERA rates), customers in areas with limited English proficiency, and HTR and DAC customers compared to the statewide average of households in these categories. The percentage of vulnerable customer groups such as these that programs served exceeded the proportion of such customers present in the state by a relatively wide margin, which is one indication programs are succeeding in providing distributional equity.



Figure 4-12. Statewide and PY2022 local 3PP HTR and related metrics



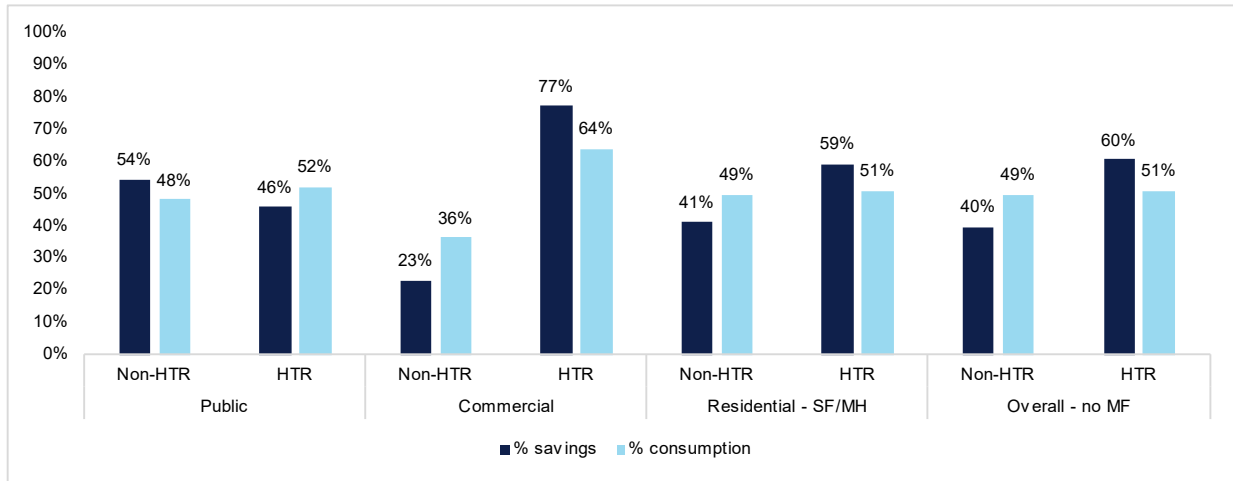
We also compared PY2021 and PY2022 participant profiles by sector. Figure 4-4 in Section 4.3.3 compares SCG’s and SDGE’s residential, PG&E’s public, and SCG’s commercial participant characteristics. Overall, local 3PP reach of HTR and other equity segment customers was better in PY2022 than in PY2021. However, the residential programs served somewhat lower proportions of customers with limited English proficiency and, in SCG’s case, in non-metro areas in PY2022 compared to PY2021. The public and commercial programs also served a lower proportion of DAC customers in PY2022 relative to PY2021. These could be areas of additional focus in future program years. However, given the significant improvement in local 3PP reach of customers in many critical underserved segments, current program efforts indicate a reasonable focus on equitable energy efficiency service delivery.

Energy savings by HTR status. Additionally, DNV examined participant energy savings by HTR status to understand if, within participants, HTR populations were receiving similar levels of service as non-HTR participants. Figure 4-13 illustrates the percent of program savings going to HTR and non-HTR participants relative to the percent of their energy consumption by sector and overall.

The figure excludes data from multifamily participants because these programs only provided utility identifiers for a subset of participants, most typically for common areas. Thus, we could not capture all the energy consumption associated with multifamily claimed savings.

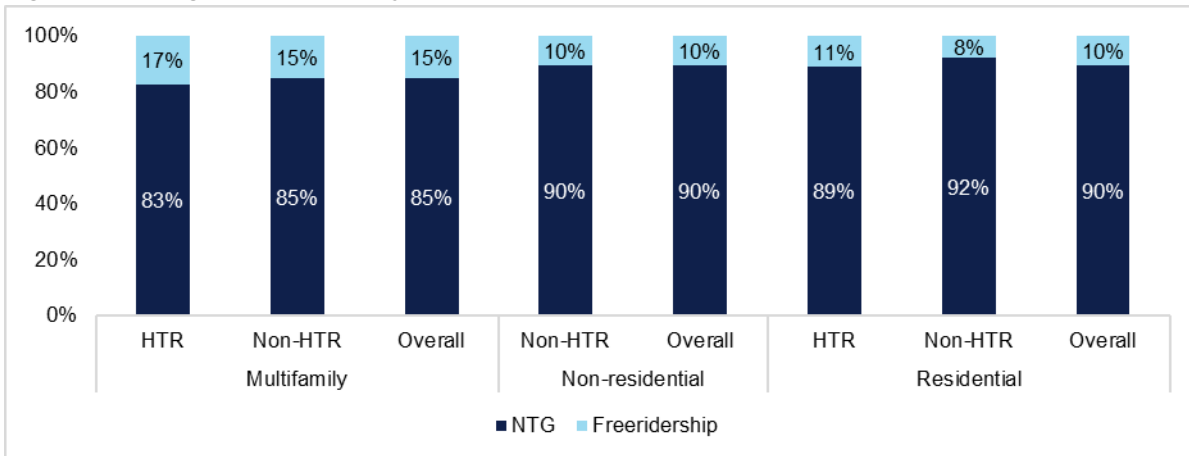
For participants receiving program benefits, the figure indicates that the depth of savings is similar or slightly better for HTR participants than for non-HTR. Overall, HTR customers received a higher proportion of program savings compared to the proportion of their energy consumption (61% compared to 57%). These benefits differed by sector. The proportion of program savings compared to energy consumption was higher for commercial and residential single-family and manufactured home HTR participants. On the other hand, the percent of program savings for public sector HTR participants was somewhat lower than their consumption as a percent of the sector’s overall consumption.

Figure 4-13. Percent energy savings for PY2022 local 3PPs by sector and HTR status



Program attribution by HTR status. We also compared NTGRs for HTR and non-HTR customers by sector to assess distributional equity further. As Figure 4-14 illustrates, NTGRs were high across all customers. NTGRs were and similar or slightly greater for HTR than non-HTR customers in all sectors.

Figure 4-14. Program attribution by HTR status and sector, local 3PPs PY2022



4.7.3 Structural/recognition equity

All of the implementers reported that they follow the contracts when deciding operational priorities. Except for CLEO, the evaluated programs are resource acquisition programs. As such, their primary goal is delivering cost-effective energy savings, not advancing equity goals. These programs have contractual goals for cost-effective energy savings and, in some cases, an HTR/DAC customer target.

As a part of the evaluation, we reviewed the KPIs related to HTR/DAC provided by the implementers. Local 3PPs formulate their strategies during the solicitation phase, and the KPIs remain consistent throughout the contract period. During the second year of evaluation, DNV observed no significant changes in KPI reporting related to HTR/DAC, compared to the PY2021 evaluation.

Table 4-36 summarizes the KPIs aligned with each program's HTR/DAC goals. Seven of the eight evaluated programs indicated they have HTR/DAC KPIs. Four programs reported that they achieved their HTR/DAC KPIs, two reported that they did not, and one failed to report one way or the other.



The two programs that fell short of their goals were in the multifamily sector, which faced ongoing challenges in market access. These two programs announced the cessation of operations in PY2023 and are inactive. We do not imply that the inability to meet HTR/DAC KPIs caused the cessation. However, considering a substantial proportion of equity-related customer populations reside in multifamily locations, it will be important for future programs to target this sector to ensure that those customers continue to receive equity access to program benefits.

Table 4-36. Local 3PP PY2022 KPIs related to HTR/DAC customer participation

Program	KPI used for HTR/DAC	Program reports KPI achieved?
GK12 - PGE_Pub_009	The program did not report any HTR/DAC KPI	N/A
Res ACE - SCG3883	To date % of participants who are HTR and/or DAC compared to Goal split on an even pro rata basis.	Yes
RZNET - SDGE4002	To date, % of achieved energy savings in HTR and/or DAC markets (average of kWh, kW, therms)	Yes
CMHP - SCG3884	To date, % of participants who are HTR and DAC compared to Goal. Target is 60% HTR customers, and 60% DAC customers.	Yes
CLEO - SCG3861	To date, % of measure installations for customers in disadvantaged communities (HTR) compared to program goal of 70%, split on an even pro rata basis.	Yes
MFEEP - SCE_3P_2020RCI_004	Forecasted savings achieved in HTR/DAC markets	No
MESP - PGE_Res_003	HTR/DAC penetration	Not reported
SMCP - SCG3882	To date, % of participants who are DAC/HTR compared to Goal.	No

4.7.4 Future focus on underserved customers

The pattern of findings suggests that the programs are achieving distributional equity, could somewhat improve on structural/recognition equity, and need improvement on procedural equity. A key driver of this pattern is that program design and contracting occurred prior to publication of current CPUC equity priorities. Program implementers are following their contracts, and for the most part, achieving their contractual obligations. Future contracts should continue to include HTR/DAC participation targets and KPIs and add community engagement targets and KPIs to communicate clear operational priorities to implementers.

The primary sector of concern for future programs is the multifamily sector. Both multifamily programs ceased operations in PY2022. A substantial proportion of equity-related customers reside in multifamily locations. This indicates that successful multifamily programs are necessary to provide equitable access to energy efficiency benefits. Thus, the CPUC, IOUs, and implementers should reintroduce programs targeting the multifamily sector. Considering the challenges multifamily programs face, the importance of them for energy efficiency equity, and the recent change in focus to total system benefits, the stakeholders should consider whether future multifamily programs would fit better as equity-related programs than as resource-acquisition or GHG reduction programs.

There was also a small gap in PY2022 public program participation, with HTR participants receiving slightly lesser depth of savings than non-HTR public sector participants. These differences are small and only cover a single year; it is possible the difference exists merely because of year-to-year variation. This finding warrants continued attention on this metric in future evaluations for identification of multiyear trends.



4.8 Key program performance findings

Program management improved: The local 3PP implementers focused on improving data collection processes to enhance program delivery efficiencies. SDGE's Residential Zero Net Energy Transformation Program (RZNET - SDGE4002) and SCG's Residential Advanced Clean Energy (Res ACE - SCG3883) introduced a geotagging tool for measure verification. The tool enables the installer team to geotag the images taken during installation. These geotagged images are then used to verify installation thereby improving validation efficiency. Similarly, the development of QA tools by RZNET also helped streamline the processes.

Effective outreach efforts included partnerships and in-person engagement: In PY2022 programs deployed various data-driven approaches to target specific customer segments, particularly HTR and DAC customers. However, based on information gathered from implementers, direct outreach methods and partnerships were most successful in engaging prospective participants. This reiterates the findings from the previous evaluation that developing partnerships with stakeholders and in-person engagements with prospective customers are components of a successful outreach strategy. Programs such as PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009) quoted that the partnerships with local government were one of the integral factors in their success.

Measure mix and market needs are important factors in program success: The local 3PPs established their measure mix during the program inception/design phase to reflect the prevailing market needs. However, after the first year of implementation, some programs have reconsidered the measures given the market response. SCG's Comprehensive Manufactured Home Program (CMHP - SCG3884) and SCG's Residential Advanced Clean Energy (Res ACE - SCG3883) have revised their measure mix to focus on tier two measures. The public sector program has streamlined its EE efforts to align with the sector's climate action goals. PG&E's public sector program (GK12 - PGE_Pub_009) has gained traction partly due to the change in its measure mix, which has emphasized fuel substitution offerings to participants that align with meeting local government carbon reduction targets.⁷²

Applications and paperwork continue to be a pain point: While satisfaction levels for the programs generally remains high, program participants and contractors continue to report dissatisfaction with required paperwork. For contractors, the timeliness of payments has also been an issue. We suggest the programs review this area to see if there could be some streamlining or process modifications to improve program delivery in this area.

KPI performance improved: In PY2021, the local 3PPs were early in their ramp up period and either partially met their KPI goals or failed to meet them at all. We saw a notable change in PY2022 as the majority of the programs met their KPI goals. However, KPIs continue to be inconsistently tracked, which makes it impossible to compare the performance across program sectors. DNV can only compare the program's individual performance to their goals unless there are consistent KPI definitions and scoring across the portfolio.

Local 3PPs faced significant barriers in the multifamily sector: In PY2022, the local 3PPs in the multifamily sector faced multiple challenges that hindered their ability to succeed. As a result, two multifamily local 3PPs (SCE's Multifamily Energy Efficiency Program and PG&E's Multifamily Energy Savings Program) became inactive, either in 2022 or early 2023. Among the challenges these programs faced were the lingering effects of the pandemic, which limited building access and impacted program ramp-up. The programs also had limited or fewer measures to offer prospective participants, which exacerbated their difficulty in recruiting participants. Additionally, the programs faced the perennial renter-owner split incentives barrier. Despite proposing innovative strategies, convincing property owners to implement measures without direct property owner financial benefits remained a barrier to program ramp-up. These programs also reported competition from other PA

⁷² Opinion Dynamics, Tierra. "Assessment of Local Government Partnerships." calmac.org, April 27, 2023.
https://www.calmac.org/publications/Group_B_LGP_YR_3_Assessment_Final_Report_2023-04-26.pdf.



programs (including REN programs) for their lack of success.⁷³ Limited direct install budgets also restricted program success. PG&E program staff overseeing the local 3PPs indicated that smaller-sized contracts limited the implementer budget and staffing for direct install offers and impacted the program's success.

Programs are achieving the equity goals in their contracts and the CPUC has added equity priorities since the programs were designed: Although seven of the eight local 3PPs are designated as resource acquisition programs, the majority have KPIs related to HTR/DAC customer engagement. In PY2022, the programs managed to reach higher proportions of HTR, DAC, and lower income, and limited English proficiency customers than the statewide average. While the programs are doing well in terms of distributional equity, there remain opportunities for improvement for procedural and structural/recognition equity. We suggest that when the PAs consider new programs or consider renewing contracts for existing programs that they consider terms that cover a standardized equity framework, including the ability for HTR and DAC communities to provide feedback in a measurable way.

⁷³ Implementers in the PG&E service territory faced competition from MCE in the North Bay and BayREN in nine Bay Area counties, while implementers in SCE's service territory reported competition from SoCalREN.

5 Recommendations and considerations

Table 5-1 presents DNV's key findings and recommendations for the PY2022 Local 3PP evaluation.

Table 5-1. Key findings and recommendations

Key findings	Implications and recommendations
<p>1. Program attribution is high or on par with claimed values, indicating the programs are reaching the intended population segments. Program delivery performance also improved or remained stable. Programs that had difficulties meeting energy savings and spending goals and were cost-ineffective in PY2021 performed better in PY2022. Programs that performed well in all three areas continued to do so in PY2022.</p>	<p>Other programs should consider emulating the strategies these programs have taken to achieve success, including offering measures that better align with customer preferences, such as electrification and deeper gas usage-saving measures, and employing more effective outreach strategies, such as direct multi-language outreach and community engagement (e.g., events).</p>
<p>2. Multifamily programs run by implementers of local 3PPs face systemic challenges that have resulted in the closure of two of these programs. Challenges included the inability to make inroads in the multifamily sector, possible competition from other PAs, inadequate funds for direct install activities, and limited measure options that programs can offer participants.</p>	<p>PAs could consider offering multifamily programs as equity rather than resource acquisition programs. Such an approach would allow them to provide higher incentives to property owners that reduce split incentive barriers and offer more measures attractive to multifamily participants. They could also consider requiring core measures for tenant units to improve renter equity.</p>
<p>3. There is inadequate data (KPIs) to track the impact of local 3PP innovations.</p>	<p>Given the heightened focus on innovation, PAs should develop and require standardized metrics to record and track the success of local 3PP innovations in all areas, including outreach and program delivery. For example, programs should track their outreach efforts: when, where, what, how, and who they reached.</p>
<p>4. The program implementers did not track efforts to obtain input from HTR/DAC communities, making it impossible to evaluate their efforts at procedural equity.</p>	<p>Track efforts to obtain input from HTR/DAC communities and track HTR/DAC community input. It is essential to track when outreach includes two-way communication that allows communities to provide feedback.</p>
<p>5. Outreach performance of local 3PPs to HTR customers and DACs remained consistent year-over-year with improved reach of DAC customers in PY2022.</p>	<p>Existing and developing local 3PPs should take note of the marketing and outreach innovations that have continued to work for this pool of programs year-over-year: direct outreach and strategic partnerships.</p>



Key findings	Implications and recommendations
<p>6. The evaluated programs do not meet all the equity standards embedded in the CPUC ESJ goals and other equity frameworks because the programs were designed and contracted before any equity plans were in place.</p>	<p>The next time PAs negotiate contracts with local 3PP implementers, they should include terms that cover a standardized equity framework.</p>



6 Appendices

6.1 Appendix A: Gross and net lifecycle savings

Gross and net lifecycle savings are in the attached pdf.

6.2 Appendix B: Per unit (quantity) gross and net energy savings

Per unit (quantity) gross and net energy savings are in the attached pdf.



6.3 Appendix C: IESR–Recommendations resulting from the evaluation research

Study ID	Study Type	Study Title	CPUC Study Manager
Group A: CALMAC ID CPU0369.01	Impact Evaluation	Local Third-Party Programs - Program Year 2022	Yeshi Lemma

#	Program or Database ⁷⁴	Summary of Findings	Additional Supporting Information	Best Practice / Recommendations	Recipient	Affected Workpaper or DEER
1	Multiple local third-party programs	Program attribution is high or on par with claimed values, indicating the programs are reaching the intended population segments. Program delivery performance also improved or remained stable. Programs that had difficulties meeting energy savings and spending goals and were cost-ineffective in PY2021 performed better in PY2022. Programs that performed well in all three areas continued to do so in PY2022.	Sections 4.1.3 and 4.4.3	Other programs should consider emulating the strategies these programs have taken to achieve success, including offering measures that better align with customer preferences, such as electrification and deeper gas usage-saving measures, and employing more effective outreach strategies, such as direct multi-language outreach and community engagement (e.g., events).	CPUC, PG&E, SDGE, SCG, SCE	N/A (Program design consideration)
2	Multiple local third-party programs	Multifamily programs run by implementers of local 3PPs face systemic challenges that have resulted in the closure of two of these programs. Challenges included the inability to make inroads in the multifamily sector, possible competition from other PAs, inadequate funds for direct install activities, and limited measure options that programs can offer participants.	Section 4.4.3	PAs could consider offering multifamily programs as equity rather than resource acquisition programs. Such an approach would allow them to provide higher incentives to property owners that reduce split incentive barriers and offer more measures attractive to multifamily participants. They could also consider requiring core measures for tenant units to improve renter equity.	CPUC, PG&E, SDGE, SCE	N/A (Program design consideration)
3	Multiple local third-party programs	There is inadequate data (KPIs) to track the impact of local 3PP innovations.	Section 4.5	Given the heightened focus on innovation, PAs should develop and require standardized metrics to record and track the success of local 3PP innovations in all areas, including outreach and program delivery. For example, programs should track their outreach efforts: when, where, what, how, and who they reached.	CPUC, PG&E, SDGE, SCG, SCE	N/A (Program design consideration)

⁷⁴ Third-party programs evaluated in PY2022, including SDGE4002, PGE_RES_003, PGE_PUB_009, SCG3861, SCG3884, SCG3883, SCG3882, SCE_3P_2020RCL_004.



4	Multiple local third-party programs	The program implementers did not track efforts to obtain input from HTR/DAC communities, making it impossible to evaluate their efforts at procedural equity.	Section 4.7.1	Track efforts to obtain input from HTR/DAC communities and track HTR/DAC community input. It is essential to track when outreach includes two-way communication that allows communities to provide feedback.	CPUC, PG&E, SDGE, SCG, SCE	N/A (Program design consideration)
5	Multiple local third-party programs	Outreach performance of local 3PPs to HTR customers and DACs remained consistent year-over-year with improved reach of DAC customers in PY2022.	Sections 4.3.3 and 4.4.2	Existing and developing local 3PPs should take note of the marketing and outreach innovations that have continued to work for this pool of programs year-over-year: direct outreach and strategic partnerships.	CPUC, PG&E, SDGE, SCG, SCE	N/A (Program design consideration)
6	Multiple local third-party programs	The evaluated programs do not meet all the equity standards embedded in the CPUC ESJ goals and other equity frameworks because the programs were designed and contracted before these equity plans were in place.	Section 4.7	The next time PAs negotiate contracts with local 3PP implementers, they should include terms that cover a standardized equity framework.	CPUC, PG&E, SDGE, SCG, SCE	N/A (Program design consideration)

6.4 Appendix D: Gross savings by program

6.4.1 SDGE Residential Zero Net Energy Transformation Program (SDGE4002)

There were two types of discrepancies between tracking data and eTRM values for this program. For the faucet aerator measure, the program neglected to claim the Multifamily-specific NTG_ID that is used in the eTRM measure package. However, this did not lead to lower net savings because although the incorrect NTG_ID was used, the correct NTG ratio was used. The rest of the discrepancies were due to claimed building types that did not match claimed savings. Most often this discrepancy occurred when the program claimed a Multifamily common area but used Multifamily building type savings, though other incorrect combinations were found as well. Ultimately this set of claims had a minimal impact on the overall GRR and NRR of the program, as 100% GRR and NRR were achieved for all three impact types. Table 6-1 provides a summary of the findings.

Table 6-1. Summary of SDGE RZNET (SDGE4002) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
Fan controller for air conditioner	380	0%	60	100%	45	100%	74%	74%
Brushless fan motor replacement	209	0%	61	100%	52	100%	86%	86%
LED, tube	37	5%	6	100%	3	100%	55%	55%
Duct seal	770	0%	251	100%	239	100%	95%	95%
Total	1,396	<1%	378	100%	339	100%	90%	90%
kWh								
Fan controller for air conditioner	380	0%	135,927	100%	101,642	100%	75%	75%
Brushless fan motor replacement	209	0%	62,473	100%	53,102	100%	85%	85%
LED, tube	37	5%	400,375	100%	221,704	100%	55%	55%
Duct seal	770	0%	463,839	100%	440,646	100%	95%	95%
Total	1,396	<1%	1,062,603	100%	817,093	100%	77%	77%
Therms								
Brushless fan motor	209	0%	-481	100%	-409	100%	85%	85%
LED, tube	37	5%	-5028	100%	-2,785	100%	55%	55%
Duct seal	770	0%	8736	100%	8,300	100%	95%	95%
Faucet aerator	32	0%	1773	100%	1,155	100%	65%	65%
Low-flow showerhead	48	2%	1514	100%	1,068	100%	71%	71%
Hot water pipe insulation	209	0%	654,566	100%	306,524	100%	47%	47%
Hot water tank insulation	338	2%	814,826	101%	467,055	100%	57%	57%
Water heater pipe wrap	629	0%	62,155	100%	47,100	100%	76%	76%
Total	2,272	<1%	1,538,060	100%	828,007	100%	54%	54%

6.4.2 PG&E Government and K-12 Comprehensive Program (PGE_PUB_009)

PG&E's public sector program achieved GRRs and NRRs very close to 100% for all three impact types (Table 6-2). Because there are not a lot of claims for this program, the minor climate zone and building type discrepancies made a marginal impact on evaluated savings. For instance, there were LED, Tube Type B and C records that were claimed for CZ04, but the climate zone maps to CZ03. Additionally, there were primary and secondary school building types that used the other school building type's savings values contributing to slight differences between claimed and evaluated savings.

Additionally, there were 17 heat pump water heater claims that had a mismatch between building type and sector (i.e., commercial building type and industrial sector). While this does not impact the evaluated savings, it is still noted as a discrepancy.

Table 6-2. Summary of PG&E GK12 (PGE_Pub_009) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
Reach-in refrigerator or freezer	2	8%	<1	100%	<1	100%	85%	85%
Ice machine	1	0%	<1	100%	<1	100%	83%	83%
LED, Tube	16	6%	29	97%	22	97%	78%	78%
LED, Tube Type B and C	4	50%	5	101%	5	100%	85%	85%
Heat pump water heater	3	0%	6	100%	4	100%	60%	60%
Total	26	12%	41	98%	31	98%	76%	76%
kWh								
Reach-in refrigerator or freezer	2	8%	1,947	100%	1,655	100%	85%	85%
Ice machine	1	0%	1,180	100%	1,003	100%	85%	85%
LED, Tube	16	6%	185,513	102%	146,365	102%	79%	79%
LED, Tube Type B and C	4	50%	41,063	98%	30,613	98%	75%	74%
Heat pump water heater	3	0%	46,100	100%	27,660	100%	60%	60%
Heat pump water heater, Fuel substitution	98	15%	-976,390	100%	-976,390	100%	100%	100%
Large heat pump water heater, Fuel substitution	22	5%	-555,953	100%	-555,953	100%	100%	100%
Total	146	12%	-1,256,540	100%	-1,325,047	100%	105%	106%
Therms								
Combination oven	1	0%	1,596	100%	1,357	100%	85%	85%
LED, Tube	16	6%	-2,268	101%	-1,778	101%	78%	78%
LED, Tube Type B and C	4	50%	-501	110%	-356	111%	71%	72%
Heat pump water heater, Fuel substitution	98	15%	112,611	100%	112,611	100%	100%	100%
Large heat pump water heater, Fuel substitution	22	5%	76,487	100%	76,487	100%	100%	100%
Total	141	14%	187,925	100%	188,321	100%	100%	100%

6.4.3 PG&E Multifamily Energy Savings Program (PGE_RES_003)

The only discrepancy found within this program was for the domestic hot water loop temperature controller measure. For this measure, the program used the industrial sector for commercial building type records. This did not impact either the GRR or the NRR for any of the three impact types (kW, kWh, and Therms) as seen in Table 6-3.

Table 6-3. Summary of PG&E MESP (PGE_Res_003) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
No kW saving measures	-	-	-	-	-	-	-	-
kWh								
Heat pump water heater fuel sub	1	0%	-2,240	100%	-2,240	100%	100%	100%
Total	1	0%	-2,240	100%	-2,240	100%	100%	100%
Therms								
Domestic hot water loop temperature controller	126	3%	584,804	100%	321,642	100%	55%	55%
Heat pump water heater (fuel sub)	1	0%	322	100%	322	100%	100%	100%
Total	127	3%	585,126	100%	321,964	100%	55%	55%

6.4.4 SCG Community Language Efficiency Outreach Program (SCG3861)

The two discrepancies found in those programs resulted in minor differences between reported and evaluated savings and impacted savings at a value of less than 1% (Table 6-4). For the Smart Thermostat measure, there was one record claimed for the PY2021 version of the measure package and its corresponding savings and NTG values. This slightly overstated savings for the Smart Thermostat since the savings were lowered in the PY2022 version of the measure package, which is what the claim should have used. The other discrepancy occurred in both the Faucet Aerator and Low-Flow Showerhead program where there were several climate zone discrepancies. Both measure's savings are dependent on climate zone. Similar to the Smart Thermostat measure, this slightly impacted the evaluated savings, but it was negligible and did not impact GRR and NRR values for any of the three impact types (kW, kWh, and Therms).

Table 6-4. Summary of SCG CLEO (SCG3861) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
Tankless water heater, res	189	0%	-0.10	100%	0	0%	85%	85%
Total	189	0%	-0.10	100%	0	0%	85%	85%
kWh								
Tankless water heater, res	189	0%	-735	100%	-625	100%	85%	85%
Smart Thermostat	481	<1%	37,591	100%	35,706	100%	95%	95%
Total	670	0%	36,856	100%	35,081	100%	95%	95%
Therms								
Tankless water heater, res	189	0%	17,901	100%	15,216	100%	85%	85%
Smart Thermostat	481	<1%	1,821	100%	1,730	100%	95%	95%
Faucet aerator	5,423	<1%	26,044	100%	22,123	100%	85%	85%
Low-flow showerhead	2,880	<1%	8,742	100%	7,426	100%	85%	85%
Diverting tub spout with TSV	356	0%	4,400	100%	3,741	100%	85%	85%
Water heater pipe wrap	460	0%	2,893	100%	2,461	100%	85%	85%
Total	9,819	<1%	61,803	100%	52,693	100%	85%	85%

6.4.5 SCG Small and Medium Commercial EE Program (SCG3882)

The Tankless Water Heater measure is the only measure within this program that had any major discrepancies (Table 6-5). This measure's savings values are normalized by input capacity in kBtu/hr. The savings were claimed as if the normalizing unit was per unit meaning the savings were severely understated. This is the reason for the high GRR and NRR for this measure, impacting the overall program values substantially. In addition, there were two minor discrepancies in both the demand control for centralized water heater and gas dryer modulating valve measures. Both measures had claims on hotel guest room building types when hotel was an option within the measure package. The building type discrepancy did not impact evaluated savings, GRR, or NRR values for all three impact types (kW, kWh, and Therms). The incorrect reporting of the tankless water heater measure savings by normalizing unit was the major contributor to the GRR and NRR differences compared to the reported savings.

Table 6-5. Summary of SCG SMCP (SCG3882) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
Tankless water heater, com	116	74%	-1.1	322%	-0.6	397%	53%	66%
Total	116	4%	-1.1	322%	-0.6	397%	53%	66%
kWh								

Demand control for centralized WH Recirculation pump	2	100%	10	100%	6	100%	60%	60%
Tankless water heater, com	116	74%	-8,984	322%	-5,418	441%	60%	78%
Total	118	75%	-8,974	342%	-5,412	441%	60%	78%
Therms								
Hot water pipe insulation	25	0%	6,764	100%	3,044	100%	45%	45%
Steam trap	1,143	0%	99,484	100%	67,649	100%	68%	68%
Gas dryer modulating valve	39	3%	19,929	100%	11,957	100%	60%	60%
Demand control for centralized WH recirculation pump	2	100%	18	100%	11	100%	60%	60%
Tankless water heater, com	116	74%	62,160	348%	37,490	449%	60%	78%
Total	1,325	4%	188,355	182%	120,151	209%	64%	73%

6.4.6 SCG Residential Advanced Clean Energy Program (SCG3883)

Within the SCG Res ACE Program, there were six measures that contained discrepancies compared to the eTRM and DEER measure package source of record (Table 6-6). Climate zone errors occurred in the faucet aerator, Smart Thermostat, duct seal, low-flow showerhead, thermostatic shower valve (TSV) with and without low-flow showerhead, and water heater pipe wrap measures. This resulted in minor changes in the evaluated savings for the measures that are dependent on climate zones (all of the previously listed measures except for water heater pipe wrap). The main discrepancy occurred in the duct seal measure where roughly 85% of the claims incorrectly captured the building vintage column. This did not impact savings, but it is important to note that this measure package has a different measure application type and EUL depending on the building vintage, so this detail is important to consider and capture correctly. These discrepancies were minimal, and the program achieved a GRR of 100% for all three impact types (kW, kWh, and Therms).

Table 6-6. Summary of SCG Res ACE (SCG3883) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
Duct seal	7,725	86%	2,192	100%	2,074	101%	95%	95%
Tankless water heater, res	370	0%	-0.2	100%	0	0%	85%	85%
Total	8,095	82%	2,192	100%	2,074	101%	95%	95%
kWh								
Duct seal	7,725	86%	1,644,288	100%	1,562,071	100%	95%	95%
Tankless water heater, res	370	0%	-1,507	100%	-1,281	100%	85%	85%
Smart Thermostat	7,888	<1%	777,099	100%	738,246	100%	95%	95%
Total	13,521	49%	2,419,881	100%	2,299,035	100%	95%	95%
Therms								
Duct seal	7,725	86%	177,699	100%	168,812	100%	95%	95%
Diverting tub spout with TSV	275	0%	2,664	100%	2,265	100%	85%	85%
Tankless water heater, res	370	0%	33,383	100%	28,375	100%	85%	85%
Faucet aerator	4,071	<1%	19,833	100%	16,858	100%	85%	85%
Water heater pipe wrap	5,591	<1%	59,855	100%	50,895	100%	85%	85%
Low-flow showerhead	5,746	<1%	20,328	100%	17,278	100%	85%	85%
TSV with and without low-flow showerhead	5,370	<1%	12,924	100%	10,991	100%	85%	85%
Smart Thermostat	7,888	<1%	40,747	100%	38,704	100%	95%	95%
Total	37,036	18%	367,433	100%	334,178	100%	91%	91%

6.4.7 SCG Comprehensive Manufactured Home Program (SCG3884)

The SCG Comprehensive Manufactured Home Program claimed savings extremely well, as Table 6-7 indicates. There were no discrepancies identified during the gross analysis process. The only differences between reported and evaluated savings were rounding differences between the claims and the eTRM. The program achieved a GRR of 100% for all fuels.

Table 6-7. Summary of SCG CMHP (SCG3884) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
Duct seal	1,486	0%	509	100%	484	100%	95%	95%
Tankless water heater, res	225	0%	-0.11	100%	0	0%	85%	85%
Total	1,711	0%	509	100%	484	100%	95%	95%
kWh								
Duct seal	1,486	0%	920,165	100%	874,155	100%	95%	95%
Tankless water heater, res	225	0%	-766	100%	-651	100%	85%	85%
Smart Thermostat	1,226	0%	99,653	100%	94,673	100%	95%	95%
Total	2,937	0%	1,019,052	100%	968,177	100%	88%	88%
Therms								
Duct seal	1,486	0%	18,900	100%	17,951	100%	95%	95%
Diverting tub spout with TSV	5	0%	50	100%	43	100%	85%	85%
Tankless water heater, res	225	0%	20,796	100%	17,677	100%	85%	85%
Faucet aerator	881	0%	3,108	100%	2,641	100%	85%	85%
Water heater pipe wrap	1,171	0%	31,853	100%	27,077	100%	85%	85%
Low-flow showerhead	595	0%	5,018	100%	4,265	100%	85%	85%
TSV with and without low-flow showerhead	513	0%	1,151	100%	978	100%	85%	85%
Smart Thermostat	1,226	0%	3,957	100%	3,758	100%	95%	95%
Total	6,102	0%	84,833	100%	74,391	100%	88%	88%

6.4.8 SCE Multifamily Energy Efficiency Program (SCE_3P_2020RCI_004)

This program was not evaluated in the gross savings analysis roll up in other sections of this report. This program was discontinued and only had one eligible claim to be evaluated. Eight of the nine claims had zero savings values and the NonSav flag set as TRUE in the claims data indicating an error correction or a possible third-party bonus payment accounting correction. Table 6-8 below summarizes the review of the single valid claim for this program. There were no discrepancies identified and the program achieved a GRR and NRR of 100% for all three impact types (kW, kWh, and Therms).

Table 6-8. Summary of SCE Multifamily (SCE_3P_2020RCI_004) tracking data correspondence with DEER values

Measure name	Number of claims	Claims with discrepancy	Claimed gross savings	GRR	Claimed net savings	NRR	Claimed NTGR	Reviewed NTGR
kW								
LED, Tube Type B and C	1	0%	0.23	100%	0.13	100%	0.55	0.55
kWh								
LED, Tube Type B and C	1	0%	15,312	100%	8,422	100%	0.55	0.55
Therms								
LED, Tube Type B and C	1	0%	-166	100%	-91	100%	0.55	0.55

6.5 Appendix E: Stratified sampling

The residential end-user sample design followed a stratified random sample at the participant measure group level. It was stratified by measure group, program, and savings magnitude. The goal was to receive 532 total responses to achieve an



overall relative precision of $\pm 5\%$ at a 90% confidence level. We received 674 measure level responses, which allowed us to meet the targeted precision level.

For the residential end-user sample design, we defined a participant as a specific contact at a specific address who participated in one of the local 3PPs. If a participant was associated with multiple claims for the same measure group from the same program at the same address, those claims were summarized and recorded in the sample frame. Participant appeared in the sample design for each distinct measure, address, and program they have a claim for in the tracking data. For example, if a participant participated in two residential programs and received two distinct measures from each, the participant would appear four times in the sample frame. We asked participants only about measures related to one address and program. For those with multiple addresses or programs we asked about their highest priority measures (i.e., measures with small populations or large savings). Table 6-9 provides the residential end-user sample design stratification by measure type.

Table 6-9. Residential end-user sampling by measure type

Measure	Target Precision at 90% confidence	Sample size	Total population	Total MMBTUs
Faucet aerator	10%	77	7,031	4,907
HVAC duct test & seal	10%	85	9,055	30,862
HVAC fan motor controller	24%	22	216	464
HVAC fan motor replacement	26%	14	137	165
Insulation (Pipe & Tank)	10%	127	7,542	11,614
Showerhead	10%	77	9,801	5,540
Smart Thermostat	10%	70	9,582	7,771
Tankless water heater	10%	60	772	7,196
TOTAL	5%	532	44,136	68,518

Table 6-10 provides the residential end-user sample design stratification by program.

Table 6-10. Residential end-user sample design stratification by program

Program	Target Precision at 90% confidence	Sample size	Total population	Total MMBTUs
CLEO - SCG3861	9%	82	7,064	6,304
Res ACE - SCG3883	6%	313	30,476	44,992
CMHP - SCG3884	11%	86	5,408	11,958
RZNET - SDGE4002	27%	51	1,188	5,264
TOTAL	5%	532	44,136	68,518

The residential non-participant sample design also followed a stratified random sample at the customer level. It was stratified by building type, utility, and energy consumption magnitude. We defined a customer as a specific contact with a unique account ID. For the residential non-participant survey, our goal was to get 1,568 total responses to achieve an overall relative precision of $\pm 3\%$ at a 90% confidence level. We received over 2,262 responses, which allowed us to meet the targeted precision level. Table 6-11 provides the residential non-participant sample design stratification by dwelling type.

Table 6-11. Residential non-participant sample design stratification by dwelling type

Building type	Target Precision at 90% confidence	Sample size	Total population	Total MMBTUs
Mobile Home	14%	68	2,258	2,098,199
Multifamily	7%	435	1,717,108	65,052,428
Single Family	3%	1,065	4,200,755	207,459,772
TOTAL	3%	1,568	5,920,121	274,610,340

Table 6-12 provides the residential non-participant sample design stratification by utility.

Table 6-12. Residential non-participant sample design stratification by utility

Utility	Target Precision at 90% confidence	Sample size	Total population	Total MMBTUs
SCG	3%	1,304	4,889,211	237,403,963
SDGE	6%	264	1,030,910	37,206,437
TOTAL	3%	1,568	5,920,121	274,610,340

We also used a stratified random sample at the participant measure group level for the non-residential participant sample design. It was stratified by measure group, program, and savings magnitude. Given expected response rates to the telephone survey, our goal was to get 48 total responses to achieve an overall relative precision of $\pm 21\%$ at a 90% confidence level. We received 64 measure level responses, which allowed us to meet the targeted precision level.

For the non-residential sample design, we defined a participant as a specific contact at one address who participated in the public sector or commercial local 3PP. If a participant was associated with multiple claims for the same measure group from the same program at the same address, those claims are summarized and recorded in the sample frame. A participant appeared in the sample frame for each distinct measure and address the participant had a claim for in the tracking data. For example, if a participant received two distinct measures at two addresses, the participant would appear four times in the sample frame. In the survey, we asked participants about all measures received at all addresses. Table 6-13 provides the non-residential end-user sample design stratification by measure type.

Table 6-13. Non-residential end-user sample design stratification by measure type

Measure	Target Precision at 90% confidence	Sample size	Total population	Total MMBTUs
Boiler steam traps	20%	13	53	9,946
Food service	0%	1	1	160
Heat pump water heater	28%	11	43	13,834
Indoor LED lighting	45%	4	16	787
Insulation	39%	4	15	676
Modulating gas valve	24%	9	36	1,992
Outdoor LED lighting	54%	2	8	491
Refrigeration	0%	1	1	11
Tankless water heater	88%	2	7	6
Water heating controls	58%	1	2	2
TOTAL	21%	48	182	34,083

Table 6-14 provides the non-residential sample design stratification by program.



Table 6-14. Non-residential end-user sample design stratification by program

Program	Target Precision at 90% confidence	Sample size	Total population	Total MMBTUs
GK12 - PGE_Pub_009	26%	19	69	15,283
SMCP - SCG3882	31%	29	113	18,800
TOTAL	21%	48	182	34,083

The multi-family sample design was a stratified random sample at the participant measure group level. It was stratified by measure group, program, and savings magnitude. Our goal was to get 110 total responses to achieve an overall $\pm 8\%$ relative precision at a 90% confidence level. We received 118 measure level responses which allowed us to achieve our targeted precision.

For the multi-family sample design, a property manager participant was defined as a specific contact at one address who participated in one of the local 3PPs. If a property manager participant was associated with multiple claims for the same measure group from the same program at the same address, those claims were summarized and recorded in the sample frame. A participant appeared in the sample frame for each distinct measure and address the participant had a claim for in the tracking data. For example, if a participant received two distinct rebated measures at two addresses, they would appear four times in the sample frame. For the survey we asked property managers about all measures received at all addresses. Table 6-15 provides the property manager sample design stratification by measure type.

Table 6-15. Property manager sample design stratification by measure type

Measure	Precision	Target sample	Total population	Total MMBTUs
Faucet aerator	60%	2	7	167
Heat pump water heater	0%	1	1	25
Indoor LED lighting	29%	9	36	899
Insulation	10%	65	343	150,962
Showerhead	51%	3	15	138
Water heating controls	15%	30	125	58,466
TOTAL	8%	110	527	210,658

Table 6-16 provides the property manager sample design stratification by program.

Table 6-16. Property manager sample design stratification by program

Program	Precision	Sample population	Total population	Total MMBTUs
MESP - PGE_Res_003	15%	31	126	58,491
RZNET - SDGE4002	10%	79	400	152,131
TOTAL	8%	110	527	210,658

6.6 Appendix F: NTGR survey scoring

For the local 3PPs, DNV used a standard NTGR approach that assesses three dimensions of free-ridership: timing, quantity, and efficiency. The programs induce savings if they accelerate the timing of measure installation, increase the number of measures installed, or raise the efficiency level of what was installed.

The timing dimension is relevant to all measures. Quantity and efficiency are relevant for certain measures and not for others. For example, it is almost always the case that the entire duct system is treated at once, so quantity would always be one. Similarly, the ducts are either sealed or not, so there is not a variable level of efficiency as there would be for a furnace. The following provides measures and dimensions covered by participant type in the PY2021 local 3PP evaluation:



1. **Smart Thermostats (timing, efficiency)** - For Smart Thermostats, the residential and multifamily property manager surveys asked about “efficiency” in terms of the type of thermostats that would otherwise have been installed but rated these at only 2 levels—smart (efficient) or not. Residential Local 3PP participants could only receive a single smart thermostat so that the quantity dimension is not applicable.
2. **Fan motor replacement (timing, efficiency)** – Fan motors in could be repaired or replaced with a standard rather than a brushless motor, therefore the efficiency dimension is relevant for fan motors. For residential programs, a quantity of one is assumed for fan controls.
3. **Fan motor controls (timing)** – We assumed a single fan motor per household in residential programs. As a controller, it is either installed or not – there are no varying levels of efficiency for fan motor controllers.
4. **Duct sealing (timing)** – As noted above, duct sealing happens for the entire home and there are no variable levels of efficiency and quantity for residential programs.
5. **Modulating gas valve (timing, quantity)** – Modulating gas valves for non-residential (commercial) participant furnaces do not have varying levels of efficiency, but the quantity dimension is applicable.
6. **Tankless water heater (timing, efficiency, quantity(non-residential))** – Water heaters in residential and non-residential (commercial) programs could be replaced with standard water or high efficiency tankless water heaters. Participants in non-residential programs may have installed more than one unit.
7. **Heat pump water heater (timing, efficiency, quantity)** – Non-residential (public sector) participants and multifamily could have installed standard water heaters or high efficiency heat pump water heaters. The quantity dimension is also applicable for this group of participants.
8. **Water heating controls (timing, quantity)** – As a controller, this measure is either installed or not – there are no varying levels of efficiency for water heating controls, but the quantity dimension is applicable among multifamily and non-residential (commercial) where the measures were installed.
9. **Boiler steam trap (timing, quantity)** – Boiler steam traps in the non-residential (commercial) installations do not have varying levels of efficiency, but the quantity dimension is applicable.
10. **Showerhead (timing, quantity)** – For showerheads, there are no varying levels of efficiency, but the quantity dimension is applicable in both the residential and multifamily programs.
11. **Faucet aerator (timing, quantity)** – Similar to showerheads, faucet aerators do not have varying levels of efficiency, but the quantity dimension is applicable in both the residential and multifamily programs.
12. **Insulation (timing, quantity for multifamily)** – There are no varying levels of efficiency for pipe insulation and happens for the entire home in the residential programs. Survey respondents who are multifamily property managers could be responsible for common areas and multiple homes and could have decided to install pipe insulation in more or fewer units. Thus, the quantity dimension is applicable to multifamily survey respondents.
13. **Indoor LED lighting (timing, efficiency, quantity for non-residential and multifamily)** – Lighting could be replaced with a standard or efficient version. Therefore, the efficiency dimension is relevant lighting. For non-residential and multifamily programs, the quantity dimension is also applicable.
14. **Outdoor LED lighting (timing, efficiency, quantity for non-residential and multifamily)** – Lighting could be replaced with a standard or efficient version. Therefore, the efficiency dimension is relevant lighting. For non-residential and multifamily programs, the quantity dimension is also applicable.

The NTGR survey scoring elements are summarized below in Table 6-17.

Table 6-17. Free-ridership elements by survey respondent type

Free-ridership dimension	Measures applicable	Question wording	Answer	Free-ridership score
Likelihood	All measures	Without [IOU]’s program, how likely would you have been to initiate and	Very Likely	1
			Somewhat likely	.75

Free-ridership dimension	Measures applicable	Question wording	Answer	Free-ridership score
		complete the entire project at an approximate full price of {low end package cost} to {high end package cost}? Would you say...	A 50/50 Chance	.5
			Somewhat unlikely	.25
			Very Unlikely	0
Timing - (FR _t)	All measures	Without the program offering on [INSTALL DATE], when would you have completed this project?	At the same time or sooner	1
			1 to 24 months later	(24 - # of months)/24
			More than 24 months later	0
			Never	0
			Don't know	Average of non-Don't know answers
Efficiency - (FR _e)	Smart Thermostats	Smart thermostats come in a variety of models. There are BASIC models that cost about \$130-\$150 (e.g., Nest E and Ecobee 3 lite) and UPGRADED models that offer additional sensing technology and cost about \$210-\$250 (e.g., Nest Learning 3rd Gen and Ecobee 4). There are also programmable and non-programmable thermostats that cost from \$20-\$100. If the program didn't offer a smart thermostat in 2022, which model would you have likely purchased?	Would have purchased the BASIC model smart thermostat(s)	1
			Would have purchased the UPGRADED model smart thermostat(s)	1
			Would have purchased standard programmable thermostat(s); (e.g., without smart capabilities)	0
			Would NOT have purchased any thermostat(s)	0
	Indoor LED Lighting	We would also like to know what influence the [IOU] program had, if any, on the decision to install new high efficiency indoor LED lighting. Without the program, which of the following would you have done?	Would have purchased STANDARD efficiency Indoor LED lights	0
			Would have purchased ENERGY STAR Indoor LED lights	1
			Would NOT have purchased any Indoor LED lights	0
	Outdoor LED Lighting	We would also like to know what influence the [IOU] program had, if any, on the decision to install new high efficiency indoor LED lighting. Without the program, which of the following would you have done?	Would have purchased STANDARD efficiency Indoor LED lights	0
			Would have purchased ENERGY STAR Indoor LED lights	1
			Would NOT have purchased any Indoor LED lights	0
	Water Heater (Heat Pump/Tankless)	We would also like to know what influence the [IOU] program had, if any, on the decision to install new high efficiency Water Heating equipment. Without the program, which of the following would you have done?	Would have purchased STANDARD efficiency water heater	0
			Would have purchased HIGH EFFICIENCY heat pump water heater	1
			Would NOT have purchased any water heater	0
	Fan motor replacements	We would also like to know what influence the program had, if any, on the decision to have a technician install a new FAN MOTOR on the furnace. Without the program, which of the following would you have done?	Replace with a high efficiency motor (i.e., brushless) similar to the one I received from the program	1
			Replace with a standard motor	0
			Repair the existing equipment	0
			Nothing, no replacement, or repair	0

Free-ridership dimension	Measures applicable	Question wording	Answer	Free-ridership score
Quantity- (FR _q)	Residential Showerheads and faucet aerators	Without the program, how many [showerheads/aerators] would you have installed at your own expense?	None	0
			1	1 – ((n - answer)/n), where n is the number of measures installed through the program
			2	
			3	
			4	
			5 or more	Average of non-Don't know answers
	Don't know			
	All non-residential and multifamily measures	Without the program offering, how many of the following upgrades would you have completed at your own expense? Please estimate the portion that would have been completed as a percent for each type of equipment.	0%	0
			1%-10%	.05
			11% - 20%	.15
			21% - 30%	.25
			31% - 40%	.35
			41% - 50%	.45
			51% - 60%	.55
			61% - 70%	.65
			71% - 80%	.75
			81% - 90%	.85
			91% - 100%	.95
			100% (All)	1
Don't know			Average of non-Don't know answers	

Using these metrics in combination allowed us to fully assess the amount of savings that could be attributed to measures that participants would have installed absent program support. We assigned each respondent a score for each free-ridership metric based on their survey responses and combined those scores into an overall free-ridership score using the algorithms in Equations 1 through 5.

Equation 1: Free-ridership Scoring Algorithm if likelihood score is 0

$$\text{Free-ridership} = 0$$

Equation 2: Free-ridership Scoring Algorithm for measures with only timing component

$$\text{Free-ridership} = \text{FR}_{\text{timing score}}$$

Equation 3: Free-ridership Scoring Algorithm for measures with relevant efficiency component

$$\text{Free-ridership} = \text{FR}_{\text{timing score}} * \text{FR}_{\text{efficiency score}}$$



Equation 4: Free-ridership Scoring Algorithm for measures with relevant quantity component

$$\text{Free-ridership} = \text{FR_timing} * \text{FR_quantity}$$

Equation 5: Free-ridership Scoring Algorithm for measures with relevant efficiency and quantity component

$$\text{Free-ridership} = \text{FR_timing} * \text{FR_quantity} * \text{FR_efficiency score}$$

Program attribution or NTGRs are simply the complement of free-ridership and estimated as: $\text{NTGR} = 1 - \text{Free-ridership}$.

Measure and program level NTGRs derived from participant surveys are weighted by savings claims to compute measure and program attribution estimates.

6.7 Appendix G: Sample weights

DNV presents summaries of the sample weights developed for the net attribution analysis (NTGR) and demographic surveys in this section.

Participant net attribution analysis: For the net attribution analysis, we merged the survey data with the program tracking data by customer and measure. Weights were calculated by measure type, building type, and hard-to-reach status. Within each of these cells, weights for most measures were calculated using a simple random sampling approach due to the uniformity of measure savings within a specific measure type and cell. Table 6-18 presents the post-stratification weights for the participant survey NTG results.

Table 6-18. Participant NTG survey post-stratification weights

Building Type	Measure	HTR	Stratum	Population	Maximum First Year Gross Savings (btu)	First Year Gross (btu)	Sample	Weight
Residential	Faucet aerator	HTR			675,479	1,073,199,744		
Residential	Faucet aerator	Non-HTR	1	2,890	977,981	4,584,744	44	65.68
Residential	Faucet aerator	HTR	2	1,534	926,124	1,241,379,934	23	66.70
Residential	Faucet aerator	HTR	3	1,370	934,767	1,275,556,089	19	72.11
Residential	Faucet aerator	HTR	4	1,237	3,691,198	1,312,361,691	21	58.90
Residential	HVAC duct test and seal	HTR	1	1,998	2,801,212	4,379,324,202	27	74.00
Residential	HVAC duct test and seal	HTR	2	1,548	3,350,175	4,655,275,512	24	64.50
Residential	HVAC duct test and seal	HTR	3	1,304	4,201,818	4,861,701,707	23	56.70
Residential	HVAC duct test and seal	HTR	4	901	182,034,052	5,601,669,132	17	53.00
Residential	HVAC duct test and seal	Non-HTR	1	1,990	3,526,944	5,383,968,953	17	117.06
Residential	HVAC duct test and seal	Non-HTR	2	1,314	13,319,053	5,979,724,812	11	119.45
Residential	HVAC fan motor controller	HTR	1	143	26,444,085	335,938,832	9	15.78
Residential	HVAC fan motor controller	HTR	2		39,481,872	39,481,872		
Residential	HVAC fan motor controller	Non-HTR	1	74	1,706,070	88,381,250	2	37.00
Residential	HVAC fan motor	HTR	1	90	10,431,055	107,418,458	7	12.86
Residential	HVAC fan motor	HTR	2		19,868,677	19,868,677		
Residential	HVAC fan motor	Non-HTR	1	47	993,434	37,750,486	5	9.40
Residential	Insulation	HTR	1	2,750	628,850	1,729,336,590	32	85.94
Residential	Insulation	HTR	2	2,338	2,169,481	1,842,863,450	33	70.85

Residential	Insulation	HTR	3	893	2,819,326	2,292,958,852	20	44.65
Residential	Insulation	HTR	4	826	2,869,314	2,336,861,357	13	63.54
Residential	Insulation	HTR	5	603	215,918,383	2,873,310,115	6	100.50
Residential	Insulation	Non-HTR	1	132	80,958,646	538,687,223	11	12.00
Residential	Showerhead	HTR			380,895	1,155,293,483		
Residential	Showerhead	Non-HTR	1	4,353	758,192	2,460,255	56	77.73
Residential	Showerhead	HTR	2	2,489	761,790	1,330,368,390	38	65.50
Residential	Showerhead	HTR	3	1,841	831,365	1,423,174,186	25	73.64
Residential	Showerhead	HTR	4	1,118	8,278,021	1,628,342,726	21	53.24
Residential	Smart thermostat	HTR	1	2,404	796,972	1,528,648,059	49	49.06
Residential	Smart thermostat	HTR	2	1,930	972,664	1,607,596,434	43	44.88
Residential	Smart thermostat	HTR	3	1,647	2,821,884	1,673,408,961	16	102.94
Residential	Smart thermostat	Non-HTR	1	1,997	796,972	1,441,528,445	9	221.89
Residential	Smart thermostat	Non-HTR	2	1,604	1,945,328	1,520,118,513	5	320.80
Residential	Tankless water heater	HTR	1	207	9,083,460	1,763,458,102	15	13.80
Residential	Tankless water heater	HTR	2	195	9,366,089	1,791,677,124	14	13.93
Residential	Tankless water heater	HTR	3	190	9,533,864	1,797,521,870	10	19.00
Residential	Tankless water heater	HTR	4	180	19,666,766	1,843,287,892	9	20.00
Non-Residential	Boiler steam traps	Non-HTR	1	31	190,354,494	4,580,405,022	12	2.58
Non-Residential	Boiler steam traps	Non-HTR	2	22	309,326,053	5,365,617,311	7	3.14
Non-Residential	Heat pump water heater	Non-HTR	1		1,429,866,173	13,833,967,795		
Non-Residential	Water heating controls	HTR	1	45	935,295	1,870,590	17	2.65
Non-Residential	Indoor LED lighting	Non-HTR	1	16	168,594,830	787,451,146	5	3.20
Non-Residential	Insulation	Non-HTR	1		100,711,924	430,449,098		
Non-Residential	Insulation	HTR	2	15	245,827,233	245,827,233	5	3.00
Non-Residential	Modulating gas valve	Non-HTR	1	36	102,175,574	1,992,423,697	10	3.60
Non-Residential	Outdoor LED lighting	Non-HTR	1	8	118,857,427	491,090,816	3	2.67
Non-Residential	Refrigeration	Non-HTR	1	2	10,669,762	10,669,762	2	1.00
Non-Residential	Food service	Non-HTR	1		159,561,856	159,561,856		
Non-Residential	Tankless water heater	HTR	1	7	46,615,465	77,094,807	3	2.33
Non-Residential	Tankless water heater	Non-HTR			3,549,737,074	6,106,778,802		
Multifamily	Indoor LED lighting	HTR	1	11	55,634,622	181,513,291	2	5.50
Multifamily	Indoor LED lighting	Non-HTR	1	25	98,943,010	532,676,246	4	6.25
Multifamily	Indoor LED lighting	HTR	2		184,893,504	184,893,504		
Multifamily	Insulation	HTR	1	60	3,787,800,499	16,401,020,219	8	7.50
Multifamily	Insulation	Non-HTR	1	225	529,035,530	37,091,916,913	26	8.65
Multifamily	Insulation	Non-HTR	2	51	1,974,452,993	53,103,548,218	15	3.40
Multifamily	Insulation	Non-HTR	3	7	10,607,388,228	44,365,527,104	2	3.50
Multifamily	Showerhead	Non-HTR	1	22	25,444,001	138,441,835	5	4.40
Multifamily	Faucet aerator	HTR	1		71,867,325	167,420,277		

Multifamily	Water heating controls		1		2,319,345,544	52,508,947,362		
Multifamily	Water heating controls	Non-HTR	2	126	5,957,425,835	5,957,425,835	56	2.25
Multifamily	Heat pump water heater		1		24,548,982	24,548,982		

Demographic survey analysis: To calculate site level weights for the participant survey respondent demographics analysis, we merged the survey data with the program tracking data by customer and measure. Weights were calculated by building type and hard-to-reach status. Within each of these cells (domains), weights were calculated based on three savings strata. Table 6-19 presents the post stratification weights for the participant survey results.

Table 6-19. Participant demographic survey analysis post stratification weights

Building Type	Measure	HTR	Stratum	Population	Maximum First Year Gross Savings (btu)	First Year Gross (btu)	Sample	Weight
Residential	Faucet aerator	HTR	1	2,890	675,479	1,070,000,000	72	40.14
Residential	Faucet aerator	Non-HTR			977,981	4,584,744		
Residential	Faucet aerator	HTR	2	1,534	926,124	1,240,000,000	32	47.94
Residential	Faucet aerator	HTR	3	1,370	934,767	1,280,000,000	40	34.25
Residential	Faucet aerator	HTR	4	1,237	3,691,198	1,310,000,000	35	35.34
Residential	HVAC duct test and seal	HTR	1	1,998	2,801,212	4,380,000,000	60	33.30
Residential	HVAC duct test and seal	HTR	2	1,548	3,350,175	4,660,000,000	46	33.65
Residential	HVAC duct test and seal	HTR	3	1,304	4,201,818	4,860,000,000	37	35.24
Residential	HVAC duct test and seal	HTR	4	901	182,000,000	5,600,000,000	34	26.50
Residential	HVAC duct test and seal	Non-HTR	1	1,990	3,526,944	5,380,000,000	36	55.28
Residential	HVAC duct test and seal	Non-HTR	2	1,314	13,319,053	5,980,000,000	24	54.75
Residential	HVAC fan motor controller	HTR	1	142	26,444,085	336,000,000	14	10.14
Residential	HVAC fan motor controller		2		39,481,872	39,481,872		
Residential	HVAC fan motor controller	Non-HTR	1	74	1,706,070	88,381,250	8	9.25
Residential	HVAC fan motor	HTR	1	90	10,431,055	107,000,000	10	9.00
Residential	HVAC fan motor		2		19,868,677	19,868,677		
Residential	HVAC fan motor	Non-HTR	1	47	993,434	37,750,486	7	6.71
Residential	Insulation	HTR	1	2,750	628,850	1,730,000,000	57	48.25
Residential	Insulation	HTR	2	2,338	2,169,481	1,840,000,000	70	33.40
Residential	Insulation	HTR	3	893	2,819,326	2,290,000,000	41	21.78
Residential	Insulation	HTR	4	826	2,869,314	2,340,000,000	28	29.50
Residential	Insulation	HTR	5	603	216,000,000	2,870,000,000	14	43.07
Residential	Insulation	Non-HTR	1	132	80,958,646	539,000,000	21	6.29
Residential	Showerhead	HTR	1	4,353	380,895	1,160,000,000	89	48.91
Residential	Showerhead	Non-HTR			758,192	2,460,255		
Residential	Showerhead	HTR	2	2,489	761,790	1,330,000,000	53	46.96
Residential	Showerhead	HTR	3	1,841	831,365	1,420,000,000	34	54.15
Residential	Showerhead	HTR	4	1,118	8,278,021	1,630,000,000	35	31.94
Residential	Smart thermostat	HTR	1	2,404	796,972	1,530,000,000	76	31.63
Residential	Smart thermostat	HTR	2	1,930	972,664	1,610,000,000	54	35.74
Residential	Smart thermostat	HTR	3	1,647	2,821,884	1,670,000,000	24	68.63
Residential	Smart thermostat	Non-HTR	1	1,997	796,972	1,440,000,000	10	199.70

Building Type	Measure	HTR	Stratum	Population	Maximum First Year Gross Savings (btu)	First Year Gross (btu)	Sample	Weight
Residential	Smart thermostat	Non-HTR	2	1,604	1,945,328	1,520,000,000	10	160.40
Residential	Tankless water heater	HTR	1	207	9,083,460	1,760,000,000	21	9.86
Residential	Tankless water heater	HTR	2	195	9,366,089	1,790,000,000	21	9.29
Residential	Tankless water heater	HTR	3	190	9,533,864	1,800,000,000	14	13.57
Residential	Tankless water heater	HTR	4	180	19,666,766	1,840,000,000	12	15.00
Non-Residential	Boiler steam traps	Non-HTR	1	31	190,000,000	4,580,000,000	12	2.58
Non-Residential	Boiler steam traps	Non-HTR	2	22	309,000,000	5,370,000,000	7	3.14
Non-Residential	Heat pump water heater	Non-HTR	1	45	1,430,000,000	13,800,000,000	17	2.65
Non-Residential	Water heating controls		1		935,295	1,870,590		
Non-Residential	Indoor LED lighting	Non-HTR	1	16	169,000,000	787,000,000	7	2.29
Non-Residential	Insulation	Non-HTR	1	15	101,000,000	430,000,000	5	3.00
Non-Residential	Insulation		2		246,000,000	246,000,000		
Non-Residential	Modulating gas valve	Non-HTR	1	36	102,000,000	1,990,000,000	10	3.60
Non-Residential	Outdoor LED lighting	Non-HTR	1	8	119,000,000	491,000,000	4	2.00
Non-Residential	Refrigeration	Non-HTR	1	2	10,669,762	10,669,762	2	1.00
Non-Residential	Food service		1		160,000,000	160,000,000		
Non-Residential	Tankless water heater	HTR	1	7	46,615,465	77,094,807	3	2.33
Non-Residential	Tankless water heater	Non-HTR			3,550,000,000	6,110,000,000		
Multifamily	Indoor LED lighting	HTR	1	11	55,634,622	182,000,000	2	5.50
Multifamily	Indoor LED lighting	Non-HTR	1	26	98,943,010	533,000,000	5	5.00
Multifamily	Indoor LED lighting		2		185,000,000	185,000,000		
Multifamily	Insulation	HTR	1	60	3,790,000,000	16,400,000,000	8	7.50
Multifamily	Insulation	Non-HTR	1	225	529,000,000	37,100,000,000	26	8.65
Multifamily	Insulation	Non-HTR	2	51	1,970,000,000	53,100,000,000	15	3.40
Multifamily	Insulation	Non-HTR	3	7	10,600,000,000	44,400,000,000	2	3.50
Multifamily	Showerhead	Non-HTR	1	22	25,444,001	138,000,000	6	3.67
Multifamily	Faucet aerator		1		71,867,325	167,000,000		
Multifamily	Water heating controls		1		2,320,000,000	52,500,000,000		
Multifamily	Water heating controls	Non-HTR	2	126	5,960,000,000	5,960,000,000	57	2.21
Multifamily	Heat pump water heater		1		24,548,982	24,548,982		

6.8 Appendix H: Detailed program-level marketing approaches

SDGE’s Residential Zero Net Energy Transformation Program (RZNET - SDGE4002): In PY2022, various strategies were used by the program, including direct outreach, email campaigns, phone calls, and door hangers. Direct outreach remained the most effective tactic in PY2022, consistent with PY2021. Program staff planned for television ad campaigns in 2023 and anticipate that they will have a meaningful impact on participation in 2023.



PG&E's Government and K-12 Comprehensive Program (GK12 - PGE_Pub_009): During last year's evaluation, the program highlighted that it shifted its approach from the data-driven to a more holistic view of marketing and outreach. The program continued to lean on the support of various stakeholders in the public sector realm. Local government partnerships (LGP) were integral in generating leads for the projects. The program confirmed that relying on trusted stakeholders, building relationships, and leveraging them was the most effective outreach method.

PG&E's Multifamily Energy Savings Program (MESP - PGE_Res_003): In 2021, the program used diverse strategies, including magazine advertisements, direct mail, email campaigns, and phone calls. However, in PY2022, in-person events resumed after a hiatus due to COVID-19. The program also shifted from focusing on apartment owners to assisted living communities to improve outreach efforts. The program also forged a partnership with a vendor. Nevertheless, the market response was lacklustre, underscoring the inherent difficulty of penetrating the multifamily segment of the market.

SCG's Community Language Efficiency Outreach Program (CLEO - SCG3861): The program continues to engage in outreach tactics from PY2021, such as participation in community-based organization activities, community booths, and language seminars. However, in PY2022, there was a notable shift in focus toward door hangers as a primary marketing outreach tactic targeting customers. The primary reason behind this change was to increase customer awareness about various programs and their enrolment in direct install measure programs. The door hanger campaign has proven effective in generating leads from customers who expressed interest in tankless water heaters and the free measures. Direct outreach remains a successful strategy for the program.

SCG's Small and Medium Commercial EE Program (SMCP - SCG3882): In PY2021, the implementer strategically utilized data and analysis tools to enhance their outreach efforts. Additionally, the implementer forged partnerships with trade allies, recognizing the value of collaboration to improve program participation. In PY2022, the program continued these efforts, focusing on targeted emails reaching out to previous participants.

SCG's Residential Advanced Clean Energy (Res ACE – SCG3883): Previously (PY2021), the program relied on direct outreach and web and social media campaigns. In PY2022, the program administrator took significant steps by establishing an internal marketing department with a videographer and a dedicated social media and website specialist. Through consistent email campaigns and web inquiries, the program has experienced a substantial increase in online engagement. The PA reported that direct outreach continues to be the most successful strategy. The program also noticed that web and email campaigns have started to gain a larger share of successful leads.

SCG's Comprehensive Manufactured Home Program (CMHP – SCG3884): In PY2021, the program used direct outreach to boost engagement and participation through clubhouse presentations in mobile home communities. It also utilized various methods, including community newsletters, door hangers, canvassing, and building relationships with community leaders for outreach. As of PY2022, there has been a shift towards emphasizing web and email campaigns. The establishment of an internal marketing department by the PA has significantly benefited the program. Despite these changes, direct outreach continues to be the most effective approach for generating viable leads, complemented by partnerships with other stakeholders such as community associations.

SCE's Multifamily Energy Efficiency Program (MFEED – SCE_3P_2020RCI_004): The program encountered various challenges in gaining market traction and eventually had to cease operations due to a lackluster market response. The program implementer identified the main obstacle as insufficient data, which hindered meaningful email or phone campaigns. Despite involving a sales team for direct outreach, the lack of customer data remained a barrier to effective outreach. The PA recognized that the employed approaches were not fruitful, attributing them to the absence of a compelling product or offer.



6.9 Appendix I: Survey instruments and interview guides

The following survey and interview guides are in the attached pdf files.

- 6.9.1 Residential end user survey instrument
- 6.9.2 Residential non-participant survey instrument
- 6.9.3 Non-residential end user survey instrument
- 6.9.4 Property manager survey instrument
- 6.9.5 Property manager IDI guide
- 6.9.6 Contractor survey instrument
- 6.9.7 PA interview guide
- 6.9.8 Implementer interview guide



6.10 Appendix J: Response to comments

Comment #	Commenter (self-identify by Party, PA, etc.)	Page (as shown at bottom of pdf document page); or "Overarching" for general comments	Comment/feedback/change requested	Evaluator's Response
1	PG&E	Overarching	PG&E appreciates the opportunity to review and provide comments on this draft report. It was well-written and well-organized. PG&E also appreciates the shift from a measure-level evaluation to a program-level evaluation and looks forward to this approach on-going.	Thank you for the feedback. We will take this into account for future evaluations.
2	PG&E	6	<p>The draft report stated, "Although some performance indicators for PG&E's Multifamily Energy Savings Program (MESP - PGE_Res_003) have improved significantly – such as TRC and the percent of net energy delivered—in PY2022 compared to PY2021, this program closed in the middle of 2023."</p> <p>PG&E would like to clarify that MESP's TRC ratio and Therms energy savings did improve in PY2022 compared to PY2021. However, its kWh and kW energy savings dropped significantly in PY2022 compared to PY2021. More specifically, MESP delivered 0.001% of its 2022 kWh savings goal (versus 32% of its 2021 goal) and 0% of its 2022 kW savings goal (versus 11% of its 2021 goal). Can the evaluation team modify the report's statement to make it factually accurate?</p>	We added a footnote to clarify the lack of program kW and kWh savings.
3	PG&E	6	<p>The draft report stated, "Competition: Implementers in the PG&E service territory faced competition from MCE in the North Bay and BayREN in nine Bay Area counties..."</p> <p>PG&E would like to clarify that this statement was not stated by PG&E program staff. Can the evaluation team modify this statement to clarify the source of this comment?</p>	We made edits to clarify that the information came from the implementer.
4	PG&E	6	<p>The draft report stated, "Limited direct install budget: PG&E program staff overseeing the local 3PP indicated that smaller-sized contracts limited the implementer budget and staffing for direct install offers and impacted the program's success."</p> <p>PG&E would like to clarify that the PG&E program team does not recall making this statement. Can evaluation team clarify the source of this comment and modify the draft report accordingly?</p>	This information came from the implementer. We edited the text to indicate such.
5	PG&E	44	<p>The draft report stated, "Although some performance indicators for PG&E's multifamily program have significantly improved year-over-year, including TRC and the percent of net energy delivered, this program closed in the middle of 2023."</p> <p>PG&E would like to reiterate and clarify that MESP's TRC ratio and Therms energy savings did improve in PY2022 compared to PY2021. However, its kWh and kW energy savings dropped significantly in PY2022 compared to PY2021. More specifically, MESP delivered 0.001% of its 2022 kWh savings goal (versus 32% of its 2021 goal) and 0% of its 2022 kW savings goal (versus 11% of its 2021 goal). Can the evaluation team modify the report's statement to make it factually accurate?</p>	We added a footnote to clarify the lack of program kW and kWh savings.



About DNV

DNV is an independent assurance and risk management provider, operating in more than 100 countries, with the purpose of safeguarding life, property, and the environment. Whether assessing a new ship design, qualifying technology for a floating wind farm, analyzing sensor data from a gas pipeline, or certifying a food company's supply chain, DNV enables its customers and their stakeholders to manage technological and regulatory complexity with confidence. As a trusted voice for many of the world's most successful organizations, we use our broad experience and deep expertise to advance safety and sustainable performance, set industry standards, and inspire and invent solutions.